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CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

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

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

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

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

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THE BUILDER

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English Gothic Architecture.



Y a curious but not unnatural inversion of the right order of things, the practice of Gothic architecture in this country as a revived style has preceded the adequate study and comprehension of this great and splendid phase of the art. It is not easy to say whether the earlier textbooks, such as Rickman's, were more the cause or the consequence of the newly-awakened appreciation which led to the Gothic revival in this country. But it is quite certain that neither that work

nor its immediate successors really went to the root of Gothic architecture. They tabulated external features, they created a nomenclature, and they formed a chronological system correct in its main outlines, but too precise and symmetrical in its conventional divisions to square with the living facts. Upon these bases, however, the revival arose and has run its course; and now that the practice of "modern Gothic" has died out except in its partial employment for churches—for even from that ecclesiastical stronghold it is getting daily unseated, we are beginning at last to rightly study and understand the meaning of that which, in regard to imitation of its forms at least, we are abandoning. And the position is empha-

sised by the publication, at this eleventh hour, of what may fairly be called the fullest and most complete illustrated treatise on the subject which has yet appeared,* the work not of an architect but of an amateur, who, with an educated comprehension of architecture, has for several years devoted to the study and illustration of his subject an amount of time and labour which no architect in practice could have spared for such an object.

Even if it were accepted that the practice of revived Gothic was to be abandoned and was a thing of the past,

* "Gothic Architecture in England"; an analysis of the origin and development of English Church architecture from the Norman Conquest to the Dissolution of the Monasteries. By Francis Bond, M.A., Lincoln College, Oxford; Hon. Associate R.I.B.A., London: B. T. Batford, 1905.

the study of the subject is of equal interest, even from a national point of view. As Mr. Bond truly says in his Introduction, "Of all the artistic achievements of the English race, two make unchallenged claim to pre-eminence: our imaginative literature and our mediæval architecture." And when we consider that nearly all French writers on mediæval architecture are ignorant of or indifferent to English architecture, and that American writers on the subject chiefly refer to English Gothic to belittle it and to represent French as the only Gothic worth attention, a work dealing fully and ably with our national architecture, by an author who has given proofs also of his extensive acquaintance with Continental Gothic, is the more to be welcomed.

Mr. Bond professes that his book is an attempt "not to classify, but to work out processes of development," to treat the subject by an evolutionary method. "English mediæval architecture has been presented too often as a sort of architectural Melchizedek, or as if it had sprung forth full-grown like some Pallas from the teeny head of Zeus, in the last half of the XIIIth century, in Caen or Canterbury. But the Norman offshoot of the great Romanesque stock had its roots in a distant past. Its history goes back to the earliest days of church building in newly Christianised Rome, to the first years of the IVth century. . . .

Throughout the book, therefore, reference has been made, where reasonable evidence exists, to the origin and history of mediæval architecture not only in our own country but throughout Gaul, Germany, and Italy in the Dark Ages." And so the author proceeds to an analysis as to what is Gothic. It is not necessarily pointed arches (as we have all come to see now). After mentioning various definitions into which we have not space to go, he ends by coming pretty nearly to the definition that it is the architecture of the buttress. In regard to its most complete forms it might be said to be architecture of the vault and buttress, which however would exclude some buildings, not vaulted, that are unquestionably Gothic. The universal element in Gothic is after all the buttress. But it may be replied that the buttress, although found in connexion with timber-roofed buildings, was first developed from the necessity for resisting the thrust of the vault at certain points; the vault is the *causa causans*; and even some of the existing unvaulted buildings were obviously intended to have been vaulted had not either the courage or the purse of the builders failed them. Mr. Bond goes on to point out that Anglo-Norman Romanesque represents a class of buildings which have or may have vaulted roofs, but in which the thrust of the vaults is stopped by general thickness of walls, not by buttresses. This affords a good distinction between Romanesque and Gothic, though even here, as the author implies, the line cannot be drawn exactly; the elements of Romanesque melt almost insensibly into those of Gothic. But the suggestion he makes as to the importance of the buttress as the distinctive element in Gothic is a good one. That dividing up of the walls into separate masses

placed at right angles to the axis of the building is the most essential structural distinction from the classic structure which treats the wall as a single mass parallel with the axis of the building. It is a process of resisting outward thrust instead of supporting vertical weight; and the treatment of the wall so as to express this function is of the essence of Gothic design. As long as the thickening of the wall at the required point retains the vertical lines and more or less of the suggestion of the pilaster, the character remains Romanesque; as soon as it is designed so as to express the function of leaning inward against an outward thrust, the true Gothic character is developed.

The plan adopted by the author for dealing with the whole complicated subject has been to divide his book into two main parts, of which the first, after the Introduction and a chapter on Definitions of Basilican Byzantine Romanesque and Gothic architecture, consists of a summary of the characteristics of English Romanesque and Gothic architecture according to chronological periods, which are divided thus:—1050—c. 1200; c. 1170—c. 1538; c. 1170—c. 1350; c. 1330—c. 1538; adding a chapter on "Chronological History of the Greater English Churches." The second and by far the largest part of the book is occupied with an analysis of the mediæval church architecture of England, in which separate elements—plan, supports, arches, vaulting, capitals, window-tracery, etc., etc., are each considered separately and in detail. The arrangement is a good one; we consider the subject first in its general aspect, secondly in its details. The last chapter of the Second Part consists of one of the most valuable items in the book, viz., a large selection of Gothic mouldings grouped in regard to the several portions of the building, in each of which the characteristic mouldings are arranged in chronological order, and (which is a very important merit) all are drawn to the same scale.

In considering the contents of so large a book (707 pages, besides the excellent and copious indexes), one can only undertake to deal with some special points, more particularly those in regard to which any special or new suggestion is made.

One point to which the author draws attention in the general summary is the great size of many of the early Norman churches of England, far surpassing the very largest of the mother country Normandy, and rarely equalled in the later days of complete Gothic architecture. The width of the Norman churches, he observes, was conditioned only by the length of the tie-beams by which they were spanned; but in remarking that this average width was not exceeded when stone vaulting was introduced, one may observe that it was not likely that it would be. It must have been felt, in those days of simple engineering science, that the vaulting of a roof with stone was a more difficult and risky undertaking than putting on a timber roof, which (in the form used in the Norman period) exercised little or no thrust on the walls; and the existence of churches in which the aisles are

vaulted in stone and the nave roofed with timber is an additional proof of this. If they had felt equal to facing the problem of vaults of 50 ft. span or upwards it would probably have been done; but at York, which is 45 ft., only a wooden groining was ventured on. But the fact of the great comparative scale of the Anglo-Norman churches has been rather overlooked, and is significant. May we not say that it was one of the indirect architectural results of the Conquest; a great military success nearly always leads to a greater expansion and boldness in architectural development, and more particularly when the conquerors left a province to gain a kingdom. Architecture also was to be carried out in the new kingdom on a scale worthy of the event. A remark on the same page however we must take exception to. After observing that, once the plan settled—mainly by considerations of ritual—the first object was to consider the roofing, the author goes on—"and a secondary object, insisted upon with astonishing persistence in the middle ages, was that the church, if large, should be fire-proofed by building beneath the roof a stone ceiling or vault." Surely this is putting the cart before the horse. We should rather say that the stone vault was the essential thing, and the timber roof over it a protection from the weather; and surely we may ascribe the preference for stone vaults to something higher than the merely utilitarian motive of fire-proofing. Is it to be supposed that the mediæval architects had no perception of the superior monumental effect of a building roofed with the same solid material as the walls? Men who could imagine and carry out such buildings were surely not devoid of that degree of æsthetic perception. In the course of his interesting and useful summary of the practical conditions of mediæval building the author is probably right in his suggestion that the very inefficient foundations often found—and which wreaked vengeance upon the builders—were not so much the result of ignorance or indifference as of economy, as we occasionally find very great care taken in the provision of adequate foundations. In some cases we may imagine that it was not merely economy of labour but of time; in the case of Peterborough front, for instance, there is every reason to imagine that the grand design was run up in a hurry to cut out Ely. Mr. Bond notes, too, the serious consequences sometimes resulting from the thrust of the aisle vault both against the outer wall and the arcade. It has been noted, he observes, by Sir Christopher Wren (he does not cite the passage) "that the pier arcade has not infrequently received a considerable inclination *inwards*, owing to the thrust of the aisle vault"; a distortion which the commonsense of Wren attributed to its true origin and not to what doctrinaire theorists call a "refinement." In regard to the theory that the sections of Gothic churches were proportioned according to the ratio of the sides of some adopted triangle, Mr. Bond is (like ourselves) entirely sceptical; as he says, "no two of these theories agree, nor are they based on uniform systems of measurement." In

regard however to the effect of the relation between breadth and height, he draws attention to an important point; that the width of the bays in comparison with their height has something to do with it, as well as the width of the cross section of the church. In the naves of Lichfield and Wells the height is only twice the span, yet they do not look low, as do the naves of Exeter and Lincoln, the section of which is about in the same proportion. The explanation suggested is that in the former cases the bays are narrower in proportion, and consequently impart an appearance of height to the whole. The mere incident of the vaulting shaft springing from the floor, or only from a corbel above the springing of the arcade, has also a considerable influence on apparent height, the former arrangement emphasising the vertical line.

Under the head of "abutment" Mr. Bond distinguishes five different systems for the abutment to the nave vault: (1) flying buttresses concealed beneath the aisle roof; (2) flying buttresses just showing above the triforium roof, no part of the architectural effect, but merely a constructive expedient; (3) similar merely constructional flying buttresses, as at Boxgrove, showing visibly in the air, but with a second similar buttress just beneath the triforium roof; here we have the double flying buttress in existence, but not forming a visible factor in the architectural design; (4) all abutment beneath the triforium roof abandoned, and a single flying buttress, as at Exeter, architecturally treated and soaring high above the aisle roof; (5) the visible double flying buttress architecturally treated, as at Westminster, but essentially a French feature, little used in England, where naves did not soar so high as in France. It is an eminently picturesque feature, but whether it is so admirable from a merely architectural point of view may be questioned. Its appearance round the east end of *Nôtre Dame* has tempted many a sketcher and etcher—notably *Meryon*; but after all, it is a little too much like a building propped up with stone scaffolding, indicating a want of repose and a sense of risky construction which does not belong to the best elements of architecture. This analysis of the arrangement of flying buttresses is, however, a good point in Mr. Bond's book, and we do not remember that we have seen it attempted before. We may notice also the remarks in regard to the proportion of clearstory window to wall, as an important point in regard to the skeleton structure of the building; the author remarking how, when it comes to such a proportion as in Westminster, where the window occupies 10 ft. of the width of a bay of 18 ft., and to the even larger proportion of window to wall in many French examples, the upper portion of the wall becomes no longer a wall so much as a pier, the whole masonic structure from base to roof becoming at this point in reality a very narrow and lofty pier, far too lofty in proportion to its width to stand safely alone, but propped up between the vault inside, the flying buttress outside, and the arches of the clearstory windows on right and left;

a method of considering the subject which intensifies our conception of Gothic architecture as an architecture of balance of pressures. Yet one may be allowed to question whether such a method of construction is really so impressive or so truly architectural as that of the heavier wall masses and smaller openings of the great Romanesque churches. The tendency to continually enlarge the window-spaces and reduce the piers has been commonly attributed to the growing passion for stained glass; this was the use made of it, no doubt, but we are more disposed to think that the predominant motive was a kind of pride in daring construction, an endeavour to try how far one could go with safety, and especially to outdo some rival builders; for there can be little doubt that rivalry was a prominent factor in the erection of cathedrals. The filling up of the wide window-spaces entirely with stained glass of a rich colour and thick consistency, besides being a decorative object in itself, no doubt had the effect, as Mr. Bond suggests, of masking the tenuity of the masonry structure and giving the eye broad surfaces to rest on; hence the exceedingly detrimental effect of the removal of the stained glass, and ultimate substitution of transparent white glass, in these later large-windowed churches: the voids become too apparent.

Passing over many points of interest which are suggested, we may conclude the present article with some remarks on the interesting problem of the west front and its architectural treatment. Here again Mr. Bond looks at the subject from a rather novel point of view. When a civic building, he observes, such as the Cloth Hall of Ypres, 440 ft. in length, was designed, no one dreamed of making one end of it the principal façade; yet this was what a church architect, for ritualistic reasons, was everywhere compelled to do. The French system was to mask it with twin towers with a partial screen between them to hide the termination of the nave roof. This was the more a natural system for the French to employ, because, partly on account of the great height to which they carried their nave and the crossing arches, they had little opportunity for employing that finest feature of the English cathedral, the central tower at the crossing, and in complete Gothic their predominant towers were always the western ones. York is the only English cathedral since the Romanesque period which frankly adopts the French system of the west front (unless we count Westminster among the cathedrals in an architectural sense), and even at York there is a massive central tower, which however does not dominate the composition, though it might have done so had the spire, which was probably intended, ever been carried out. Canterbury and Lichfield have their complete western towers, but not only are they quite secondary to the central tower, but they do not mask the nave roof, which shows its gable between them, making an awkward and broken-up line of front. York shows the gable indeed, but as it is at a flatter pitch it does not cut so awkwardly into the composition. But it is the only English

cathedral front which can be compared with *Nôtre Dame*, as being distinctly of the same type. Mr. Bond's view of the problem is that as it was impossible to give to the front breadth enough to enable it to dominate, as a façade, a building of which the transepts would project to a far greater width, the "adequate solution" was to give the façade in height what it could not have in breadth. But this consideration seems to us to be only one-half of the matter. It was not only that the west end was narrow in comparison with the whole size of the building, but that the section of nave and aisles, with sloping roofs and lower at the sides than in the centre, gives a form which could never be architecturally impressive in elevation, however well it might work in section. Whatever may be said in favour of the simplicity and architectural honesty of such a treatment, none of the English west fronts which are content with simply showing the end of nave and aisles, with some turreted buttresses to carry off its flatness, can be regarded as anything but failures, having regard to their position. Such a section requires to be masked to make anything like an effective façade. The French tower system is one way of doing it; the screen system, as at Lincoln and Peterborough, is another. The dual tower system is the more effective in itself; the screen system has the advantage that it leaves the central tower the dominant feature, which in the English cathedrals is a distinct advantage, inasmuch as their lower proportions of height not only admit but seem to demand the central tower. The Lincoln screen is rather barbaric in its early detail, but fine in general effect; the defect is that the towers of which the upper portion is seen above it do not seem to belong to it, and are not seen down to the ground. This is also the case with the less important towers at Peterborough, but to say, as the author does, that "they rise in an inexplicable fashion in the rear of the façade" is hardly the right way to put it; that is the case with Lincoln, but at Peterborough the façade was deliberately put in front of them, after they had at all events been founded and commenced. Our main point is, however, that there can be no doubt that in front of a nave and aisle section a screen, either of towers or of another kind, is necessary if anything worth calling a façade is to be established; and that the cathedrals where no such attempt has been made are the best proof of this.

We must defer to another article a consideration of some portions of the Second Part of Mr. Bond's book; merely observing that it is a book which every student of architecture, professional or amateur, ought to have.

AUSTRIAN GOVERNMENT EXHIBITION. — The Gewerbe Verein of Vienna will co-operate with the executive committee of the Austrian Government Exhibition, which will be held at Earl's-court next year, under the promotion and subvention of the Austrian Government. The exhibits will include specimens of the arts and crafts, and examples of the various industries, including the smaller domestic industries of Salzburg, Tyrol, Bohemia, Galicia, and Dalmatia, and illustrations of Austrian scenery. Some of the State establishments, such as the Imperial Mint and the Government printing works, will be represented, and a "Tyrolese village" is to be constructed in the grounds.

SS. SERGIUS AND BACCHUS,
CONSTANTINOPLE.

By Mr. ARTHUR E. HENDERSON.

THE church of SS. Sergius and Bacchus is one of those buildings which sets us wondering how it was planned. After the architect had grasped all the ritual requirements of the ecclesiastics he has handed down to us a beautiful and interesting example of Byzantine art. It looks as though after he had settled in his mind, roughly, what his ground plan should be, he designed from the dome downwards. This church is not a basilica, but it is designed on the principle of the central area, and, although the superstructure is carried by eight piers united by semi-circular arches—one left open for the sanctuary, three backed by arching, and the remaining four angle bays backed by semi-circular semi-domes (these united form an octagon)—yet the plan has a square appearance (see lithograph), the exedrae encircling the four corners. This octagon is by no means regular, as will be obvious in the plan of the gynæceum on the same sheet; each bay varies somewhat,

and the eastern is much wider, as it contains the sanctuary, and, of necessity, pushes out the piers of the north-east and south-east bays (exedrae); also, in consequence, the length from east to west is greater than from north to south. It is with the dome the greatest interest lies. By looking at the plan taken at the base of the dome it will be seen, although it stands clearly upon an octagonal bed, that it is divided into sixteen compartments, without the expedient of pendentives. This clever arrangement can be studied also in the plate showing the constructive sections. On looking at the transverse section and comparing it with the plan at the base of the dome (on the same sheet), it will be seen that the dome has sixteen groins, which really are the strength of the dome; their curve is somewhat peculiar, for, although the height of the dome is half the diameter, the sweep is by no means a semi-circle, and from the bed to above the window-heads the radii are greater than half the diameter, but the centres are at springing level. About 5 ft. above this the curves are quick, and again, above, very long

radii are taken, with centres considerably below the springing level.

It is impossible to say positively whether the beading to the groins is in stone or plaster, but from appearance one would say the latter. Fig. 1 shows the springing of the dome in the brickwork, as it would appear were the plaster entirely removed. Naturally the groins would meet in a point at the apex, but this is obviated by arching them into one another, leaving a saucer-shaped crown in the interior (see the section); and externally (Fig. 2) the Turks have built a large ornamental finial, making it impossible to say how the dome was originally capped.

Eight of the compartments (those over the arches) rest flush with the inner face of the octagon, without a moulding marking their commencement. The webs, if they may be so called, rise on both sides of the windows, easing into a domical curve, and above the window arches they have a common radius in the centre of the dome. Interest lies chiefly in the remaining eight compartments, or those over the piers. They are deeply segmented, or scolloped; the centres of the radii are formed by having three points given, viz.—the groins on either hand and the angle of the octagon in the centre.

With these three points, for each compartment the radius is given and an arc turned, giving the concavity required for each web at its springing. Naturally a small segmental ledge is formed between the groin and angle of octagon, two to each compartment. As the webs rise they are still kept very scolloped, and show externally (Fig. 2) as pear-shaped excrescences, making the other compartments look as though they were concave on the exterior and consequently dangerous. The external weighting and buttressing to the dome is shown on the geometrical and constructive sections, and on Fig. 2. It will be seen that a wall is carried up to about half the height of the dome and filled in to act as counterpoise to the thrust at the haunch of the dome. Each of the sixteen compartments has a square external face; eight resting upon arches, and containing the windows, are the same thickness as the main arches. The other eight faces are the same thickness; they rest upon the piers, but the webs cut somewhat into them. The whole of the wall, with its sixteen faces surrounding the dome, is further thickened on three sides by the walls carried by the gynæceum arcades and semi-domes of the exedrae, but they rise only to the height of the springing of the dome windows; and on these a small buttress rises in the centre to the whole height of the wall. The buttressing does not end even here, for further buttresses are built against these thickened walls—they run down and rest upon arches built in the massive barrel vault of the gynæceum. Those north and south transmit the thrust to the external walls. At the east

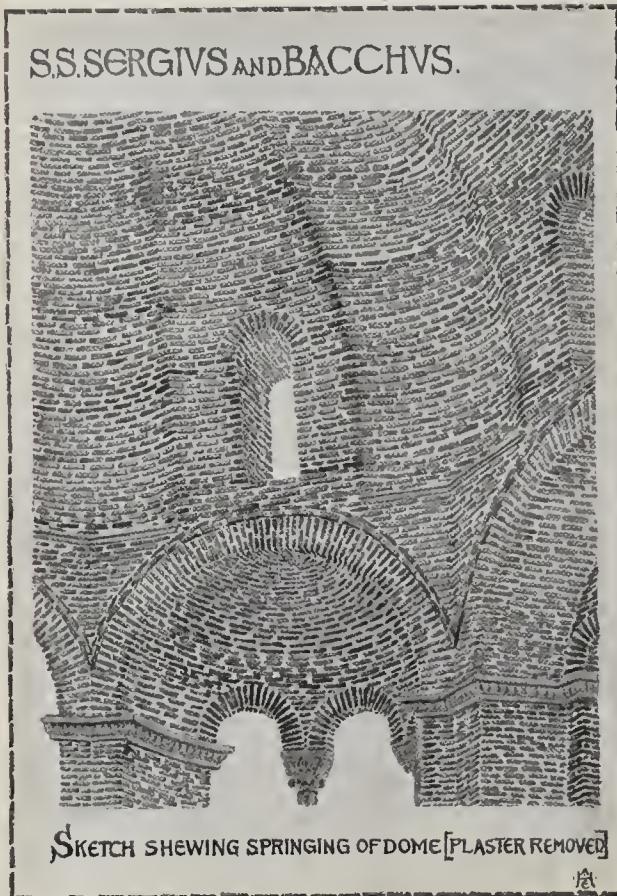


Fig. 1.

the sanctuary walls act as buttresses, and to the west the arches first span the aisle, and with a second span they reach the external wall of the upper narthex. These arches are well bound in by iron tie beams, which look to be original.

Other buttresses come down these piers and rest partly upon the semi-domes of the exedra, but principally on the substantial barrel vault, which carries the thrust over the gynaeceum to the corners of the church, which are specially massive, and small alcoves are cut out of them.

The Greek ritual and church customs are entirely different from the Latin, and necessitate a totally different plan. In the East women are not permitted the use of the nave during service, but are placed in galleries above the aisles and at the west end—even there they may only look through lattices. The planning of SS. Sergius and Bacchus is exceptionally good in respect to its spacious gallery, for, although the screen crossed under the triumphal arch, it could be seen from nearly all points, and, as most of the service was conducted in a low enclosure outside the screen by the monks and choir, all present near the front of the gallery were able to see and hear. The exedrae at the corners, besides giving a very pleasing contrast to the square bays north, south, and west, help to buttress the dome, give much more frontage to the gallery, and square out the plan. It is a strange anomaly, but the approach to this fine gallery is by a meagre flight of stone steps from the narthex, barely 3 ft. wide, the treads only enough to place one's foot upon, and the risers are as high as 9 in. The south aisle wall is strengthened by two thicknesses of arched walling, erected after one of the numerous earthquakes, very likely soon after the church was built, and probably the one which caused the destruction of the first dome of S. Sophia. The north aisle wall, which acted as a party-wall to the Basilican church of SS. Peter and Paul (now removed and the space occupied by a Turkish graveyard), has numerous arches and bricked-up openings corresponding to the south wall, and the imposts of the buttressing arches, both on gynaeceum and ground levels, now show externally. Much of this wall has been repaired, and it is at present quite impossible to find any indication as to the original appearance of this brother church.

Naturally, the ground plan is on the same lines as the gynaeceum, but of a slightly more massive description—columns are thicker, and piers take the place of the two columns of the upper narthex. It is unfortunate that the execution of Byzantine designs was carried out in such a careless manner, but this does not account for the great variation in the orientation of the central structure with the external walls. At present the only reason which can be suggested is that the external walls are built upon an earlier foundation, therefore the orientation for the outside of the church could not be adapted to the newer orientation of the nave and sanctuary, and it can be seen at a glance, from the plan, that the apse corresponds with the nave

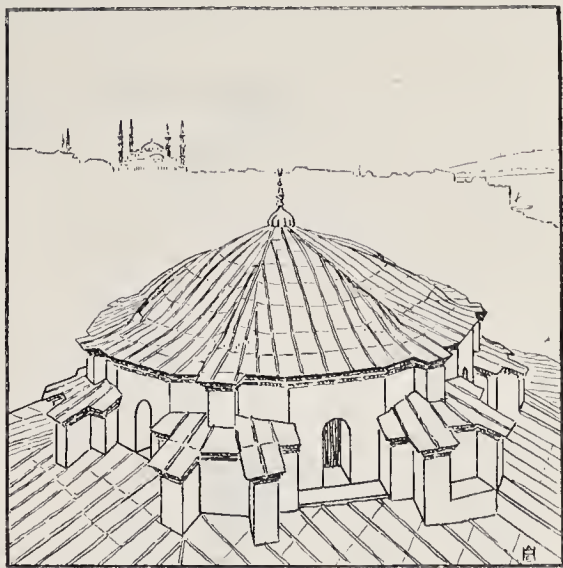


Fig. 2. Sketch of Dome from the Minaret.

and sanctuary, and not with the rest of the exterior. Externally all trace of the monastery to the south has disappeared, as also has the arcaded atrium at the west. The Turks have erected a handsome portico, and added a cloister in front, probably following the old lines of the atrium walls of both churches. The proportions of the interior, unfortunately, have been marred by the Turks placing a joisted and boarded floor upon the pavement, and so covering the bases of the piers and columns, thus stunting the height of the lower arcades, which are at full height too low for our western eyes accustomed to Gothic proportions (see the interior in the plate of Interior Views and Details).

In studying this church one's thoughts turn to San Vitale at Ravenna, a larger church and of more perfect finish, but lacking the variety of design in the nave, so pleasing in SS. Sergius and Bacchus. The proportions of San Vitale are higher and more pleasing when viewed from below, but from the gallery the same extent of nave cannot be seen.

The architectural detail (some of which is shown in the plate of photographs) is very well worth examining, but before describing it it would be well to mention that it is now thickly coated with whitewash, and in some instances to such an extent as to lose the pattern, thus photography does not show the detail to advantage. Classic influence still lingers, but with a much greater freedom than was used when the Church of St. John of the Studium (in the same city) was built, 164 years earlier.

We will look at the details from the ground upwards (see Fig. 3 and photographs). The bases to the columns are Proconnesian marble of uninteresting debased attic form, and the columns are in pairs of Proconnesian Verd antique and red Synnadic marbles, filleted with broad bands top and bottom. The capitals,

of basket form, are exceptionally beautiful. The abaci resemble in shape their Corinthian prototype; the carving of the baskets shows four tiers of interlacing circles on the eight projecting parts, inclosing leaves and a monogram in centre, and, branching from the circles, leaves spring off into the hollows, their points meeting, all being deeply undercut. The neckings are worked with the capitals and enriched by "egg and dart" pointing upwards.

The cymata or impostos of the piers are enriched by a repeating design of two spreading leaves on either side of a flower; it is thought by some that these flowers were bunches of grapes, symbolising the name of the martyred Saint Bacchus; but, as can be clearly seen in the photographs, the grapes would be hanging the wrong way. The heavy entablature of the lower order (see plate of Details, sketch, Fig. 4) is another feature of this church—at one time it completely encircled the nave, but now the portion crossing the sanctuary has perished. The soffit of the architrave is enriched by sunk panels of various patterns, and only in two cases has a six-armed cross been used. The beadings to the facias are enriched by a "rope" design, a debased "head-and-reel," a large, flattish and wide-spreading "egg-and-dart," and above again another "head-and-reel."

The frieze is in two heights, the lower half a semi-circular polyvina, elaborately carved and very deeply undercut, the design being of freely growing and twisting acanthus leaves. At first sight it looks so delightful one can hardly call it a design, but on studying it it is found to be a true recurring pattern. The upper half is occupied by an inscription, the background being sunk from the letters, in honour of the Emperor Justinian, the donor of the church, and Theodora. Fig. 5 represents

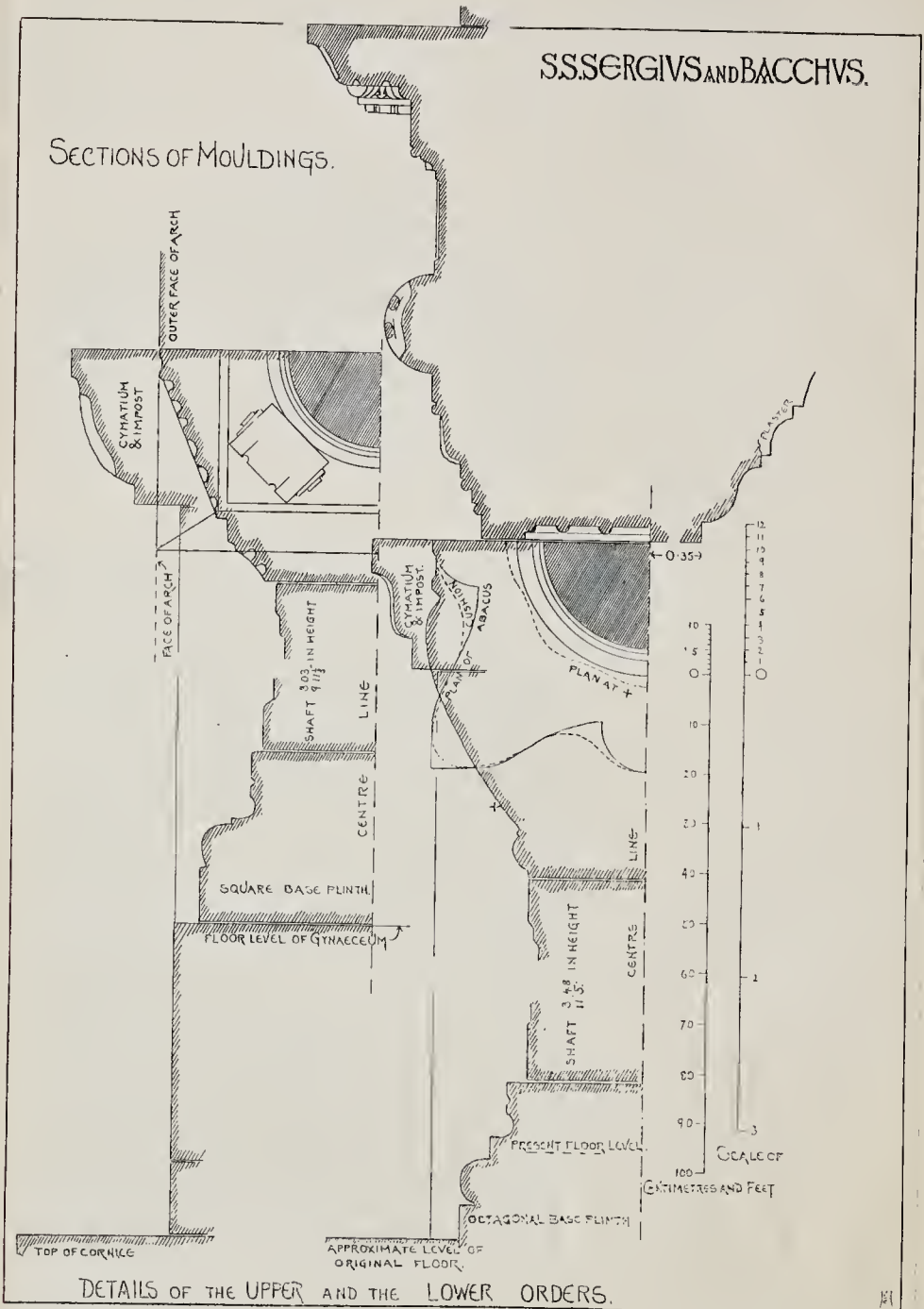


FIG. 3.

the lettering of the inscription as cut on the walls. It reads as follows in cursive Greek:—

Ἄλλοι μὲν βασιλεῖς ἐτιμῶσαντο θανόντας
Ἄνερας ὃν ἀνόητος πόνος ἐν ἡμέτερος δὲ
Ἐδοξέων σκηπτῶχος Ἰουστινιάνος ἀέξων
Σέργιον αἰγλήεντι δόμῳ θεράποντα γερῆρι
Χρίστου παγγενέτω, τὸν ὃν περὸς ἅμας
ἀνάπτων
Οὐ ἔξῳς σιχ' ἐτέρη βασιάνου εἰδράζεν
ἀνάγκη.

Ἄλλὰ θεοῦ τέτληκεν ὑπὲρ χριστοῦ δαμῆναι
Ἄματι κερδαίνων δόμον στίβων. Ἄλλ' ἐν
ποσίῳ

Κοιρανῆν βασιλῆος ἀκοιμήτου φιλῆσοι
Καὶ κράτος ἀξέσησκει θεοστέφους θεοδώρης,
Ἡ νόος εἰσεβῆθι φαιδρῖνται, ἡς πόνος αἰεὶ
Ἀκταίων θρηπῆρες ἀφείδους εἰσιν ἀγάμες.

The following is the translation:—

"Other Kings have honoured the dead, whose labour was in vain; but our Justinian, bearer of the sceptre, increasing in piety, glorifies with this splendid building the servant of Christ, Giver of all life, Sergius, whom neither the kindling breath of fire nor the sword nor any other stress of torment has shaken; but for the sake of Christ, his God, he endured to be slain, winning by his blood a heavenly home. But in all things may he guard the sovereignty of our ever-watchful King, and increase the might of Theodora, crowned of God, whose mind and whose labours are ever bright with piety, and her unsparring efforts are feeders of the poor."

This inscription dates the building of the church soon after the accession of Justinian to the throne, 527.

The cornice commences with small dentils, above which is "bead-and-reel," and consoles project from the fascia above, with leaves carved upon their soffits; a bed mould of "egg-and-dart" surmounts the fascia, and runs round the consoles supporting the cyma, the soffit of which is ornamented with leaves, and its face with intertwining acanthus leaves. The whole entablature presents an overloaded appearance, but contrasts greatly with the simplicity of the other portions of the church.

Rising to the gynæceum level, we find it is about 20 ft. above the ground and, strangely, 2 ft. above the cornice below. Here, again, the bases require no special remark, neither do the columns, which are considerably less in size than those below, but the capitals are well worthy of note.

I am of opinion that Byzantine Constantinople was strongly influenced by the architecture of Ionia and its neighbouring provinces—Ephesus, Miletus, Tralles, and Hierapolis, with other prosperous cities—all erecting handsome buildings during this period, and we know that the architects for S. Sophia were natives of Tralles and Miletus. Looking at the capitals shown in the Plate we still see vestiges of Ionic volutes, but they are merely ornamental angle brackets to square dossierets above—this dossieret device allowed a column of small diameter to carry the springings of wide stone or brick arches above. In San Vitale the expedient of placing a simple capital above the rightful one is only a makeshift. The carving on the dossierets is a free form of acanthus, only the front faces being undercut, and each carries a monogram of Justinian worked in the centre of the design. The upper cymatium is enriched by upright flutings.

Six columns have, as yet, been unnoticed; two are in the south aisle (see one in Plate of Details), having a wide

fillet worked on both sides of the bases, columns, and capitals, showing a framework of stone or wood was affixed to them. At one time, evidently, here was the approach to the monastery. The capitals are of simple Byzantine shape with monograms worked in a very free treatment of stems and leaves. Above these columns stand another two in the gynæceum, of poor design, which seem to have been brought from elsewhere and adapted to their positions; the one capital to the west is debased Ionic with dossieret, a cross being carved upon it, and the other is of basket form, with roundels carved on the faces.

The remaining two columns connect the western aisle of the gynæceum with the upper narthex (see Plate of Details), and are of similar pattern, but stouter, to those of the gallery. There is a strange lack of the cross in all the carving of the church. Dedication crosses were inlaid into the columns, certainly, otherwise, except in the three cases mentioned, there is no indication of others. No mosaics have been found in the church; fresco paintings there may have been; if remaining they are covered by whitewash and the new decorations. As far as can be ascertained, brick was the material used for walls, piers, vaults, and domes. By settlements, due mostly to earthquakes, the whole church has been greatly damaged and badly restored, but the original dome, though distorted, still stands.

It is generally remarked that SS. Sergius and Bacchus is the prototype design of the cathedral church of

S. Sophia—it certainly is of the same school of architecture, and the planning of the gynæceum has a likeness to it, in regard to its western bay and angle exedra; but in S. Sophia the transseptal arcades are the same width as the diameter of the nave, thus making the whole length of the nave a double square, whereas in SS. Sergius and Bacchus it is a single square. Again, in S. Sophia pendentives are used throughout; in SS. Sergius and Bacchus there are none. The large semi-domes of S. Sophia spring from the same level as do the exedrae and other arches, but in SS. Sergius and Bacchus spandrels are carried up on both sides of the arches, and the dome stands upon them. In S. Sophia Byzantine architecture is now fully developed, arches being placed upon all columns, and a new form of Ionic capital suitable to carry these arches was invented, but in SS. Sergius and Bacchus the architrave is still an important factor in the design. It is unfair to a small church to compare it with a cathedral, though SS. Sergius and Bacchus stands the comparison with great credit, and is one of the finest Byzantine monastic churches erected.

A few of the principal dimensions are as follows:—

	Ft.	In.
The whole internal length from east to west	129	
The length without narthex	101	
The length of aisles, absent	86	
Width, including aisles (not including recess in south wall), average	77	6
Width, excluding aisles	59	
Length of octagon	33	6
Width of octagon	50	6
Length of dome	55	
Width of dome	52	6
Width of square bays—north, 16 ft. 3 in.; south, 16 ft. 6 in.; west	17	

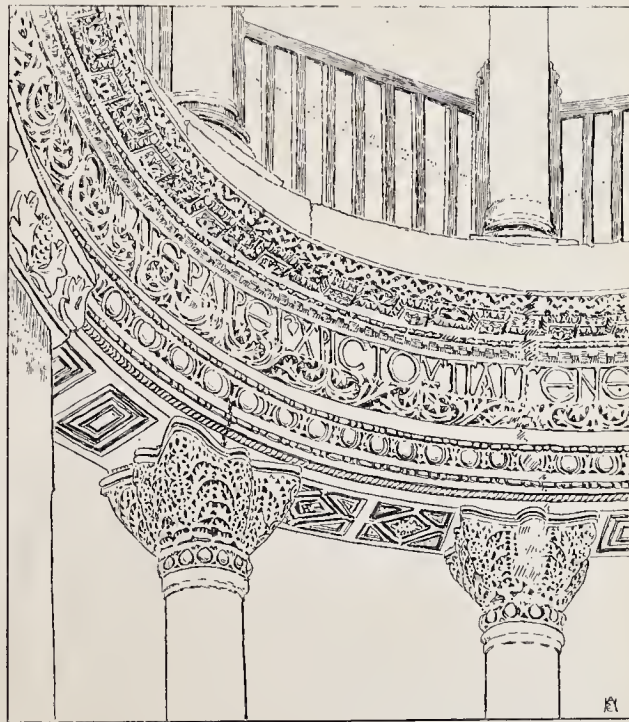
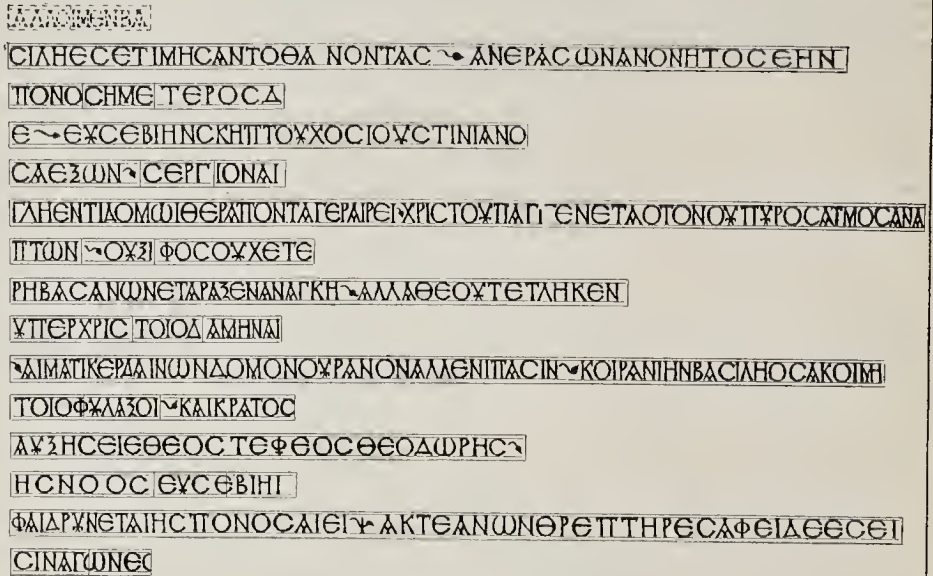


Fig. 4. Entablature of South-West Exedra.

SSSERGIVS AND BACCHVS.



INSCRIPTION ON THE FRIEZE.

Fig. 5. Inscription Round Nave in Honour of Justinian and Theodora. (See page 7).

	Ft.	In.
Depth of square bays, not including arcades, 4 ft.	4	6
Width of exedra, average	17	
Width of impost piers to arcades, average	2	9
Width between the piers of triumphal arch	21	6
Thickness of triumphal arch	4	
Width of sanctuary	25	
Depth of sanctuary	12	
Radius of sanctuary apse, about	12	3
Length of narthex	70	
Width of narthex	14	6
Height from floor to crown of dome, about	71	
Height from floor to springing of dome	45	
Height from floor to springing of main arches	33	6
Height from floor to gynaeceum	20	
Height from gynaeceum floor to crown of vault, average	13	6
Height from ground floor aisles to vault, average	18	3
Height of upper colonnades	12	7
Height of lower colonnade	14	9
Height of entablature	3	5

NOTES.

DESPITE the efforts of one or two organisations for encouraging the re-afforestation of suitable areas in the British Isles, little has been accomplished in this direction, and practically no general interest is felt in the subject. Our supplies of timber for structural and other purposes are drawn largely from abroad, but there are already indications that in process of time ordinary varieties of timber will not be exported so readily as at present. Fir and pine are growing scarce in the United States, where re-afforestation has become a necessity, and is looked after by a Government department. Notwithstanding the extensive forests existing in Canada it is highly probable that the agricultural and industrial development of that country—now proceeding by leaps and bounds—will in a comparatively short space of time deprive us of a resource hitherto looked upon in the light of a bottomless well. The position is one

that ought to be faced, especially as the remedy of re-afforestation cannot bring relief until after the lapse of many years. In these islands we have, roughly, 15 million acres of mountain and heath lands more or less suitable for afforestation. The value of such lands is small, but might become very considerable if devoted to the growth of timber upon a proper basis. Further, the establishment of a new industry would do much towards the solution of the great unemployment problem.

At a time when so many street-widening schemes are being carried out decisions under the old Act of Parliament known as Michael Angelo Taylor's Act (57 Geo. III. cxxix) are of general interest, since the local authorities derive their powers to acquire property for this purpose from this ancient statute. In our issue of August 19, 1905, in a Note on the case *Pescod v. Mayor, etc.*, of the City of Westminster, we referred to the law on this subject. The latest case is *Thompson & Jackson v. Hammersmith Corporation*, where the plaintiffs were lessees of land and a double shop in King-street, Hammersmith, and were about to considerably alter the premises under the terms of their lease when the Corporation sought to acquire a strip varying in depth from 5 ft. 2 in. to 7 ft. 2 in. of the frontage to High-street. The plaintiffs contended that they must take all the premises. It has been decided that sect. 82 of the Act is subject to sect. 80—that is to say, since sect. 80 speaks of "any part of" the premises

being acquired, sect. 82, which deals with the compulsory acquirement, is to be read as containing a like provision (see *Gordon v. Vestry of St. Mary Abbots*, 1894), and that the test as to whether a part may be acquired or the whole must be taken is, can the portion desired to be taken be removed, still leaving the house as a house capable substantially of being enjoyed as before (see the same case and *Gibbon v. Paddington Vestry*, 1900). In the present case it was attempted to differentiate the law on the ground that the plaintiffs themselves were about to pull down portions of the house; but this contention did not prevail, and the Court held that the portions required by the Corporation destroyed the house as a house, and that the whole premises must be taken.

At last the shallow underground tramway is practically ready for operation, and will be opened to the public after the official inspection of the Board of Trade. The new line will be worked in connexion with the electrified tramway route between Southampton-row and Islington, and passengers will then be able to proceed without change of car from the Angel to the Strand, and *vice versa*, the alteration of level taking place by means of the incline at the junction of Southampton-row and Theobald's-road. Owing to lack of foresight, or to an unusual, and in this case unwise, impulse in the direction of economy, it is impossible for the ordinary rolling-stock of the London County Council to enter the

subway. Consequently, single-decked cars have been built specially for this service. The disadvantage may appear small at the present time, but when the line comes to be extended and placed in communication with the southern system of tramways, none of the cars now running on the latter will be able to pass along the new subway. It would be interesting to hear what the County Council have to say upon this point.

Water Supply in Leicester. OWING to the low rainfall during the end of last year, the water authorities of Leicester are experiencing the utmost difficulty in providing supplies for the inhabitants. Water is already shut off for ten hours out of the twenty-four, and the period of supply will probably be further curtailed. One of the three corporation reservoirs is practically dry, and the others contain less than one-fourth of the normal quantity. A disused colliery shaft is at present yielding about 300,000 gallons a day to supplement the supply from the waterworks, and so critical is the situation that water to the extent of some 200,000 gallons a day is being drawn from a well close to the Belgrave-road cemetery. An idea of the grave emergency that has arisen is to be gathered from the statement that water is being pumped direct into the mains at a point only a few yards from a place where dead bodies lie and others are being buried daily. It is reassuring to learn that the water is found to be wholesome, but in these days of hygiene the procedure seems a strange one, and the inhabitants are far from feeling satisfied as to its wisdom. The case of Leicester serves to emphasise the necessity for dealing in a comprehensive manner with the question of water supplies, and of apportioning available sources so that large towns unable to draw upon gathering grounds in the mountains of Wales and the Lake district, may be reasonably free from the risk of famine, without prejudice, of course, to the requirements of smaller centres.

Railway Amalgamation. THOSE persons who live on what is known as the old London, Chatham and Dover Railway lines begin to wonder when the benefits which were promised to them on the amalgamation of this company with the South-Eastern Railway Company are to be conferred upon them. It cannot be denied that the amalgamation has been of benefit to this latter company, as when the Chislehurst tunnel subsided the Chatham Company's lines were invaluable to them, and now that Charing Cross station is closed the Chatham lines termini are again of service to them. The South-Eastern Company, however, offers no *quid pro quo*. The passengers by the London, Dover and Chatham lines suffer by the dislocation in the service, and their trains are made unpunctual owing to the assistance rendered to the South-Eastern Company, yet no facilities of quick communication between the two systems have been offered them in return. To pass from the Maidstone and Chatham branches to the South-Eastern main line is just as difficult as it was when the two

companies were running in opposition to one another; indeed some of the time-tables seem to have been preserved as models of railway obstruction to rapid means of transit.

Tramways v. Light Railways. THE Parliamentary paper recently published with the returns relating to tramways and light railways contains some very interesting statistics. The return goes back to the year 1878, when the route mileage was only 269 miles, the capital expenditure some 4,000,000*l.*, and the number of passengers 146 millions. The route mileage is now 2,116.78 miles, the capital expenditure 52,675,152*l.*, and the number of passengers 2,069 millions. It is not hard with the assistance of these figures to understand the depression in our railways. Electricity is making rapid progress as the means of locomotion, as, out of the 2,117 miles now open, 1,780 miles are worked by electricity. Although the capital expenditure per mile is originally much larger than for steam or horse traction, exceeding them both by, roughly speaking, one-third, the net percentage of receipts to the capital outlay is nearly double that given for steam and horse traction, whilst the percentage of working expenditure to gross receipts also shows a diminution, and the average fares are also at the same time slightly lower. The return shows that the local authorities still continue to absorb this class of undertaking, which possibly is the most profitable they have yet attempted to manage. Continued improvement in electric locomotion is, however a factor yet to be considered, and at any moment the ratepayers may find themselves pledged to increased capital expenditure, or, in place of this, the general public may be condemned to use antiquated and obsolete systems on account of the municipal monopolies.

"Clinton" Reinforcement for Concrete. A NEW power-house recently built in Baltimore illustrates the value of steel network for the reinforcement of concrete for building construction. This power-house is 180 ft. long by 72 ft. wide, and is 70 ft. high above the ground floor. In place of the steel rods generally used to reinforce the floor slabs Clinton electrically-welded fabric was employed. This form of netting was selected for two reasons; first, because being supplied in long lengths the architect was able to make the reinforcement continuous for the whole width of the building; and second, because the transverse wires of the fabric not only keep in position the longitudinal wires, but provide for the resistance of any strains that may be exerted at right angles with the latter. The continuous bond provided by the steel netting permitted considerable economies to be made in the upper part of the building, which contains the coal bunkers, and consequently has to bear heavy strains. One great advantage of using reinforcement in the form of sheets is that there are no bars or rods liable to be wrongly placed by workmen. Consequently the cost of superintendence can be considerably reduced. Similarly satisfactory results have already been secured by the use of expanded metal.

Bombay Harbour Works. DURING his visit to India, in 1875, the King laid the foundation-stone of the first dock in Bombay harbour. Now, after the lapse of thirty years, the Prince of Wales has inaugurated the equally important work by laying the foundation-stone of the Alexandra wet dock and a new dry dock, basins that will probably serve to accommodate the largest ocean steamships that are likely to be built for the next thirty years. The dimensions of the dry dock are based upon the requirements of a vessel 1,000 ft. long by 100 ft. beam, and a draught of 36 ft. Quays are to be built near the entrance to the docks, permitting the largest steamers to be berthed alongside so as to land passengers without the aid of tugs and lighters before discharging cargo in the Alexandra dock, which will have a water area of nearly 50 acres, and about 3 miles of quays and transit sheds. These works, involving an outlay of more than 2½ millions, form only part of the extensive programme inaugurated in 1873 by the Bombay Port Trust, and when they are completed Bombay will be not only one of the finest natural harbours in the East, but probably the best equipped port in that part of the world. Something more is to come, however, for the Trust have under consideration a great scheme for reclaiming nearly 600 acres of land along the shore of the harbour that would give space for 2½ miles of quays, and probably facilitate an extension of the city that would do much to relieve the overcrowded condition from which it now suffers.

Sanitary Condition of Barnard Castle District. DR. E. P. MANBY'S Report to the Local Government Board upon the sanitary circumstances and administration of the Barnard Castle and Startforth Rural Districts (which are comprised within the Teesdale Union), states that in the Barnard Castle Rural District the houses are built of stone but defective in various points. At Middleton, in the main street, a number of houses have been built so closely together as to contravene the most elementary rules of sanitation. Windows where existing in houses are often so fastened up by paint or otherwise that they cannot be opened. Water supply has been much neglected and is from sources liable to contamination. Few water-closets exist in the district, except at Middleton and at Gainford. Privy-middens are chiefly in use, many of them dilapidated and foul. Some pail closets were met with, but sufficient attempt has not been made in the past to get pails substituted for privies. In regard to the Startforth Rural District, the Report is much the same. In regard to water supply it is stated that in some villages where the supply of the Tees Water Board is available, on the ground of expense many residents refuse to have this water, and continue to take their supply from wells:—

"There are public wells at Mickleton, Romald-kirk, Ovington, Hutton, and other places. The quality of the water derived from these wells is said to be satisfactory, but the supply cannot be described as reasonably accessible for all the houses in any of these villages. At Rokeby School, Wycliffe School, Brignall Mill, and other places, I saw water used for drinking, which either was obviously contaminated, or was exposed to the possibility of animal and vegetable contamina-

tion. The medical officer of health reported unfavourably on the water supply at Thwaites Farm as long ago as April, 1901, but no action on the Report has been taken by the Rural District Council. The tenants have to go to a spring some 200 yds. distant for their supply of drinking water. The carrying of water for considerable distances is not infrequent in the case of isolated houses in the district."

The main point of Dr. Manby's Report is that there are three medical officers for the two districts, no one of whom has much time to give to the work of inspection, and that a single competent medical officer ought to be appointed for the whole area, at a salary that would enable him to devote his time to the work, and would organise a uniform system of sanitary improvement.

Report of Enteric Fever at Basingstoke.

THE Report by Dr. Reginald Farrar to the Local Government Board on the causes of an outbreak of enteric fever at Basingstoke, which appears to have commenced suddenly and as suddenly ceased, is a very interesting one as showing the slight causes which may infect a water supply so as to cause disease, and the necessity of constant vigilance in guarding against any contamination of water supply. We have not space to go into the details,* but the Report is very instructive as to the manner in which accidental sources of contamination may arise, and also in showing the method of investigation and reasoning by which the mischief was traced to its probable source, a temporary leakage of a small percentage of sewage matter into an otherwise satisfactory chalk well from which water for the town service was pumped. The following paragraph is worth quoting, as an illustration of the close relation between cause and effect in cases of this kind—

"The following case, which may be thought to have almost crucial value, occurred among the domestics of one of the medical practitioners in Basingstoke. All water used for drinking in this house had been systematically boiled since the beginning of the outbreak. But on a single occasion, and, so far as can be ascertained, on one occasion only, viz, on October 21, a servant maid drew off one glass of unboiled water from the tap and drank it; this girl went away to Alton, on October 23, and was notified at Alton as suffering from enteric fever on November 1, eleven days after drinking the water. It will be noted that this incident occurred on the very day before the disinfection of the mains was carried out, and is consistent with infective matter having remained in the mains for a considerable period after its introduction to them may be inferred to have occurred."

Trees in Towns. MR. F. G. HEATH recently called attention in the *Times* to the necessity of systematic tree-planting in towns. The moment is opportune for reference to this subject, because for another month the planting of deciduous trees may continue. That the planting of trees in towns should be carried on on a systematic plan is obvious. Both in London and the provincial towns it is done, as one may say, either experimentally or spasmodically. There is not a town in England, especially in the suburbs, where the planting of trees would not be an improvement. We wish a society could be formed to press this matter on the notice of local authorities. It is certainly an anomaly that whilst in the country private individuals spend so much thought and money on gardens and shrubberies,

* The Report can be obtained from WYMAN & SONS, London; OLIVER & BOYD, Edinburgh; or, E. PONSONBY, Dublin. Price 1s.

local bodies show so little energy or taste in this direction. On the Continent, where private gardens are far inferior to those of England, tree-planting in cities and suburbs is carried out constantly and systematically.

The Six Landscape Painters' Exhibition. THE exhibition of the works of six landscape-painters—Messrs. R. W. Allan, Anmonier, Austen Brown, J. S. Hill, Peppercorn, and Leslie Thomson—again makes its annual appearance, always a pleasant and interesting event. The pictures, forty-eight in number, are hung in the Gallery of the Old Water-Colour Society. Taking them in the order of hanging, those of Mr. Austen Brown, Nos. 1, 5, and 6 at all events, hardly come properly under the definition "landscape," being foreground pictures in which figures or animals are prominent. "An Early Autumn Afternoon" and "After Sundown" (2 and 3) are rather slight paintings of very different aspects of nature—different in method too, showing that the artist is not a painter of one effect. Mr. Leslie Thomson's best work is perhaps "The Brook" (10), where a stretch of distance is framed in foreground foliage, and a group of girls bathing in the brook make a bright centre to the composition. Among the others are "Norham on the Tweed" (7), a flat country with a river zig-zagging through it ("Rura que Liris quietâ mordet aquâ"), and "Holyhead Mountain" (13), a level composition divided by a strong line of water and distant hills one-third up from the foreground. In Mr. Hill's largest work, "Magdalen Tower" (17), the sky presses heavily on the composition; and in "The Thames at Milbank" (19) the Houses of Parliament are not kindly treated. "On the Welsh Coast" (18), one of the smaller works, is a powerful little picture of waste land. Mr. Peppercorn's heavy and colourless landscapes, with blotchesque masses of trees, we cannot accept as nature or even an adequate translation thereof; "Twilight" (28), where there are no trees, represents better what this artist can do in giving the sentiment of landscape; but on coming to Mr. Allan's "A Grey Day" (31), in spite of its title, we are inclined to exclaim with Milton "Hail, Holy light!" for here at least there is light and colour; the sea is very well treated too. "The Approach of Winter" (32), a hill picture with touches of snow, is fine; so is "A Haven of Rest" (36) and "In from the Sunlit Sea" (39), both notable for colour and calm light; "Autumn" also (34) is a good little wayside composition. Mr. Anmonier, whose works occupy one end of the room, has the best of it in the exhibition; his large melancholy landscape, "A Lonely Heath" (43), is unquestionably the most powerful work in the room; and "Sunlight on the Downs" (46), with the varied lights over the long folds of down, show how well he can treat a subject of totally opposite character. If we cannot admire the works of all the six painters equally, it is always interesting to be thus reminded how many different ways there are of interpreting nature through the medium of painting.

LETTER FROM PARIS.

IN 1899 the Municipality of Paris purchased, for 300,000 francs, the Hôtel de Lauzun, which was condemned to be demolished. The Council at the time proposed to reconstitute the building as a typical example of a first-class mansion of the XVIIIth century. The cost of restoring it completely, however, was seen to be so great that the proposal was abandoned. The suggestion to transform it into a museum, as a kind of annexe to the Carnavalet Museum, was also dismissed, on account of the inevitable injury to, or obscuration of, the wall paintings and wood carvings which decorated the walls. Consequently, not seeing any way to make use of it, the Council has decided to Baron Pichon, grandson of the last proprietor, who intends to make it his home, and has consented to reimburse the Municipality for all its expenditure in connexion with the building, and to put it in complete repair. The Hôtel, it may be observed, is scheduled among the "Monuments Historiques." All the money gained or recovered by the Municipality, in connexion with the transaction, is to be devoted to the enlargement of the Carnavalet Museum, which will permit of the exhibition of many objects of historic interest not at present exhibited to the public.

Having settled this question, the Council is now occupied with the Hôtel Bagatelle, which still remains empty. The Park of Bagatelle is to be transformed into a kind of ornamental botanic garden which is to be planted with specimens of as many as possible of trees and plants of French growth. The house itself is to be made use of for periodical art exhibitions, organised either by individuals or societies, and the sums arising from entrance money will be set apart for the purchase of works of art for the Municipal museums.

The Municipal Council is also occupied recently with the consideration of the completion of the Metropolitan railway system, comprising six new lines, to be carried out at a cost of 200 million francs. The first line will prolong to the Hôtel de Ville that of the Palais Royal, which was to have ended at the Cour de Carrousel. The second line, starting from and returning to the Invalides, will form an interior "ceinture" line with stations at the Place de la Concorde, Rue Royale, Grands Boulevards, Boulevard Henri IV., Rue Cuvier, Rue des Ecoles, Rue Monge, Boulevard St. Germain, and Rue St. Dominique. The third line will run from the Porte de Picpus to the Porte d'Antonie, by way of Avenue St. Mandé, Boulevard Picpus and Boulevard Voltaire, Place de la République, La Cité, Rue Monge, and Avenue des Gobelins. The fourth is to go from the Place de la Bastille to the Porte de Montreuil by way of the Faubourg St. Antoine and Rue de Montreuil. The fifth is the prolongation between the Opéra and the Trocadero of a line already voted for the Boulevard Haussmann and the Rue La Boétie and Rue Pierre Charron. The sixth will go from the church of St. Augustin to the Ternes, by way of the Boulevard Haussmann, the Faubourg St. Honoré, and the Avenue des Ternes.

The jury of the Ecole des Beaux-Arts appointed to judge the Godebeuf competition have awarded the prize to M. Danis, a pupil of M. Deglane. The subject given for the competition was "Les Portes d'un Hôtel."

In a few days there will take place, at the Rond-point des Ternes, the inauguration of Barthold's monument to the aeronauts and the carrier-pigeon societies of the Sieve of Paris. This, the last work of the sculptor, is much inferior to most of his productions. M. Mercier's monument to Alfred de Musset will also soon be in position. Of other statues soon to be erected in Paris may be mentioned that of Baron Taylor, to be placed on the Boulevard in front of the Théâtre de l'Ambigu; that of Theodore Rousset the philanthropist, to be erected on a site in the Eleventh Arrondissement; and a monument to Carpeaux, executed by his pupil Pagel, which is proposed to place in the Jardin de l'Infante at the Louvre.

The works are shortly to be commenced for the enlargement of the Palais de Justice, after the plans of M. Tournaire, architect to the Department of the Seine. The works necessitate the total demolition of the picturesque old houses forming a large quadrilateral bounded by the Boulevard du Palais,

the Quai des Orfèvres, and the Rue de la Sainte Chapelle, which latter will alone remain and will form a kind of interior court to the new portion of the Palais, with entrances from the Quai and from the Boulevard. On the new plan the Quai des Orfèvres will have a width of 19 mètres between the Rue de Harlay and the square tower situated at the corner of the Quai, which will form a symmetrical pendant to the Tour de l'Horloge at the angle of the quay of that name. The new buildings will be connected to the old ones by a footbridge thrown across the Rue de la Sainte Chapelle. The cost of their construction is estimated at 10 million francs.

The separation of Church and State recently voted will have its effect on art, in an unexpected manner, since it will permit of the utilisation of a site for a museum to contain the Luxembourg collection. It is proposed for this purpose to take possession of the large garden of the Séminaire Saint-Sulpice, which will before long be "disaffectée," and which will afford an ample site for a new Luxembourg. Considerations both of legal arrangements and funds will, however, defer for some time the realisation of the scheme.

There is at last some talk of relieving the Ile de la Cité of the untoward building of the Morgue, which rises behind the *chevet* of Notre Dame. This melancholy establishment is, it appears, to be transferred to a site at the eastern extremity of Paris, beyond the Bois de Vincennes, on the margin of the Quai Saint Bernard, near the buildings of the Fourrière, the reconstruction of which is shortly to be the subject of a public competition.

The death is announced, at the age of 66, of B. Delahaye, "architecte-expert," to the Tribunal of the Seine, and Director of the "Reforme du Bâtiment," who had rendered excellent service in the professional defence of architects. We should mention also the death of M. Amedée Pigeon, a distinguished writer on art, and for many years an assiduous contributor to the pages of the *Gazette des Beaux-Arts*.

THE OLD MASTERS EXHIBITION.

THE loan exhibition at Burlington House this year is not a very remarkable one, and few are now sure that the most interesting section of it is not that included in Gallery IV, which consists principally of works by artists not long ago deceased. Here we have the opportunity of seeing once more Millais' remarkable picture "The Knight at the Ford" (115). Near it hangs what is perhaps Rossetti's best work, "The Beloved" (117); the one which shows most of his power of colour and least of his defects of design. The figures show little more than a collection of heads; that of the beautiful blonde, the bride, in the centre, surrounded by attendant faces, while below her the head of a negro boy holding up a gold cup makes a remarkable colour contrast with her fair face and bright green drapery. The whole picture is an inspiration in decorative colour and design, and the faces are not disguised by the large and sensual lips which Rossetti was too fond of, and which appear so disagreeably in the adjoining picture of "Mnemosyne" (119), which represents Rossetti's shortcomings as decidedly as the other work represents his best powers. Various paintings by Burne-Jones appear in the same room, of which the best is the well-known "Love Among the Ruins" (128), beautiful in itself, though quite at variance with the full-blooded passion of the poem by Browning which gives the title to the picture. There is the "L'aus Veneris" also (121), another fine work of his kind, and "The Princess Sabra Dying the Lot" (122), before which one's first thought is—what a collection of weak and feeble heads! Albert Moore's decorative nude, entitled "White Hydrangeas" (111), is a typical example of that artist's power over delicate and refined colour-schemes; and close to it, as if to present the most intense contrast possible, is one of the finest and most highly elaborated of Lewis' wonderful Oriental scenes. "An Intercepted Correspondence" (109), sparkling all over with brilliant colour and delicate detail. Two very fine landscapes by Alfred Hunt, "Whitby: Morning" and "Whitby: Evening" (130, 132), are to be found in the same room; pictures the delicate colour and

atmospheric effect of which are intensified by contrast with the commonplace and heavily coloured figure-painting by a late R.A. which hangs between them. There is an ironical significance in the fact that the painter of the two landscapes which hang on each side of this was never invited to become a member of the Academy.

Coming to the older pictures, Gallery I. is rather a medley of some fine things and a majority which are not of much interest. There is Reynolds's excellent half-length portrait of himself (5); some Hogarth portraits of which the best is "Mrs. Desaguliers" (2), and his "Assembly at Wanstead House" (20), which, if it be (as we are told) his earliest known picture, is of interest as a kind of prelude to the more incisive studies of contemporary fashionable society which he was to produce later. How, by the way, did Hogarth obtain that knowledge of the foibles of dress and manner of the fashionable society of his day which he portrays with such convincing power in "Marriage à la Mode"? He could hardly have been admitted into these sacred but unsanctified circles. It was the same insight of genius, perhaps, that enabled Thackeray to portray the fashionable life of his own day when as yet he was personally outside its boundaries. Of the other portraits in the same room, there are Gainsborough's of his two daughters (10) and of Miss Adney (18), both careful and refined; Raeburn's very fine and energetic half-length of John Gilbert (17), and a half-length "Portrait of a Girl" (21) by the same painter which in colour and in characteristic expression is worthy of Reynolds, whom it rather recalls. Romney's "Mrs. Dawes" (29) is interesting because it is so different from the usual Romney style and scale of colour; it was painted in 1783, when he was in the middle of his career, and therefore at the same time as some other (and finer) works in a totally different style. One is almost tempted to ask whether it can really be his; but we have not heard of any doubt being cast on its authenticity. Opie's head of "Mrs. Warde" (35) is perfectly charming in design and colour and in a certain *espégle* of character, and raises one's idea of this artist's powers. In the centre of one wall is hung Turner's remarkable attempt to emulate Titian, the "Venus and Adonis" (28) which was exhibited some little time since in the gallery of a London dealer. The figures, as might be expected, are hardly immaculate in drawing, but the hold and unusual treatment of the sky and the landscape background leaves one in no doubt that Titian was in the mind of the artist when he painted this. Two of Richard Wilson's landscapes (4 and 6) show Wilson's limitations rather than his success; the kind of thing that Wilson could best do is seen in the smaller picture, "The Lake of Albano" (16). De Wint's "Lincoln" (9) is heavy and unsatisfactory; the "Cornfield" (11) shows more of the real de Wint. Gainsborough's attempt at a classical landscape with ruined architecture is not in his best way.

Gallery II. contains some fine things, among which we ought to mention first a superb architectural scene by Holland (63), one of the finest and most effective of his scenes of Venetian architecture. It is a real interest, too, to see the very fine portrait group of "Mrs. De Wint and her Daughter" (62) by Hilton, since it goes to explain the position held among his contemporaries by a painter whose fame seems somehow to have suffered eclipse in these days; the taste which dictated his large historical pictures is *passé*, but there is nothing *passé* about this portrait of his sister and her child, which for power of handling and colouring will hold its place anywhere. Reynolds's beautiful and well-known group of the Hon. Frances Harris and her dog, one of the best of his child portraits, holds the centre place on the walls, and would be always welcome. This room contains two noble landscapes, John Linnell's "Arcadian Shepherds" (39) and Crome's "Preston Tower on the Orwell" (45); in the latter a mass of foliage fills the centre of the composition, hatched by a warm coloured cloud which combines with it in the composition and forms a kind of radiance around the dark trees. Constable's two small Hampstead Heath pictures

(48, 49) are dull and heavy, and seem perfunctorily painted; the more so by contrast with Stark's "Rabbiting, near Crome" (51), a masterly hit of landscape-painting, and so true to the character of that part of the country. Turner's "Boats" (56) has suffered so much from decay that it is difficult to estimate what might have been its original charms; the "Venice" (60), one of the works in his well-known later Venetian style, is in a good state, and is a good example of this fascinating but rather conventional phase of his art. Besides Stark and Crome, another of the Norwich school, George Vincent, shows well in his "Greenwich Hospital" picture (54), and a small Bonington, "On the Coast of Normandy" (38), is an excellent example of the charm of composition and sky effect which are never absent from Bonington's work; it is somewhat of a conventional style—a suggestion of picture-making in it, but it is so admirably done that criticism is disarmed. In this case Bonington's peculiar delicacy and brightness is intensified by the small work being next to Linnell's dark and richly coloured landscape before mentioned. Among pictures of another class Landseer's "The Cat's paw" (50) shows a most brilliant and forcible piece of animal-painting; and two small pictures by Wilkie, "The Errand Boy" (37) and "The Rabbit on the Wall" (68), hung as pendants, are worth special attention as illustrating the care which Wilkie took over detail in subjects of this class, before his Spanish trip had unfortunately turned his attention from a class of subjects in which he really excelled to one which was foreign to his genius. In one which was noticed the contrast between the easy delight of the small spectators and the careful and serious face of the operator intent on producing his effect; it is a piece of real humour worked out with the greatest delicacy of handling, and no accessory detail of the scene is slurred over or neglected.

In the large gallery unquestionably the most remarkable work in the room is neither the large crude portrait group by Franz Hals (102), nor the large and monumental portrait of Dr. John Ash by Reynolds (73), nor yet the Vandyck portrait (83) at the opposite end of the room, but a small portrait by Gainsborough of Giardini the violinist (79), who was also an eminent composer in his day, though this fact is not mentioned in the catalogue note. There is not a portrait in the exhibition so original, so refined, so full of character and expression as this. Among the other portraits in the room Reynolds's of a little boy playing a drum (74) is noticeable for its fine colour. Hoppner's "The Sisters" (79) is effective but somewhat melodramatic; Reynolds's well-known "Venus and Piping Boy" (81), which we have always held to be a very fine design, is unfortunately so much decayed that it is difficult to realise what the effect of colour and texture may have been when it was fresh. Reynolds's "Miss McGill" (89), Hoppner's "Miss Palmer" (90), and Opie's "Master Impey" (94), are all interesting works, the last named especially. The large picture of "St. Sebastian" (87) is interesting because it is Vandyck's, and because it is rare to find him in this class of subject, but it serves rather to emphasise the fact that his real field of success lay in portraiture. Among landscapes there is a fine early Turner sea-piece, "The Pilot Boat" (77), with a much better sea than he painted in later life, and a large and rather prosaic landscape by the same artist, called "Classical Composition: Temple of Jupiter" (85), which, except for the fine treatment of the distance, looks a good deal like a stage effect; what temple of Jupiter is meant we know not; the ruin, with Doric columns, rather suggests an inaccurate representation of the Parthenon. Gainsborough's "The Woodcutter's Home" (95) is a landscape worth note for its beautiful composition; the concentration of the main group of figures at the left, and the way in which the figure of the woodcutter seems to connect them, as it were, with the distant perspective of the landscape from which he is returning, make it an admirable example of the manner of placing figures in a landscape so as to assist its effect and expression. That the same artist should have painted this landscape

and the Giardini portrait is a remarkable testimony to the versatility of Gainsborough's genius. Collins's large work, "The Harvest Shower" (75), is a fine example of a school of landscape-painting in which composition went for more than colour or truth to detail; while George Vincent's "Landscape" (71) shows how superior the Norwich school were to their contemporaries elsewhere in painting study of nature. Vincent's picture may be thought a little hard, but the careful way in which the mass of trees in the centre is painted, and the attention given to the distance, form a marked contrast to the generalities of Collins; no one would guess, from comparing these two works, that the two painters were nearly contemporary,* and these two pictures very likely painted about the same time.

Gallery V. offers some striking warnings in the way of works by artists once generally accepted as "eminent"; how do their productions show in the light of the present day? This room contains however one really fine picture, "Running Water" (140), a large painting of a river in spate by G. Paul Chambers, a painter little remembered now; but this is a really fine and powerful work. There is also to be seen Millais' portrait of Mr. Hook, one of the finest of his works of this class.

There are some fine things scattered about in the water-colour room, including three perfect little works by Frederick Walker (Nos. 225, 226, and 235), on the screen; a very fine visionary landscape by Samuel Palmer (162); a beautiful "Composition" in landscape (173) by De Wint; Boyce's "Smithfield, 1867" (196); A. W. Hunt's fine stormy picture called "Blue Lights, Tynemouth Pier" (199); two fine Alpine scenes by Turner (208, 211); and a David Cox—"Ulverstone Sands" (215), which is typical of the artist's best work.

The Black and White room contains the studies and drawings by G. F. Watts which he bequeathed to the Royal Academy; mostly outline studies of figures on brown paper, including also studies of drapery and first sketches for the composition of pictures. The rapid outline studies of different attitudes or different points of view of the same model are instructive; they show how the painter studied the outline and pose of the figure; there is no finish and no shading, only the lines that were needed to fix on the mind the action or outline of the figure. This collection of sketches will be of great interest to artists.

NOTES ON OLD LONDON.

THE THAMES-SIDE BETWEEN CHARING CROSS AND BLACKFRIARS BRIDGES; HUNGERFORD, CHARING CROSS RAILWAY, AND WATERLOO BRIDGES; VICTORIA-EMBANKMENT: 1801-1900.

Hungerford Market.—The site of Charing Cross Station and Hotel was occupied *temp.* Charles II. by Sir Edward Hungerford's house and gardens, converted for market uses under a charter of 1679. An Act of 1685 provided for the sale of general produce, Sir Stephen Fox and Sir Christopher Wren at that time sharing the profits. From them the market passed to one Wise, whose successors sold it in 1824-5 to a company, reconstituted under an Act of 1830, for 110,000. The old premises, consisting of booths and shops, with a colonnade at out a central hall, stood at the end of Hungerford-street (163 ft. long), and were traversed by a much-frequented footway—Craven-court, now Craven-passage and the archway under the railway-station. The new buildings, erected upon an incline, were opened on July 2, 1833. They were designed by Charles Fowler, architect also in 1829-30 of Covent Garden Market (see Plate II.). His signed plan of February 21, 1833, shows the site as lying between Charles-court, north-east, and Brewer's-yard, or lane, at Nos. 15 and 17, Strand, south-west, with Craven-court leading from Craven-street to the "great hall," and Hungerford-arcade leading from the "upper area" into Villiers-street. Fowler's elevations, etc., are illustrated in the (old) *Architectural Magazine* of April, 1834. The buildings, constructed of granite and

stuccoed brick, extended 475 ft. from the end of Hungerford-street, and had a frontage of 126 ft. to the Thames. The plan comprised a spacious hall between two quadrangles—the upper and lower "areas." The northern area, 140 ft. by 70 ft., in the clear of the Doric colonnades, had twelve shops for meat and produce, with living-rooms on two stories above, along its two sides, and entrances opposite the arcade and Craven-court. Between that quadrangle and the hall was a portico or corridor, with stairs at the ends leading up to galleries above the shops on the sides of the hall and down to the cellars. On the two sides of the hall, 188 ft. by 123 ft., were shops for poultry, meat, and produce; a flight of steps descended to Craven-court. The roof of the middle aisle of the hall was raised upon open arches above the roofs of the two side aisles. A portico or corridor lay at the lower end of the hall, separated from it, as at the upper end, by an open arched screen. Stairs from the corridor gave access to the galleries above and to the fish-market; and the vaulted cellars on two tiers beneath, with a prospect tower over each staircase. The level of the southern area, 120 ft. by 70 ft., lay one floor lower; a wide range of steps descended from its upper end to the fish-market, 120 ft. by 70 ft. The river-front consisted of a double colonnade having a terrace above, flanked by the Dolphin (east) and Swan (west) taverns, which had flat roofs planted as gardens. The proprietors bought more ground, and embanking the deep bay of the shore, built a quay and jetty. From the wharf, 95 ft. by 218 ft., granite steps communicated with the jetty, which projected 250 ft. into the river. From the wharf to Villiers-street extended a large open space for the hay-market; the sailing barges laden with hay formed a pleasing element of the view. On the northern wall of the old market-house was a bust of Sir Edward Hungerford (Plate II.), wearing his 500-guinea wig, over a tablet inscribed:—

REGIA VIRTUTI PUBLICÆ PERQVAM NECESSARIUM REGIA CÜRATA 2^o ANNUNTIË MURÆSTVÆ PROPRIË SVPMTIBVS CREXIT PERFECTO D. EDVARDVS HVPNGERFORD BALNEI MLES ANNO MDCLXXXIII.

That house, in the XVIIth and XVIIIth centuries a French church, was lately tenanted by the British Fire Office and a dairy. For Charles Dickens's boyhood in No. 30, Hungerford-street, and the market, *vide* "David Copperfield."

York-buildings and the Water Gate.—An Act of May 15, 1624 assigned in exchange to James I. the "inn" of the Archbishops of York, which had been that of the Bishops of Norwich. He bestowed it upon George Villiers, Duke of Buckingham, who pulled down the house and built some reception-rooms in its stead. For his intended mansion he built the Water Gate, which remains in a hollow of the Embankment-gardens. The gate, bearing his cognisance, a fount anchor, as Lord High Admiral, was executed by Nicholas Stone after a design generally ascribed to Inigo Jones (September 19, 1896, Mr. W. R. Mosley's measured drawings)*. Under their London Open Spaces Act, 1893, the London County Council acquired Villiers-walk (since York-terrace) and the water-gate; they planted the walk, repaired and underpinned the gate, and roofed it with lead. On May 12, 1888, Mr. Justice Chitty made an order for winding-up a long-forgotten enterprise named the Lessee Proprietors of the York-buildings Waterworks. Ralph Bucknall and Ralph Waine obtained licence under the Great Seal in 1675 "to erect a waterwork on the grounds of York House"—being their own land. An Act of 2 & 3 Will. and Mary incorporated "the Governor and Company of Undertakers for raising Thames's water in York Buildings." The proprietors sold their venture in 1719 for 7,000l. In 1812 a sum of 30,000l. was expended upon a new engine-house, the substitution of iron mains for the wooden pipes, and an enlarged conduit to the reservoir beneath Villiers-street. By indenture of September 16, 1818, the New River Company acquired the undertaking, and covenanted to

make certain annual payments, including four annuities of 500l. apiece to terminate in June, 1911. An Act of 1829 dissolved the corporation. The works fed a reservoir in Marylebone-fields for supplying the western parts of the town; the number of houses never exceeded about 2,700. Savery constructed the engine, known as the York-buildings dragon, copying the parts, doubled in each dimension, of one he had made in 1712 for a Mr. Balle at Camden Hill, Kensington; confer R. Bradley's "Ten Practical Discourses, etc.," 1727-33. Savery's machine forced 3 tons of water per minute into a leaden cistern at the top of a wooden tower, about 65 ft. high and octagonal on plan (see Plate I.). It is the "noble engine" described by Switzer in his "Hydrostatics and Hydraulics," 1729; De La Motraye gives a view, 1735, of Savery's engine and its successor, Newcomen's beam-engine, side by side. The fuel proved to be costly, the plant often became disabled, and the soot and smoke caused great annoyance in the neighbourhood. Savery's engine, disused in 1731, was preserved there during a long time as a curiosity. The water-tower, upon a projecting wharf (latterly the site of Charing Cross Music-hall) midway between the end of Villiers-street and Black Lion-stairs at the foot of Charles-court, survived much longer. There are views of it in the National and Guildhall Collections, and a water-colour drawing of the tower and the gate in the Turner Collection at the National Gallery; see also Samuel Scott's picture of the riverside bought in 1891 for the National Gallery. Of the two houses at the south end of Buckingham-street (1675), No. 14, at the western corner has been rebuilt, as clearly appears from a painting of the riverside, in or about 1756, by W. James, which is now, or was lately, in the Queen's Presence Chamber, Hampton Court Palace. The former house, of red brick, on that site—depicted by James—had been the residence of Peyps in 1694-1700, and then, *teste* Hatton in his "New View," 1708, of Ralph, first Duke of Montagu, Master of the Royal Wardrobe. The present house was the home of Clarkson Stanfield, R.A., and in 1826-49, of William Etty, R.A. In 1689 Peyps had the Tsar Peter the Great for his opposite neighbour at No. 15, still extant, and a former home of the Institution of Civil Engineers, and of W. Black, the novelist, *vide* his "Sunrise." George-street and Of-alle are renamed York-buildings and York-place.

The Adelphi.—As the story of the Adelphi is told and illustrated in the *Builder* of December 6, 1902, there needs to say only that the once notorious "Arches" are now cleaned, guarded, and lighted, and to cite the fine perspective drawing of "the Royal Terrace . . . with the wharfs, arcade, and entrances to the subterranean streets . . ." engraved by B. Pasternini, in the third (and posthumous) volume, 1822, of "Works in Architecture" by Robert and James Adam. David Turner's water-colour drawing in the "Crowley" Pennant depicts the "sea-water house" at the west end of the wharf. In 1818 some sea-water baths were in Buckingham-street; and there were some at No. 21, St. George-street.

The Salisbury Estate and Hotel Cecil.—Under the enabling provisions of the Settled Estates Acts, the late Marquis of Salisbury sold his property lying between the Strand and the former riverside in 1887 for, it is said, 200,000l. J. W. Hobbs & Co. subsequently acquired the fresh-water pumping-lay out a curved road, to rise to 35 ft. above the embankment level, to the Strand at Wellington-street. That project gave way to Messrs. Perry & Reed's plans for covering the area, nearly 2½ acres, with a vast hotel. Traversed by Ivy Bridge-lane at No. 76, Strand, and by Salisbury and Cecil streets, the ground embraced a strip of land adjoining the Embankment gardens, whereon, at the foot of the lane, remained until the winter of 1888-9 an old messuage which, fifty-five years ago, was known as the Fox under-the-Hill, whence at Salisbury-stairs the half-penny steamboats, *Ant, Bee, and Cricket*, plied to London Bridge. The traffic ceased after the disastrous explosion of the boilers of the *Cricket*, which killed six persons and injured many more. The lane was then closed by a gate at the Strand end, though for several years afterwards it could be ascended from the Thames side. The upper

* Collins born 1788, died 1847; Vincent born 1796, died some time after 1830.

* Dates within square brackets relate to illustrations in the *Builder*. For Stone's share in the work, and the data upon which its design might be claimed for him, see the *Builder* also of May 13, 1854; June 18, 1864; May 26, 1898; and September 19, 20, 1896. Some say that Sir Balthazar Gerbier was the Duke's architect.



- a. Old German Lutheran Church.
- b. French Church.
- c. Little Savoy-gate (Savoy-steps).
- d. Middle Savoy-gate (Savoy-street).

- e. Site of German Calvinist Church.
- f. Site of Savoy Water-gate.
- g. Military Prison.
- h. Fox under the Hill.

- i. Site of Ivy Bridge.
- k. Site of Strand Bridge.
- l. Former Offices of the Builder (1842-1873).

Fig. 1. The Savoy before the Building of Waterloo Bridge and Wellington-street.

epd, now a passage to the hotel, marks the position of Ivy Bridge, formerly Ulle-brig, in the Strand, across a rivulet flowing from Cock and Pye fields, near Seven Dials. Stow records:—

"Ivy bridge in the high street, which had a way under it leading down to the Thames, like as some time had the Strand bridge (see under Savoy), is now taken down, but the lane remaineth as afore, or better, and parteth the liberty of the Duchy and the City of Westminster on that south side."

The lane under the bridge formed a frequented thoroughfare for foot traffic between Covent Garden and the waterside; across its lower end projected, until lately, the west half of the crescent circus which, together with the retaining wall and the flight of steps descending 24 ft. to near Salisbury-stairs, the brothers Adam added to Salisbury-street, rebuilt in or about 1785 by James Payne. Ivy Bridge-lane, overlooked by the hack bay-windows of houses along the west side of Salisbury-street, presented a singular appearance, being covered for the greater part of its length by portions of houses on both sides, which darkened the way and converted it into an almost continuous tunnel, square in section. The entrance at No. 76, Strand, was incorporated in 1893 in the front of the Club Café by Mr. P. E. Pilditch, since pulled down. Many of the earlier Cecils were buried in the old church of St. Martin-in-the-Fields. The registers contain an entry of a payment of 3s. 4d., in 1650, to William Wright:—

"for a stone ingraved with letters on it which is sett in the wall of the Earl of Salisbury at his house at Ivy Bridge to divide the two parishes of St. Martin in the fields and St. Clement Dances at that place."

Sir Robert Cecil, advanced Earl of Salisbury on May 4, 1605, built a mansion on the west side of the gardens of the Bishop of Carlisle's "inn"—since Russell, or Bedford, House, and then Worcester House; Queen Elizabeth was present at the house-warming on December 6, 1602. William, second Earl, subdivided the mansion into Great Salisbury House and Little Salisbury House, reserving the former for himself, and renting the latter to his son-in-law, William Cavendish, third Earl of Devonshire, and other persons of quality. In 1692 the site of Little Salisbury House was leased for the making of

Salisbury-street, since altered by the brothers Adam, and by Payne, as already mentioned. Another parcel of the estate was leased for a range of shops, the Middle Exchange, which extended from the Strand to the river bridge or stairs. Having proved to be a failure the Middle Exchange was, together with what remained of Salisbury House, demolished in 1695, and their site was taken for Cecil-street, whereof the east side lay within the Savoy precinct, abutting against Carting, formerly Dirty, lane, at No. 38, Strand, by the side, in later times, of the Savoy Theatre. Looking down Salisbury-street (closed in May, 1892), one saw the obelisk on the Embankment. Of the hotel, opened in 1896, the southern block, abutting on Savoy-place, was built by J. W. Hohhs & Co., and the eastern and western blocks by Messrs. Perry & Co., after Messrs. Perry & Reed's plans and designs—all the metal work being calculated for and supervised by Professor A. B. Kennedy (October 20, 1888, with section and two plans; October 19, 1895, Strand façade, grand staircase, and two plans); the three blocks stood around a courtyard, 300 ft. by 80 ft. The plans illustrated in the Builder were modified on the demolition in 1898-9 of Nos. 76-7-8, Strand, between Ivy Bridge and Carting-lane, together with the northern ends of Salisbury and Cecil streets which had formed the two entrances into the courtyard, and on the setting back of the frontage so as to widen the Strand there to 90 ft. Mr. J. Carnichael built the extension to the Strand, comprising shops, offices, and Cecil-chambers, after Mr. Joseph Sawyer's designs.

Savoy Hotel.—In June, 1889, a company was formed to take over Beaufort House at the south end of Beaufort-buildings, Strand, and the nearly completed hotel erected by Mr. G. Holloway, who, we understand, acted as "working master builder," no professional architect having been employed. The south front, with its heavy iron verandahs, is incommensurate with its position, and perhaps the best one could say for it is that it gains by contrast with the adjacent Examination Hall. A special feature of the rearrangements consisted of numerous self-contained suites on every floor, and a central courtyard, 6,006 sq. ft. superficial, treated after the Continental manner. The decorations, by

Messrs. Collinson & Lock, of the restaurant, reception-rooms, etc., are from drawings by Mr. T. E. Collcutt, who also made special designs for the mantelpieces throughout. Some additions to the courtyard, by Mr. T. E. Collcutt, are illustrated in the Builder of July 11, 1896. The more recent extension, embracing the Strand front, with "Simpson's" (1843), were made by Messrs. Collcutt & Hamp, in association with the Worcester Buildings Company, and in connexion with the widening of the Strand by the Westminster City Council. The new entrance, Savoy-court, having a raised level, absorbs Beaufort-buildings and Herbert's-passage; the façade supplants Nos. 89-104, Strand, between Carting-lane and Savoy-buildings leading to Fountain-court and the Savoy. Of Fountain-court the remaining (west) side was pulled down in 1902, and with it No. 5, the home, during the last seven years of his life, of William Blake, who lodged in the back room on the first floor, and died there on August 12, 1827, drawing with a final effort a likeness of Katharine Boucher, his wife. Opposite, on the east side of the court, stood the Occidental tavern, reputedly more than 270 years old, and of high standing during the Regency, but after 1851 known as the Coal Hole, the *soi-distant* Chief Baron Nicholson's, which, with the adjoining Nos. 15-4, suddenly collapsed on the morning of March 26, 1837, after they had been dismantled for the building of Terry's Theatre [Mr. Walter Enden, April 9, 1837].

The Savoy.—The Court Leet of the Royal Manor and Liberty of the Savoy has existed during longer than 700 years, and is charged with maintaining the boundary marks in the Hotel Cecil, at the Lyceum, Child & Co.'s Bank, Twining's tea warehouse in Devereux-court, the Embankment, and other places. The jurisdiction extends from the Hotel Cecil to the Middle Temple, taking in the north side of the Strand, the south side of Holywell street (now pulled down), and the Lyceum and (old) Gaiety theatres. Of the former buildings a fragment of stone wall, by the wharf, survived until 1877 at the south-east corner of Savoy-street. The Hospital of St. John the Baptist, erected by Henry VII. and Henry VIII., and built by Humphrey Cook, the "King's carpenter," with, at its east end, Charles II.'s French

Protestant Church of St. John the Evangelist (1661), first founded in 1641 by B. de Rohan, Lord of Soubise, lay between the Chapel Royal and Duchy-lane. Duchy-lane, or place, or court, opposite the site of Strand bridge, was entered by a steep flight of steps between Nos. 137-8, Strand, and is absorbed by a recent widening and rebuilding, at the corner, east, of Wellington-street. A valuable set of (undated) drawings by Sir William Chambers and Robinson in the Soane Museum contains plans and designs for proposed public offices on the Savoy site, after the style of Somerset House, with plans of the old hospital and adjacent buildings. The latter plans plot the "coach-passage" shown in Vertue's earlier plan of 1736, leading from the Broadway to the Friary, which had been cut obliquely through the nave, or western arm, of the cruciform hospital, all of which was then occupied as soldiers' barracks. At the north end of the Broadway was Middle Savoy-gate; Savoy-street, formerly Great Savoy-hill, has replaced the Broadway and coach-passage, Wellington-street and Lancaster-place traverse the sites of the Friary, the eastern part of the hospital, and the French Church. The military prison at the south-west angle of the Chapel Royal faced Little Savoy-gate—now Savoy-steps, at Nos. 107-8, Strand. Savoy-mansions are on the site of the prison and of the western portion of the barracks. The Medical Examination Hall marks the position of the German Calvinistic Church on the east side of the river stairs, and of the (old) German Lutheran Church between the Calvinistic Church and the Friary. The Lutheran Church, rebuilt on adjacent ground, was pulled down for the widening of Savoy-street; the French Church was rebuilt in Bloomsbury-street (now Shaftesbury-avenue). On succeeding to the throne Queen Elizabeth converted the hospital chapel (1503-5) into a parish church, for the parishioners of St. Mary-le-Strand, which, by letters patent of November 27, 1775, became a Chapel Royal. George IV. repaired and improved the chapel in 1826-30; in 1845 Sydney Smirke the elder, surveyor-general to the Duchy of Lancaster (*ob.* 1877), restored the fabric for Queen Victoria, Willement designed the glass for the window above the reredos, and restored the reredos, by some ascribed to Sir Reginald Bray, and the roof and ceiling. Smirke altered the interior in 1860, removing the gallery and fitting in a new organ. A fire, which broke out in the rear of a house in the Strand on Thursday afternoon, July 7, 1864, destroyed nearly all but the walls, the roof, and the beautiful ceiling of oak and pear wood, divided into 138 enriched quatre-foil panels. Smirke re-instated the chapel at a cost of 7,000*l.*, destroyed by the Queen. Messrs. Perry & Reed added a porch and vestry in 1877; the schools, with the Royal Savoy clubroom [Messrs. Perry & Reed, May 5, 1883], were built for Queen Victoria by Mr. W. Brass. The Sovereign's ecclesiastical authority is supreme in the precinct, and all the buildings are exempted from the district surveyor's supervision and the provisions of the London

Building Acts. In 1875 the late Metropolitan Board of Works obtained powers (38-9 Vict. c. 179) to make a road (Savoy-hill) through lands belonging to the Queen in right of her Duchy of Lancaster, and one (Savoy-place) through their vacant lands to the east boundary of Lord Salisbury's property at the south end of Carting-lane. The Act further empowered the Chancellor and the Council of the Duchy to widen Savoy-street by setting back the graveyard railing and the return of No. 118, Strand, and by taking in nearly all the site of the later Lutheran Church on the west side. The improvement, completed in March, 1877, cost 3,669*l.*, the Board not being required to pay for the land thus thrown into the public way. The Turkish baths at the lower end were fitted after the Moorish mode by C. J. Phipps (*ob.* 1897), architect (1881) of the Savoy Theatre, the first London theatre lighted with electricity.

Somerset House and King's College.—Mr. W. Monk's drawing [January 4, 1902] of the south front of Somerset House, as it appeared before the making of the embankment, evinces how the raised embankment, with its land-side balustrade, has spoiled the effect of the terrace arcade rising directly from the water at full tide. The plinth course of the arches and of the side water-gates is now concealed, whilst the solemn gloom of the great middle arch which is blocked up to above the springing is quite destroyed by a wall inserted almost flush with its face for the conversion of the archway into rooms, with a door and windows in the wall. A stone wall and repository (1837) at the west end of the river front replaced the Dock House, a waterway for barges leading to Somerset-place, or West-court. Sir James Pennethorne completed Chambers's design with the west block opposite Lancaster-place in 1852-3. For his successful work on that occasion seventy-five leading architects presented him with a gold medal. One day, as he crossed Waterloo Bridge with a friend, Telford pointed to the corner of the river front, saying: "Forty years ago I heaved and laid those stones when I worked on that building as a common mason." King's College was established in 1828; the buildings are by Sir Robert Smirke, 1830-1. The Government granted a parcel of vacant land on the east side of Somerset House, stipulating that the river front should be in keeping with that of the latter. But additions carried out in yellow brick on that side spoil the continuity of the two designs. The chapel over the hall and projecting eastwards is by Sir G. G. Scott. In 1897 the school migrated from the basement and the north wing to new buildings at South Hayes, Wimbledon; in 1900 Messrs. Banister Fletcher & Sons built an additional storey on the south wing, and reconstructed the second storey of the north wing for laboratories, the museum, and the architectural, geological, and other scientific departments [November 3, 1900].

Whitefriars and Bridewell Precincts.—The Carmelite convent founded by Sir Richard Gray, 1241, stood between Inner Temple

and Water-lane—now Whitefriars-street. Crocker's, or Brocker's, lane, granted to the Friars for building their church, 1407, is now Lombard-street; Huton-street supplants the notorious Wilderness-lane. In the *Builder* of November 16, 1895, is an account of the discovery of the crypt at No. 4, Britton's-court. Of "Alsatia," in the early years of the XVIIIth century a graphic description is given by Sir Walter Scott in his "Fortunes of Nigel." The *Gazette à la mode, or Tom Brown's Ghost*, No. 3, of May 26, 1709, records the demolition of the Dorset Gardens Theatre (1671, by Wren) in that year when the New River Company took the ground for their timber-wharf, pipe-boring shops, offices, etc.; the City of London Gas Company established their works in 1814 on the site, which is now that of the City of London School. An excavation, in 1892, on the site of Bridewell Palace (*see* Plate II.), behind De Keyser's Royal Hotel, revealed a pointed arch built upon piles, and some walling carried by red brick arches with chalk abutments resting on elm piles. G. P. Boyce's drawings of St. Edward's Chapel and the adjacent buildings were deposited in the Museum, South Kensington. In the Guildhall is a picture, by Samuel Scott, of Bridewell dock, 1770, with Dr. Sacheverell's house distinguished by a mural sun-dial. The old burial-ground is in Dorset-street. The remaining buildings comprise the court-room, offices of Bridewell and Bethlehem Hospitals, and treasurer's residence. An Act of 52 Geo. III. provided that a portion of the old hospital and house of correction should be available for the detention of refractory apprentices; some cells remain, and they are still used upon occasion. The prison was pulled down in 1863-4; the chapel—where is now Bridewell-place—in 1871.

Hungerford and Charing Cross Bridges.—I. K. Brunel's suspension bridge [April 12, 1845] was erected by Sandys, Carne, & Vivian, of Cornwall, who contracted for some 15,000 tons of ironwork, and by W. Chadwick, who built the abutments and the two piers and their towers, after designs by Bunning (*ob.* 1863), in the Italian style, to harmonise with the facade of the market, where the bridge joined the terrace roof of the central colonnade. Brunel (*ob.* 1859) built the brick piers upon the gravel, without piles, adopting the coffer-dam principle after the old form. The piers, whose bases remain, carried rectangular towers, 22 ft. square on plan. The 14-ft. footway, having iron diagonal trusses to minimise undulation, hung by single suspension rods, 12 ft. apart, from four chains, in two lines, composed of 2,600 links weighing in all 750 tons; each link being 7 in. wide, 1 in. thick, 24 ft. long, and weighing 5½ cwt. The chains passed over rollers on the towers, the saddles having a free movement of 18 in. each way, and were secured in tunnels at the abutments to two iron girders, 44 ft. long and 5 ft. deep, solidly embedded in the brickwork in cement backed with concrete. The towers rose to a total height of 80 ft., or 58 ft. above the footway; the deflection of the chains

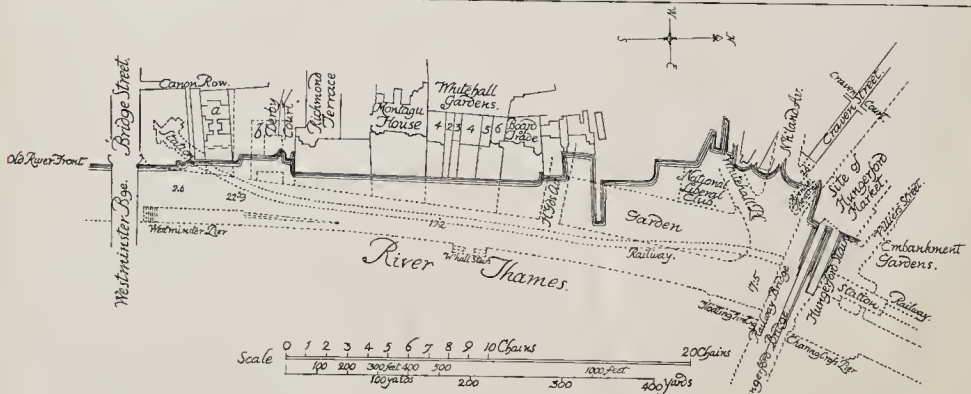


Fig. 2. The former Riverside, and Victoria Embankment.

amounted to 50 ft., their entire weight and that of the platform were thrown on to the columns and not the arches of the piers. The middle span, 676½ ft., was 116½ ft. more than that of the Menai Straits bridge, and second to only that (nearly 900 ft.) of Chaley's similar bridge at Fribourg, in Switzerland, each of the two other spans was 335 ft. The footway was 22½ ft. at the abutments, 28½ ft. at the piers, and 32½ ft. at the middle point above high-water mark, giving a graceful camber, rising to 7 ft. higher than the crown of the middle arch of Waterloo Bridge; each pier had flights of steps descending to the river. Begun in the spring of 1841, and costing a total sum of 110,000^l, Hungerford Bridge was opened on May 1, 1845; the half-penny tolls yielded a fair dividend to the proprietors. Under their Act of 1861 the South-Eastern Railway Company obtained powers to extend their line from London Bridge Station (Surrey side) to termini at Cannon-street and Charing Cross. The chains of Hungerford Bridge were taken for the completion by J. Hawkshaw and W. H. Barlow (*ob.* 1902) of the suspension bridge [August 8, 1863] across the Avon at Clifton, which I. K. Brunel had designed many years previously. They were adapted to the span there of 702½ ft., with a deflection of 7 ft. Harrison Hayter, C.E. (*ob.* 1898), designed the iron railway bridge, with footpaths on cantilevers, supplementing the two brick piers with iron cylinders. For sinking the cylinders he discarded the compressed-air method, employing divers, who worked inside until the cylinders had reached the clay to a maximum depth of 32 ft. in the river bed, when they were pumped dry. The shallower piers he sank 25 ft., the piles for the greater part penetrating the stiff London clay, with beds of septaria—confer the *Proceedings of the Institution of Civil Engineers*, vol. 49. The Metropolitan Board of Works opened the bridge toll-free on October 5, 1873, paying 98,540^l compensation to the railway company. In 1884-5 Mr. Brady, engineer to the South-Eastern, since the South-Eastern and Chatham, Railway, widened the bridge by 40 ft. on the upstream side for four more lines, Messrs. J. Cochrane & Sons being the contractors. The terminus was opened on January 11, 1863; the hotel, built by Messrs. Lucas, at a cost of about 150,000^l, is by E. M. Barry (*ob.* 1880), who also made the designs for the copy, in the forecourt, 1863-5, of the Queen Eleanor Cross, at Charing. On December 23 last we published a description, with drawings, of the station and roof designed by Sir J. Hawkshaw.

Waterloo Bridge.—For a company formed in 1809 Ralph Dodd, the projector, aided by John Linnell Bond, prepared designs for a horizontal bridge, having elliptical arches, which they based upon those of Jean R. Perronet for the bridge (1768-74) across the Seine at Neuilly; the Act of 1809 (49 Geo. III. c. 191) names Bond as "assistant architect." The designs were referred to John Rennie and Jessop; the company appointed Rennie as their engineer. Of his two designs—one for seven, the other for nine, equal arches—they chose the latter as the less costly. Rennie followed the model of his bridge across the Tweed at Kelso (1799-1803), having five semi-elliptical arches of 72 ft. span, with engaged Doric columns on the piers and abutments, a plain block cornice, and a balustrade, and a level roadway. The nine arches have a span of 120 ft., their crowns are 30 ft. above high water at ordinary spring tides; the arch stones increase regularly from 4 ft. 6 in. at the crown to 10 ft. in depth at the haunches—a correctness of principle which Rennie was the first engineer to adopt. The piers decrease in width from 30 ft. at the foundations to 20 ft. at the springing of the arches, and the abutments similarly decrease from 40 ft. at the base to 30 ft. at the springing. Over the points of the piers are two three-quarter engaged Grecian Doric columns, designed after those of the temple at Ægesta, in Sicily, each having a diameter of 5 ft. 8½ in. at the base, a height of 25 ft. 9 in., and a width of 4 ft. 4 in. at the under side of the capital, and each pair carrying a recess from the footpath, 17 ft. wide by 5 ft. deep. Between each pair of arches, at a level of 19 ft. above the springing, is an inverted arch, of which the stones are 4 ft. 6 in. deep at the crown, and decrease regularly on each side

as they unite and abut against the extrados or backs of the voussoirs of the main arches. A Grecian Doric block cornice and entablature carry a balustrade parapet 5 ft. high. Rennie employed coffer-dams for constructing the foundations of the piers, a then novel expedient in a large tidal river, with an ingenious method of constructing, floating, and fixing the centring [May 28, 1898; sections of arch and pier of Waterloo and London bridges, showing pile foundations and construction of centring—Mr. A. T.

Walmisley]. The balustrade was worked at Aberdeen; the rest of the granite was hewn on the Surrey side, and it is recorded that one horse, "Old Jack," drew nearly the whole of the stones to the work. Rennie put the face of the northern abutment in a line with the terrace of Somerset House, and laid out the roadway to be level, as nearly as possible, with the Strand, whence the rise to the top point on the bridge has a gradient rate of 1 in 250, or about 2 ft. in all; the two

(Continued on page 19.)

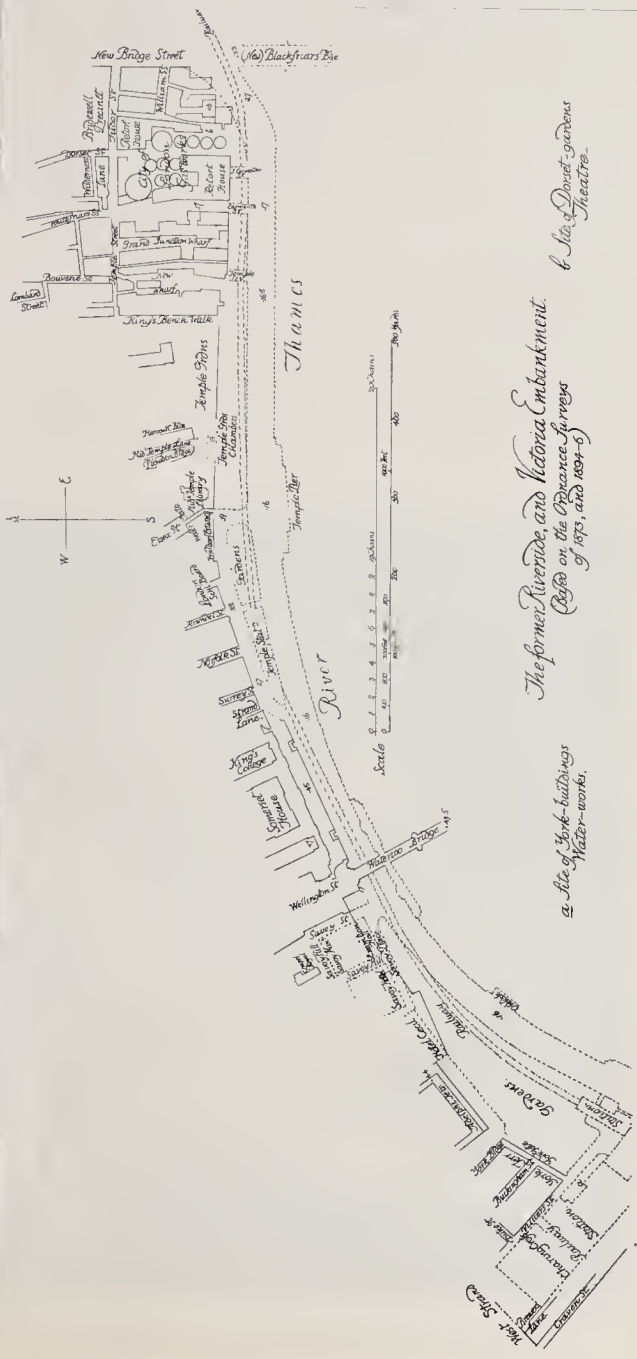


Fig. 3.

Fifty Years Ago.

FROM THE *Builder* OF JANUARY 5, 1856.

THAMES ESPLANADE AND RAILWAY.

A COMPANY has just been registered under the title of the "River Thames Esplanade, Railway, and Sewage Company." The promoter, Mr. Wieland, of Glasgow, proposes to construct river walls on both banks of the Thames, extending from London Bridge to Westminster Bridge, with the view of improving the channel and navigation, while increased wharfrage accommodation would be given by means of quays and archways extending inwards from the river a depth of 120 ft. On the north side of the river the quay is to be 40 ft. wide, and 80 ft. in depth from the quay, is to be covered by a double row of groined arches, 35 ft. span, and about 35 ft. in height. It is proposed to raise a road or esplanade on the top of these arches 80 ft. wide, running parallel to the river on the level of the various bridges from London Bridge to Hungerford Market. On the river side of the esplanade is to be a parapet and balustrades, and on the land side a row of handsome shops, warehouses, or offices. Underneath would be a series of warehouses communicating with the quays. On the south side of the river it is proposed to adopt the same plan, with the exception that the esplanade would only be 40 ft. wide, and on the greater portion of it the warehouses above the shops would give way to private dwellings, built in flats, on the Scotch and Parisian plans. The esplanade on either side of the river is to form junctions with the bridges and leading streets. It is also proposed to form an additional railway under the arches of the railway on the Middlesex side of the river from London Bridge to Hungerford Market. Another feature of the

scheme is to prevent the pollution of the river Thames by conveying the sewage from the mouths of the present sewers to convenient spots, where it may be deodorised and converted into manure for agricultural purposes. The importance of the object is admitted on all hands—what is wanted is a practicable mode of effecting it, and this the company will have to show by details. The Thames ought to be embanked, and it will be, we have no doubt—it is simply a question of time and the right man.

Illustrations.

PORTION OF ROOF, MILAN CATHEDRAL.

THE Cathedral of Milan is of unknown authorship, as regards the architect, though the design is probably, to a large extent, of German origin. Its wonderful roof, with the crowd of pinnacles, statues, and flying buttresses, makes an intricate study. Many of the sculptures have been over-rated, and some of them are very meagre, as regards any artistic quality; but the effect of intricacy and elaboration of the whole, produce a *tout-ensemble* the like of which is nowhere else to be seen. The statues include saints, prophets, prelates, beings, and martyrs; the latest addition to the illustrious company being Napoléon (about 1805).

The upper slopes of the flying buttresses are adorned on each side with a carved cresting, representing different flowers (very crudely cut), from which circumstance the roof has sometimes been known as the "Garden."

The upper part of the second buttress pinnacle to the right has been omitted in the

sketch, as cutting out too much of the "Aguglia," or central lantern—a very beautiful feature. A. C. C.

THE NEW WAR OFFICE.

THE new War Office, now completed externally, was, as our readers will probably remember, designed by the late Mr. W. Young, who unhappily died before the building was commenced, and has been carried out by his son, Mr. Clyde Young, with whom is associated Sir John Taylor, as consulting architect on the part of the Office of Works.

The contractors are Messrs. Foster & Dicksee, of Rugby. The whole of the stonework is specially selected Portland stone, which has all been worked at their yard in Chelsea, where they have established a most up-to-date plant for dealing with it, and the result is a most excellent piece of masonry, on which they are to be congratulated. Needless to say, fire-resisting construction has been used throughout, and the danger of fire reduced to a minimum.

We content ourselves for the present with these few particulars. When the building is completed will be the time to give fuller details as to the whole scheme, and the treatment and purposes of the various rooms and other portions of the interior. We give however a plan of one of the floors, which Mr. Young has kindly furnished us with.

The perspective view of the exterior was specially made for this issue by Mr. E. B. Lamb.

SCULPTURE AT THE NEW WAR OFFICE.

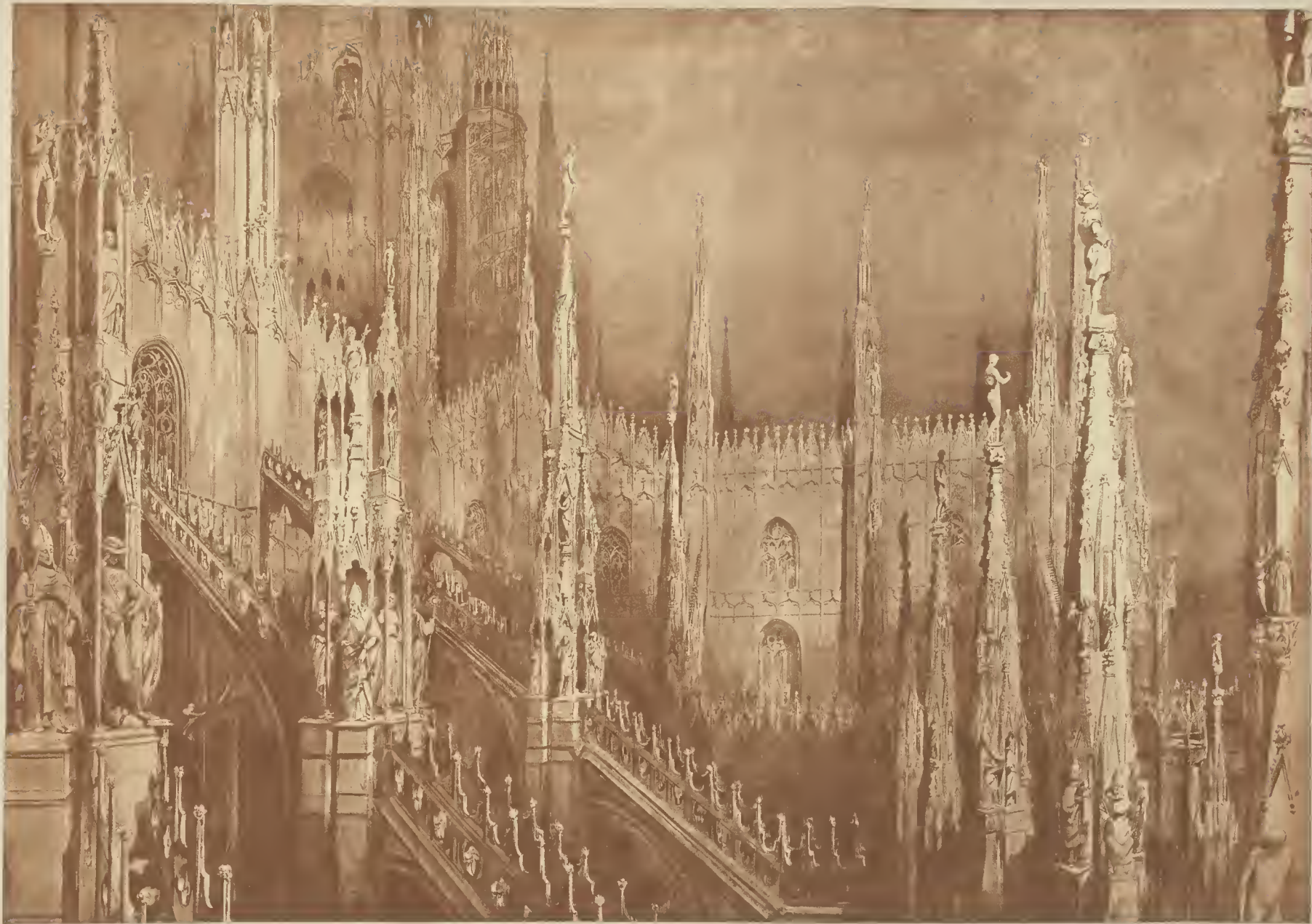
THROUGH the kindness of Mr. Alfred Drury, A.R.A., who has been commissioned to execute the principal groups of decorative sculpture on the exterior of the War Office.



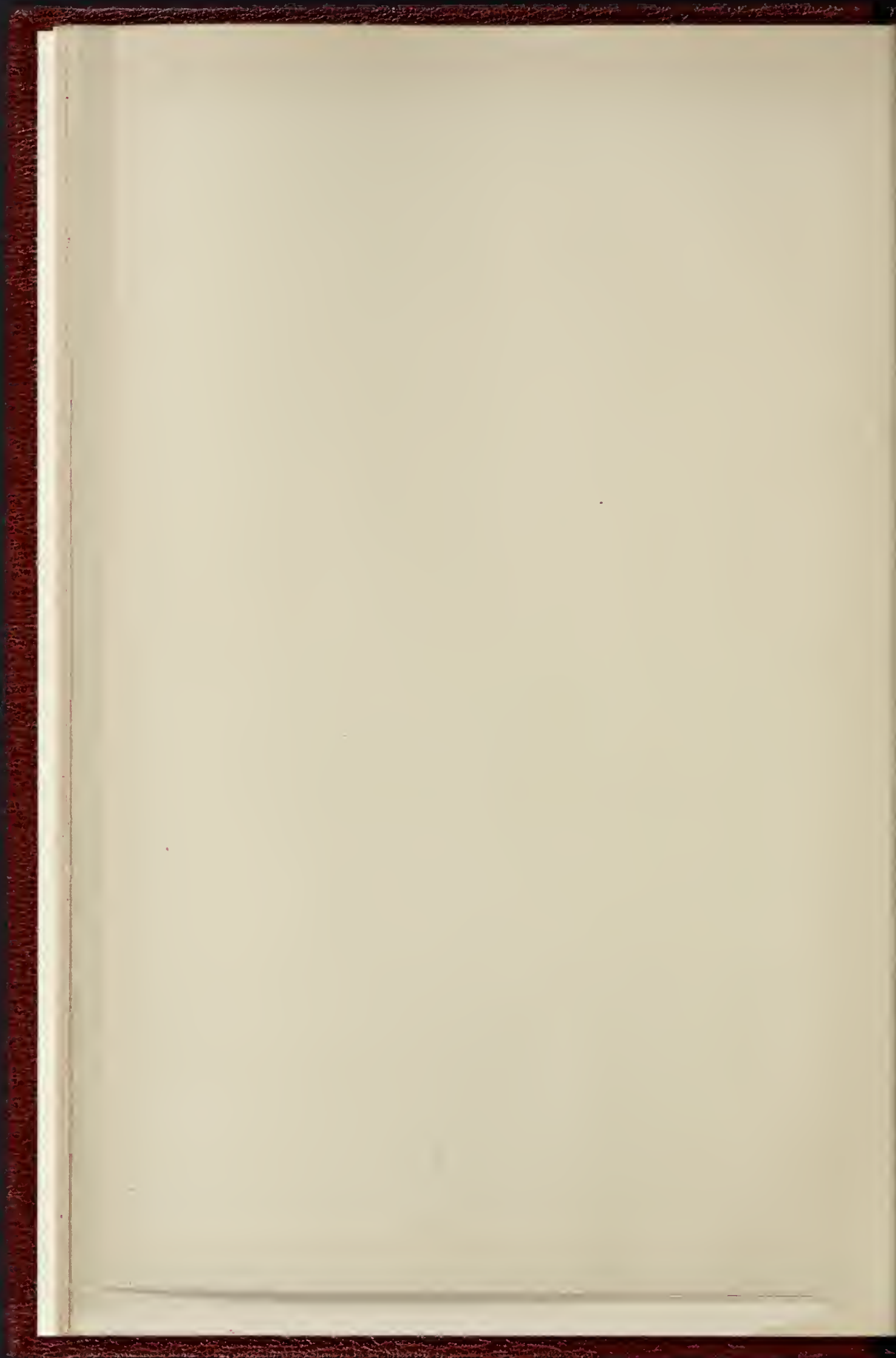
Truth.

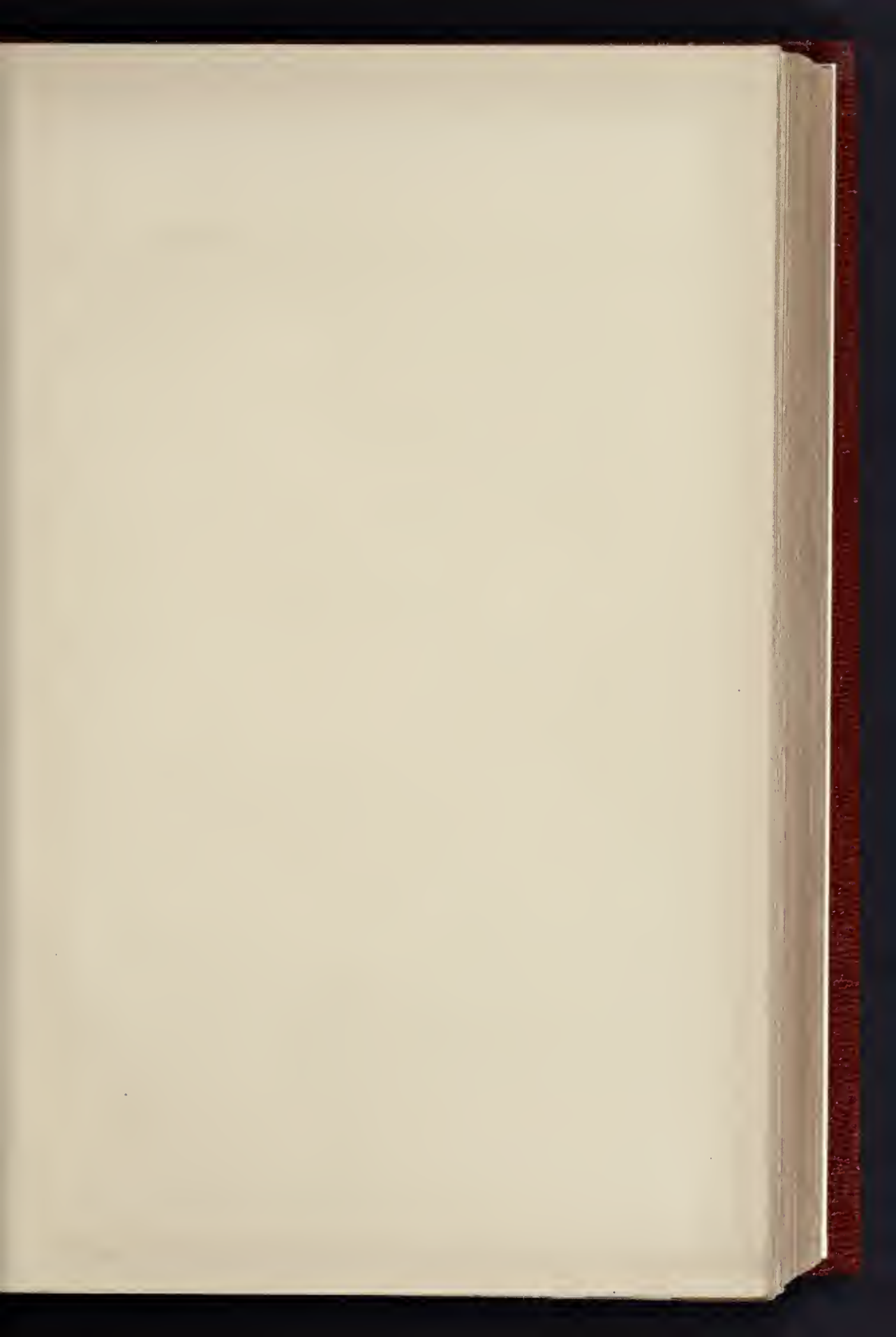
Justice.

Sculpture Group on the New War Office.



ON THE ROOF AT MILAN.—DRAWN BY MR. A. C. CONRADE.







"THE HORRORS OF WAR."

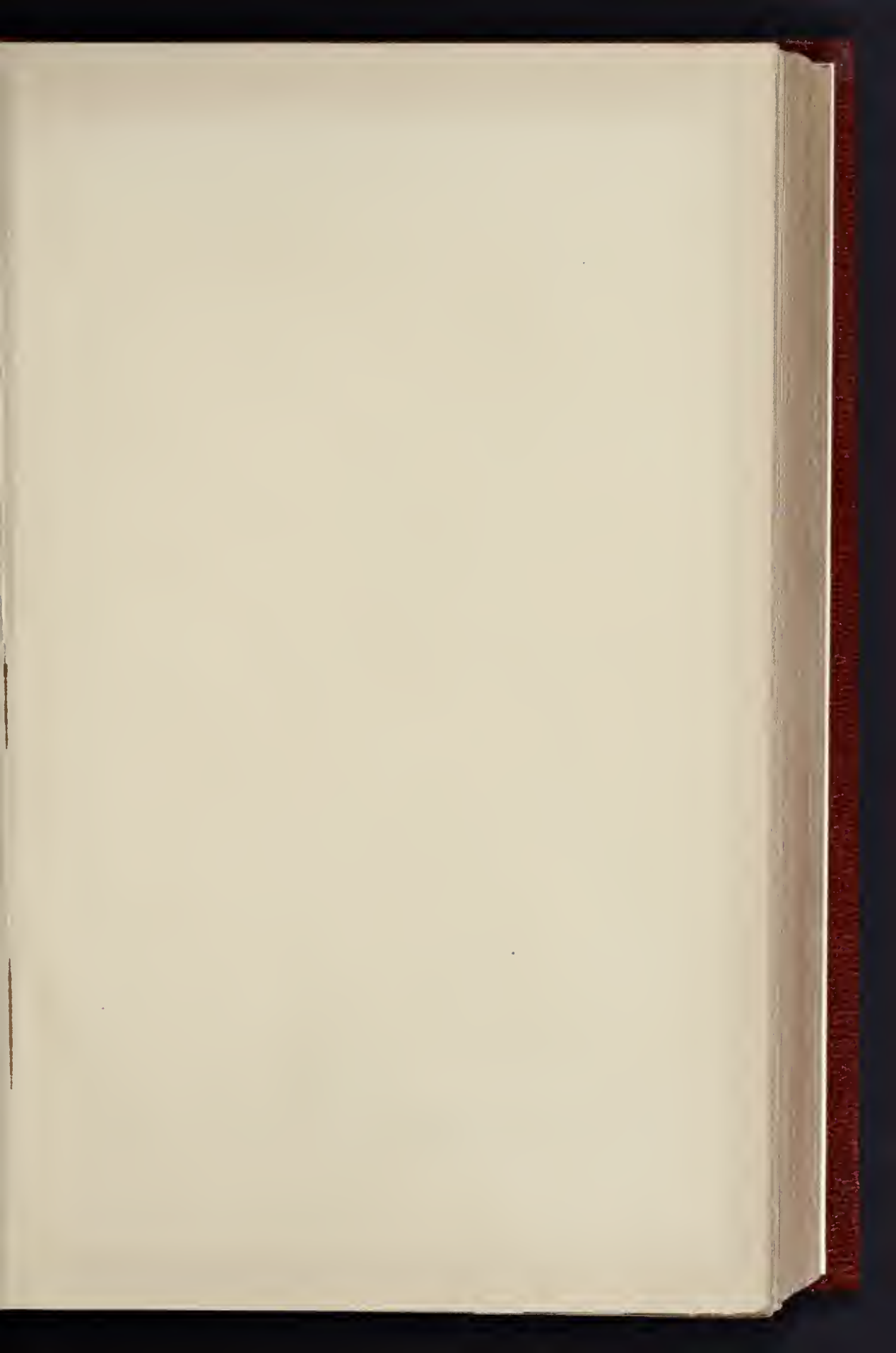
SCULPTURE AT THE NEW WAR OF



INK PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET KETTER LANE E.C.

"THE DIGNITY OF WAR."

—MR. ALFRED DRURY, A.R.A., SCULPTOR





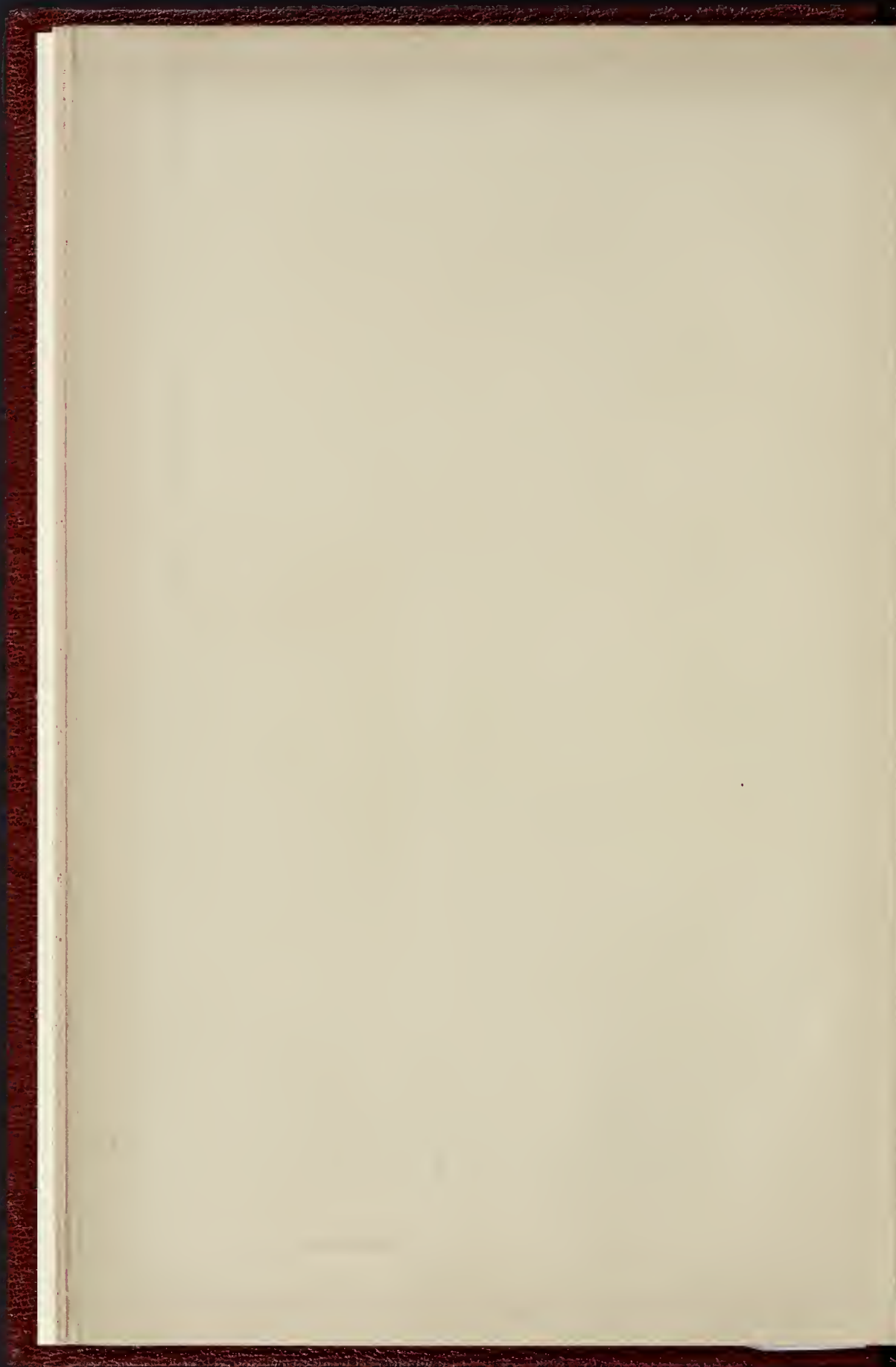
"VICTORY."

SCULPTURE AT THE NEW WAR OF



"FAME."

ALFRED DRURY, A.R.A., SCULPTOR. STREET FETTER LANE, E.C.





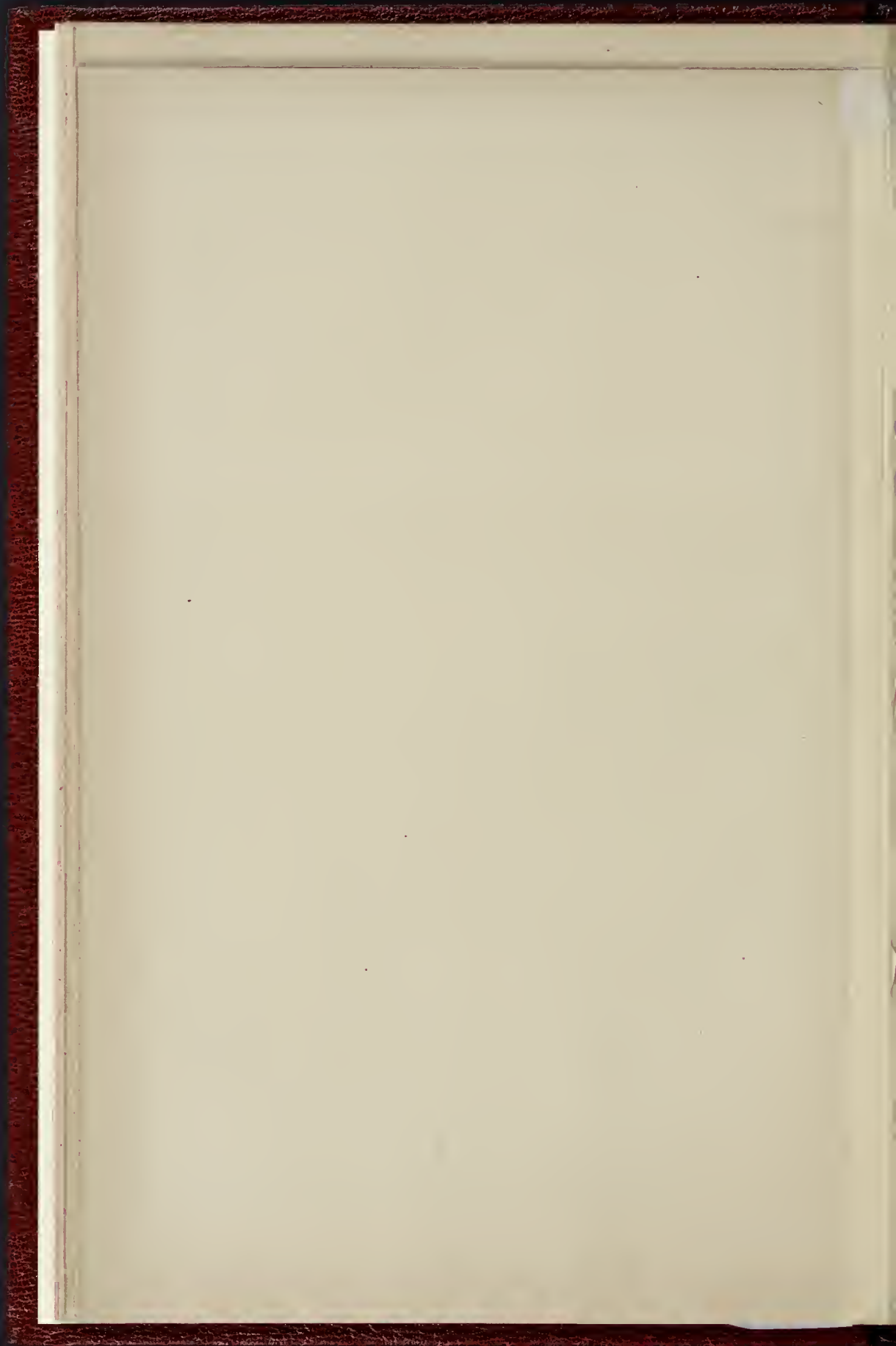
CARRIED OUT BY MR. C

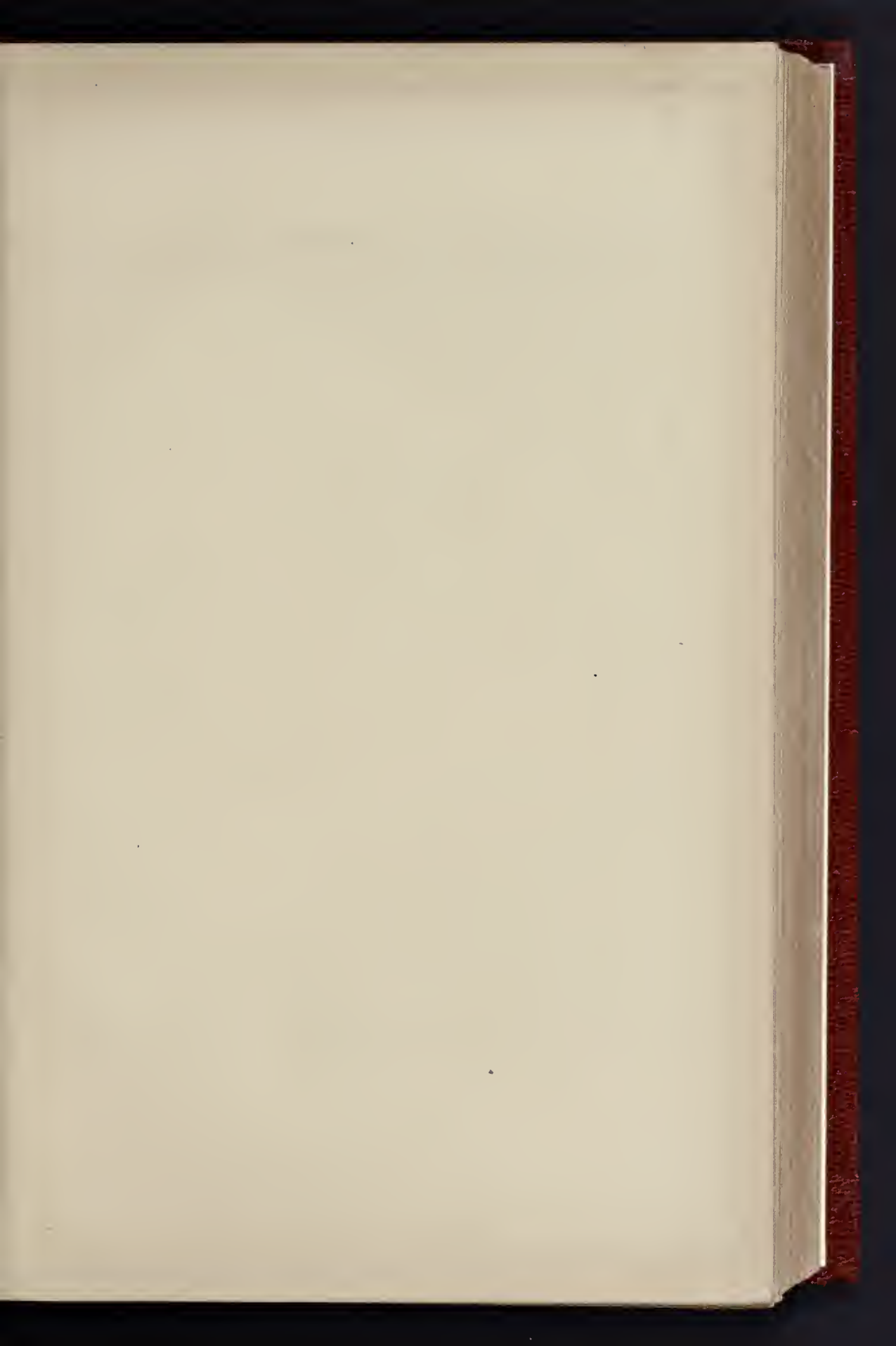




THE NEW WAR OFFICES.

LYDE F. YOUNG, A.R.I.B.A., FROM THE DESIGN OF THE LATE WILLIAM YOUNG, P.R.I.B.A.





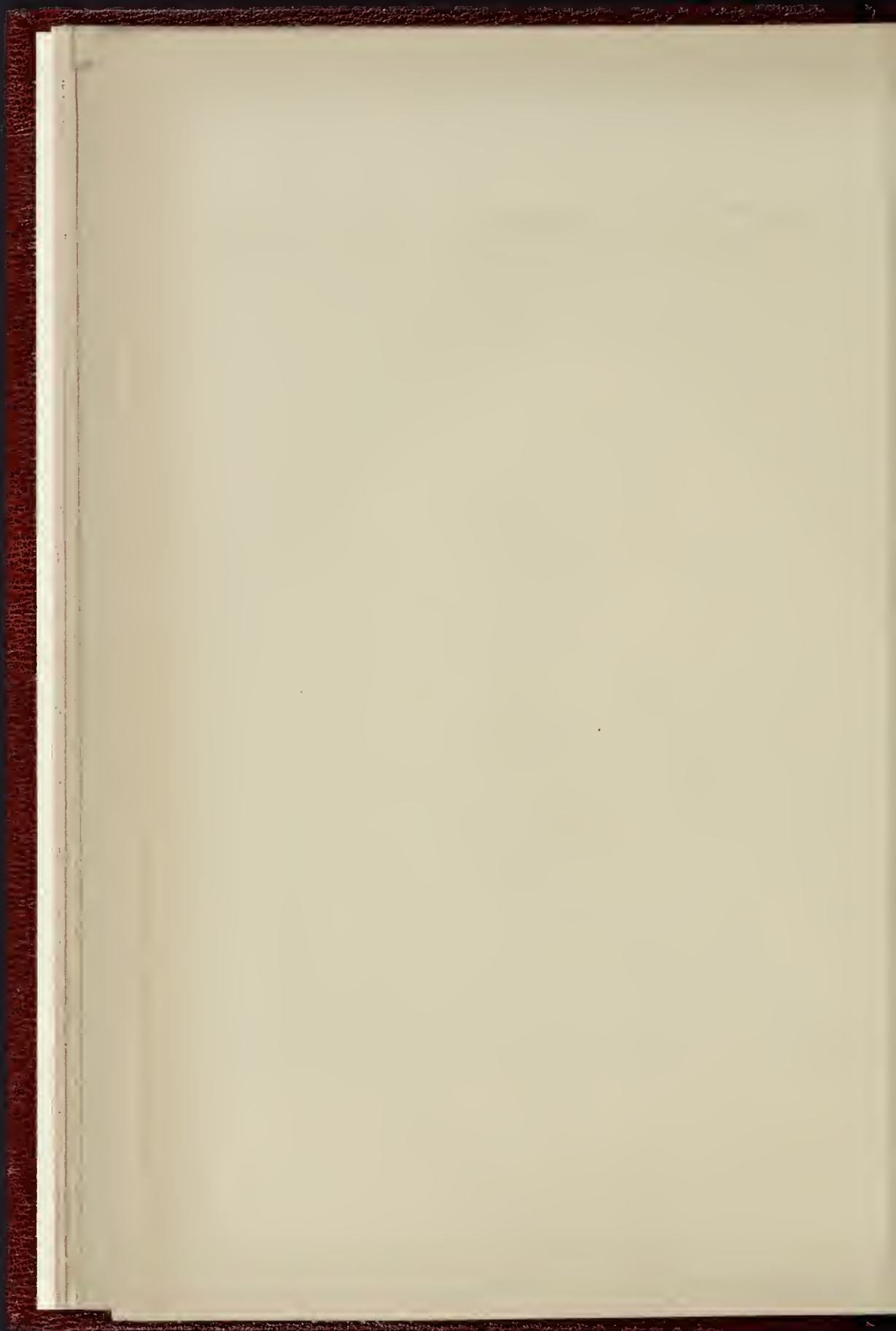


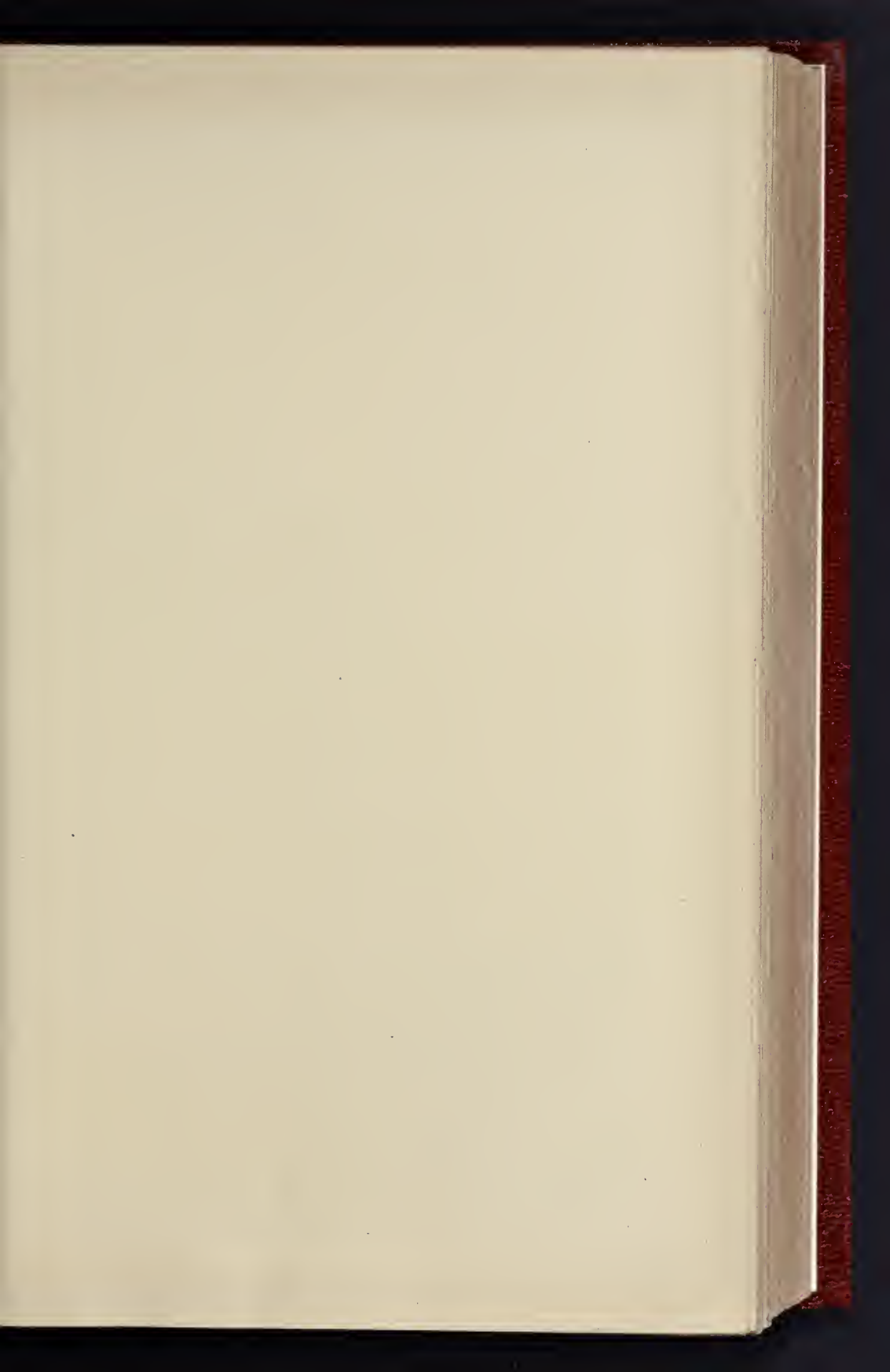
"THE FATHERLESS AND WIDOW."



"THE WINGED MESSENGER OF PEACE."

E.—MR ALFRED DRURY, A.R.A., SCULPTOR







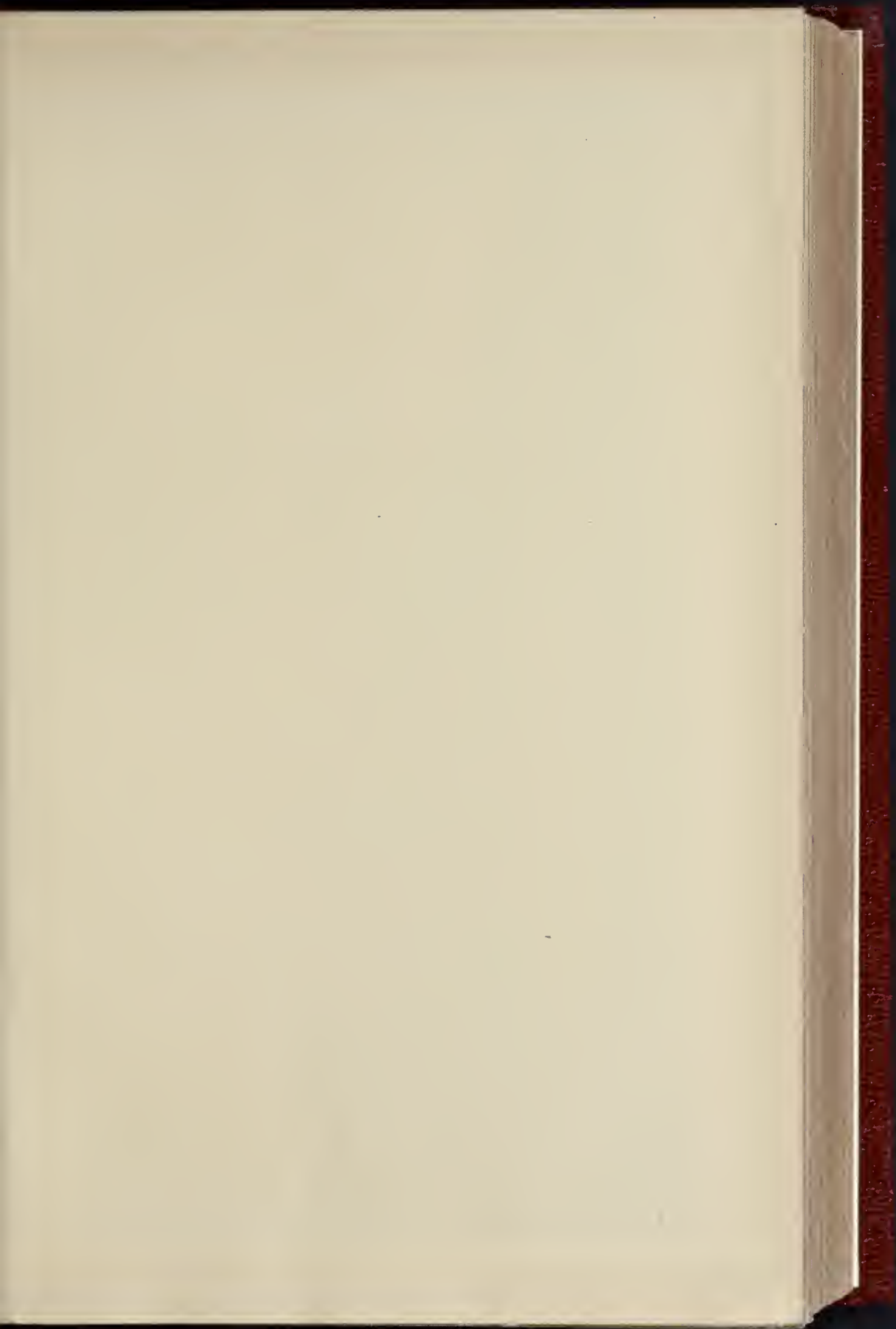
NEW HOTEL DE VILLE, VE
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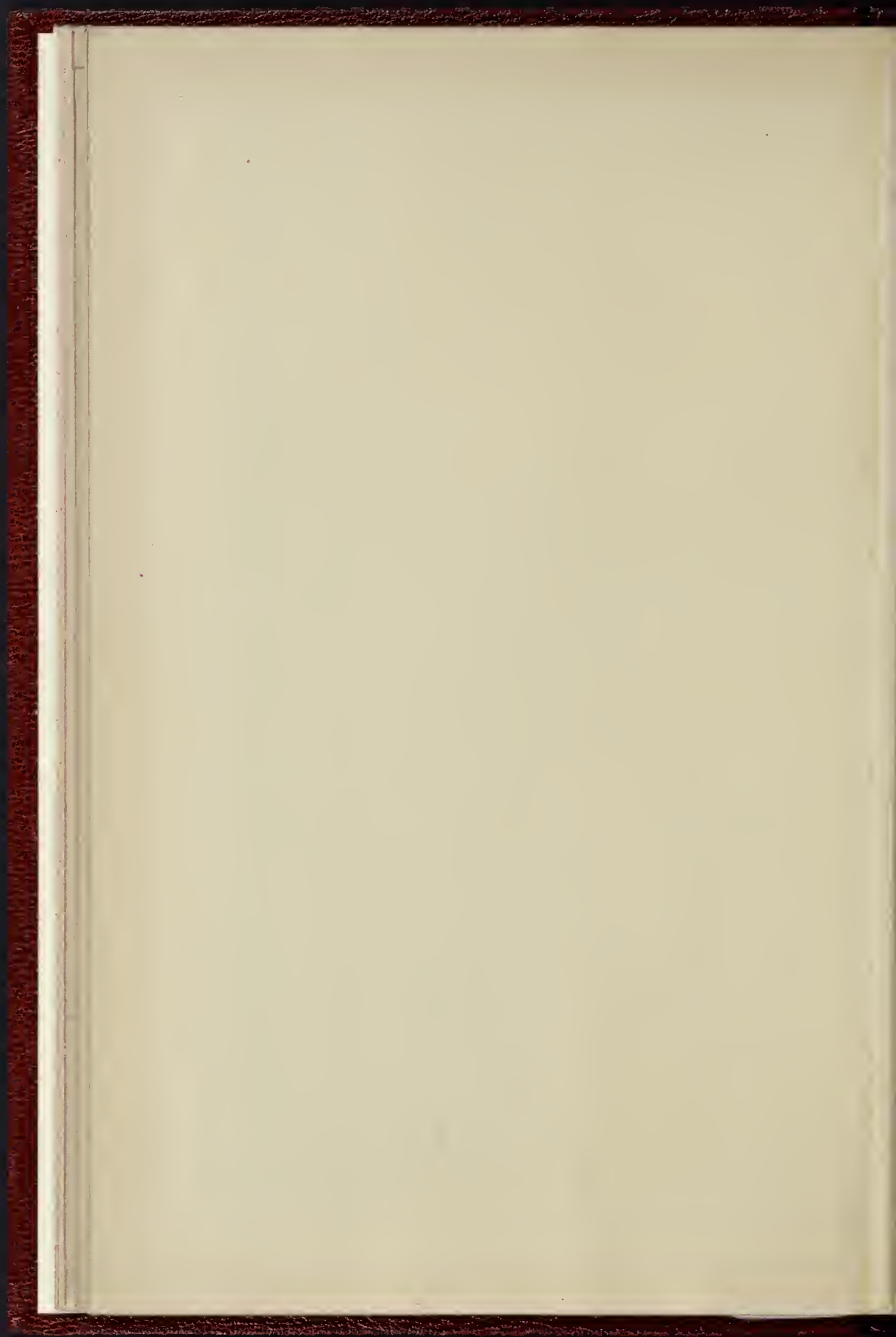


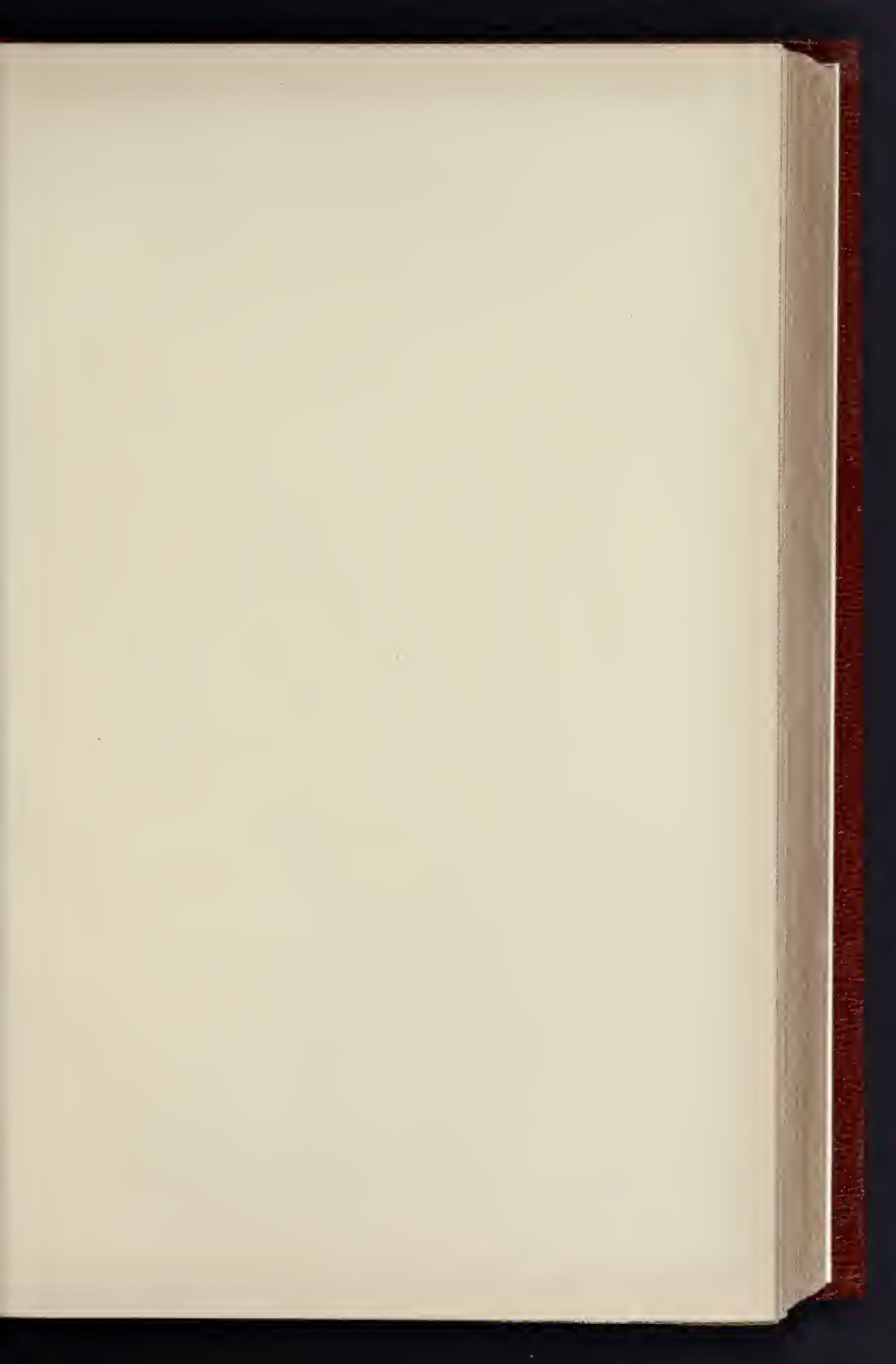
NEW HOTEL DE VILLE



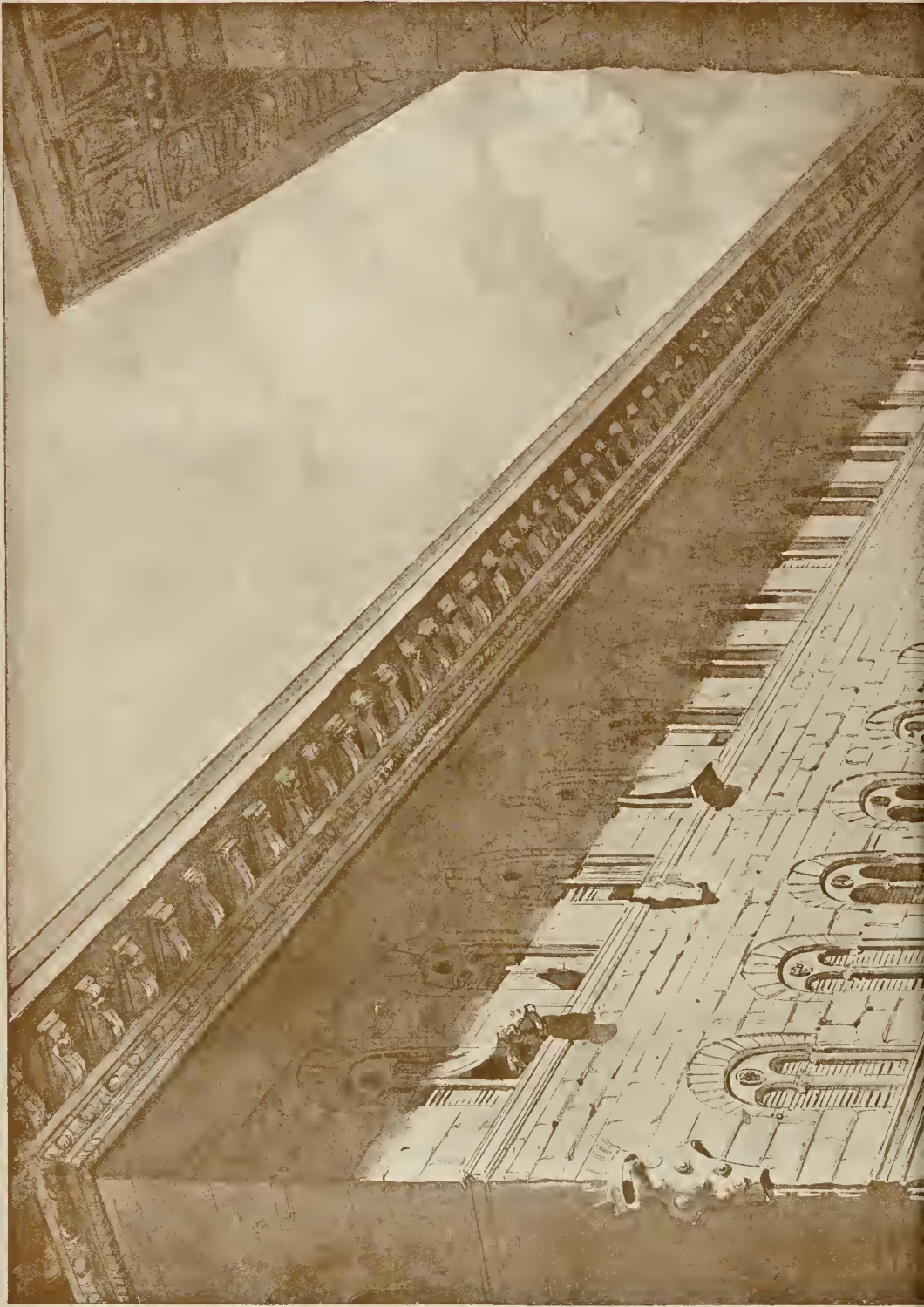
VERSAILLES.—M. LE GRAND, ARCHITECT.
IN COURTYARD.

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





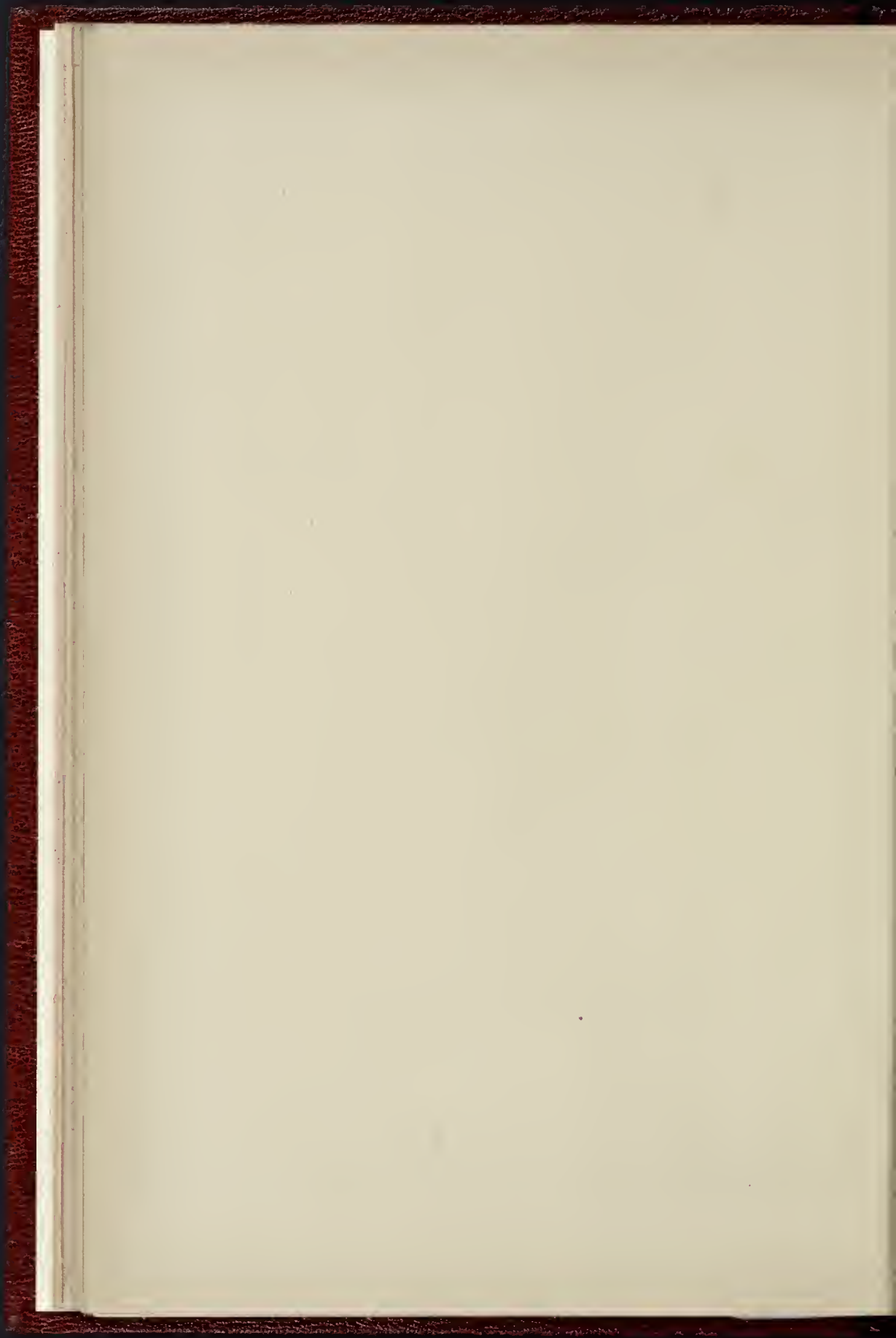
THE BUILDER, JANUARY 6, 1906.

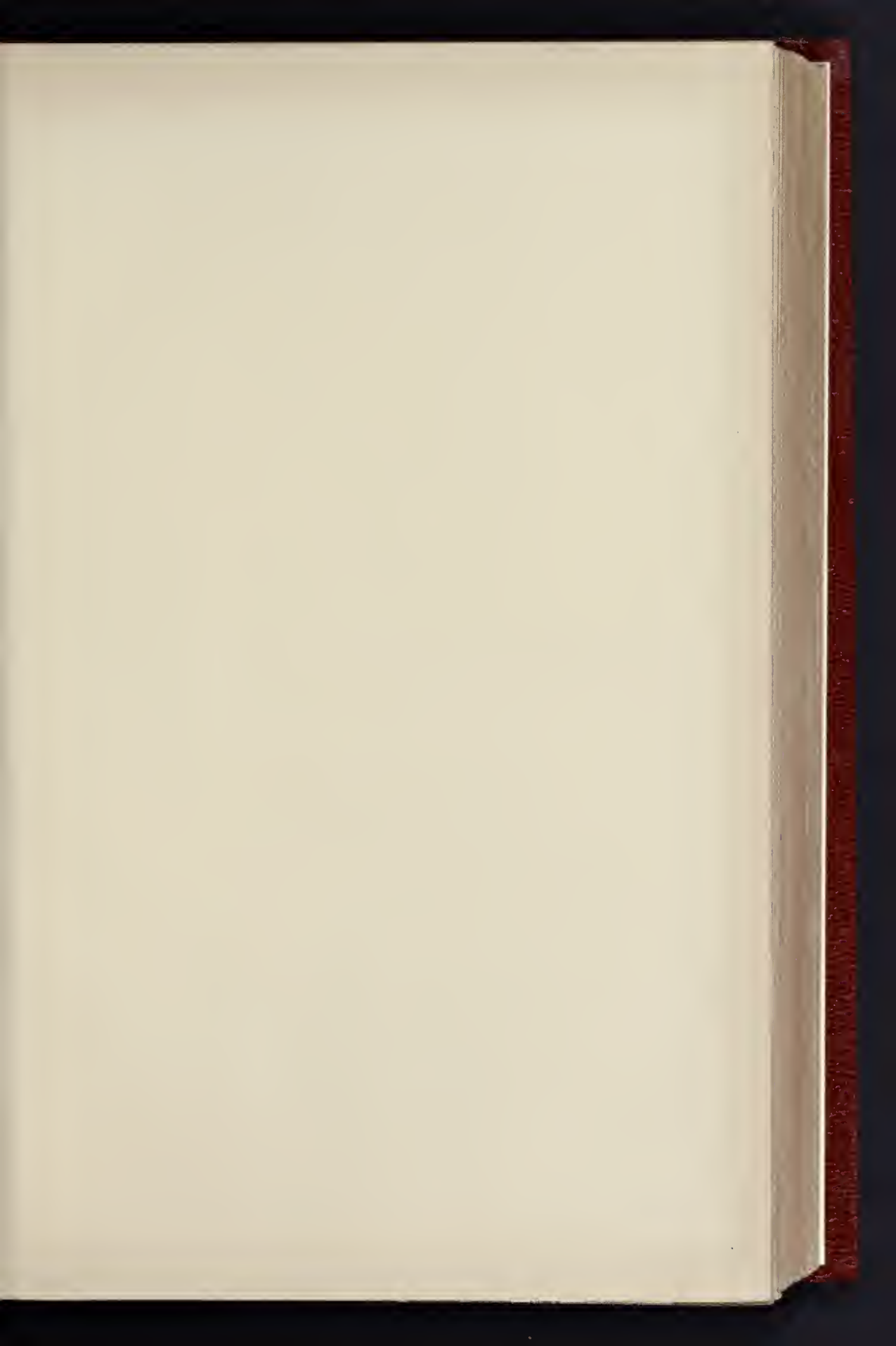


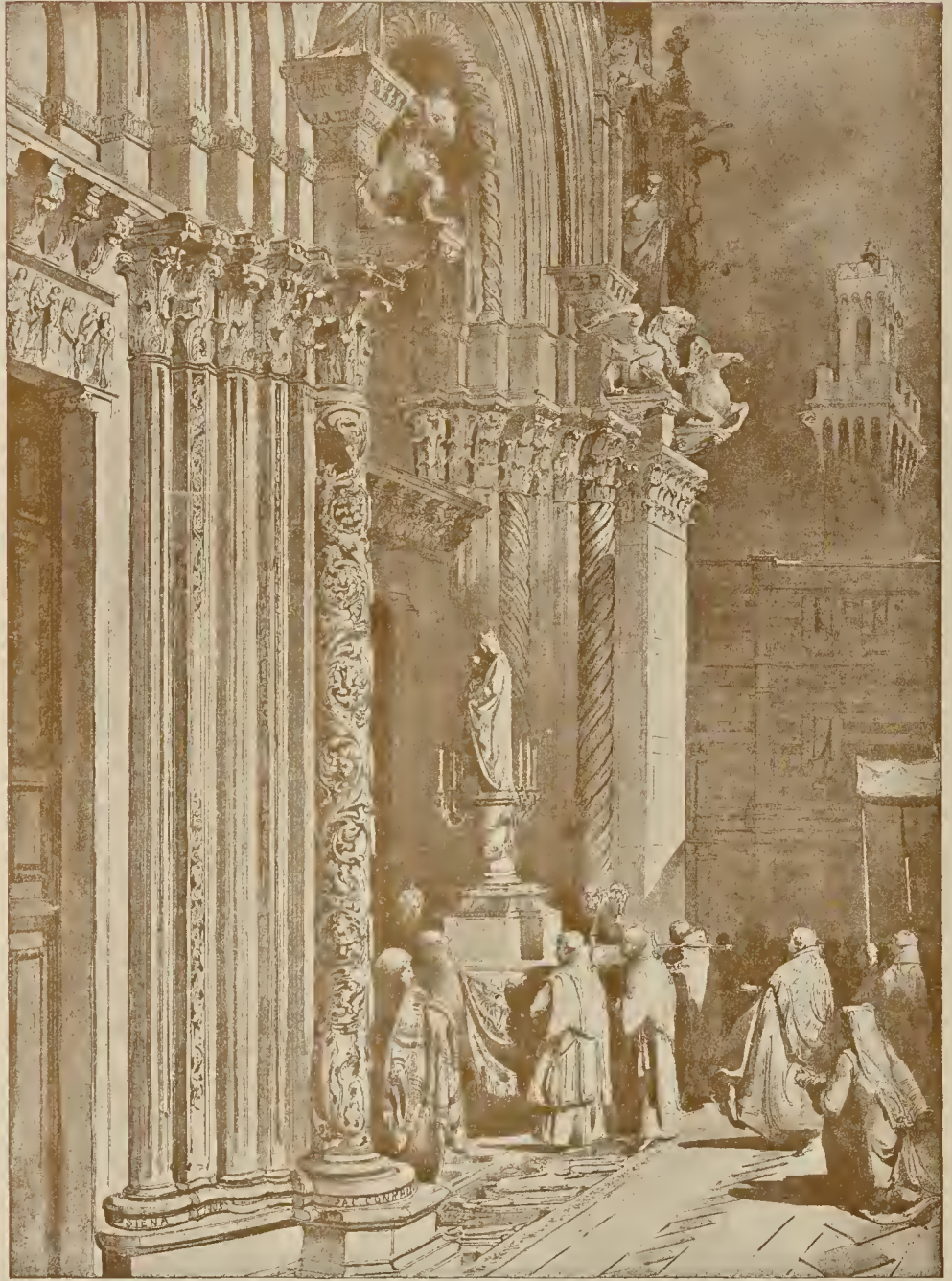


INK PHOTO. SPRAGUE CO. N. 4 S. EAST-WARDING STREET. PETER LANE E.

RICCARDI PALACE, FLORENCE.—DRAWN BY MR. A. C. CONRADE







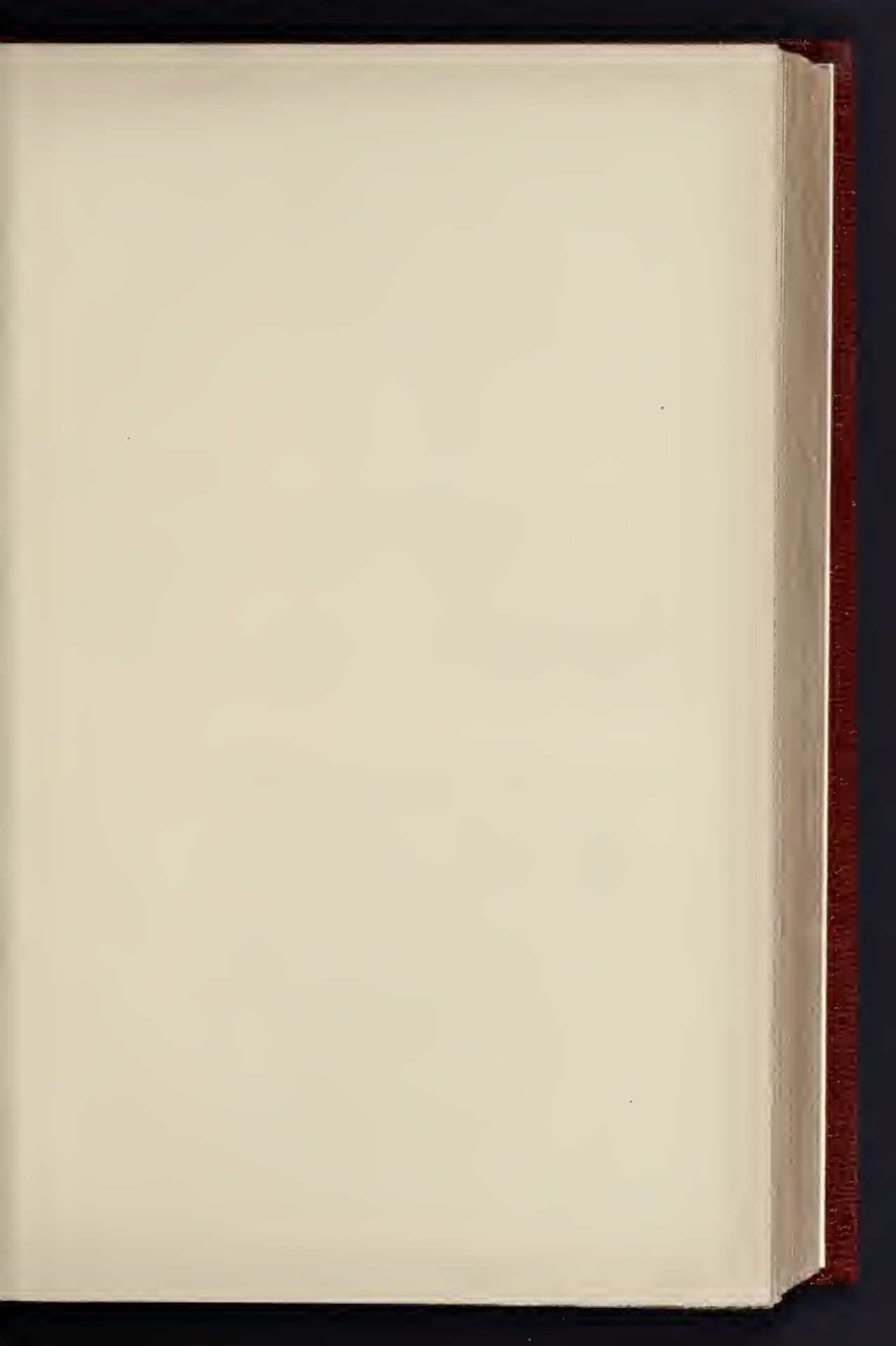
INK-PHOTO, SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

PART OF FAÇADE, SIENA CATHEDRAL.—DRAWN BY MR. A. C. CONRADE.



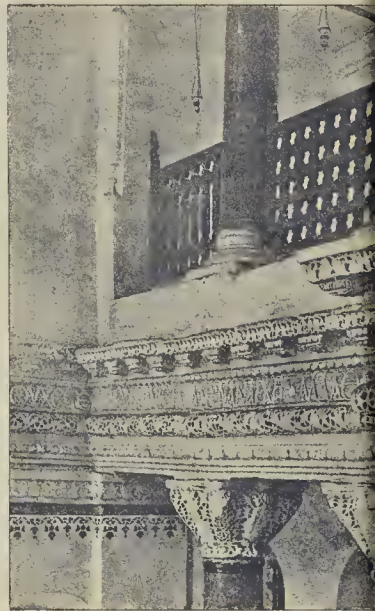
INA PHOTO: SPRAGUE & CO. L^Y 4 & 5, EAST HARDING STREET FETTER LANE E.C.

PICCOLOMINI ALTAR, SIENA CATHEDRAL.—DRAWN BY MR. A. C. CONRADE.





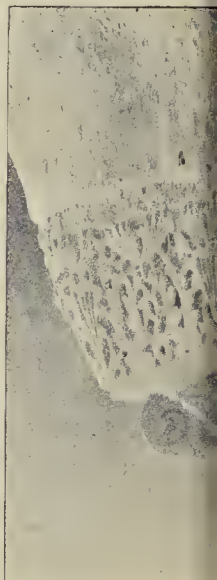
NORTH-EASTERN EXEDRA.



ENTABLATURE TO THE



CAPITALS CONNECTING UPPER NARTHEX WITH GYNÆCEUM.



CAPIT



UPPER ORDER, WESTERN BAY.



CENTRAL PORTION OF THE SOUTHERN GYNÆCEUM.

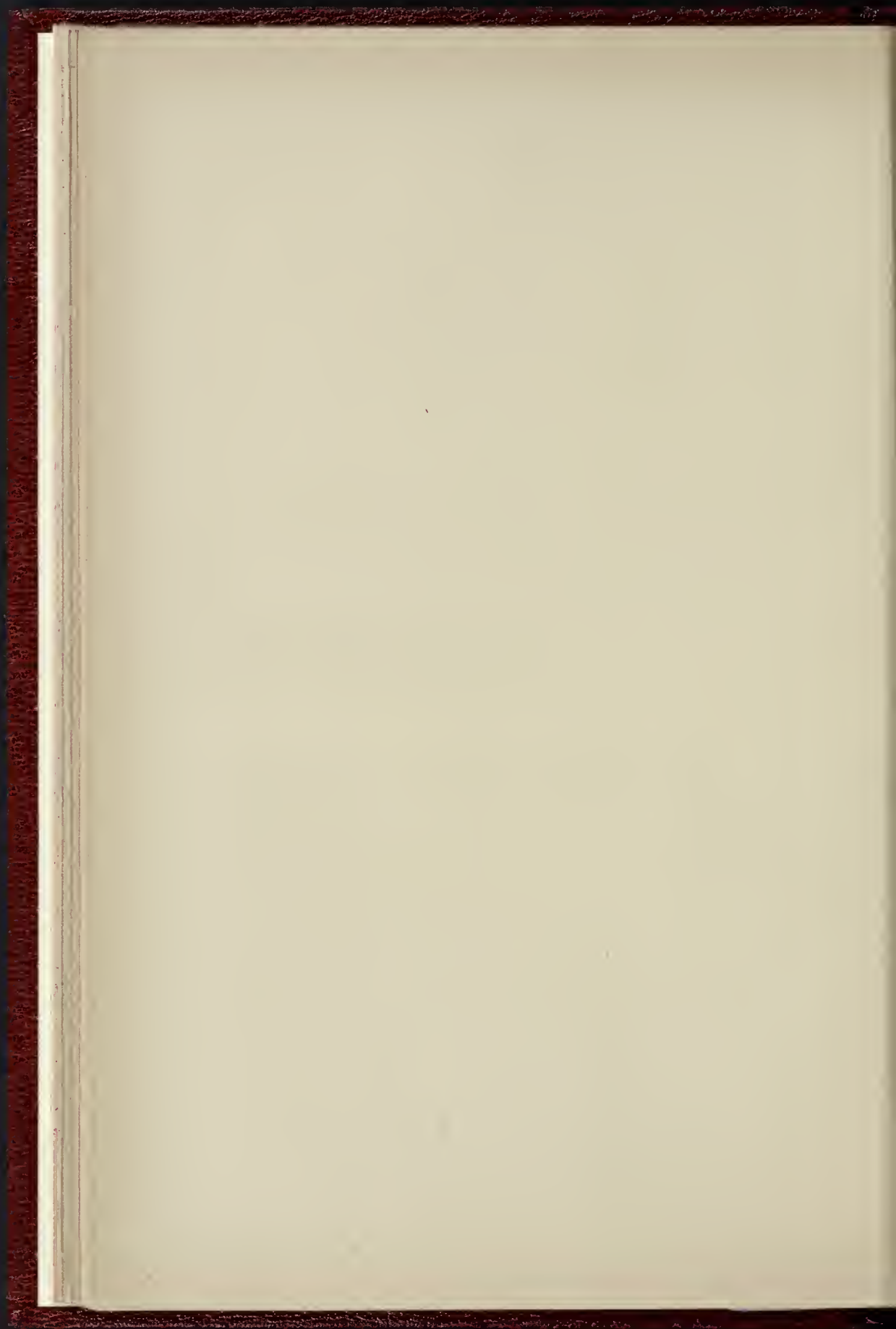


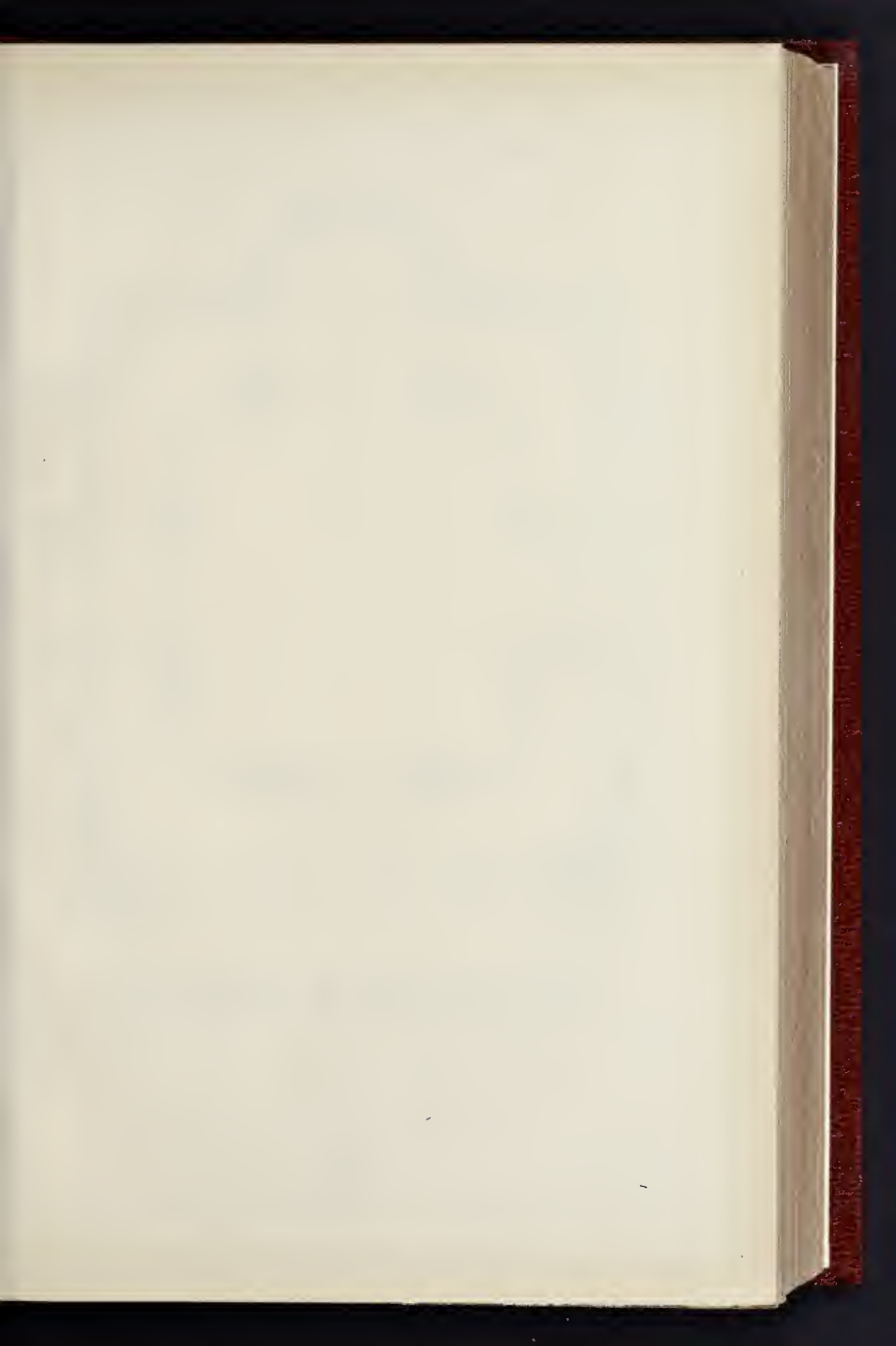
UPPER ORDER.



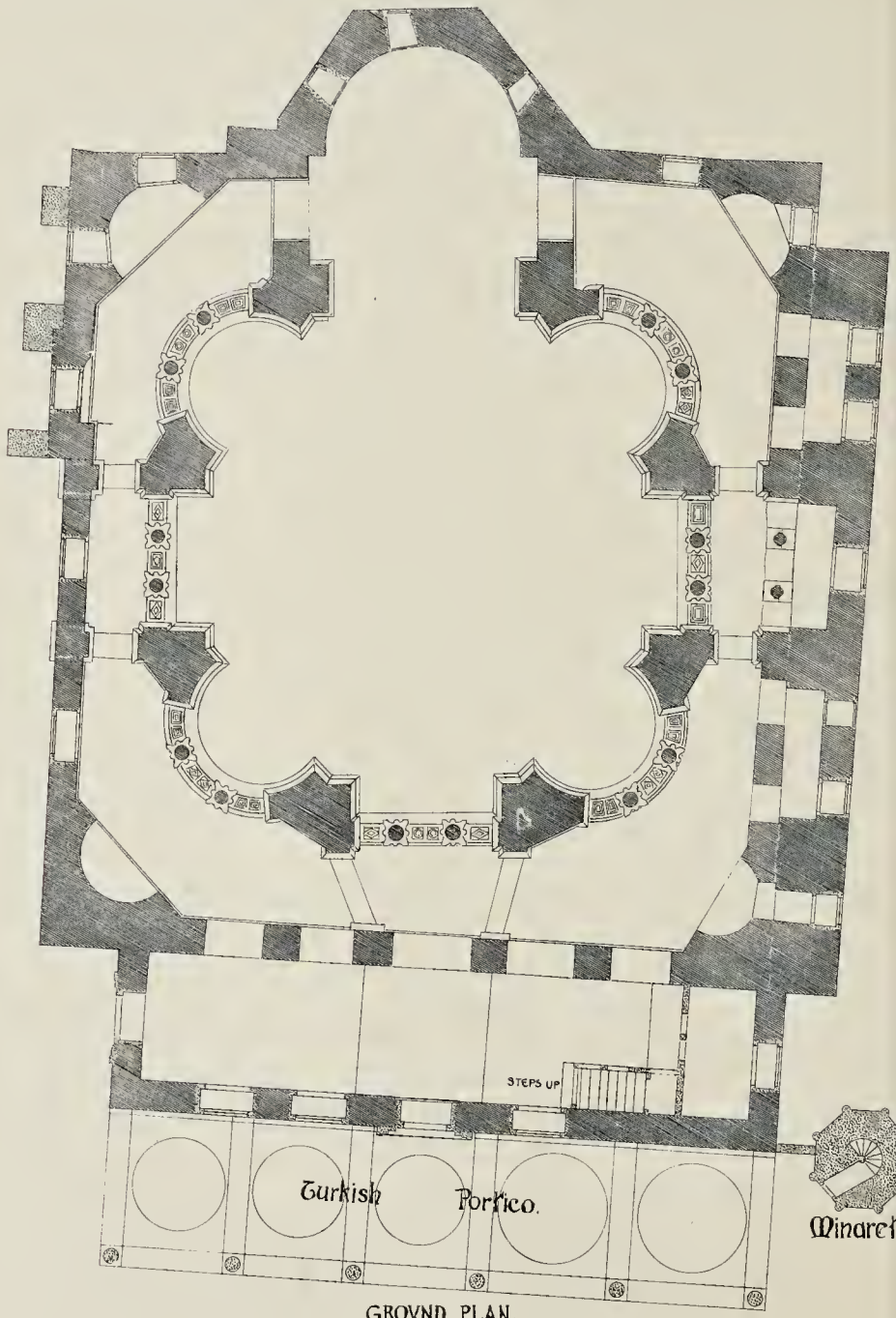
CAPITAL TO RECESS IN SOUTH AISLE.

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

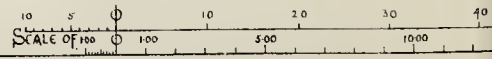




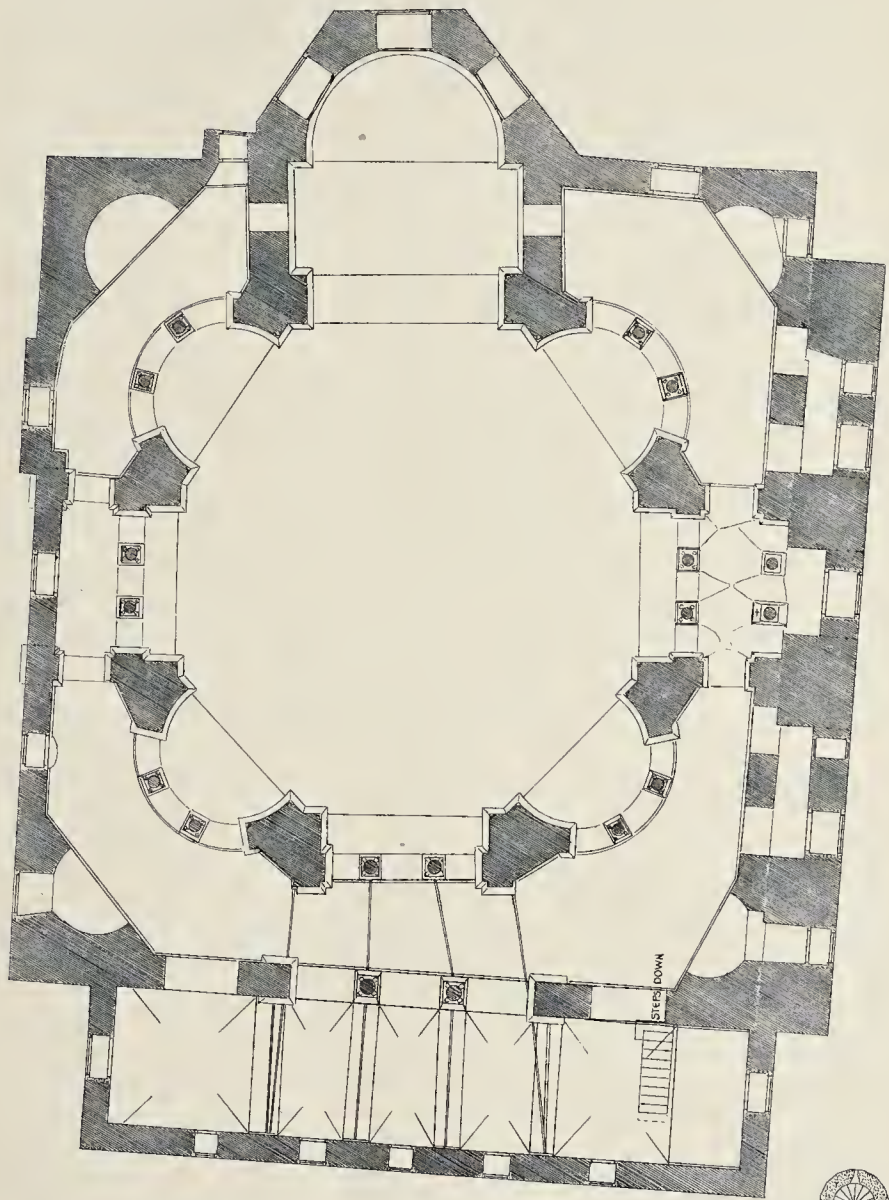
S.S. SERGIUS AND BACCHUS.



GROVND PLAN.
LOOKING VP.



S.S. SERGIUS AND BACCHVS.



GYNACCEVM PLAN,
LOOKING UP.

*Measured and drawn by
MR. ARTHUR E. HENDERSON*

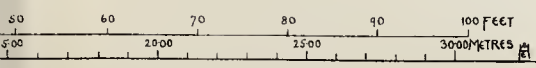
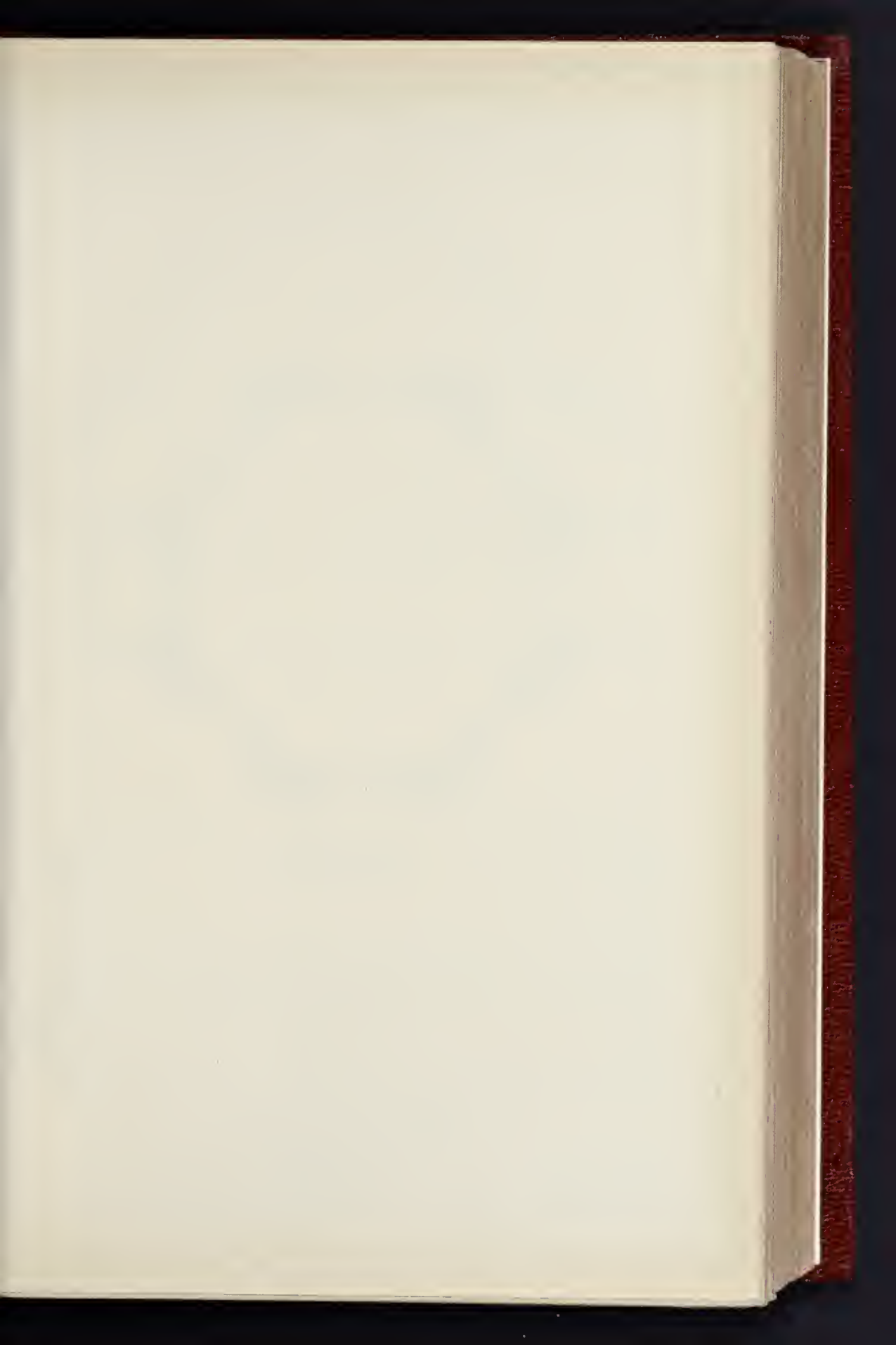
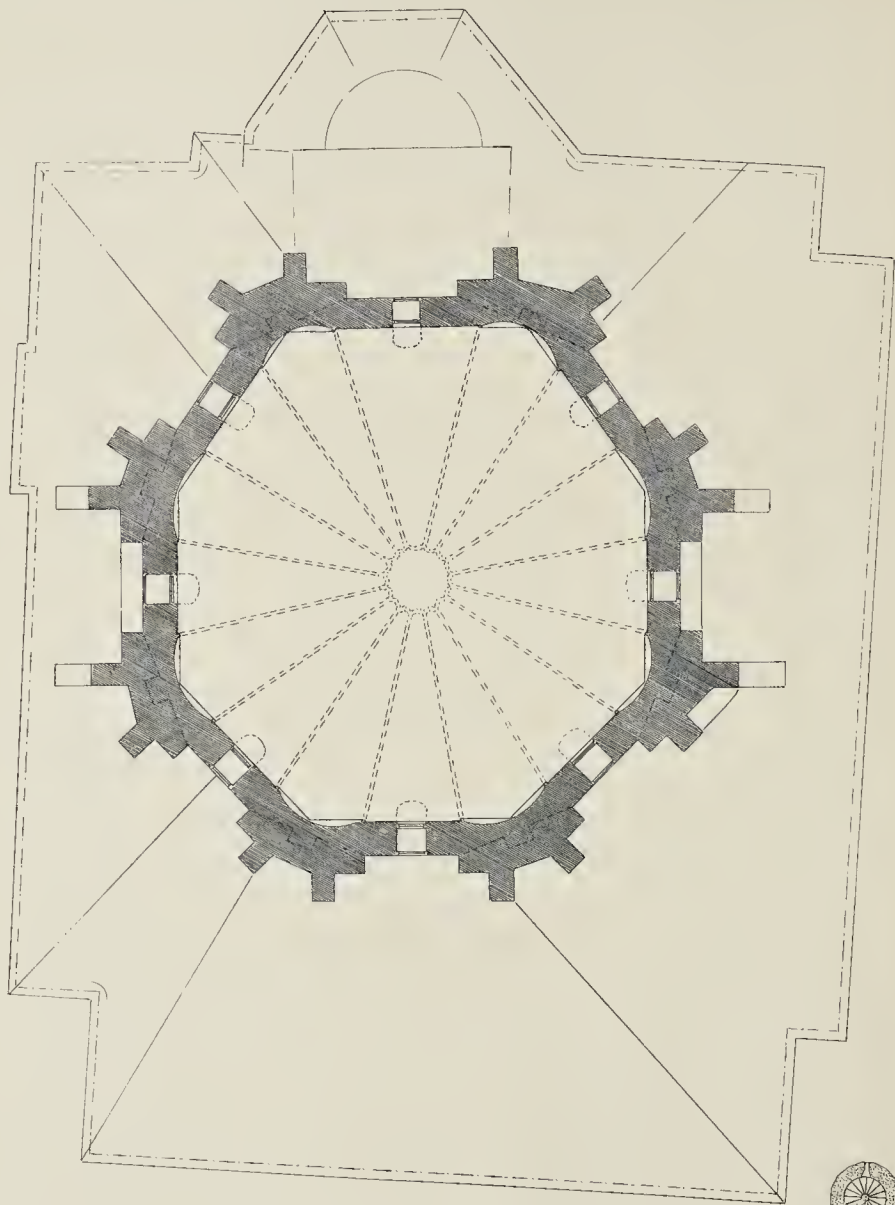


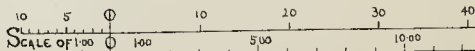
PHOTO LITHO SPRAGUE & CO. 135 EAST HAWKING STREET PETER LANE E.C.



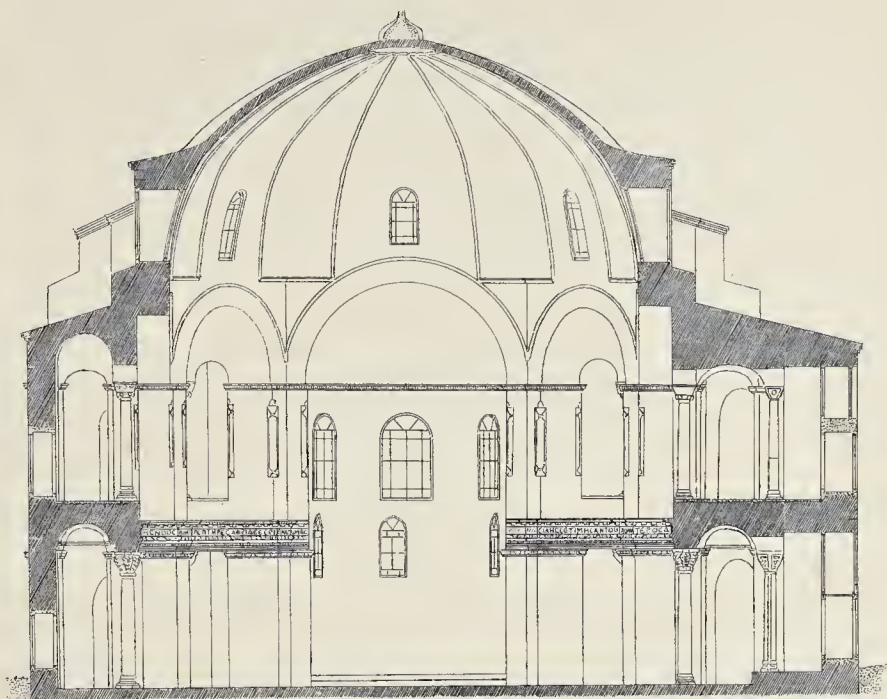
S.S.SERGIVS AND BACCHVS.



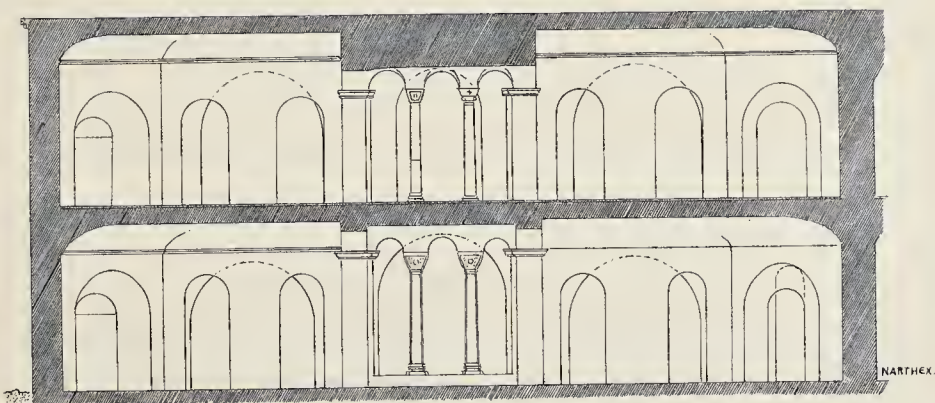
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S.S. SERGIUS AND BACCHUS.



TRANSVERSE SECTION.

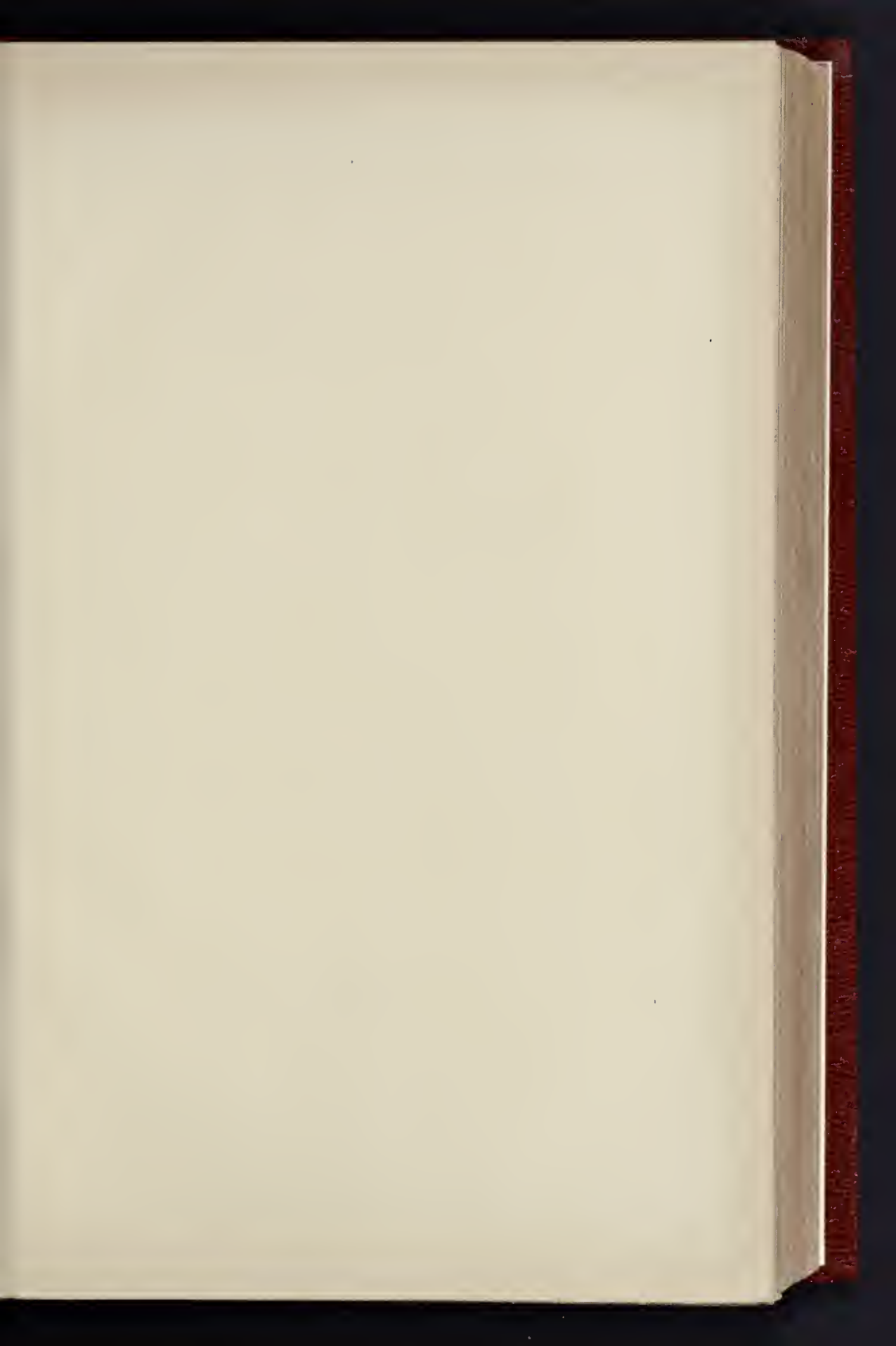


SECTION THROUGH SOUTH AISLE.

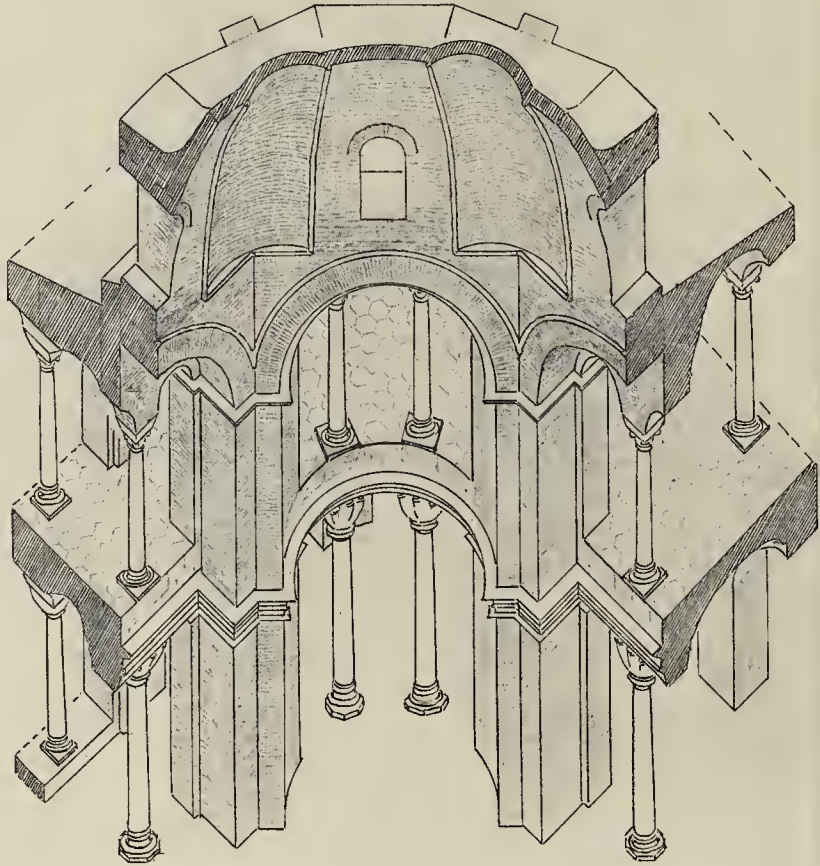
NARTHEX.

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Measured and drawn by
 M^r ARTHUR E. HENDERSON

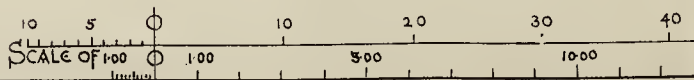


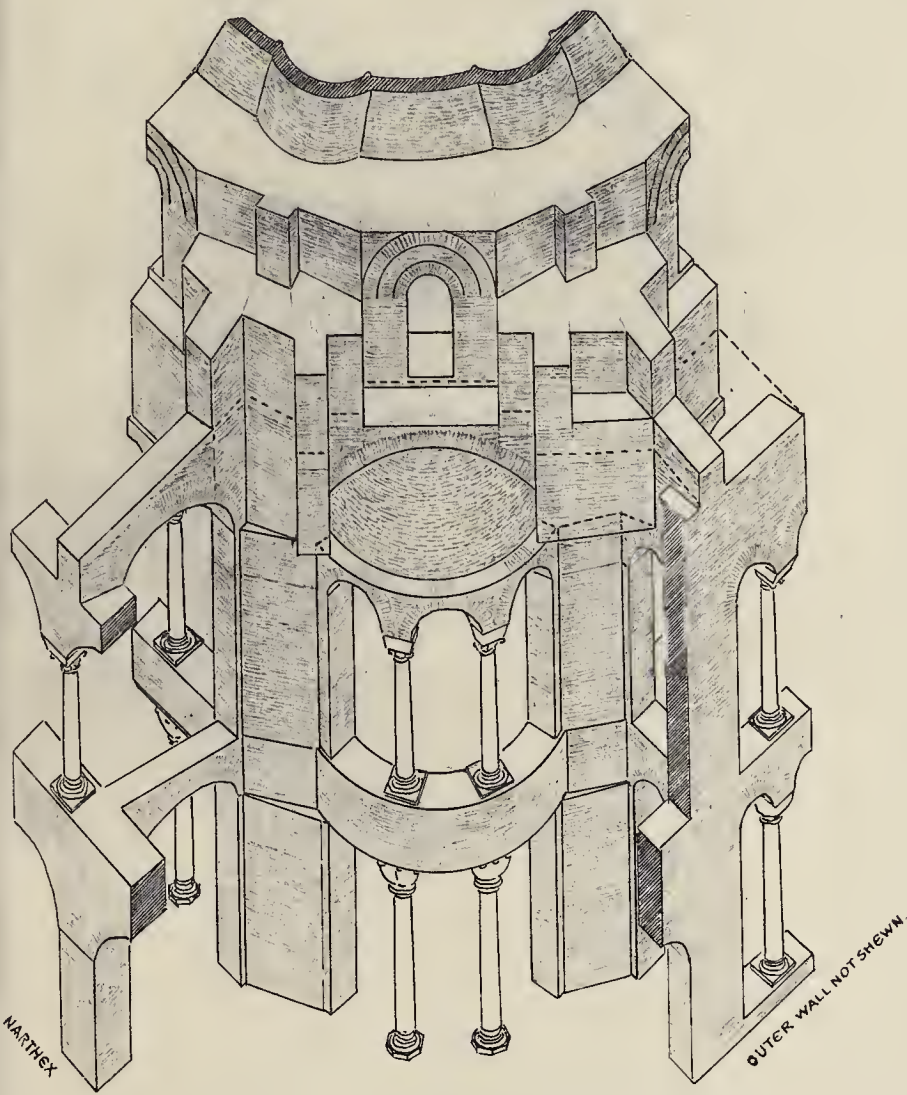
S.S.SERGIVS AND BACCHVS.



THE INTERIOR ARRANGEMENT
SHEWING GYNAECEVM FLOOR, VAULTING, ROOF AND
SPRINGING OF DOME

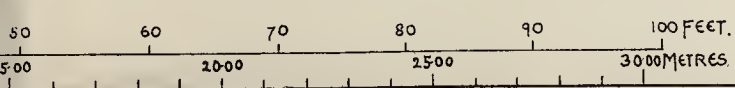
CONSTRUCTIVE SECTION





THE REAR - WITH GYNAECEVM FLOOR & ROOF REMOVED.

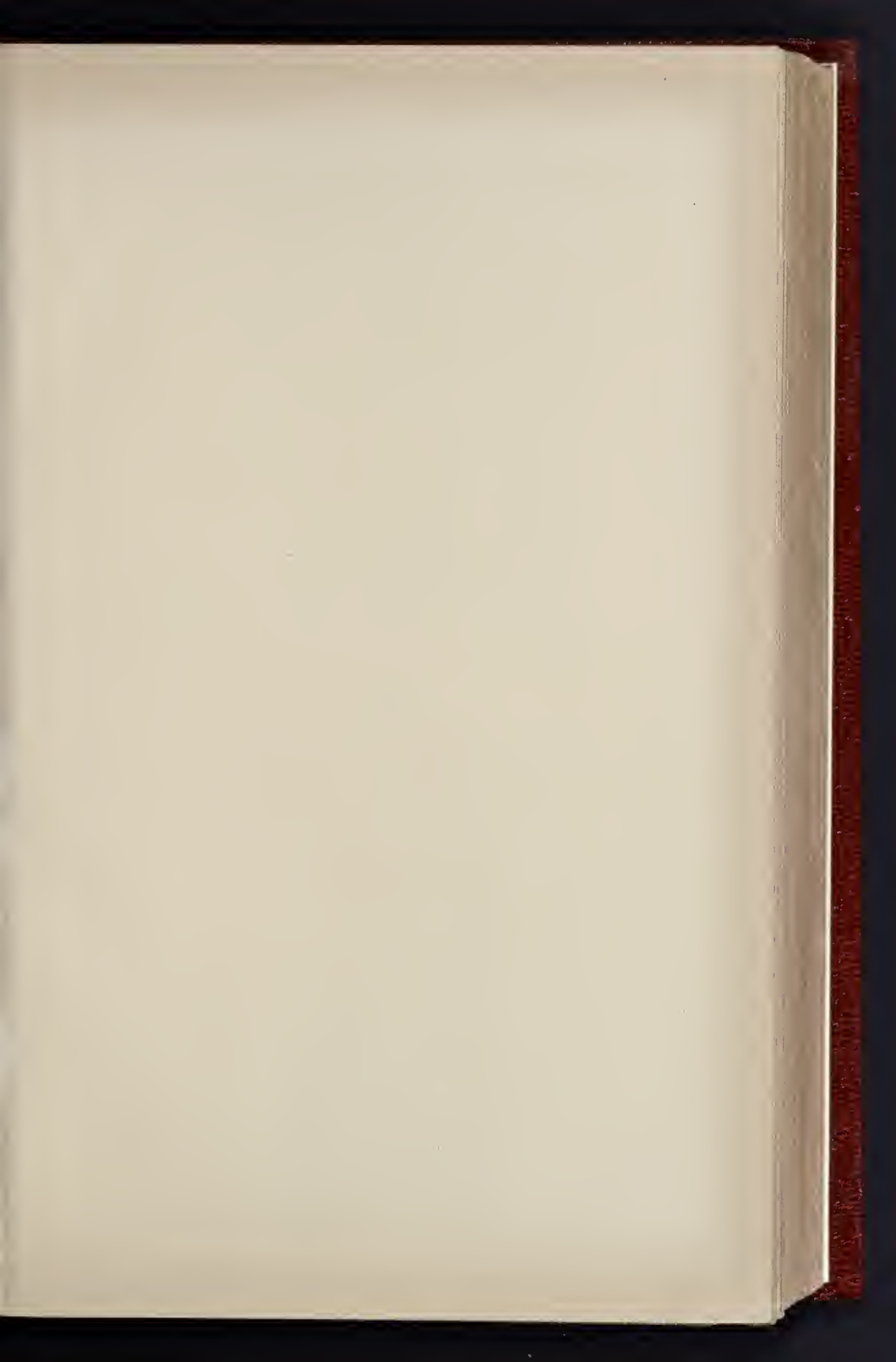
OF THE SOUTH-WEST EXEDRA.

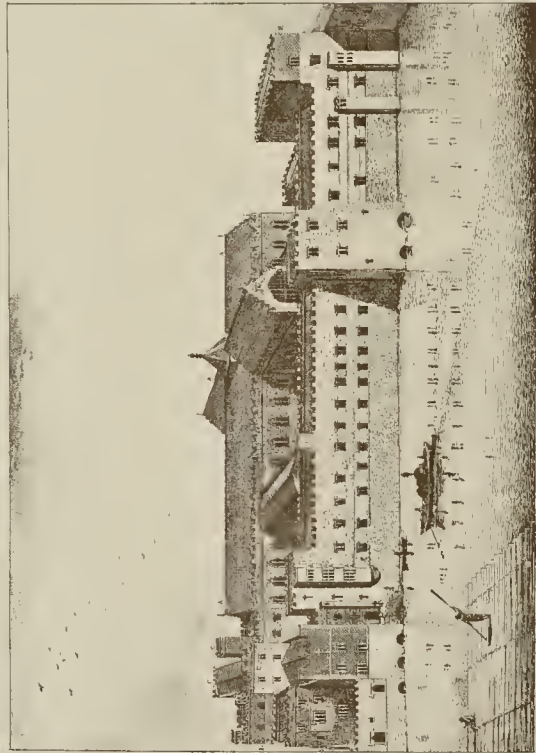


Measured and drawn by
MR. ARTHUR E. HENDERSON

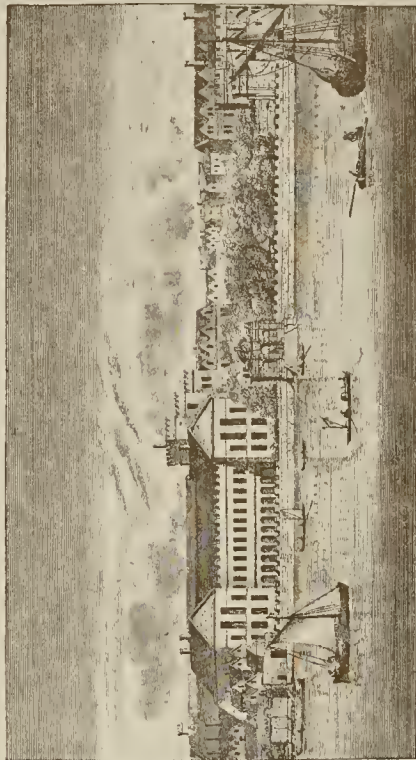
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The Savoy, from the Thames. (From Vertue's drawing, 1736.)



York House and the Water Gate (circa 1630).

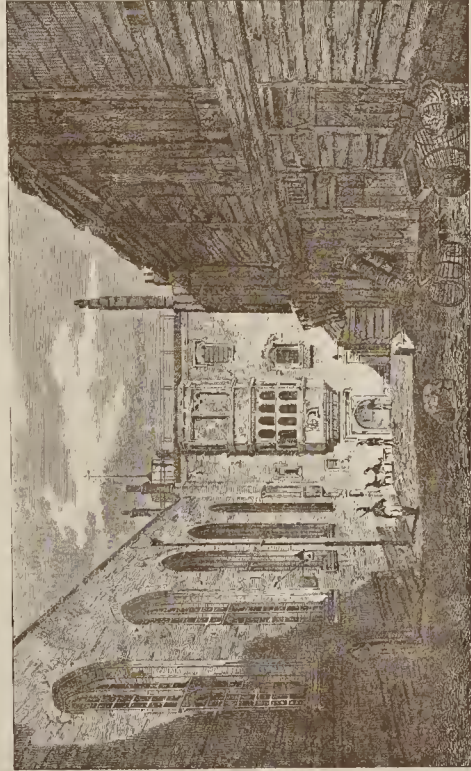




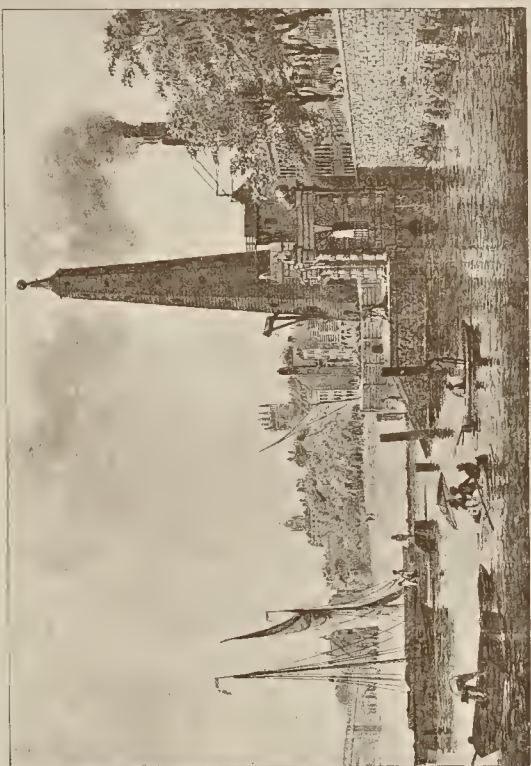
Part of the Ruins of the Savoy in 1816.



Derby House, Westminster (circa 1750).

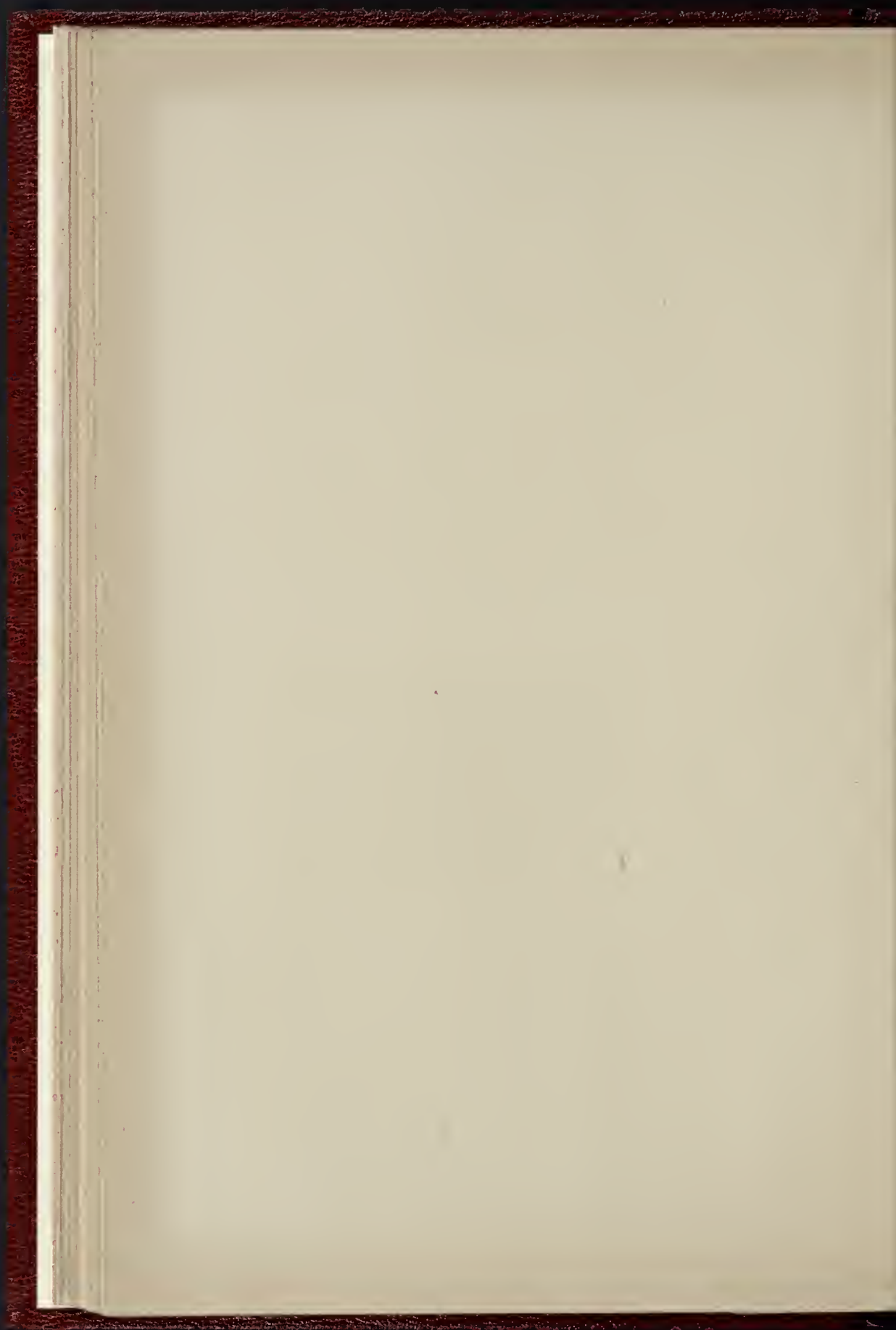


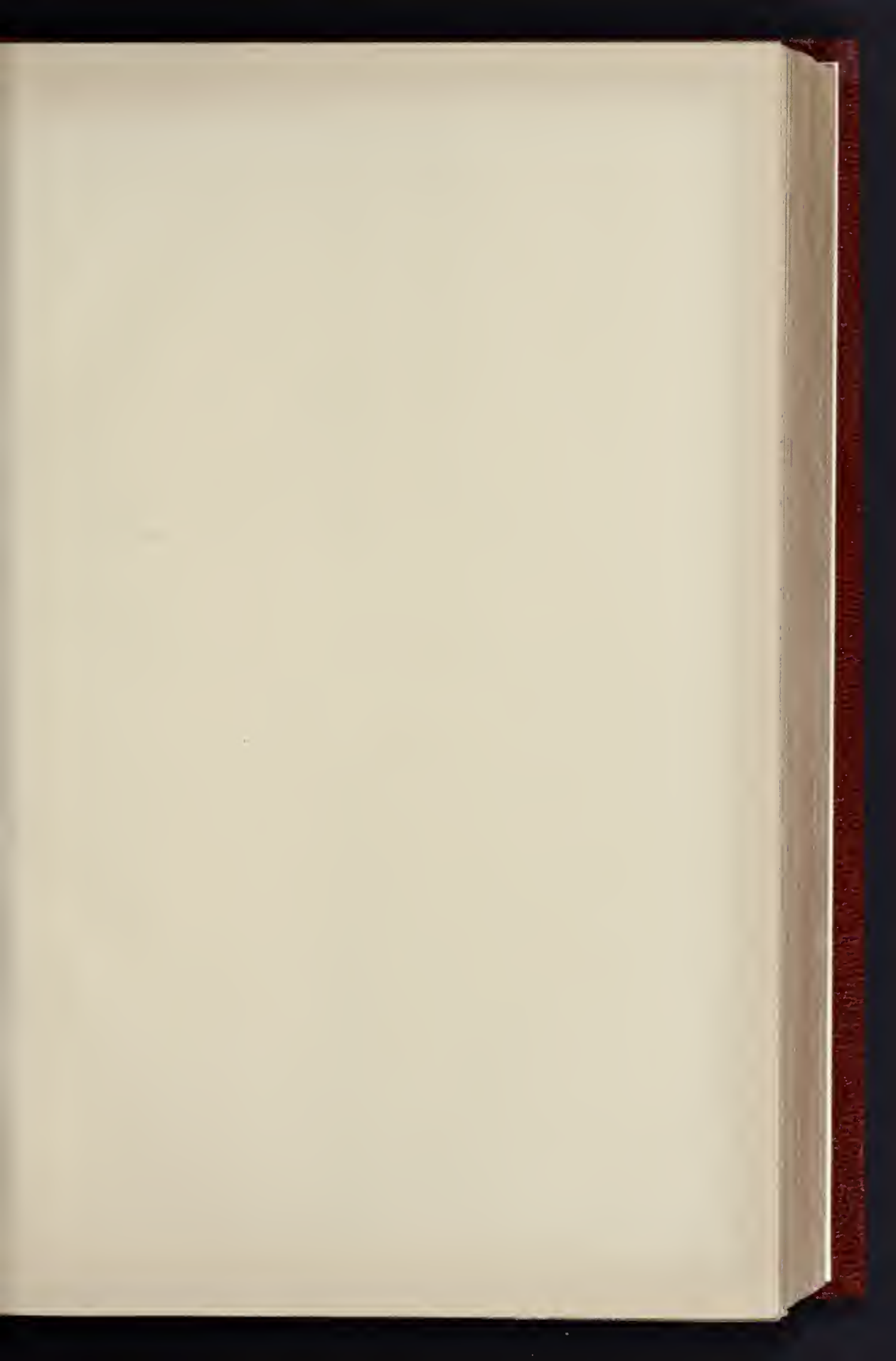
Savoy Chapel and Palace (in 1810).

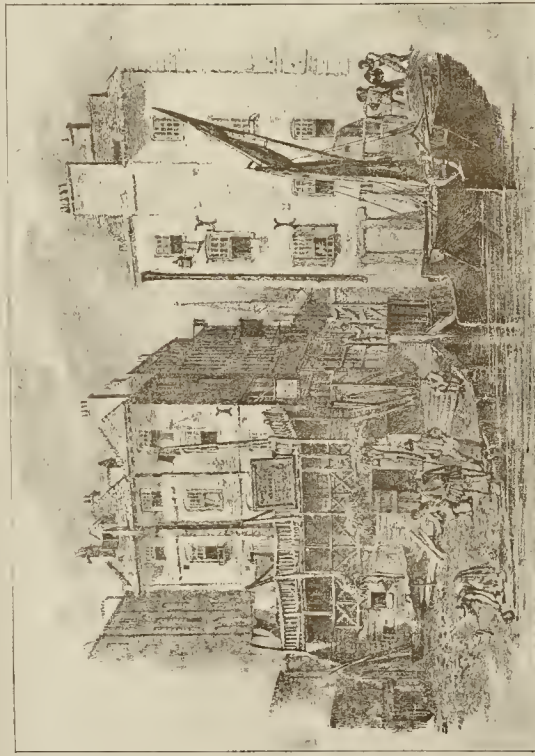


York Gate and the Water Tower (1797).

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Hungerford Stairs, Westminster.



Worcester House.

Salisbury House.

Durham House (circa 1639).

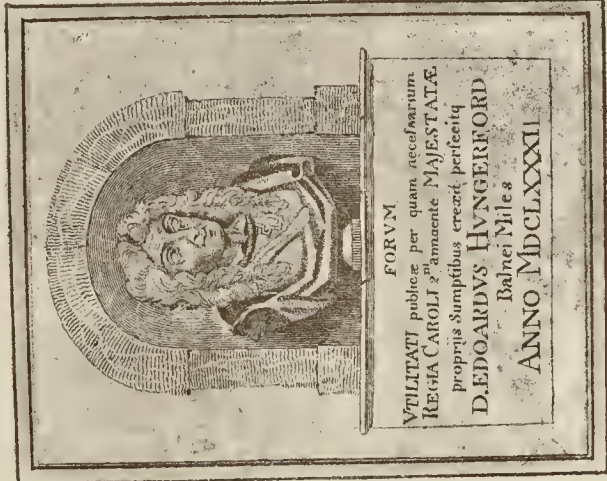




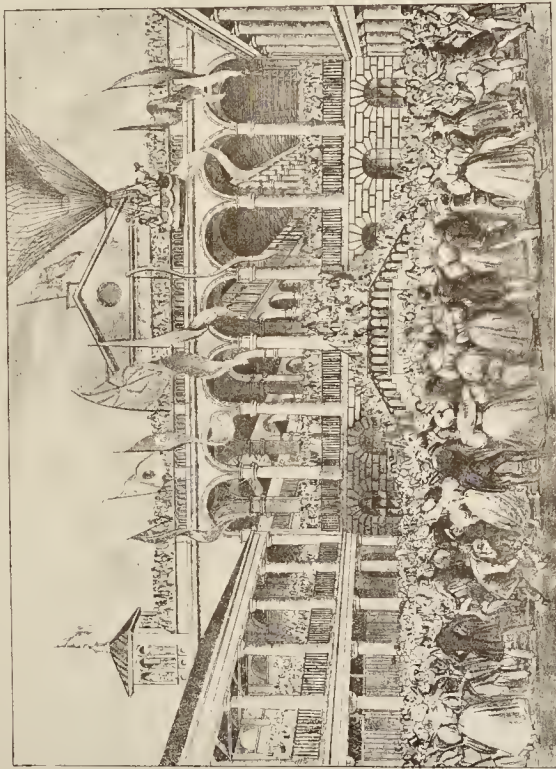
Bridewell Palace, with the entrance to Fleet River: circa 1660.



New Hungerford Market: River Front: 1833.

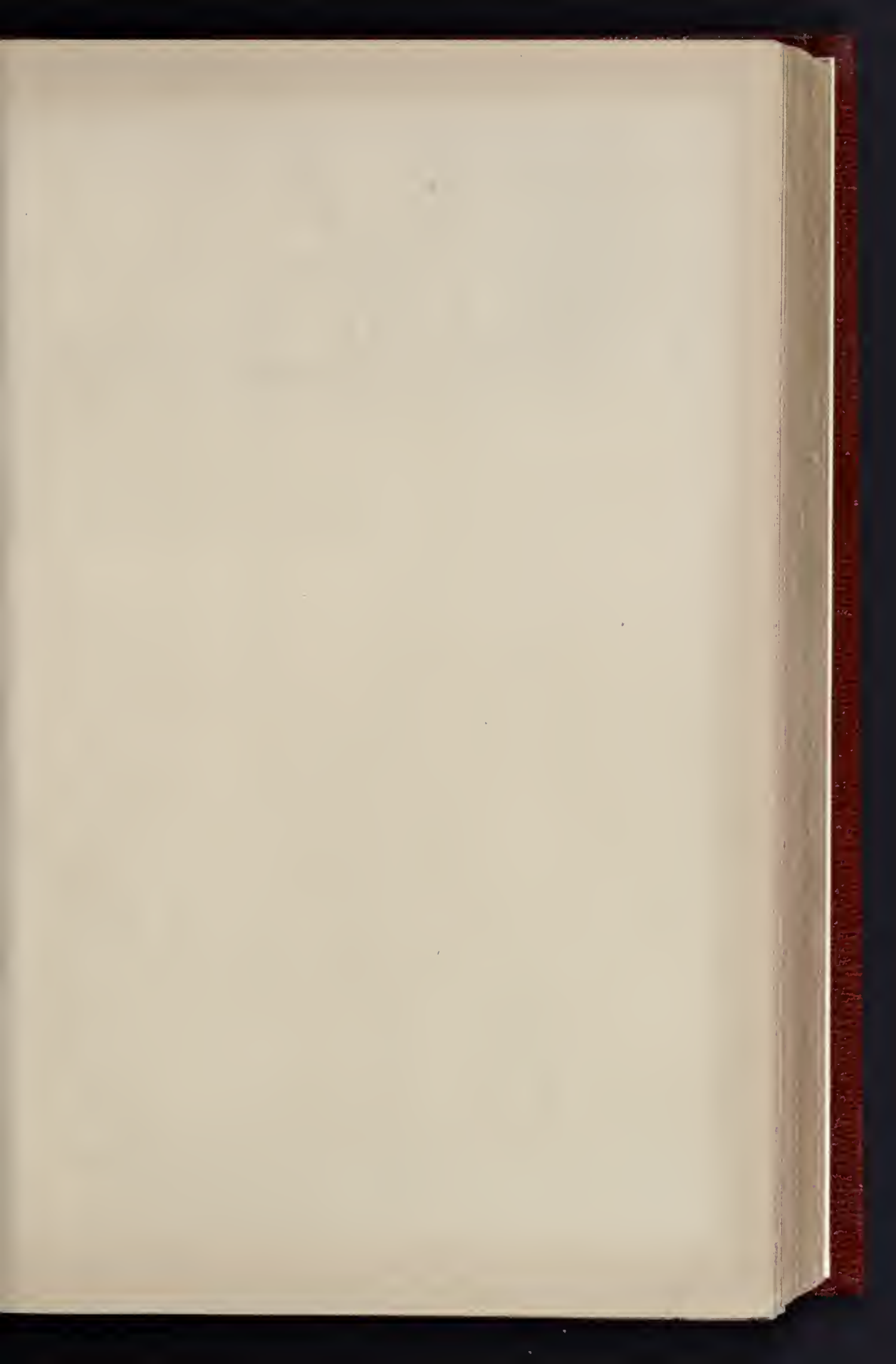


Portrait bust of E. Hungerford, placed on north side of Old Market-house



New Hungerford Market, on the day of opening, July 2, 1833.

14. PHOTO - FRAGUS & CO. 4 & 5 EAST-WARDING STREET, LONDON E.C.



THE BUILDER, JANUARY 6, 1906.

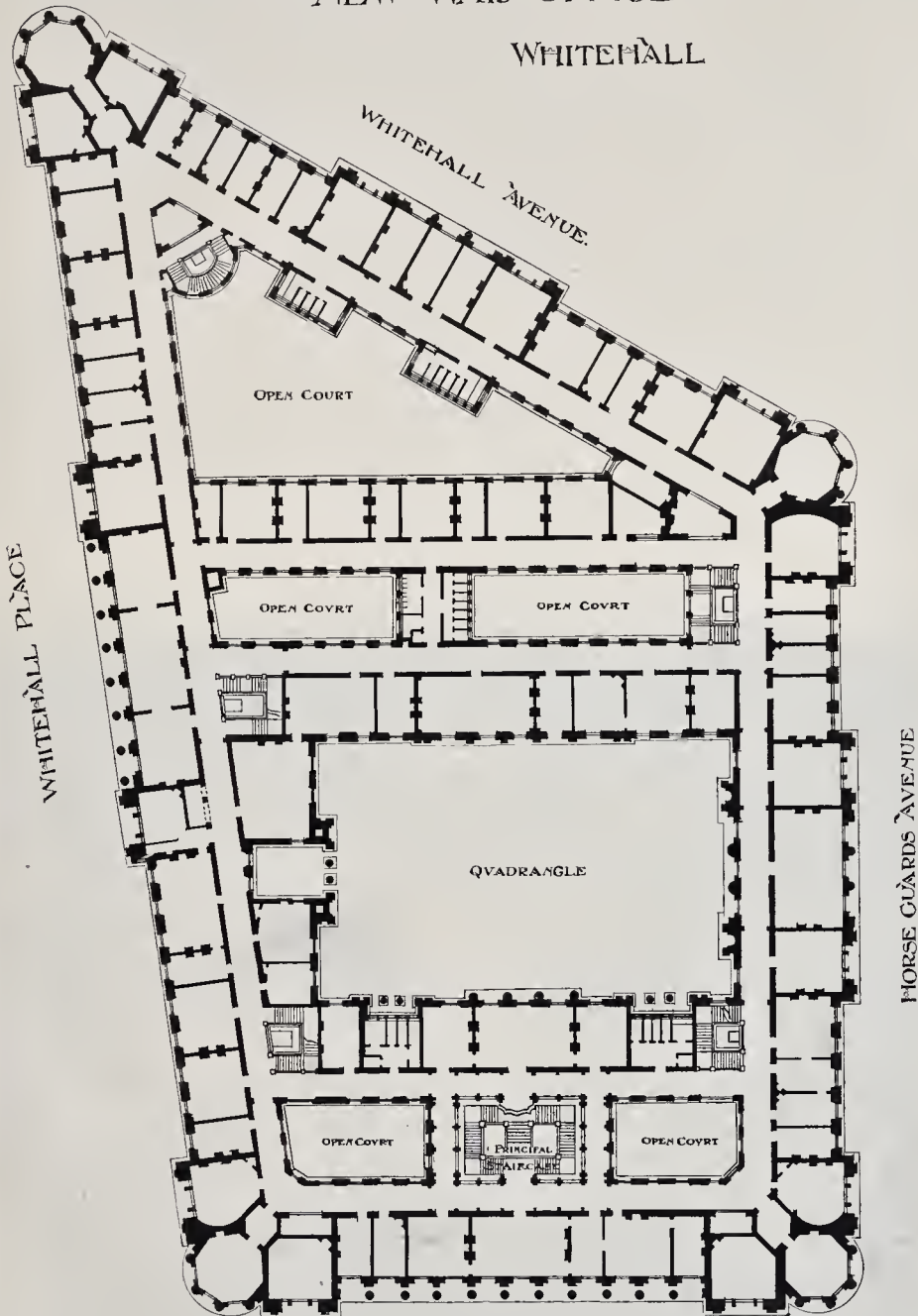




THE PHOTO SPRAGUE & CO. 4 & 5 EAST HINDING STREET, LONDON, E.C.

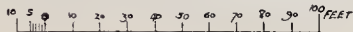
UNDER THE TEMPLE PORTICO.—By THE EDITOR

NEW WAR OFFICE WHITEHALL



WHITEHALL

PLAN OF PRINCIPAL FLOOR



we are enabled to give illustrations of six of the figures or groups which occupy positions over the decorative pediments on the face of the building.

We give two of the groups on a small scale, as illustrations in the text, in order to show the manner in which they are arranged and combined in connexion with the line of the pediment and the central stele. One group represents "Truth" and "Justice"; the other, which has "Peace" for its ruling motive, represents on one side one of the sad results of war, "The Fatherless and Widow"; the other, which seems to us a peculiarly charming conception, represents "The Winged Messenger of Peace" bringing the glad tidings.

It is necessary to observe that these photographs, as well as those on a larger scale in the lithograph plates, were made from the models in the sculptor's studio, and therefore are necessarily deprived of the proper architectural adjuncts in the shape of mouldings, etc. On the other hand, there is the advantage that they are taken in a more favourable position than would have been possible after the figures were *in situ* on the building.

The separate plates give the figures or groups already mentioned on a larger scale, and also two figures from a group of which "War" is the motive; the two figures representing respectively "The Horrors of War" and "The Dignity of War," two views of war which are equally true, but are unfortunately often considered apart from each other; the "peace-at-any-price" people seeing only the horrors, and not the necessity which is sometimes unquestionable; while the ultra-military spirit tends to see only the glory of war. The combination of the two ideals in one composition becomes therefore a kind of moral lesson set forth in sculpture.

NEW HOTEL DE VILLE, VERSAILLES.

GOING out to Versailles two years ago, our attention was caught by what was obviously a just completed Hôtel de Ville, standing near the tramway leading up to the great palace, and then in all the bloom of fresh-hewn stone. We made a mental memorandum to have this illustrated, and now give two illustrations from photographs specially taken for the *Builder*.

These district Hôtels de Ville or Mairies (as they are sometimes termed) in the various arrondissements of Paris, are among the most characteristic modern buildings of Paris. There is a considerable family likeness between them in style and in general disposition of parts, which is as it should be, as it is desirable that the Hôtel de Ville of the district should be easily recognisable by its architectural character; in the same way and on the same principle that in London we have seen a distinctive style and treatment adopted for the London School Board schools.

The architect of the Versailles Hôtel de Ville is M. Le Grand, of Paris.

THE RICCARDI PALACE, FLORENCE.

THIS celebrated building, though now known by the name of its later owners the Riccardi, was built by Cosimo di Medici, and was at first the home of their family. Browning makes it the scene of the wedding feast in his remarkable poem "The Statue and the Bust," the heroine of which was

"A bride the Riccardi brings home to-day."

And in some vigorous lines further on the speaker, supposed to be a Florentine of the period, refers to its origin and his hatred of the original founders:—

"A feast was held that self-same night

In the pile that the mighty shadow makes.

For Via Larga is three-parts light,

But the palace overshadows one;

Because of a crime which may God requite!

To Florence and God the wrong was done,
Through the first republic's murder there
By Cosimo and his cursed son."

The palace is a remarkable example of the application of the classic cornice to a whole building, and not to a mere order attached to it; and its architectural effect really depends mainly on this tremendous cornice which (like that of its twin-palace the Strozzi) projects nearly 10 ft. from the wall line. The treatment, other than that of the cornice, is rather flat and tame, and in this respect it looks less effective in perspective than in the engraved elevations published in architectural books.

The drawing was made for us by Mr. A. C. Conrade.

PORTION OF FACADE, SIENA CATHEDRAL.

THIS facade was designed by Nicolo Pisano; it shows, in its centre gable, a very effective combination of three primary forms—the square, niche, and triangle. The lower stage contains three great doorways, with massed arches, pediments, and elaborate sculptural decoration. Detail, suggestive of the Early Renaissance, is largely introduced, though the feeling throughout remains Gothic. Each one of its crowded shafts has a different treatment, whether of spiral, narrow panelling, or fluting; the same applies to the recessed arch-moulds. The capitals are evidently based on the Corinthian; above the caps are, on projecting brackets, some very spirited figures of horses and lions. The building was, on account of the plague of 1356, never completed, and consists at present only of the transept of what was intended to have been a vast cathedral. The foundations of the nave, etc., were laid, and can still be traced.



The Fatherless and Widow.

The Winged Messenger of Peace.

"Peace": Group on the New War Office.

At each angle of the platform before the front is a column (not seen in sketch) surmounted by a group of the female wolf with Romulus and Remus; in reference to the derivation of Siena from a Roman colony.
A. C. C.

THE PICCOLOMINI ALTAR, SIENA CATHEDRAL.

This is a pleasing example of somewhat Early Renaissance. There is an iconostasis in three stages, each of which contains niches with figures of saints and ecclesiastics, with the figure of the Virgin in the centre of the upper stage, the right-hand niche of which latter is, for some reason, empty. The whole is effectively set off by the horizontal lines of the light and dark marbles which clothe all the walls and columns of the interior of Siena Cathedral. A semi-domed recess contains the altar.
A. C. C.

ILLUSTRATIONS OF THE CHURCH OF SS. SERGIUS AND BACCHUS.

Or the four sheets of illustrations of this celebrated church, given in this issue, the sheet of "Interior Views and Details" is from photographs taken by Mr. Arthur E. Henderson; the drawings are executed by him from measurements taken on the building, which he has been studying on the spot for many months. They are referred to in the article by Mr. Henderson, which, with other sketches and diagrams, will be found on another page.

VIEWS OF OLD LONDON IN THE NEIGHBOURHOOD OF THE SAVOY AND CHARING CROSS.

THESE two sheets of views are reproduced from old prints and drawings in the invaluable Crane Collection in the print-room of the British Museum. They are given as illustrations to the article on this portion of old London which appears in the present issue, and to which the reader is referred.

UNDER THE TEMPLE PORTICO.

THE intention of this drawing was to give the effect of a view of a landscape from beneath the portico of a Doric temple in strong shadow. It is not entirely realised in the reproduction; lithography by the agency of the photograph is a useful but somewhat capricious servant to the artist; you never know quite what it will do; and in the present case it was found that an impression in which the foreground was as dark as in the drawing, the distance had chosen to come out much darker than in the drawing, and to avoid this defect it was necessary to print the whole in a lighter tone, which does not altogether realise the effect aimed at in the drawing.

The scene is, of course, wholly imaginary, but the arrangement of columns, with thicker columns and wider inter-columniations in the exterior order, is taken from the Parthenon portico. It is, in fact, a very unusual arrangement as far as existing remains give evidence, but it suited the composition better than placing the outer and inner columns on the same axis.

It being a festival day (for which the young lady in the foreground is an early arrival among the spectators), the temple was festooned externally with garlands, which show against the sky, and help to break the rigidity of the horizontal lines of the entablature.

It is worth while to remark, when people are constantly exaggerating the idea of the entasis in Greek columns, that the slight entasis shown in these columns, and which is barely noticeable to the eye (but which will appear on applying a straight-edge to them), though it was intended to represent the entasis of the Parthenon columns, is really considerably in excess of that; and that on the scale of the foreground columns in this drawing the entasis as existing in the Parthenon would be represented by a deviation from the straight line of little more than half the thickness of a post-card. I tested this by scale, applying the edge of a post-card to the scale, where it just filled up the inch (the Parthenon entasis is .56 of an inch). The fact is a significant commentary on the exaggerated representations of entasis which are now often made in drawings of Greek architecture. H. H. S.

(Continued from page 15.)

landing-stairs at each abutment are a noteworthy element of the design. The dry arches of brick on the Surrey side are forty in number; thirty-nine of them are semi-circular, 16 ft. in diameter, and one is semi-elliptical over Narrow-wall and 26 ft. in diameter. The first stone was laid on October 11, 1811. The total length of the bridge and causeways amounts to 2,456 ft., made up of 1,580 ft. for the bridge and abutments, 310 ft. for the approach from the Strand, and 766 ft. for the causeway on the Surrey side. The piers are 87 ft. in length at the base. The bridge is 42 ft. wide between the parapets, with a roadway of 28 ft. The cost, with the approaches, amounted to 937,391l. 11s. 4d. Sir John Rennie, who assisted his father in the work, relates in his Autobiography that the piers and abutments were founded on the solid bed, a strong gravel, of the river, and that they rest upon a wooden platform, carried by piles 12 in. in diameter, driven 20 ft. into the bed. In his paper upon "Foundations," printed in the *Builder* of May 28, 1838, Mr. A. T. Walmisley mentions that this was the first bridge on the Thames for which coffer-dams were employed, being composed of double piling, with muddle between the piles. As in the case of old Blackfriars and Westminster bridges, the foundations were not carried through the sand and gravel down to the clay, and there was one pile to every square yard of bearing surface at the piers. The heads of the piles, having been sawn off, timber bearing piles and pieces were fastened on, both lengthwise and transversely; on them was fixed a flooring of 6-in. planks, to take the first course of masonry. Under their Metropolitan Toll Bridges Act, 1877, the Metropolitan Board of Works bought the bridge for 474,200l., and, on October 5, 1878, opened it free from toll. Indications of the subsidence had already become manifest; in 1877 stones were dropped around the piers—a futile expedient which created a backing-up of the water, and scoured out a deeper channel under the arches. Throughout the year 1879 the mean low-water level of the river was 1 in. lower than in the forty-five previous years, and the high-water level was nearly 3 in. higher than in any year before 1875. In 1882 Mr. Edward Bazalgette, engineer to the bridges belonging to the Board, made an examination of the foundations. His investigations revealed certain facts which amply justified a warning given by this journal, albeit our presage was but lightly esteemed at the time. The demolition of old London and Westminster bridges, the building of the embankment, and other concomitant causes had deepened the stream under Waterloo Bridge to an additional extent of 8 ft. The piles, denuded of the gravel, had sunk beneath the superincumbent weight. Mr. Bazalgette drove great piles around portions of the piers; their spaces were caulked with oakum and puddled, and the water was then pumped out of the dams. Each pier was then seen to rest upon vast blocks of rough Bramley Fall and Craigleith stone, which had become crushed down by a load, for each pier, calculated at about ten to eleven thousand tons; the measure of the drooping of the bridge could be gauged from the circumstance that the cut-waters, not being a part of the actual fabric, had preserved their original level. The footings rested upon piles of beech, set in rows, 3 ft. 6 in. from centre to centre. Mr. Bazalgette concentrated his labours upon the arrest of a mischief which could not be entirely remedied. He lowered blocks of concrete, weighing from 5 tons to 6 tons, into position on the river bed, so as to form an apron from 4 ft. to 5 ft. 6 in. thick, and as hard as the solid rock, around each of the piers. The apron sloped outwards from the pier at an inclination of 1 in 56, and extended 18 ft. all around, its outer edge reaching to the piles of the dam, of which the lower portions were left as an outwork to protect the foundation piles if the river should become deeper still. The piles of the dam are massive beams of American rock elm, and, being cut off at the level of the concrete apron, prevent scouring of the gravel beneath it. W. Webster contracted for 70,000l., and completed the work from shore to shore in 1884. The bridge, which Canova said was the most beautiful structure in London, was opened as Strand Bridge by the

Prince Regent and the Duke of Wellington on June 17, 1817, and Constable depicted the scene. Rennie died on October 4, 1821. In June, 1898, the London County Council began the substitution, at a cost of 500l., of attenuated and tasteless electrical light standards for the eighteen lamp standards which had been especially modelled to suit the character of the bridge, and were, besides, uncommon and admirable examples of cast-iron design [July 2, 1904, the old and new standards]. The old railings, after a similar pattern, remain in Lancaster-place.*

Victoria-embankment.—The embanking of the Thames is no new thing. Many maintain that from Richmond it flows mainly between artificial limits, and that the earthworks for protecting the marshes in the lower reaches are of Roman origin. It must, however, suffice to merely mention that many encroachments and short embankments were made in later times along both shores in London, and that larger schemes have been propounded by Wren and Evelyn, and, in the XIXth century for the left bank, by Thomas Harrison (1810), Colonel Sir Frederick Trench (1828) for a viaduct level with Somerset House terrace, and carrying a railway, James Walker and others for the City Corporation (1841), and James Edmeston, whose project is described in the *Builder* of June 29 and July 6, 1861. A report (1844) of a Commission contains plans advanced by Sir Charles Barry, Trench, Thomas Page, Walker & Burges, and John Martin, the painter. Martin exerted his unruly will, but was the first who proposed to intercept sewage from the river; he published drawings of his conceptions, notably a set, in 1856, for a sewer-quay, colonnaded wharves, and a railway. Martin's plans for public walks with gardens upon the river's bank, and Wren's for a new quay, partly begun under the Acts 1666-7 and 1670, in Upper Thames-street and a "fair quay or wharf on all the river side from London Bridge to the Temple of the breadth of 40 ft., as also from the Tower wharf to London Bridge," are described in the *Mirror*, vol. xxviii., 1856. In August, 1860, a Select Committee of the House of Commons reported in favour of three schemes formulated by Sir Joseph W. Bazalgette, Bidder, and Forster, respectively, out of more than fifty submitted for an embankment from Westminster Bridge to Queenhithe. They recommended that the construction should be entrusted to the Metropolitan Board of Works, who, being charged under the Act, 21-2 Vict. c. 104, with the metropolitan main drainage, had powers to deal with the foreshore for that purpose, and that the coal and wine duties, to expire in 1861, should be temporarily renewed to supplement the funds already voted for the new low-level sewer. They estimated the total outlay at 1,000,000l., including, at least, 250,000l. for the sewer, and that the 3d. wine duty and the 8d. and 1d. portions of the coal taxes would yield about 100,000l. per annum. The Commissioners appointed in the following year to consider the plans preferred one by F. W. Shields [August 3, 1861, two alternative sections; with text of report] for a solid embankment from Westminster to Blackfriars, with a sewer beneath the road, to many projected viaducts with docks. Whilst recommending that the embankment should not extend below Blackfriars Bridge in view of the anticipated heavy claims for compensation, they advocated the laying-out of a new street from the bridge, instead of from Queenhithe, across Cannon-street, to the Mansion House, and the making of a viaduct eastwards from the Temple Gardens, with waterways to the City of London Gas Company's works, and the adjacent wharves in Whitefriars. An Act of 1861 renewed the coal and wine levies until 1872. The much-vexed question of intercepting vehicular traffic along the east front of the Crown property at Whitehall was ultimately decided in the negative. The Thames Embankment (North) Act, 1862 (25-6 Vict. c. 93) did not include the new road—Queen Victoria-street—through the City, for which statutory powers were obtained in the following year, but did include certain works which were abandoned under an Act of 1868, as, for instance, a

* In August last, after consultation with Sir W. Richmond and Mr. G. Frampton, R.A.A., the Council agreed to replace the old standards and fit them with incandescent burners.

viaduct for a road, 70 ft. wide, from the Temple Gardens to Blackfriars Bridge, and a street from Lancaster-place, having a gradient rate of 1 in 40, and partly upon arches through the Savoy, and beneath Hungerford Bridge to Northumberland-wharf, communicating with Villiers and Buckingham streets and with a new street from Whitehall-place to George-street, near the Adelphi.

The proposed viaduct of two arches, having a span of 70 ft., and a roadway of not less than 8 ft. above Trinity House high-water mark in front of the gas-works, together with a similar arch in front of Whitefriars Dock, were disposed of by the more successful action of the Metropolitan District Railway Company. In a report of October 22, 1862, Sir Joseph Bazalgette, Chief Engineer to the Board, stated that the clear waterway of the Thames was 900 ft. at Blackfriars and Westminster, 1,120 ft. at Waterloo, 1,020 ft. at Hungerford, 650 ft. at Southwark, and 700 ft. at London bridges, so that at the two last-named places the tidal water flowed with a velocity enough to keep the channel free from deposit. But where it spreads to nearly double the width, as at Waterloo Bridge, a partial and contracted channel is formed in the north bend, with much deposit on the south side. He first struck his embankment line to take in the second arch and pier of that bridge, which would have given a more uniform section of river and 8 acres more of reclaimed land. Through some bungling, for which the Board were not responsible, the limits of deviation did not take in the second pier of the bridge. The entire scheme, as amplified by the Act of 1863, included the right bank of the Thames from Vauxhall to Westminster Bridge, and was connected with the sewerage and street improvements in the City and the western parts of the town.

Of the three separate contracts, comprising numerous short lengths of intercepting sewers, but excluding 30,000l. for ornamental work, standards, etc., the length, 3,740 ft., from Westminster Bridge to a short distance below Waterloo Bridge, was undertaken by George Furness (ob. 1890) for 520,000l.; the length, 1,970 ft., to the east end of Temple Gardens by Ritson & Co. for 229,000l., the resident engineers being Mr. T. Lovick and Mr. E. Cooper, respectively; W. Webster took the third contract to Blackfriars Bridge, and made the roadway throughout. The contractors carried the foundations to a considerable depth, for the removal of old London Bridge had caused a deepening of the river bed, which contributed to the failure of old Westminster and Blackfriars Bridges, and was also affect-

ing Waterloo Bridge. Dispensing with the old coffer-dam method Bazalgette chose, he says, a system of excavation within a connected line of iron caissons sunk below the bed and filled with Portland cement concrete to within 6 ft. from low-water level, and otherwise constructed so as to form a full-tide dam (Fig. 4). The specifications required that the river-wall foundations should be taken down to 20 ft. at least below Ordnance datum—that is to say, to 32 ft. 6 in. below high-water level, or 14 ft. below low-water level; the river wall to be faced with granite to a curved batter from 2 ft. below low-water mark to about 1 ft. 6 in. below high-water mark, where should be a chamfered plinth and surface mouldings to a plain face of about 2 ft. forming a sub-plinth to the parapet; a counter-fort, 3 ft. thick, to be built over the arch of the subway at the back of each of the fifty-eight lamp-pedestals to receive the washers of a long mooring bar passed through the entire construction, and attached to the mooring rings upon the pedestals. Each ring of cast and hammered gun-metal, appears as though it were held in a lion's mouth. For Furness's contract the caissons, contrived by Mr. Joseph Phillips, of Messrs. Cochrane, were oval on plan, 12 ft. 6 in. by 7 ft., outside measurement, having end-grooves 6 in. wide and deep. In each caisson the groove, with a similar one in the butted end of the next caisson, took the timber pile which formed one of the guides to the descent of the caissons as well as a joint, made water-tight with packing. Each caisson was built in divisions 4 ft. 6 in. high, the divisions being of wrought and riveted boiler-plate where left in below the bed, and of cast-iron where above and serving merely for the dam. Before the building up and sinking of the caissons the line of the face of the embankment was obtained with sufficient accuracy: at about the middle of the length from one bridge to another a point was fixed in the rear of the general line of staging, and marked with a pole or wand resting upon a small staging; the lines from each point to two points on the bridges made a large angle, in which the curve was found by offsets taken at every successive 50 ft., namely, at the end of four caissons.* The steamboat piers, landing-stages, and stairs for smaller

* The curve from Westminster Bridge to Temple Pier is not quite circular. The writer finds it nearly coincides with an arc struck at a radius of say 3050 ft. from a centre in Waterloo road between Aubin-street and Holmes-terrace, and passing through those two points.

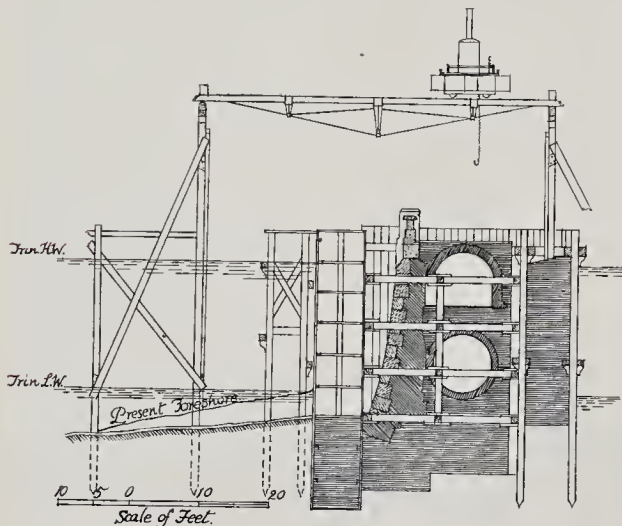


Fig. 4. Section of Coffier-Dam used in Laying Foundation-stone, Retaining Wall, Sewer, and Subway of Thames Embankment, and Caissons forming the Front of the General Coffier-dam Construction in the first Contract. (From the "Builder" of August 6, 1864.)

craft, constituted an important feature of the work. The old piers, whereof some yet remain at other points on the river, consisted of worn-out barges, with shifting gangways; they had been replaced here and there with the improved structures of the Conservancy Board, the Cadogan suspension pier at Chelsea, and Thomas Cubitt's pier at Pimlico. The embankment dummies, or pontoons, rise and fall on the tide in recesses, of which those at Charing Cross and Waterloo bridges [July 30, 1864] contains the storm-water outfalls of the Northumberland-street and Savoy-street sewers. Temple pier and landing-stages, over 470 ft. long, comprise a recess of 250 ft. for the pontoon, with a middle recess 25 ft. wide at the back, the total projection into the river being 31 ft.; the recesses contain the outfalls of the Essex-street and Norfolk-street sewers. At Waterloo Bridge the total length is about 50 ft. more, for two recesses, the foundations of which, as well as of the wall, were carried down lower than the foundations of the pier of the bridge, and the soil about the bridge-pier was enclosed within a permanent dam of cast-iron plates and piles secured to the older footings with iron tie-rods bedded in concrete whereon was laid an inclined apron of granite blocks everywhere dowelled together. A large rusticated arch, with console head and plinth and pedestal for sculpture, marked the parapet at Temple pier. It was originally intended to remove York water-gate to opposite Whitehall-gardens, and to put it in the middle of a projecting space 108 ft. long, having two end pedestals for sculptured lions couchant, recesses for seats, and landing-stairs in three flights. The main roadway is 100 ft. throughout, with a carriageway of 64 ft. The general level of the road is 4 ft. above high-water mark, with an upward incline at each end. Within the wall and embodied in its structure is the northern low-level intercepting sewer, fully described in the *Builder* of August 27, 1864, an integral component of the Main Drainage scheme, having a diameter of from 7 ft. 9 in. to 8 ft. 9 in.; above the sewer is a subway, 7 ft. 6 in. high by 9 ft. wide, for pipes, wires, etc., both being beneath the footpath nearer to the river. The embankment is 1 mile 455 yds. long; of the total area, 37½ acres, reclaimed, 19 acres are absorbed by roads and paths, and 7½ acres passed under the Act to the Crown, the Inner and Middle Temple Societies, and other riparian landowners. About 9 acres were devoted in perpetuity to the public benefit and enjoyment, mainly through the exertions of W. H. Smith, M.P. for Westminster, who, on August 7, 1870, carried a motion by 156 to 106 votes against the Government for an address to Her Majesty praying she would be pleased to direct that no public offices be erected on that portion of the embankment which is reserved to the Crown, and which had been reclaimed from the river at the cost of the metropolitan ratepayers. The gardens of the houses at Whitehall were lengthened; the Templars were inhibited from building on the land added to their gardens; but that provision was relaxed by the Board of Works' Act of 1875 which permitted an encroachment in favour of Temple Gardens-chambers (see the Temple). A subway at Westminster affords access to the Houses of Parliament, the bridge, and the railway station. The net cost, with that for ancillary works, amounted to 1,156,981l.; with Bazalgette (ob. 1901) were associated C. H. Driver (ob. 1900) for the architectural features of the wall and stairs, and John Dixon, C.E. (ob. 1891), for the landing-stages and piers. G. J. Vulliamy, the Board's Superintendent Architect (ob. 1886), adjusted the settlement of compensations, about 450,000l. in all, and the purchases of property; Mr. A. McKenzie and Mr. Weston laid out the three ornamental grounds. The work was begun in the autumn of 1863, the first pile being driven in front of Montagu House, Whitehall; on July 20, 1864, Sir John Thwaites, chairman of the Board, laid the first stone in a dam sunk to 21 ft. below high-water mark on to the concrete bed and footings of the wall and sewer construction near Whitehall-stairs; on July 15, 1870, the King (then Prince of Wales) and the Princess Louise opened the Embankment on behalf of the Queen. The section, reproduced from the *Builder* of August 6, 1864, shows the actual construction of the permanent coffer-

am, with the caissons forming the front of the general dam or coffer-dam construction, and the retaining wall, sewer, and subway, foundations, etc., between Westminster and -omerset House. An Act of 1872 placed the whole thoroughfare, which passes through several parishes, under the control and management of the Board. The road is not much frequented, but is found convenient for the assembly of troops, and the marshalling of processions; the side streets from the Strand and Fleet-street are narrow and steep; with a few exceptions the buildings that line its course are unworthy of their position. Nevertheless, he has not seen London who has not seen it from Victoria-embankment in the early morning, or evening, of a bright summer's day.

SOME NOTABILLIA.

Jaenes, Plans, etc.—The riverside palaces, by Jollar, prints by Herbert and Wilkinson, 1806, that of York House from the drawing, 1630, in the Pepysiana Library, and the Museum, Cambridge (1851). *Jaenes, Plans, etc.*—The riverside palaces, by Jollar, prints by Herbert and Wilkinson, 1806, that of York House from the drawing, 1630, in the Pepysiana Library, and the Museum, Cambridge (1851). *Jaenes, Plans, etc.*—The riverside palaces, by Jollar, prints by Herbert and Wilkinson, 1806, that of York House from the drawing, 1630, in the Pepysiana Library, and the Museum, Cambridge (1851). *Jaenes, Plans, etc.*—The riverside palaces, by Jollar, prints by Herbert and Wilkinson, 1806, that of York House from the drawing, 1630, in the Pepysiana Library, and the Museum, Cambridge (1851).

Maréchal's & F. A. David's "Les Antiquités d'Herculanum," 4°, 1780, vol. vii. Surrey-street, south end, east and west blocks—Mr. D. C. Nicholls. St. Stephen's Club (April 11, 1876)—John Whicher, the younger, Ordnance and Transport Office, Board of Control, and, lastly, Civil Service Commission. W. Pilkington, 261, site of A. A. police station etc.—Mr. J. Dixon Butler, 1900. New Scotland-yard—Mr. R. Norman Shaw, R.A., 1888-90, on site of the abortive Grand National Opera House, of which Anne Trevelyan bought the first brick on September 7, 1875. Royal Avenue Theatre—F. Fowler, 1881-2. Examination Hall, Royal College of Physicians and Surgeons (March 20, 1886)—Mr. Stephen Salter, Offices for the (late) London School Board (December 30, 1882; March 13, 1886)—Messrs. Bodley & Garner, 1874; west extension—Mr. E. R. Rolison, 1895; further enlargement, 1891-2—Mr. R. W. Edis; sculpture over later doorway—Mr. Dressler; Astor Estate Offices, 1893—J. L. Pearson, R.A. (ob. 1897); sculpture by Mr. Nicholls. Temple chambers—J. Whicher, 1885; National Telephone Company (May 26, 1900; January 25, 1902)—Mr. A. N. Bromley, 1898-9, carving by Mr. G. Soale. Messrs. Foster and Dicksee, Contractors; Metropolitan Asylum Board (June 11, 1898)—Mr. E. T. Hall, 1897-1900, carving by Mr. Felix. Messrs. Shillcock & Sons (super-structure) and Leslie & Co. (foundations). Temple Court, Bowdoin (October 1903); Hamilton House (July 22, 1899)—Sir W. Emerson; National Press Agency (January 16, 1897)—Mr. E. T. Hall, and Fire Brigade station, Carmelite-street, 1897—N. Bushill (ob. 1905); Thames Conservancy—Messrs. Hunt & Steward, 1893-4, Guildhall School of Music (September 5, 1885)—Sir Horace Jones (ob. 1887), extension in John Garmett-street way (May 5, 1880, view and four plans; December 16, 1882, great hall)—Messrs. Davis & Emanuel; general architectural carving by Mr. W. S. G. W. S. Messrs. John Mowlem & Co. (main structure) and Messrs. Higgs and Hill (foundations); removed from Milk-street, Chesapeake (Wm. Ward's City of London School for Girls)—Mr. A. Murray, 1893-5; Messrs. Atherton & Latta, contractors. St. Giles (May 1, 1880, view; May 5, 1886, detail elevation and ground plan)—Sir A. W. Blomfield (ob. 1899); Messrs. Foster & Dicksee.

NOTES ON NEW BUILDINGS IN LONDON.

V.—CAXTON HOUSE, WESTMINSTER.

On the north side of Tothill-street there has just been completed (externally at least) one of the immense blocks of new stone-fronted buildings which are now rising in so many parts of London. The prevalence of stone we are glad to see; after all that may be said about the colour effect of red brick (which does not retain its richness very long in London) there is no building material so noble and monumental in its effect as good stone; and though it darkens, it does not become grim with age, as brickwork does. Caxton House has the now usual sin of being too high for the width of the thoroughfare, and we suppose this running to height is inevitable; it might indeed be urged that the sin lies with our forefathers, who did not lay out wider streets.

Unlike the remarkable building last under our notice, Caxton House, which appears to be intended as a block of offices in the lower portion and perhaps of residential chambers above—that at least is the impression produced by the exterior treatment—is entirely built with the orthodox construction of piers over piers and openings over openings. The lower two stories are treated architecturally as one, and form a lofty rusticated podium to the remainder of the elevation. This is boldly treated with a series of arches running through both the lower stories, which are marked off only by the window and floor lines crossing the openings. This is a bold and effective treatment, but it cannot be denied that the proportions both of arches and piers are too high and narrow for the best effect, and the piers appear wanting in solidity and mass, not constructively but architecturally, for the mass of the building carried by them. Very likely the architect is of the same opinion, and has done his best to conciliate architectural effect with demands for light; but we are almost inclined to think that a better effect would have been produced by making the arcade a lower and wider one for the ground story only, as in the building in the Strand described last week, and grouping the windows of the next story with the others above the rusticated base. To the high rusticated base in itself we see no objection, only the narrow proportions of the piers and arches in it. The three stories

above are divided into bays by large pilasters treated with a simple panelling which has a good and refined effect; the windows between are square-headed with a square panellated centre column below and circular columns in the next two stories. The effect of all this is quiet and refined, but the plain raised square panels with their angles cut out, which fill the spaces above the third floor windows, form rather a commonplace detail which is neither interesting nor ornamental. The centre of the front is slightly projected and emphasised by angle quoins corresponding with those at the angles of the building. The principal entrance is treated in the now rather hackneyed form of a rusticated arch with a concave quarter-circle curve on plan at the reveals, and a pedimented and columned doorway inserted beneath it. The projecting oriel, which runs up the centre above the doorway, certainly requires more appearance of architectural support than is given by the scroll cartouche which finishes under its flat soffit; it has the appearance of standing on nothing. The balcony above the main cornice, with the graceful sculptured figure-carrying it from beneath, is much better managed; and the decorative iron railing is of a massive character suitable to the whole scale and size of the building. The central portion above the main cornice is a nice bit of composition, with its vertical curve in the shape of a segmental fronton, and the backward horizontal curve of the attic which finishes this portion; only we do not like the side scrolls or consoles; they are rather meagre in proportion for their surroundings, and not graceful in curve and outline.

A fairly powerful cornice is carried right round the building, breaking at the centre projection; it strikes us that it would have been better in effect had the modillions been closer spaced; they are rather wide apart.

The east or return elevation is very simply treated as a mass of brickwork, with cornice and angle quoins of stone. A deep recess in the plan on this side divides it into two pavilions treated alike, each with a stone oriel running up the centre in the middle of a field of brickwork. The effect of the massing of the building here, with the deep recess between the two wings, is very good from a distance, but will unfortunately be hidden when the new Wesleyan Hall is built, which will come to eastward of it with only a 40-ft. passage between.

ELECTRIC POWER BILLS IN 1906.

A LARGE number of private Bills relating to schemes for the supply of electric power to large consumers are down for consideration during the coming Parliamentary session. The large number of these Bills shows that the supply of electric power in bulk gives good promise of being commercially successful. The reason of this can be readily understood from an inspection of any of the more modern power supply stations which have been erected round London during the last two or three years. Take, for instance, the Brimsdown Station of the North Metropolitan Electric Power Company which supplies the power to work the Metropolitan Tramways. It is situated on the banks of a canal, so that the great quantities of coal slack required can be conveyed cheaply by barges, and the large amount of water required for condensing purposes can be had for a nominal fee, as it is returned into the canal. The crane and coal-conveyor plant for unloading the barges are worked electrically, and take very little power. As automatic stokers are used, and the ash and clinker are carried away by the buckets of the conveyor, practically no manual labour and almost no supervision is required in the furnace and boiler-house. The prime movers are Parsons' steam turbines, which require very little supervision, compared with that required by reciprocating engines. The dynamos are coupled directly to the turbines and generate at 10,000 volts. The power is transmitted at this pressure by a three-core cable, sheathed in lead, directly to the rotary converters at the tramway substation, twenty miles away. Under these circumstances it is not surprising that electric power can be sold profitably at a price less than half the minimum price required by an ordinary lighting station. One point

DESCRIPTION

MODELS OF THIS KIND CAN BE MADE OF ONE UNDIVIDED PIECE OF ORDINARY DRAWING PAPER, UNITED AT ANGLES BY THE FOLDING FLAPS, WITHOUT THE USE OF ANY ADHESIVE MATERIAL.

A SHARP PENKNIFE SHOULD BE USED TO CUT OUT THE MODEL, WHERE INDICATED BY THICK BLACK LINES. THE DOTTED LINES SHOW WHERE THE PAPER IS TO BE FOLDED OR BENT. AFTER THE FOLDING FLAPS

HAVE BEEN PASSED THROUGH THE SLITS, ALSO INDICATED BY THICK BLACK LINES, THEY SHOULD BE FLATTENED OUT.

A MODEL CAN BE FURTHER STIFFENED AS ILLUSTRATED IN THIS DESIGN BY PASSING CERTAIN PARTS OF IT UP THROUGH THE ROOF.

WITH A LITTLE INGENUITY ALMOST ANY DESIGN CAN BE MODELLED IN THIS WAY IN ONE PIECE, OR SEPARATELY AND JOINED TOGETHER.

THE SCALE TO WHICH MODELS ARE DRAWN DEPENDS UPON THE SIZE OF A BUILDING AND THE STRENGTH THAT A HOLLOW PAPER MODEL MAY BE EXPECTED TO HAVE. IN THIS CASE IT IS $\frac{1}{6}$.

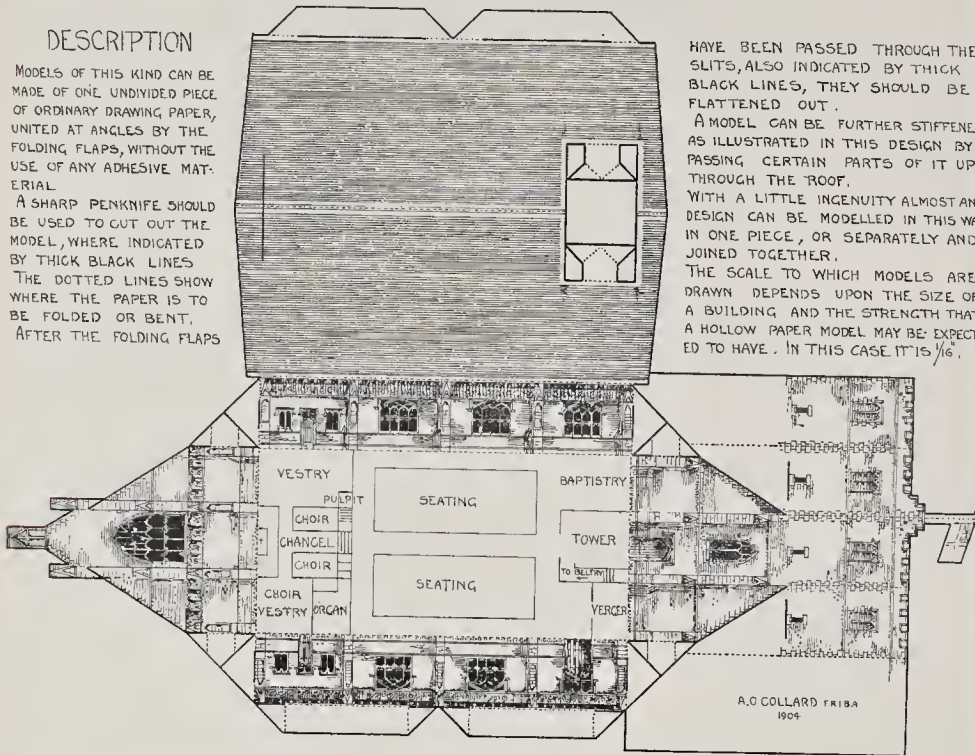


Diagram of Construction of a Paper Model. By Mr. A. O. Collard, F.R.I.B.A.

we wish to emphasise in connexion with the Drimadown Power Station is that power is transmitted for twenty miles by underground mains at a pressure of 10,000 volts. The engineer tells us that there has not been the slightest trouble in working at this pressure since the station opened, about a year ago. It seems to us that the Parliamentary Committees should not sanction the claims made by many of the power companies—the London County Council amongst others—for permission to erect overhead mains without the closest scrutiny and a clear statement of the additional cost required for underground mains. The use of electric power for industrial purposes in London will probably increase enormously in a few years, but there is plenty of room for extension in most of the existing power stations. Owing to the great progress that has been made in electrical engineering, the mechanical and electrical problems involved admit of easy solution, and there is no reason for treating the promoters of the power Bills more leniently than the local authorities whose streets they are seeking permission to break up.

PAPER MODELS OF BUILDINGS.

We give an illustration, from a drawing by Mr. Allan O. Collard, architect, of Buckingham-street, showing his method of making up a model of an architectural design out of elevations drawn on paper, and then put together. Mr. Collard writes:—

"The idea shown by the plan illustration, reduced from an eighth to the inch scale, was partly the result of a desire to show to a client, quickly and cheaply in model form, the general appearance of a proposed building. When drawn in some such way as suggested, and coloured, it can be cut out with a penknife and be united at the corners in a few minutes, the angle flaps rendering any adhesive fixing quite unnecessary.

A complete model is astonishingly substantial

considering it is only made of ordinary drawing paper.

A large building of complicated plan could be treated with similar ease, by making some



of the blocks separately, though, of course, there may be limitations to the process. The small illustration is from a model actually made, to show how the idea works out."

SCHOOL, GLASGOW.—The Hayfield Public School, Glasgow, has just been opened. The school, situate at the junction of Rutherglen-road and South York-street, is a red stone three-story building, Italian Renaissance in character, and covering about 1,863 sq. yds. There are in all twenty-four classrooms, twenty-one of which have a southern aspect. The classrooms seat nearly 1,500 pupils. Accommodation for drill and marching is afforded by the central hall, which is 64 ft. long by 28 ft. broad. The walls of the rooms are timber-lined for 5 ft. up, those of the hall, passages, etc., being tiled to the same height. The architect is Mr. John Hamilton, I.A.

DIARIES AND ALMANACS.

VERY little can be added—except to mention certain new features—to what we have said in previous years concerning the "Mechanical World Pocket Diary and Year Book" for 1906 (Emmott & Co., Ltd., Mechanical World Offices, Manchester). A short section on the Steam Turbine, by Mr. R. M. Neilson, contains a concise account of and practical data as to seven varieties of this essentially modern type of prime mover. Another new section on Refrigerating Machinery, Ice Manufacture, and Cold Storage seems scarcely necessary in a handbook of this class, owing to the somewhat special character of the subject. Other additional information that is perfectly appropriate relates to High-speed Steel Tools, Screw Threads, the Strength of Crane Chains, Shaft Bearings, Gas and Oil Engines, and sundry matters of everyday interest to mechanical engineers and contractors. The table giving Factors of Evaporation, for use by engineers and boiler owners, has been extended by the inclusion of pressures from 150 lb. up to 300 lb. per square inch, and by doubling the number of temperatures for which factors are given. This is a desirable and perfectly appropriate addition to a convenient book of reference.

Messrs. Waterlow Bros. & Layton, Ltd. (Birchin-lane, E.C.), have sent us a copy for which we will publish, and the excellence of which we have often referred to. The diary portion gives one day to a page, and there is an index in connexion with it. The rest of the work consists of all that useful information generally to be found in a publication of this kind, such as lists of members of the various professional bodies, the London Building Act, 1894, and the Amending Acts of 1898 and 1905, and much other matter of interest to professional men. The diary is published at 3s. 6d. and 6s., according to the binding.

From Messrs. Hudson and Kearns (Stamford-street, S.E.) we have received specimens of their excellent blotting-pads for 1906. The principal pads are No. 8A and the "Banker's," each of which consists of blotting-pad, blotting-pad diary, and date remembrance, while No. 8A has provision for standing memos. These and other specimens are neat in appearance and very convenient in form and arrangement, and leave little or nothing to be desired.

The "City Diary" for 1906 (W. H. & L. Collingridge, 148 and 149, Aldersgate-street, E.C.) is the forty-third annual edition of a useful little diary containing much information as to City matters. The diary proper gives three days to a page, and is interleaved with blotting-paper. It is well bound and neat, and is published at 1s.

The "Gloucester Diary" (published for the Gloucester Railway Carriage & Wagon Company, Ltd., Gloucester) is well bound and convenient in size, but unfortunately the back of each diary page shows an advertisement.

Messrs. L. & C. Haridmuth have sent us one of their "Koh-i-Noor Pencil Calendars."

Messrs. Edward Wood & Co., Ltd., constructional engineers, Cannon-street, E.C., have issued a neat little pocket diary for 1906. It contains tables of Safe Loads for Compound Girders and Stanchions, which have been considerably augmented.

Messrs. Ashwell & Nesbit, Ltd., engineers, of London, Leicester, Manchester, and Nottingham, have again issued their Shaking-spear tear-off date indicator. The indicator is suitable for office use, as the figures are of good size.

Books.

The Architects' Law Reports and Review (illustrated). By ARTHUR CROW, F.R.I.B.A.; Legal Editor, A. F. Jenkin, of the Inner Temple, Barrister-at-Law. Vol. II. (London: Printer for Arthur Crow, 18, Great Prescott-street, E.C. 1905.)

The second volume of "The Architects' Law Reports and Review," Vol. I. of which publication created a new departure in this form of literature, contains much information of use to that public whose requirements it is intended to serve, and who are particularised on the cover as being "architects, surveyors, engineers, and others interested in the laws affecting buildings and streets." It is stated in the Introduction that it was originally suggested that this work should be regularly issued in quarterly parts, but this scheme seems to have been abandoned, and apparently the publication of future volumes will depend upon the importance of the decisions given in the courts dealing with the subject matter this publication is concerned with. In the volume before us the first ninety-three pages constitute the Review, whilst the Reports fill 249 pages. Of the Law Reports themselves it is sufficient to say that they are reprinted, by permission, from the *Law Times* and the *Justice of the Peace*, and, therefore, their excellence and accuracy is assured. Certain plans and photographs have been published with them, and these may lend an additional interest to the Reports in the eyes of the lay reader, but will be accepted with caution by any lawyer, unless they were formally proved and put in evidence at the trial, a fact which will always be stated in the report. The cases contained in the Reports are grouped under alphabetical headings, and there is an index both to the names of cases and to their subject matter. The volume also contains what are termed "Accumulating Subject Indexes"—should not this be "Indices"?—this, in reality, is a digest under similar headings of the cases reported in the two volumes which have been issued, and thus every facility for reference has been afforded. The Reports are preceded by "Legal Notes," which are chiefly confined to some comments on the law regulating single private drains and by-laws as to lodging-houses. These notes appear to us written with rather more boldness than discretion. For instance, the statement that the Court of Appeal had no jurisdiction to hear the appeal in the case of *Thompson v. Eccles Corporation* seems unnecessarily daring in a publication of this

description, and the notes generally appear framed rather with the view of criticising the judgments than of assisting the reader, and especially the lay reader, to a comprehension of the law which is binding upon him.

The first portion of the Review is devoted to the London Building Act of 1905—the Act which is intended to secure greater security from fire in the metropolis. There is an excellent Introduction, and the text of the Act is published with notes containing cross references and references to decided cases which should be most useful. This part of the work especially commends itself to us. The Act in question is one of those numerous "Private" Acts of Parliament which deal with matters of primary domestic importance to the public, and which are extremely difficult for that public to obtain information upon or to refer to. If we may make a suggestion to the editors in a most friendly spirit, it is that, in future publications of this Review, they should extend this part of their work even to the exclusion of so many reports of cases. We think, in doing this, they will be rendering a valuable service to those classes they intend to assist. Full reports of cases are not of so much assistance to the public this publication is intended for, except in cases when construction or drainage systems, etc., are entered into in detail, and, as a rule, a headnote, or a note in popular language, stating the effect of the decisions, is equally serviceable to the layman. Full reports of cases, moreover, in the space available, cannot be carried out exhaustively, thus, in the volume before us, only two cases on Workmen's Compensation are given, whereas, in the period covered by this issue, there are numerous decisions equally important and equally *ad rem*; but a publication of Acts of Parliament with notes such as the above, brought out as quickly as possible after the measures are passed, supplies a felt need, especially in the case of "Private" Acts, and we congratulate the editors on having engaged in this enterprise. The Act is well indexed, and the volume also contains papers on "Building By-laws and Rural Architecture," and "Matched-Lined Buildings and Escape from Fire."

Knights' Annotated Model Bye-laws. Seventh Edition. Edited and Revised by WILLIAM A. CASSON, of the Middle Temple, Barrister-at-Law of the South-Eastern Circuit; late of the Legal Department of the Local Government Board. (London: Knight & Co., Local Government Publishers, 1905.)

The first edition of this work was published twenty-two years ago, the present author being associated in that and the subsequent editions with Sir Richard Thorne-Thorne and Mr. P. Gordon Smith. Owing to the death of these gentlemen, the present author has been left to edit this last edition alone, although, as he explains in a somewhat curiously worded paragraph at the end of the Preface, he has received assistance from other of his late colleagues still associated with the Local Government Board. Perhaps the most important feature of the present edition is the inclusion of the Local Government Board's model code of by-laws for urban districts of 1904 and the model rural code of 1903. With regard to the rural by-laws, the author with a touch of officialism accuses the public of entirely failing to appreciate the real issues involved in the application of by-laws, but he himself refrains from alluding to the real point at issue—the discretion vested in local authorities to adopt by-laws unsuitable to particular districts. This work is invaluable to those in any way connected with local government, and, as the tendency to legislate by by-law is increasing, the demand for such a work must be the greater. The present edition consists of 342 pages and an index, and seems well edited and brought up to date. One or two of the recent cases on invalid by-laws in connexion with common lodging-houses might possibly have been included with advantage.

The Painter's Pocket-book. A reference guide in everyday work. By PETER MATTHEWS. (London and Manchester: John Heywood, 1905. 3s.)

This is a conveniently shaped book for carrying about, containing practical information in

relation to house-painters' work. It contains a list of permanent and non-permanent colours, a table of combinations of colours for producing various tints; advice as to dealing with a great number of practical difficulties in connexion with defects arising in old work or from the nature of the materials to be painted, etc.; hints on practical geometry and setting out work; examples of various forms of lettering, etc. It seems a thoroughly practical little book, and likely to be very useful to painters.

BOOKS RECEIVED.

PRE-RAPHAELITISM AND THE PRE-RAPHAELITE BROTHERHOOD. By W. Holman Hunt. (Macmillan & Co. 42s.)

PROCEEDINGS OF THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS. Vol. XXXI.; 1904-5. Edited by Thomas Cole, A.M.Inst.C.E. (E. & F. N. Spon.)

SUBJECT LIST OF BOOKS ON HEAT AND HEAT ENGINES. (Patent Office. 6d.)

SUBJECT LIST OF BOOKS ON AERIAL NAVIGATION AND METEOROLOGY. (Patent Office. 6d.)

Correspondence.

"STANDARDISING" BILLS OF QUANTITIES.

SIR.—With reference to the several letters appearing in recent numbers of your valuable paper relative to the proposed standardising of quantities, the Council of the Quantity Surveyors' Association beg to state that they have had the subject under discussion for some months past (*vide* our issue of April 22, 1905, page 435, entitled "A Plea for a Uniform System of Measurement in England," and also that of June 3, 1905, page 535, entitled "Practice of Our Profession and Suggested Reforms"), and propose in due course to call a meeting of the various interested bodies to consider the matter.

P. B. HOLZES,

Hon. Secretary and Treasurer
Quantity Surveyors' Association.

DRILL HALLS AND GYMNASIA.

SIR.—At a public meeting recently held at Royston (pop. 3,500) it was decided to try and raise a sufficient sum of money to build a drill hall and gymnasium with a false floor, under which a swimming bath should be built for use in summer. At a committee meeting held later it was felt that it was desirable to try and get information from towns where similar buildings existed, and that the best means of getting to know what towns possessed buildings of this description would be through the columns of your paper, if you would be kind enough to insert this letter.

Names of such towns and any information regarding probable cost of erection and subsequent upkeep would be gratefully received by me.

C. F. WHITMAN.

Royston, Herts.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—I.

Introduction—Mathematical Signs.



FEW words will suffice to make clear the general aim of the articles commenced in the present issue. The possibility of misunderstanding may be prevented if we state at the outset that the series is not intended to constitute a mathematical treatise, although some simple branches of mathematics will necessarily be discussed.

After collecting and defining mathematical signs, symbols, and terms in convenient form for reference, we purpose to deal briefly with some labour-saving methods of performing calculations such as fall within the province of architects and others engaged in work connected with the design, construction, and equipment of buildings. Simplicity will be the keynote throughout, for simple methods are generally best suited for practical men, who regard mathematics merely as a means of arriving at approximately accurate results, and have other absorbing interests that debar them

from attaining those lofty levels where mathematical science is looked upon as an end and almost becomes a religion to its devotees.

Having dealt sufficiently with methods of computation, we propose to give selections of formulae, memoranda, tables and diagrams, such as appear to us most likely to be of service to students of building construction and allied subjects.

Modern science has advanced so rapidly that several subjects now brought within the daily practice of architects cannot be thoroughly familiar to all.

There are only two correct ways of dealing with problems arising out of unfamiliar departments of work. One is to invite the co-operation of a consulting engineer, and the other for the architect to become his own engineer.

One of our objects in presenting this series of articles is to help the rising and present generation of architects to become more dependent upon their own knowledge in dealing with subjects occupying a subsidiary place in ordinary curriculum of study, or lying beyond its limits.

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Multiplication is also indicated by placing two factors closely together. Example: $ab = a \times b$.

A dot placed in front of one or more figures indicates that the quantity is a decimal fraction.

: : This sign has two meanings. (1) Indicating multiplication. (Rare.) (2) Signifying *as is, equal to, or is equal to*.

In this sense the sign is used to denote proportion, or the equality of ratios.

÷ Indicates geometrical in contradistinction to arithmetical proportion. (Rare.) Example: $m : a :: b :: c : d$.

— Division is very generally indicated by placing the dividend above a horizontal line, and the divisor below the same line.

÷ Division is also frequently indicated by this sign, which has the advantage of saving space. Example: $6 \div 3$.

/ Division is sometimes indicated by placing the dividend before a sloping line, and the divisor after the same line. Example: $6/3$.

÷ Division can also be indicated by this sign. (Rare.)

• Division can also be indicated by two dots one above the other, but the more general application of the sign so formed is to indicate ratio.

• When placed between two symbols or numbers, this sign signifies *is to* or *the ratio of* one factor to the other.

• Because, or hence.

> Is greater than. Example: $3 > 2 = 3 - 2 = 1$ is greater than 2.

< Is less than. Example: $2 < 3 = 3 - 2 = 1$ is less than 3.

≥ Is not less than. Example: $2 \geq 2 = 2$ is not less than 2.

≤ Is not greater than. Example: $3 \leq 3 = 3$ is not greater than 3.

∞ Infinity, infinite, or indefinitely great. This sign is employed to indicate a quantity greater than any finite or measurable quantity.

∞ Infinitesimal, or indefinitely small. This sign has three uses:— (1) As the numeral *naught*.

(2) As a symbol indicating zero. (3) As a symbol indicating infinitesimal, or indefinitely small.

∠ Angle. Example: $\angle ABC$ is the angle ABC .

∧ The angle between. Example: $A \wedge B$, or $A \wedge B$, that is, the angle between the lines A and B .

∩ This sign is a less common sign denoting an angle. (Rare.)

⊥ Right angle. Example: $\angle ABC$ is the right angle ABC .

⊥ Perpendicular, perpendicular to, or is perpendicular to.

∥ Parallel, parallel to, or is parallel to. Example: Draw $AB \parallel CD$ = draw AB parallel to CD .

∦ Not parallel, not parallel to, or is not parallel to. Example: $EF \not\parallel GH$ = the line EF is not parallel to the line GH .

∇ Equiangular, or is equiangular to. Example: $ABCD \nabla EFGH$ = the square $ABCD$ is equiangular to the square $EFGH$.

⊚ Equilateral, or is equilateral to. Example: $ABC \oslash DEF$ = the triangle ABC is equilateral to the triangle DEF .

○ Circumference of a circle. ○ Circle. ◌ Semicircle. ⌒ Arc of a circle.

□ Quadrant. △ Triangle. ▣ Square. ▢ Rectangle.

° Degrees in angular measurement, also in thermometric measurement.

' Minutes in angular measurement, and in measurement of time, and feet in linear measurement.

'' Seconds in angular measurement, and in measurement of time, and inches in linear measurement.

— Vinculum, placed above figures or factors meaning they are to be taken together. Example: $(4 + 2) + a + b$.

() Bracket, meaning that the figures or factors enclosed are to be taken together. Example: $(4 + 2) + (a + b)$.

[] Bracket enclosing smaller brackets, also meaning that the enclosed quantities are to be taken together. Example: $[a \times (4 + 2) + 3] + [c \times (a + b) - d]$.

{ } Bracket enclosing the preceding terms of a bracket. Example: $\{ [8 \times (4 + 2) + 3] \}$; $\{ e [c \times (a + b) + d] \}$.

√ Root, or radical sign—a modification of the initial letter of the Latin word *radix*.

When used without a small numeral above it, this sign indicates square root.

To denote any other root a small figure indicating the degree of the intended root is placed above the sign.

Examples: $\sqrt{4}$ = the square root of 4; $\sqrt[3]{4}$ = the cube root of 4; $\sqrt[4]{4}$ = the fourth root of 4; and so on.

The root of a quantity is sometimes denoted by a fraction in small characters placed after and near the top of the quantity, the denominator of the fraction indicating the degree of the intended root.

Examples: $4^{1/2}$ = the square root of 4; $4^{1/3}$ = the cube root of 4; $4^{1/4}$ = the fourth root of 4; and so on.

Index.—A small number or letter placed after and near the top of a quantity is termed an index, and indicates the power to which the quantity is to be raised.

Examples: $a^2 = a \times a$, or the square of a ; $a^3 = a \times a \times a$, or the cube of a ; $a^4 = a \times a \times a \times a$, or the fourth power of a , and so on.

When the index is preceded by the *minus* sign, the reciprocal of the corresponding power is indicated.

Examples: $a^{-1} = \frac{1}{a}$; $a^{-2} = \frac{1}{a^2}$; $a^{-3} = \frac{1}{a^3}$.

OBITUARY.

MR. SANG.—Mr. Frederick Sang, the once well-known decorative artist, died at Tynford Abbey on December 27 in his ninety-third year.

MR. W. H. R. CRABTREE, Borough Surveyor of Doncaster, died on the 27th ult. at the age of forty-eight. Mr. Crabtree was born at Manchester in 1857, and was the son of Mr. Wm. Crabtree, who was for many years Borough Surveyor of Southampton.

romenade extension works. In 1879 he carried out extensive works under the late Mr. Mansergh, and seventeen years ago was appointed Borough Surveyor of Doncaster. Many important schemes and works of street improvement have been carried out at Doncaster under his direction, including the electricity works, the tramway scheme, and the erection of Corporation schools. He had just completed plans for carrying out three schemes, comprising the erection of a Municipal Secondary School, the erection of Corporation elementary schools, and a model lodging-house, at a cost of over 50,000. Mr. Yerkes leaves a widow and seven children.—*Yorkshire Post.*

MR. YERKES.—Mr. Charles Tyson Yerkes, who died in New York on December 29 in his sixty-ninth year, held large interests in several railway and tramway schemes in both this country and the United States. His parents were Quakers of Philadelphia, where he was educated in the Quaker and High schools. By his own preference he began life in a very humble capacity, his first regular employment being a clerkship in Messrs. James P. Ferot & Brother's flour and grain warehouse, and then as cashier, at an annual salary of 600, in Philadelphia. In 1868 he became a stock-broker in that city, and later came eastwards to buy a banking business there. His fortunes were for a while adversely involved in the financial panic which followed the great fire at Chicago; and, being heavily indebted to the corporation, he was compelled to suspend payment and to make an arrangement of his property. The result was that he lost the right of the exercise of their legitimate rights as ranking amongst his creditors, and he, obliged to submit, suffered a term of civil imprisonment. Mr. Yerkes, however, speedily recovered from that disaster: in 1873 he speculated heavily in stocks of all kinds upon his discharge from any creditor, and in a short time he had acquired a large fortune. He became owner of the 17th and 19th Street Railway and similar undertakings in Philadelphia. Enlarging the field of his enterprises, he built a loop-line to connect all the elevated and other railways into one system, having an aggregate mileage of 500 miles in Chicago, and he opened a branch line and acquired extensive railway interests in New York. With his co-capitalists he gradually acquired control of several local tramways, changing the motive power from horse to cable. Five years ago he came to London where he realised that a fortune lay in the similar schemes for passenger traffic, and as chief promoter of the "Yerkes-Perks" syndicate, began operations for the construction of tube railways, worked by electricity, traversing London in various directions. For one of these schemes, the Baker-street and Waterloo station line, which is nearly completed, he placed the contracts with British companies and was solicitor for the employment of only British labour. He was chairman of the Underground Electrical Railways Company, who are owners and constructors of the Baker-street and Waterloo, the Charing Cross, Euston, and Hampstead, and other suburban railways, and he carried out the contracts for the Metropolitan, the Metropolitan and District lines. Mr. Yerkes presented the big telescope to the observatory he founded at Lake Geneva, Wisconsin, and evinced his artistic tastes in forming a remarkable collection of pictures in his residence at New York. Mr. Yerkes, who married twice, leaves a son and a widow. He bequeaths his art collections and two houses in Fifth-avenue to the Metropolitan Museum of Art; the bequest, valued at five million dollars, comprises twenty-three rugs, which, it is said, are the finest and most valuable known.

GENERAL BUILDING NEWS.

MISSION CHURCH.—St. GEORGE, BRISTOL.—The new mission church of St. Ambrose, Stratford-road, St. George, was dedicated on the 21st ult. This new church, together with the classrooms, has been erected by the vestry of St. John the Baptist, Bristol, and it consists of the mission church, which will accommodate 300, together with two large classrooms with accommodation for 1,000 persons. The architect for the building is Mr. H. C. M. Hirst, and the contractors Messrs. E. Walters & Sons.

BUILDING IN DUNDEE.—With the cry that is at present very general for the creation of garden cities and the transfer of the people from the crowded central cities to outlying areas, it is curious to note that during the past year the building trade of Dundee has been given over chiefly to the construction of large blocks of tenements such as are already so numerous in the city. On former occasions certain districts of the city were noted for the erection of tenements, but this year all quarters of the city present a large block of dwelling-houses erected. There are at present in course of erection in the city thirty-two tenements, twenty villas and cottages, two shops, and one warehouse.

The Corporation undertook a large number of contracts during the year, the most important of which were in connexion with the scheme for providing work for the unemployed. This scheme embraced new streets or improvements on existing ones, and represented an expenditure of between 6,000, and 7,000. The Craig-street Markets were considerably remodelled, and shops erected on the west side at a cost of about 1,000; while wash-houses have been erected in the West End costing over 6,000. The year, on the whole, has been a very steady one for the workmen, for although there has been no work of any magnitude other than the Courier building, the large number of tenements and villas have kept the various tradesmen well employed. There were no disputes during the year, and wages ruled as formerly.—*Dundee Courier.*

BRADFORD CENTRAL FREE LIBRARY.—On the 18th ult. the Mayor of Bradford reopened the Bradford Central Free Library after extensive alterations and rearrangements which have been carried out during the past eighteen months. The removal of the art gallery to the Cartwright Hall in the spring of last year rendered the large room hitherto used for picture exhibitions in the uppermost story of the Darley-street premises available for an extension of the Free Library, and work towards this end has been proceeding since that time. The whole building has been subjected to an entire reorganisation, an important part of the work being the adoption of artificial ventilation. The old art gallery has been divided into four sections, the part nearest the entrance being reserved as magazine-room. A considerable part of the accommodation is devoted to the reference library, with tables for casual readers, and there are in addition two smaller rooms. The room on the floor above, divided previously between the magazine readers, the reference library, and the ladies' reading room, has now been reserved, and will provide accommodation for the leading library, a very much enlarged reading-room for ladies, and a work-room for the staff. The space vacated by the leading library at the side of the newspaper-room, has made an addition to the accommodation for newspaper readers. The whole building has been redecorated, and alterations of a minor character have been made. The total cost of the whole work, which has been carried out to designs by the City Architect (Mr. F. E. P. Edwards), has been about 3,000.

ISOLATION HOSPITAL, AMPHILL.—His Grace the Duke of Bedford recently opened the new Isolation Hospital which has been built in the parish of Steppingley, for the Amphil Rural and Urban District Councils, at a cost of nearly 10,000, not including the site. The new hospital, which is situated about three-quarters of a mile from Flitwick station, is a hospital for twenty beds, and for the simultaneous isolation of three diseases, which do not include small-pox, provision for that disease having been already made in an iron building about half a mile nearer Millbrook. The buildings consist of five blocks. The administration and isolation blocks enclose a hollow square, outside of which and a little to the north stands the laundry and disinfection block. Most of the front elevations have a southerly aspect. The hospital was built from the design of Mr. H. Percy Adams, and the contractor was Mr. S. Foster, of Kempston, whose foreman on the works was Mr. F. Taylor.

HIGHWAY OFFICES, LEEDS.—The new highway offices of the Leeds Corporation, which have been erected in Kirkstall-road, were opened on the 19th ult. The building has been erected by Messrs. Charles Myers & Sons, contractors, of Woodhouse, the architect being Mr. W. Bruce, of Leeds.

THEATRE, SOUTHSEA.—A new theatre is to be erected at Southsea, at the junction of Albert-road and Exmouth-road. The plans have been prepared by Messrs. Frank Matcham & Co., of London, and the theatre, to be known as the King's, will be built of fireproof materials, and lighted by electricity, and will accommodate about 3,000 persons. The principal elevation is to be towards Albert-road, and there will be a tower at the angle, with entrances to the stalls and dress circle. The doors giving access to the other parts of the house will be situated at the eastern end of the building, and between this and the tower several shops will be erected. On the Exmouth-road side there will be additional entrances and exits.

BUILDING IN HALIFAX.—During the year the Halifax Corporation Improvement Committee have had 276 plans submitted for their consideration, and 236 were approved. The latter number was made up as follows: New streets, 15; alterations to public buildings, 1; mission-rooms and farm buildings, 27; cattle and cart sheds and trade premises, 48; motor houses, 2; and green-houses and minor buildings, 140. The houses certified fit for occupation number 170, and are distributed amongst the wards as follows:—Blingworth, 9; Ovenden, 10; North, 12;

Kingston, 15; Skircoat, 60; Pellon, 23; Copley, 9; Southowram, 4; Wadley, 3; Southowram, 1; and Akroydon, 24. The foregoing statistics have been prepared by Mr. Tylecote, Deputy Borough Engineer.

PUBLIC HALL, EPWORTH, YORKSHIRE.—A new building, to be known as the Imperial Hall, erected by a company at Epworth at a cost of 1,000, was opened on the 20th ult. The hall is in Chapel-street, and comprises a public-room, with accommodation for over 400 people, and two rooms at the back, measuring 12 ft. by 11 ft., and there are two entrances, with ticket office and lobby. There is a billiard room, 30 ft. by 24 ft., with reading-room, 12 ft. by 12 ft., at the rear. The building, the plans for which were prepared by Mr. Henry Kelsey, architect, Epworth, has been erected by Messrs. Kelsey Brothers, Epworth and Goole.

BANK, HULL.—The new premises of the Halifax Commercial Bank are situated in White-Inn-gate, Hull. The lower story, to a considerable height, is built of black Labrador pearl granite, with bands of red Aberdeen. The upper stories are of coarse millstone grit, from the Halifax district. The interior of the bank hall is paneled in oak. The floors are of granite and concrete, finished with mosaic terrazzo and wood blocks. The architects are Messrs. Walsh & Nicholas, of Halifax. Mr. George Houlton, Baker-street, was the contractor; Messrs. J. Houlton & Sons, joiners; Mr. J. G. Mason, mason; Mr. W. G. Padgett, plumber; Mr. T. W. Bailey, painter; and Messrs. Williamson & Co., slaters.

THEATRE, POPLAR.—The new Prince's Theatre in the East India Dock-road was opened on the 23rd ult. The building was designed by Messrs. Owen & Ward, architects, of Birmingham; and it has been erected by Messrs. Kirk & Kirk, of Westminster. There is accommodation for an audience of 2,500. The auditorium is 78 ft. deep from the curtain line to the back of the pit, and it has a clear width of 61 ft. The stage is 60 ft. in width and 41 ft. deep from the curtain line, and the grid is 54 ft. high from stage level. At the rear are arranged the dressing-rooms, seventeen in number, heated, and fitted with lavatories with hot and cold water. The principal elevation has a frontage of 60 ft. to East India Dock-road. It is of red brick with buff terra-cotta facings, supplied by the Hathern Station Terra-cotta Company. The building is equipped with fire hydrants and appliances supplied by Messrs. Motleyweather & Co. The decorations of the auditorium, which are in the French Renaissance style, have been executed by Messrs. F. De Jong & Co.

PRESBYTERIAN HALL, SIX BELLS, ABERDEEN, MON.—The memorial hall of a new hall, which is being erected in connexion with the Presbyterian Forward Movement, were laid recently at Six Bells. The building comprises a chapel and schoolroom, accommodation being provided for 700 people in the former, and 400 in the latter. It is built in the Gothic style, of native dressed stone, faced with native polished stone and in many parts of Dean stone dressings. The schoolroom will be underneath the chapel. There are galleries all around the chapel, with an organ platform arranged in the centre of the gallery at the rear of the rostrum, with a vestry underneath. The seats, rostrum, and inside fittings will be of pitch-pine, with which the ceiling will also be panelled. A heating chamber is provided under the schoolroom, and the entire building will be heated on the hot-water principle. The contractors are Messrs. D. W. Richards, Ltd., Newport, and the work is according to the designs, and is being executed under the supervision of Mr. R. L. Roberts, Aberdeen, the total cost being about 2,300.

BUILDING IN NEWCASTLE-ON-TYNE.—Though the past year has not been marked by the general activity that characterised some recent years, a fair amount of work has been got through. The prospect for the coming twelve months is, however, not so promising. In many parts of the centre of Newcastle business premises have undergone demolition and reconstruction, more in accord with modern ideas of light and space, and this class of work, as one can see on a perambulation of many of the central thoroughfares, is yet far from accomplished. Collingwood-street is rapidly taking rank with the best streets in regard to architectural features, and the transformation of Pilgrim-street proceeds steadily. A large amount of property has been razed to the ground in connexion with the Market-street extension to New Bridge-street, whereby the east end of the Central Station will be brought into more direct communication, and the pressure of traffic of Blackett-street and the east end of Grainger-street considerably relieved. This latter scheme was adversely criticised by Mr. J. T. Cackett in his presidential address to the Northern Architectural Association a few weeks ago, when that gentleman expressed the opinion that one of the most desirable improvements would be to add to the usefulness of Percy-street—and thus relieve Grainger-street—by either improving the approach to it or making a new

street to the north of Clayton-street. A street from the Monument to the Haymarket he also thought desirable, and he trusted the building of a free high level bridge across the Tyne would not be long postponed. The present scheme, which he regretted had been postponed *sine die*, he thought provided an admirable route through route from High-street, Gateshead, to the North-road. The latest improvement undertaken by the Council—he referred to the Market-street extension—would, if properly carried out, prove one of the greatest boons to the city since the days of Grainger; for it duplicated New Bridge-street, and so might relieve it of the great amount of through traffic which so congested it now. But when they looked at the details of the scheme, it seemed to leave much to be desired; and, in his opinion, it was a striking example of shortsightedness. Continuing, Mr. Gackett said that apart from the centre line there was nothing in the scheme worth preserving, and that it had been conceived in the most parochial spirit. His criticism of the Market-street extension had tempted him to consider whether, by dealing with the matter as Grainger and Dobson certainly would have done, there was not room for a magnificent improvement to this part of the town, which would also be financially successful. The great expense of the scheme lay in the purchase of all the property between New Bridge-street and New Market-street and the old property to the south of New Market-street. With, he thought, one or two unimportant exceptions, all the property in this area was old, and there were schemes for rebuilding a very considerable portion of it. Were this property brought up and the area laid out as he had planned, they would have blocks commensurate with modern requirements, and with frontages that would command prices that would go far to pay for the scheme, even if it did not do more. He did not think the most extravagant reconstruction would produce a finer or more appropriate site for municipal buildings.—*Newcastle Journal*.

BUILDING IN SHEFFIELD.—"The year has been a bad one, but the outlook is not altogether gloomy." In this sentence an expert summed up the state of the building trade in Sheffield to our representative. Building is still keeping in front of the demand by tenants. This applies to all classes of houses, and especially to middle-class houses from 200 to 400. Fairly large houses which have previously been rented at more than 40l. are not now fetching so much. This is the more noticeable in the case of houses which are not on or near to the tram routes, while there is still a strong movement by people who have been accustomed to living within walking distance of the centre of the city to go to the more distant suburbs where the trams help them. But suburban houses that are not near the tram routes are a bad speculation. Expert opinions as to the condition of the cottage property market are conflicting. One has it that it has not been so bad in Sheffield for many years; another holds that there are not quite the number of empty houses that there were a year or even two years ago, for the simple reason that many cottage builders have cried halt, and fewer now have been built. In any case, statistics show that there has been an inclination during the year to build half a dozen cottages instead of a dozen. The realisation of that class of property has been bad all through the year. So far as Corporation building is concerned it may be said at once that partial failure has attended the departure of building lock-up shops in the blocks of flats which have been erected in Sing-hill and Skales-moor. The controversy which has been going on for some time as to the expense of erecting dwellings for working classes at such a rate as to enable the Corporation to let them at a rent which could be paid by the average worker, has resulted in the carrying-out of a scheme at Wincobank. Official figures obtained from the City Buildings Inspector (Mr. Green) show that while he and his staff have been fairly busy they have not had so much to do as last year. There has been a marked decrease in the number of plans deposited. Last year there were 1,530, but this year, up to December 20th, there have been only 1,288. Of these 974 have been approved, as compared with 1,093 last year. Sanctioned on those plans were 2,076 houses—451 fewer than twelve months ago. Plans have been approved for 661 buildings of a general description. Here, again, the decrease is considerable, since in 1904 there were erected 777 general buildings, and the same remark applies with even greater force to the number of houses certified. Of these there have been 1,191, whereas in 1904 there were 1,963; while there have been 392 other buildings of a general description written off as satisfactorily completed. Last year there were 371. A large number of dangerous structures have been dealt with, and a good deal of attention has been paid to the means of exit from various public buildings and workshops. There have been comparatively few large and important buildings completed during the year. First and foremost is the University. One of the largest plans submitted during the year was

that for no fewer than 87 houses in Anns, Fryem- ing, and Mill-hill roads, in the Olive-grove district. A glance at the list of principal plans submitted during the year indicated that extensive develop- ments have been made in the church and chapel life of the city, and mission halls and parish rooms have not been at all few and far between.—*Sheffield Independent*.

THE UNITED SERVICES CLUB.—Recently it was decided to modernise and renovate the club entirely. The work carried out is as follows, viz.:—The entire re-decoration of the club from top to bottom; a large addition to the smoking-room on the ground floor, making this noble room still more spacious; the conversion of a large portion of the basement into the "Shone" system; electric passenger lift from basement to first floor; new heating system and additions to the cooking apparatus; additional staircases, and alterations and improvements to the kitchens, parlours, and offices generally. The work has been carried out under the direction of Messrs. Isaacs & Florence, architects. The manage- ment system has been carried out by Messrs. Shone & Ault. The general contractors were Messrs. Aldin Bros. & Davies, of South Kensington (whose contract amounted to nearly 15,000l.), and the personal supervision of the work under the personal supervision of their manager, Mr. Leslie Shingleton, assisted by Mr. Robinson, their general foreman, Mr. Sutton acting as clerk of works. The Otis Elevator Co. supplied the electric passenger lift; Messrs. George Jen- nings the sanitary fittings; and Messrs. J. Slater the heating and cooking apparatus.

THE YORKSHIRE BUILDING TRADE.—There is remarkable unanimity in the tone of the reports from the big centres of Yorkshire as to the state of the building trade during the past year. In nearly every instance the word "depressed" summarises the position. In many cases the towns are over-built, in some slackening of municipal enterprise has had an unfavorable influence, and bad trade generally is the dominant factor. Thousands of joiners, bricklayers, masons, and plumbers are either out of work or working short time. According to the latest official returns, the percentage of trade union members unemployed among carpenters and joiners at the end of November, though smaller than last year's percentage, was 10½. The percentage of unemployed plumbers was higher at the end of last month, being 11½, as compared with 10½ at the same time last year. One effect of the slackness in the building trade has been a corresponding depression in the fire-clay industry. The price of material has varied during the year. Lead has gone up in value lately, but common bricks have been rather cheaper during the last month or two. Certain kinds of timber have fallen in price, but generally speaking this class of material is dearer than it was a few years ago. As to the future, there is generally a more hopeful tone, and it is anticipated that the present year will be more active than the year that has passed. This feeling is entertained in Leeds. Here 1905 has been a very uneventful year. A few large schemes have been conceived of or commenced. But big schemes of any kind are very scarce. The most important is the new sewage scheme which the Corporation have just decided upon. The number of empty houses in the city—reckoned by thousands—does not encourage speculative building. Never in modern times, it is said, have building operations been so scanty in Bradford, but in the Huddersfield district a good number of cottages and middle-class houses have been put up. A few new mills and weaving sheds have also been erected, and extensions of mills have been carried out in Hindesfield and The Colne, and Holme Valleys. It is probable, however, that but for the extensive buildings that are being put up at the West Riding Asylum at Storthes Hall short time would have had to be resorted to. Many men in Hull are out of work, and the amount of unemployed property is a very disquieting feature of the situation. Good progress is being made with the new law courts, and the second part of the new City Hall is pretty well advanced. From Hull to Halifax is not a far cry, and a similar story of slackness is told in the West Riding town. The new Halifax Theatre Royal having been finished, no new large buildings are rising. Not much speculative building of any kind is going on, but there will be more activity in this direction early in the new year. The two large contracts in the York district—the North-Eastern Railway offices and the new Asylum at Naburn—are completed, and with one exception there has been no work of the warehouse type. Extensive private street works have been undertaken, but the building of cottage property and private residences has been reduced to a minimum. In the latter respect Harrogate has a rather different tale to tell, a fairly large amount of medium and cottage property having been built in the popular watering-place. It must be remembered that about a thousand new houses have been built since 1901, about 125 of them during the past year. The new Free Library is practically

completed. There is considerable work in hand in the conversion of private property into shops and business premises. Here, as elsewhere, the year ends with a brightening prospect.—*Yorkshire Post*.

BUILDING IN ABERDEEN.—The past year has not been prosperous for the Aberdeen building trade. The revival that is taking place in the general industry of the country has not yet begun to make itself felt in the trade, and 1905 must be regarded as one of the very leanest years in the experience of Aberdeen builders. So far as prospects for the immediate future are concerned, it cannot be said that the outlook is at all cheerful. It is the misfortune of builders that their trade is ever the first to be hampered by any serious depression in the industry of the country, and is over one of the last to be reached by the returning wave of prosperity. In Aberdeen, building has passed through a variety of experiences during recent years; time was, and that not so long ago, when the city was famous for the amount of speculative building that was carried on within its bounds. The results of this craze were soon seen, when the city built over its own means, and speculators suffered, and, judging from the past year or two, it was seen that the speculative building mania has practically entirely subsided. The number of plans passed by the Town Council during the year is the smallest that has been before them for about fifteen years, so that unless there is a very decided change for the better experienced during this year, it is probable that the builders of Aberdeen will have another twelve months of dull trade to look forward to. The most important mason-work contract that has been completed during the year is the Marischal College extension.—*Aberdeen Free Press*.

EDINBURGH BUILDING TRADE.—The building trade has not by any means been in full swing, and as a consequence a large number of artisans and labourers have been idle, and many of the large building yards in the city have been practically like deserted villages. It was expected with the introduction of machinery into these yards that manual labour would be largely diminished, but even the machines have had their term of inactivity during the year. The most important buildings which have passed through the Dean of Guild Court are as follows:—For the School Board were the new schools at Drummond-street and Gilmore-place, additions to Students' Union, Park-place; new church, McDonald-road, for the Rose-street United Free; extensive additions to and alterations of the old Infirmary buildings for the University; the King's Theatre, Tavist-street; a large new warehouse in Elder-street for Messrs. Ritchie & Co., and additions to Messrs. Nelson & Sons' Printing Works, Parkside. Under-noted is a record of the work of the Dean of Guild Court work for the year and a comparison of the previous year. The total for the year represents a value of 658,013l. Embarked in this amount were 713 warrants for 62 tenements, 51 villas, 269 self-contained houses, 132 public and other buildings, and 492 alterations. In the foregoing tenements were 10 shops, 19 houses of 1 apartment, 118 houses of 2 apartments, 147 houses of 3 apartments, 19 houses of 4 apartments, 30 houses of 5 apartments, and 9 houses of 6 apartments, representing a total number of 513 tenement houses. For the corresponding period last year the total work represented a value of 977,883l., representing 832 warrants for 67 tenements, 71 villas, 312 self-contained houses, 123 public and other buildings, and 583 alterations. In the foregoing tenements were 8 shops, 37 houses of 1 apartment, 266 houses of 2 apartments, 218 houses of 3 apartments, 156 houses of 4 apartments, 23 houses of 5 apartments, and 9 houses of 6 apartments.—*Scotsman*.

STONE AND BUILDING TRADES, SHIPLEY.—During recent years there has been a great deal of building done in Shipley, and each year as it has come round the opinion has been expressed that the place was being over-built. Yet of all the hundreds of new houses erected in that short period few have remained long unoccupied. The past year has been considered a comparatively quiet one in this direction, and yet 100 new houses have been entered upon the rate-books. In the past the great bulk of the new houses erected have been of the terrace class, with rental values ranging from 19l. 10s. upwards. Latterly, however, a strong demand has arisen for semi-detached and detached houses, surrounded by a little private ground, and selling at 400 and more. A considerable number of these have been erected or are in process of being built. Out of the hundred houses forty-four are in the West Ward, and are all of a large size, while thirty-four, of a little less value, have been erected in the South Ward. Twenty cottages have been built in the East Ward. Notwithstanding the fact that there has been about the increase in houses, the stone trade has only been moderately busy, and prices have been low.

THE BUILDING AND STONE TRADES, BRADFORD.—The depression in the Bradford stone and building trades, which in 1904 was said to have reached a point unknown for nearly twenty years, has

been still more serious during the year which has just ended. "There is no doubt," says the representative of a prominent firm, "that 1905 will be regarded as a year of most unparalleled inactivity. The present generation of builders and contractors do not remember ever before to have passed through such a period of severe depression." No large contracts have been let either for public or private buildings, and comparatively few small ones. Of contracts let there may be enumerated the hospital at the Bradford Workhouse, consisting of blocks for maternity and children's coves, the cottage homes at Daisy Hill, the Crematorium at Scholemoor Cemetery, Hanson School extension in Barkerend-road, and the basement for the Town Hall extension. The Bradford Dyers' Association have done a good deal of reconstruction and made additions at many of their works. Other private building enterprises include a wool store in Subbridge-road, box works off Manningham-lane, a warehouse in Canal-road, shop premises in Darley-street, an extension to dye-works in Cemetery-road, and new truck works in Preston-street. Eighty-eight buildings and a number of houses in Bradford, the speculative trade has been very poor, and although many fewer houses have been put up than was the case last year, more appear to have been built in some districts than the demand has warranted. Toller-Lea district is still being developed, and at the top of Underley, the London and Midland road, a good deal of house building has been going on. The hope is entertained that the depression has reached its lowest level, and that an improvement in the staple trade of the city may bring in its wake better times for the building and allied trades. One class of building materials, bricks, is still in short supply, and the number of enquiries of the state of trade that only about half the brick-works in Bradford have been kept running. Quarries in various parts of Bradford are shut down for the reason that the quarry-hills are overstocked. Whilst the local trade in stone has been worse than in former years, prices having had a lowering tendency, the London and Midland trade has also fallen off considerably. Prices have ranged somewhat as follows:—Self-faced flags, 1½ in., 1s. 6d. to 1s. 8d.; 2 in., 2s. to 2s. 2d.; 2½ in., 2s. 6d. to 2s. 9d.; 3 in., 3s. to 3s. 4d. per super yard. Tooled flags, 2½ in., 4s. to 4s. 4d.; 3 in., 4s. 2d. to 4s. 6d. per super yard. Ashlar, 1s. 6d. to 1s. 9d. per foot cube. Outside wallstones, 3s. to 4s. 2s. per rod; inside wallstones, 18s. to 21s. per rod; pitch-faced wallstones, 38s. to 42s. per rod.—*Yorkshire Observer.*

BUILDING IN MANCHESTER.—Several housing schemes have had the attention of the Manchester City Architect's Department during the year. A site for one has been purchased in Hulme, and sketch plans for its utilization are in course of preparation. Tenements have been erected in Rochdale-road, at the corner of Sudell-street and Moore-street. The elevation to Rochdale-road is a good example as a commencement of improved buildings in that thoroughfare. The much-criticised barracks appearance is avoided in the treatment. Accommodation for six-hundred families in tenements of two and three rooms has been provided, and a corner of the site, which could not be thus utilised, has been covered by two shops, with work-rooms over. Land in Barrack-street has been purchased, and application has been made to the Local Government Board to sanction the money for the erection of a building thereon of workmen's dwellings. Several works have been carried out during the year by the Parks and Cemeteries' Committees, the Markets Committee, and the Fire Brigade Committee.

BUILDING IN GLASGOW.—The year just closed has not been a prosperous one for these trades connected with the building industry. For several months they were all affected by a large number of the operatives in two of those trades stopping work with the view of resisting a reduction of wages, and other differences arose between those connected with the Employers' Union and the Union of Engineers, and the result was working by-laws. There has been a considerable falling off in the number of applications to the Dean of Guild Court for new buildings, as well as in the value of all classes of property, in contrast with previous years; indeed, the value is the lowest since 1896. No doubt the reason for this has been the scarcity of the supply, which is sufficient for present requirements. The large amount of building of dwelling-houses which is in progress in the suburban districts of the city has also to be taken into account. These houses in most cases become occupied as soon as they are ready, showing that there is a growing disposition to migrate from the city to the suburban districts. Nor is there any doubt but that suburban houses will continue to be supplied so long as the demand exists. There are other reasons for the decline in building operations in the city. Speculative building, for instance, is for the present practically at a standstill, for in every district of the city empty houses are to be seen, while many of the older properties of the warehouse class have either

been entirely demolished and re-erected into handsome buildings or otherwise altered to suit the more modern requirements. The total valuation of the new property which came before the Dean of Guild Court this year is 1,439,434, as against 2,118,800, for the previous year. During the year there were ninety-two linings granted for houses and shops with a valuation of 582,853, against eighty-three linings in the previous year, the valuation being 621,400. There has been a considerable increase of houses of one and two apartments in the eastern district as compared with last year, viz., 1,403 houses as against 999, being the highest in any district of the city. Queen's Park comes next with 426 houses, and Maryhill district third with 279 houses. No dwelling-houses have been erected in the southern or northern districts. As already mentioned, the greater falling off is in buildings of the warehouse class, for which 125 linings were granted, the valuation being 376,715, as against 131 linings and a valuation of 828,720, in the previous year. There were twenty linings for public buildings with a valuation of 193,514, against eight linings and a valuation of 248,060, for the previous year. For churches, halls, and schools ten linings were granted, compared with eleven linings last year, the valuation being 72,400, while for alterations and additions there were 221 linings against 276, the valuation being 303,351, against 307,070. For the length in yards being 3,298 against 5,891 in the previous year. While there has been a considerable falling off in the erection of all classes of buildings, it is encouraging to note that the ordinary building trades are fairly well employed. The large decrease in operations will, it is stated, principally affect those who have been building for speculative purposes.—*Glasgow Herald.*

BUILDING IN LEEDS.—Between March 25 and November 29 last, 1,172 houses have been erected in Leeds, of which 565 are through, and 522 back-to-back houses. In the same period 973 miscellaneous buildings have been completed. At the present moment 952 houses are in course of erection, of which 629 are through and 352 are back-to-back houses. The number of miscellaneous buildings now being proceeded with is 737.

LEITH BUILDING TRADE.—The building trade in Leith during the past year has been in a depressed condition, and there are no signs of work becoming brisker for some time to come. During the year forty-one warrants were granted by the Dean of Guild Court for new buildings, in addition to fifty-nine warrants of a minor character. The total value of these buildings is estimated at 92,000. This compares unfavourably with the two previous years, the value of the buildings in 1904 having been 180,000, and in 1903 260,000.

SCHOOLS, HAWKLEY.—New Church of England schools have been built at Hawkley at a cost of 1,000. They were erected from the plans of Mr. H. T. Keates, architect, of Petersfield, by Mr. Marshall, builder, of Lass.

PROVIDENT WORKMEN'S INSTITUTE, ROSHERVILLE.—A workmen's institute is to be erected on a site between Bersford-road and Burnaby-road, Rural Vale, Rosherville, from plans prepared by Mr. Clay. The building will contain a reading-room and card-room on either side of the entrance, a central hall, and the usual offices, provision for the caretaker's apartments being made on the upper floor.

THEATRE, WOOLWICH.—On December 21 last Earl Roberts opened the new Royal Artillery Theatre at Woolwich. The building has been erected on a site facing Woolwich Common at a cost of 11,000. Mr. W. G. R. Sprague was the architect of the work.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, ST. FRIDESWIDE'S.—A memorial window has been unveiled in the parish church of St. Frideswide's to the late Rev. A. J. Miller. It was designed and executed by Mr. Herbert Davies, of North Finchley. The subjects are in painted glass, and the three central lights represent the Crucifixion, the light on the north side "The Nativity," and on the south "The Adoration of the Magi."

FOREIGN.

TIMBER RESOURCES OF NEW ZEALAND.—According to a report on the timber industry just issued by the Lands Department of the Colony, the estimated quantity of milling timber on Crown lands in 1904 was 20,000,000,000 superficial feet of all classes of timber, whilst, on a very rough estimate, there were 21,000,000,000 superficial feet on private and native lands. The saw mills of the colony number 414, with an aggregate of 9,497 horse-power; cutting capacity per annum, 704,930,600 superficial feet; output per annum, 413,289,742 superficial feet; number of hands employed, 6,912.

ARGENTINA.—A despatch received at the Foreign Office from H.M. Consul at Buenos

Ayres (Mr. A. C. Ross) states that there is a large amount of building going on in that city on account of private individuals, but it is improbable that any of the projected municipal works which require skilled workmen will be undertaken in the near future. Bricklayers and carpenters, it is reported, do just as they please about working or resting, and contractors are very chary of binding themselves under contract.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. William H. Thorp, architect, has removed his office from 61, Albion-street, to Phoenix-chambers, South-parade, Leeds.

CROWN LANDS.—A departmental measure has been prepared for the ensuing session to authorise the Commissioners of Works to convey bridges under their management to bridge authorities who are willing and able to accept such conveyances, and to transfer the management of Richmond and Kew greens to the Richmond Borough Council. The Bill provides further for the improved management and regulation of the New Forest, and for vesting the veredors with increased powers to prohibit the discharge of sewage, the placing of refuse, rubbish, etc., and the erection of booths and encampments upon the forest lands. Other clauses of the Bill relate to powers for authorising the transfer of any forest-shore under the control of the Commissioners of Woods to the management of the Board of Trade, and *vice versa*, and for authorising the Commissioners of Woods, the Board of Trade, and the Chancellor and Council of the Duchy of Lancaster respectively, to enter into agreements for compensating claims to foreshore.

COPYRIGHT IN WORKS OF ART.—The *Copyright in Works of Art Act, 1905*, passed in the last session of the Cape Parliament. As regards the importation and sale of copyright works of art, it is provided by sect. 6 that "if any person, not being the proprietor for the time being of the copyright in any work of art, shall without the consent of such proprietor make or cause to be made any copy, reproduction, repetition, or colourable imitation of the work in which such copyright exists, for sale, hire, exhibition, or distribution, or shall knowingly sell, let to hire, exhibit or distribute, or cause to be sold, let to hire, exhibited, or distributed any copy, reproduction, repetition, or colourable imitation made without such consent, or shall import, or cause to be imported, any copy," etc., "such person shall be liable to an action for damages for infringement of the copyright, and all such copies shall be forfeited to such proprietor." Works of art, as defined by the Act, include sculpture, paintings, drawings, and photographs.

ST. JOHN'S CHURCH, HULL.—It is proposed to acquire the site of the church of St. John the Evangelist and of Osborne-street mission-rooms for the erection thereon of offices for the tramways of the Corporation, and the disposal of the remainder of the ground for general building purposes. The church was built, in 1790-1, of red brick with stone dressings; the pinnacled tower was erected a few years afterwards, and the chancel was added in 1866. It became a parish church in June, 1868, and contains 1,690 seats.

THE NATIONAL COLLECTIONS OF PICTURES AND PORTRAITS.—Amongst the recent additions to the National Gallery of British Art, Millbank, are "The Shrine of Edward the Confessor," by David Roberts, R.A.; "Cottage at Hambleton," by Myles Birket Foster; and "A Street in Antwerp," by Samuel Prout—bequeathed by Mr. Charles Fraser. The trustees of the National Portrait Gallery have accepted as a gift of the artist Mr. H. R. Hope-Pinker's portrait bust of the Right Hon. William Fawcett, M.P., and have purchased the original portrait, in crayons, of William Cowper drawn by Romney in August, 1792; Gainsborough's portrait of John Joshua Kirby, writer on perspective, and President of the Incorporated Society of Artists (*obit* 1774); portraits by Kneller of Charles Talbot, Duke of Shrewsbury, Secretary of State, etc., and Richard Graham, Viscount Preston, statesman and diplomatist; and Lely's portrait of Admiral Sir John Harman. The portraits will be exhibited in the galleries as soon as the trustees have sufficient funds at their disposal for the purpose. The trustees of the Chantry Bequest have bought C. W. Furse's "The Return from the Ride," F. E. Cowper's "St. Agnes in Prison," H. Speed's "The Alcantara, Toledo," E. Bundy's "The Morning of Sedgemoor," J. Ammer's "The Black Mountains," and E. Alexander's "Peacock and Python."

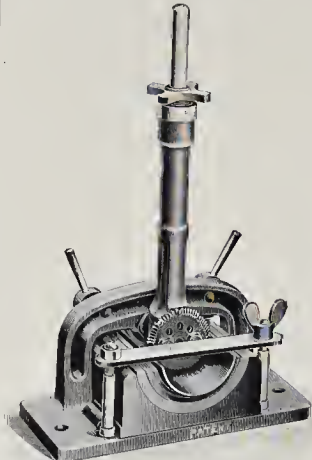
THE BRITISH FIRE PREVENTION COMMITTEE.—During the year 1905 the membership of this Committee has increased by 75, and the number of subscribers (non-members) by 35. The Committee, during the year, moved its testing station to Recent's Park and equipped it with additional testing chambers, etc., the removal and extensions involving a fresh capital expenditure of

over 1,100. The testing operations for the year have increased from 6 to 17. During these 17 testing operations, the following subjects have been under investigation: Four floors, 1 ceiling, 4 partitions, 1 wall, 4 column encasements, 6 window openings, and 4 skylights glazed with special glazing, 2 doors, 1 shutter, 7 concrete aggregates, and 1 fire alarm system. Fifteen "Red Backs" have been issued, also two numbers of the Committee's *New Journal*. A competition for the production of a useful fable for children, setting forth the dangers of playing with fire, has been dealt with. The meetings of the Executive during the year numbered 14; of its General Purposes Sub-Committee 8, and of the General Testing Arrangements Sub-Committee 8. Further, 17 special sub-committees were appointed to deal with individual fire tests.

THE LABOUR MARKET IN THE COLONIES.—The January circulars of the Emigrants' Information Office, 31, Broadway, Westminster, S.W., state that it is too early in the season for the ordinary emigrant to go to *Cuba*, unless he goes to friends, or has sufficient means to keep himself till the spring. In *New South Wales* there is a demand for skilled miners, but there is not much demand for mechanics. In *Victoria* there is no demand for more labour at Melbourne or other towns. There is little demand for more labour in country districts. In *South Australia* the labour market is fully supplied, and speaking generally, no working man is advised to go there unless he is specially skilled in his trade, or has friends to go to, or sufficient money to live on at first. In *Queensland* there is not much demand for emigrants other than skilled farm labourers, unless they have received cheap nominated passages through friends in the State, or have means of their own. In *Western Australia* the returns of the Department of Labour at Perth for the quarter ending September 30, 1905, show that there is no demand for men in the building and other trades, and at Kalgoorlie, Perth, and one or two other places, the supply exceeds the demand. In *Tasmania*, miners and mechanics on the west coast are fairly well employed, but the local supply is as a rule sufficient. In other parts of the State there is no general demand for more mechanics, but there is an opening for them if they have sufficient money to keep themselves at first. In *New Zealand*, single men who can push their way into the country need not be out of employment, work of all sorts offering in the season, such as shearing, bush work, road-making, fencing, general farm work, etc. Competent workers in the building trades, and plumbers, and blacksmiths should be able to secure employment at this season without difficulty. No one may enter *Cape Colony* unless he possesses 20*l.* on arrival, or has secured work beforehand. The labour market in the building, engineering, and other trades, though the demand for men has improved, is still fully supplied, and a great many unqualified mechanics and labourers at Cape Town, Port Elizabeth, East London, King William's Town, Alwal North, Cradock, and other places are unable to find work. Most of the men out-of-work in the different trades are either unemployed, or are second-rate workmen; first-class men on the spot can almost always find places. But there is very little opening for mechanics (especially house carpenters or bricklayers) from this country, unless they go out to situations engaged for them, or have means of their own sufficient to keep them for some months, and in any case there is no opening for indifferent workmen or unskilled labourers. In *Natal* at present labour is plentiful, and some carpenters and bricklayers, and especially unskilled workers and indifferent mechanics, are unable to obtain employment. Plasterers' wages have been reduced 1*s.*, and now stand at 15*s.* a day. No one, therefore, should go to *Natal* at the present time unless he has means of his own, or is nominated by friends in the Colony. *Transvaal*.—No one may enter the *Transvaal* without a permit; no permit is granted to any one who does not possess 20*l.* on arrival, or has secured bona-fide employment beforehand. Affairs in Johannesburg and the *Transvaal* generally show no signs of improvement; almost every trade complains of stagnation, and a considerable number of persons are receiving relief. The cost of living, especially for a married man, is very high. Trade in *Pretoria* is reported to be very dull, and labour to be plentiful. *Orange River Colony*.—No one may enter the Colony without a permit and no immigrant can obtain such permit unless he possesses 20*l.*, or has obtained bona-fide employment in the Colony. There is no opening for more labour at the present time.

THE "CRANVILLE" PATENT GUTTER-CUTTER.—Contractors who have to fix gutter cutters, and iron merchants who deal in guttering, should appreciate the simple machine illustrated on this page. The appliance was originally devised for his own use by a practical plumber, with the object of reducing the cost of cutting by the ordinary method, and the frequent waste of material occasioned by breakages when half-round gutters had to be cut to length. It is equally valuable in iron warehouses, as by its aid old and broken pieces of gutter can be cut

square for sale instead of being consigned to the scrap heap. Upon the bedplate of the machine a hollow saddle block is fitted of suitable size for receiving the largest size of gutter ordinarily made, and the saddle is supplied with loose half-round backing pieces, so that the smaller sizes can be held in position. The cutter, which is



circular in shape, is reversible to four different cutting positions, and consequently is equivalent to four separate cutters. A spring is provided in the sleeve carrying the cutting tool for the purpose of allowing the latter to ride over the hard pieces which frequently occur in castings. To operate the machine the gutter is laid in the half-round saddle, or in the parking pieces inserted therein, and fixed in position by means of two cams on one side, and by a bar with wing nut on the other side. The cutter is then fed into its work by the star wheel on the handle until sufficient cut is put on, and then the gutter is cut through by working the handle backwards and forwards, the tool operating on each movement. The weight of the machine is less than 50 lb., and by its aid any gutter castings can be cut off square and clean without the least risk of breakage.

HONOURS FOR A STEVEDOR.—On the occasion of his retirement, after thirty years' service, Mr. Frederick Strimmons, deputy-surveyor of Windsor park and forest, was decorated, on December 29, with the Fourth Class of the Royal Victorian Order and at the same time received a cheque for 500*l.*, with an illuminated address and other gifts from residents and servants on the King's estate.

IRON AND STEEL.—Messrs. Matheson & Grant's thirty-first annual Engineering Trades' Report states that pig-iron has gradually advanced in value during the past year, and is now high enough to upset the price-lists of many manufacturing engineers. The enormous stocks held by warehouses always render forward-purchases speculative, but trade prospects seem to justify the present current rates. Steel plates and beams rise and fall in value mainly in accord with the demands for ship-building, and the present activity at the rolling-mills is assumed for some time to continue. Recent amalgamations among steel-makers tend to economy in manufacture, and it is now claimed that nowhere in Europe or America can rolled steel be produced so cheaply as in the North of England, and that Spanish or other foreign ores are only contributing to the main sources of material, namely, Middlesbrough ore and Durham coke. The demand for steel had increased sufficiently to justify the present improved prices when assisted by tacit agreement among makers. The trade in structural steelwork has only slightly improved during the year, for although there is a steady advance in the prices of material, the aggregate tonnage of iron and steel work ordered has been below the manufacturing capacity available. The very great depression in the building trades throughout the country has necessarily limited the use of iron and steel work, and the export demand for steel bridges has not been brisk enough to make up for this slackness at home. The recent failure of a large life of a portion of the iron roof over Charing Cross station need cause no alarm in regard to roofs in which proper and available precautions are taken. A faulty weld, aggravated by rust, was the apparent and probable cause. Welds can and should be avoided in such structures; and so should even smith's work where steel is the material. Easy and convenient access should be provided to all parts for examination,

and no part exposed to the air should be beyond the reach of the painter's brush. Unfortunately, however, there are too many structures in which the designers seem to consider only the primary purpose of a roof covering strong enough to withstand stresses from wind and snow, and in which no allowance is made in the factor of safety for the contingency of waste by rust. All these things are even more necessary to modern steel structures, than when the bars or plates were rolled from puddled iron, of which the Charing Cross roof was constructed forty years ago.

THE PLUMBERS' COMPANY.—At the quarterly meeting, held at the Guildhall last week, the following operative plumbers were admitted to the Freedom of the Plumbers' Company on having passed the Examination of the Company in the technology of plumbing and workmanship in the Honours Grade. Their ages range from twenty-two to thirty-two:—F. G. England, R.P., of Sunderland (trained at the Cheltenham Technical School); F. J. Fearn, of Manchester (winner of two scholarships under the Lancashire Education Committee, tenable at the Company's special course of advanced instruction for plumbers at King's College, London); Alexander Forbes, R.P., of Aberdeen (was a student at Robert Gordon's College, Aberdeen, where he is now teacher of the plumbing classes); William Morris, R.P., of Southport (winner of two scholarships under the Lancashire Education Committee tenable at the Company's special course of advanced instruction for plumbers, held at King's College, London, winner of second prize in the prize competition for workmanship held under the auspices of the Lancashire Education Committee and the Company in 1904); Hargreaves Riley, R.P., of Artington (winner of several scholarships under the Lancashire Education Committee tenable at the Company's special course of advanced instruction for plumbers at King's College, London); J. Palmer, R.P., of Blackpool (winner of several scholarships under the Lancashire Education Committee tenable at the Company's special course of advanced instruction at King's College, London); and E. J. H. Upham, of Cardiff (trained at the Cardiff Technical School, winner of several local scholarships). The Master of the Company, Mr. W. D. Coles, in congratulating the new Freemen on the result of their work, urged them to remember they were obtaining no security by their admission to membership of the Company, as they were binding themselves by its old oath of allegiance to maintain its best traditions of good craftsmanship and loyal citizenship wherever their work might be done.

Legal.

DANGEROUS BUILDINGS.

At Marylebone Police Court recently, before Mr. Plowden, two summonses, issued at the instance of the London County Council, against the owners of business premises at 168 and 170, Edgware-road, W., for failing to comply with an order of the Council to take down the back walls where loose, cracked, or otherwise defective, the structures being in a dangerous state. Mr. Coles, who is prosecuted for the Council, explained that the proceedings had been instituted at a day's notice as it was a matter of great urgency. Already about a ton and a half of bricks, etc., had fallen while workmen were engaged on the premises; and it was feared that unless something was done to the walls serious and perhaps fatal consequences would ensue. Mr. Arthur Ashbridge, the District Surveyor for Marylebone, said the danger arose through the taking away of the lower portion of the walls for the purpose of putting in a girder over the shop-fronts. Originally both the front and the back walls were in a very dangerous condition, and he had no doubt that if he had not interfered the front walls, at any rate, would have been the cause of a serious accident. That wall, however, had now been secured; but the back was still in a perilous state, and unless it was more securely shored or pulled down an accident might happen at any moment. Mr. Plowden: What is the danger you apprehend? Mr. Ashbridge: The wall may give way, and if it does the fifty men employed there are bound to meet with serious accident. Mr. Plowden: You do not think they are aware of the danger they are running?—a miniature Charing Cross. Mr. Ashbridge said he had both matters in hand, and he was far more anxious about this than about Charing Cross. The defendant, (Mr. Edward Burns) denied that the walls were dangerous, and was supported in his denial by his builder and his architect, Mr. J. W. Stevens, who complained that the District Surveyor had practically taken the matter out of his hands for three weeks. The builder expressed the opinion that the buildings were 140 years old. Mr. Plowden said that, if this had been an ordinary case in which the experts on either side differed, he should probably have dismissed it. But in view of the serious statement of Mr. Ashbridge, the District Surveyor, that the walls were in imminent danger

of falling and injuring a number of workmen employed there, he felt he ought not to be a party to such a possibility; and he preferred, therefore, to be in the wrong with Mr. Ashbridge, if he were wrong, than in the right with the defendant. He therefore made an order for the walls to be immediately secured to the satisfaction of the District Surveyor.—Times.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

27,815 of 1904.—W. F. PROBERT: Boiler for Heating Water for Domestic and other Purposes. This relates to boilers for heating water for domestic purposes, and consists of an outside shell of the boiler made of sheet metal, corrugated or fluted as may be desired, either longitudinally or vertically in relation to its axis. Inside the boiler is fitted a fire-box, which fire-box is made conical with the larger end towards the bottom of the shell of the boiler and may form part of the shell of the boiler, or it may be fixed into the boiler by riveting, bolting, or by any suitable means, and may be of any required outline, that is to say, it may be fluted or corrugated either vertically or horizontally or in any angular direction.

556 of 1905.—F. C. PULSFORD: Steam Heating Apparatus.

This relates to a steam heating apparatus comprising in combination a radiator, a hand-operated steam admission valve therefor, a cut-off valve the diameter of which exceeds that of the admission valve by an amount proportional to the difference in the lifts of the two valves, a rod or tube located within the radiator and fixed at one end thereto so that when heated by steam it expands in the direction of its other end to operate the cut-off valve, and a spring located between the latter and said rod or tube to prevent the valve being forced with undue pressure on to its seat, due to negligence or failure of the reducing valve in the steam supply pipe.

6,167 of 1905.—W. F. STANLEY and W. F. STANLEY & CO., LD.: Perspective Drawing Tables.

This relates to a perspective drawing table, and consists of a suitable standard for supporting the table top, preferably terminating with three feet, which is provided with a screwed pillar working inside the outer pillar connected to the latter and said rod or tube to prevent the valve being forced with undue pressure on to its seat, due to negligence or failure of the reducing valve in the steam supply pipe.

6,633 of 1905.—J. SHANKS: Valve Closets.

This relates to a valve closet, constructed with the usual valve or valves for direct downward discharge, and with a swinging vertical lever for operating said valve or valves, having its lower horizontal arm engage with the valve levers connected by a detachable cover, allowing freedom of movement of the handle and accessibility to the working parts thereby enclosed and protected.

12,693 of 1905.—R. FLEMING: Lifts for Use as Fire-escapes and the like.

This relates to a fire-escape or lift of the kind in which the elevator platform is raised by means of an extensible standard on the lazy-tongs principle and a fluid actuated telescopic standard, rods located within the extensible standard and forming a pivoted connexion between the lengths of the telescopic standard and the connecting cross rods of the extensible standard.

13,651 of 1905.—J. S. YOUNG: Tools for Cutting Stone.

This relates to a stone saw and consists of a series of thin flat blades vertically arranged at intervals between two bars which form the back or body of the saw, bolts or screws clamping the bars together, means for simultaneously operating the bolts or screws, and means for securing the bars in the reciprocating frame of the machine.

18,160 of 1905.—A. BELL: Ranges or the like Fireplaces.

This relates to ranges or like fireplaces, and consists in the flue being formed and made in one with the casting of the cover plate at the back of the range—that is to say, the said plate is set back or channelled from its front face in the shape of the required flue, which at its lower part or junction with the oven is made about as wide as the oven itself, but tapers in width to a narrow exit at the top of the said plate, and at the same time deepens on it reaches the top so as to give time dependent on the same superficial area at the top as at the bottom. The cover plate is then provided, which by means of screws or other convenient fastenings, may be readily secured upon the front of the said flue. The top doors and dampers may be provided as required.

18,247 of 1905.—H. A. GEORGE: Safety Catches for Window Sashes.

This relates to a safety catch for window sashes and consists of a loose tumbler or bolt pivotedly mounted on a round stud and projecting from the vertical plate of an angular open case, the horizontal plate of which is furnished with holes for the attachment of the whole to the upper surface of the frame of the lower sash, the head or tongue of said tumbler being heavy, the head normally in an inclined position against the vertical side of the frame of the upper sash, and tending to fall on a raised support fixed to the bottom of the case by the potential energy of gravity in such manner that the upper part of the said tongue shall project beyond the vertical plane of the rear surface of the frame of the upper sash.

20,061 of 1905.—T. MATTERSLEY: Kitchen Fire Ranges.

This relates to a kitchen fire range and consists of means for fixing a horizontally extending adjustable shelf by constructing the said shelf with rearwardly extending arms having upstanding hooks or equivalents at their ends, the arms being adapted to pass in between the sides of the bar frame, and to take under lateral projections on the inner surfaces of the said sides, while the hook parts pass behind said projections, the parts of the shelf extending beyond each outer side of said arms entering slots formed in flanges projecting forwardly from the bar frame, whereby such shelf is not dislodged by being drawn forwardly while it is supported horizontally by a long supporting base at each side.

20,651 of 1905.—J. WAHRE: Flushing Cisterns.

This relates to a cistern having a main flush and an after flush, and consists in the main flush being operated by the raising of a conical valve off the discharge outlet whilst the after flush works siphonically.

1,188 of 1905.—J. SMITH: Siphon Flushing Arrangement for Cisterns.

This relates to a siphon flushing arrangement for cisterns having siphon bend which can be tilted, said bend being pivoted near the bottom of its one leg to a bolt secured to the bottom of the cistern and at the bottom of its other leg is provided a rubber sleeve which is fixed to the grooved part of the leg by an interlocking bead and groove, and is also curved or curved inwards on its under side and provided with a stiffening ring so as to close tightly into the mouth of the outflow pipe which is flared for its reception.

7,183 of 1905.—T. W. DEBNEY: Joints for Uniting Soil Pipes to Closet Basins or Traps.

This relates to a joint for uniting soil pipes to closet basins or traps, and consists in the formation in the end of the mouth of the closet basin or trap of a number of holes or recesses of suitable shape, and in fixing therein by means of jointing material corresponding shaped tapped metal plugs.

7,394 of 1905.—W. SMITH, R. S. SMITH, C. S. WALKER, E. E. SMITH, and D. R. MAYHEW: Fireproof Ceilings and Floors.

This relates to a fireproof structure for ceilings and floors, and consists of a metal skeleton framework made up of girders having circular apertures in the webs thereof, and joists of tubular form rigidly fastened at both ends in the apertures in the webs of the girders.

MEETINGS.

FRIDAY, JANUARY 5.

London Institution.—Professor Vivian B. Lewis, on "Our Atmosphere and its Wonders," illustrated by experiments. 4 p.m.

MONDAY, JANUARY 8.

Royal Institute of British Architects.—General business meeting. (1) The chairman to move "That the Council be instructed to enter into negotiations concerning a site for new Institute premises, and to report to a general meeting." (2) Election of candidates for membership. 8 p.m.

Liverpool Architectural Society (Incorporated).—Mr. Percy Scott Worthington, M.A., on "The Houses of the Monks in the Middle Ages," illustrated by lantern slides. 6 p.m.

The Incorporated Clerks of Works Association.—Paper by Mr. J. Palm (President) on "Coal and its Formation." 7.30 p.m.

TUESDAY, JANUARY 9.

Institution of Civil Engineers.—Papers to be submitted for discussion.—(1) "The Elimination of Storm-Water Sewerage Systems," by Mr. D. E. Lloyd-Davies. (2) "On the Elimination of Suspended Solids and Colloidal Matters from Sewage," by Lieut.-Colonel A. S. Jones, D.C., and Mr. W. O. Travis, M.D. 8 p.m.

WEDNESDAY, JANUARY 10.

Edinburgh Architectural Association (Associates' Meeting).—Mr. Ramsay Traquair on "Tombs," illustrated by lantern slides. 8 p.m.

The Association of Engineers-in-Charge (S.I. Brite's Institute).—Mr. Frank Croxer on "Storage Batteries and their Application to Public Institutions." 8 p.m.

THURSDAY, JANUARY 11.

Institution of Electrical Engineers.—Conclusion of discussion on Mr. W. H. Fratch's paper on "The Charging Cross Company's City of London Works." 8 p.m.

FRIDAY, JANUARY 12.

Institution of Civil Engineers (Students' Meeting).—Professor J. D. Cornack, B.Sc., on "The Theory of Machines." 8 p.m.

PRICES CURRENT OF MATERIALS.

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

Table listing prices of various materials such as Bricks, Hard Stocks, Rough Stocks, Facing Stocks, Shippers, Pictons, Red Wire Cuts, Best Fareham Red, Best Red Pressed, Best Blue Pressed, Staffordshire, Do. Bulhouse, Best Stourbridge Fire Bricks, GLAZED BRICKS, Best White and Ivory Glazed Stretchers, Headers, Quoins, Bulhouse, and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered Squints, Best Dipped Salt Glazed Stretchers and Headers, Quoins, Bulhouse, and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered Squints, Second Quality White and Dipped Salt Glazed, Thames and Pit Sand, Thames Ballast, Best Portland Cement, Best Ground Blue Lias Lime.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime (Harl Bed) 11s. 0d. per yard, delivered. Stourbridge Fireclay in sacks 37s. 0d. per ton at rly. dep.

Table listing prices of stone: BATH STONE—delivered on road wag. s. d., 1 6 1/2 per ft. cube. Do. do. delivered on road waggons, 1 8 1/2. Nine Elms Depot, 1 8 1/2. PORTLAND STONE (30 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depot, Nine Elms Depot, or Fulham Wharf, 2 1. White Bashed, delivered on road waggons, Paddington Depot, Nine Elms Depot, or Fulham Wharf, 2 2 1/2.

Table listing prices of stone: Aeneaster in blocks, 1 10 per ft. cube, del. rly. depot. Beer, 1 6. Greenhill, 1 10. Darley Dale in blocks, 2 4. Red Corsehill, 2 2. Clonsburn Red Freestone, 2 0. Red Mansfield, 2 4.

YORK STONE—Robin Hood Quality. Scappled random blocks, 2 10. 6 in. sawn two sides landings to sizes under 40 ft. super., 2 3 per ft. super. 6 in. rubbed two sides ditto, ditto, 2 6. 3 in. sawn two sides slabs (random sizes), 0 11 1/2. 2 in. to 2 1/2 in. sawn one side slabs (random sizes), 0 7 1/2. 1 1/2 in. to 2 in. ditto, ditto, 0 6.

HARD YORE—Scappled random blocks, 3 0 per ft. cube, 1 in. sawn two sides landings to sizes under 40 ft. super., 2 3 per ft. super. 6 in. rubbed two sides ditto, ditto, 3 0. 3 in. sawn two sides slabs (random sizes), 1 2. 2 in. self-faced random flags, 0 5.

HOPTON WOOD (Harl Bed) in blocks 2 0 per ft. cube, del. rly. depot. 6 in. sawn both sides landings 2 7 per ft. super. M.D. rly. depot. 3 in. sawn both sides random slabs, 1 0. 2 in. do., 0 5 1/2.

Table listing prices of slates: In. lb., £ s. d. 20x10 best blue Bangor 13 2 6 per 100 of 1200 at r. d. 20x12, 13 17 6. 20x10 first quality, 13 0 0. 20x12, 13 15 0. 16x8, 7 5 0.

PRICES CURRENT.—Continued on page 30.

List of Contracts, etc.

CONTRACTS.

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

Table with columns: Nature of Work or Materials, By whom Advertised, Form of Tender, etc., supplied by, and Tender to be delivered. Contains numerous entries for construction projects across various locations like London, Manchester, and Birmingham.

AUCTION SALES.

Table with columns: Nature and Place of Sale, By whom Offered, and Date of Sale. Lists auction sales for items like Great Hall, Winchester House, and Freehold Property in Lewisham.

* Those with an asterisk are advertised in this number: Competitions, —; Contracts, IV. VI. VII. X.; Public Appointments, XIX.; Auction Sales, I.

PRICES CURRENT.—Continued from page 29.

Table listing prices for slates, including columns for size (e.g., 16x8), material (e.g., best blue Port), and price per 1000.

TILES.

Table listing prices for various types of tiles, including columns for tile type (e.g., Best plain red roofing tiles) and price per 1000.

Table listing prices for ornamental tiles, including columns for tile type (e.g., Do. Ornamental do.) and price per 1000.

WOOD.

Table listing various wood products like Deals, Battens, Fir timber, etc., with prices per standard.

JOISTS, GIRDERS, &c.

Table listing joists and girders with prices per standard.

METALS.

Table listing various metal products like Iron, Sheet Iron, etc., with prices per standard.

METALS (continued).

Table listing metals like Iron, Sheet Iron, Galvanised flat, etc., with prices per ton.

ENGLISH SHEET GLASS IN CRATES.

Table listing sheet glass in crates with prices per ft. delivered.

OILS, &c.

Table listing oils like Raw Linseed Oil, Turpentine, etc., with prices per gallon.

VARNISHES, &c.

Table listing varnishes like Fine Pale Oak Varnish, etc., with prices per gallon.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications...

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is sent direct from the offices to residents in any part of the United Kingdom at the rate of 12s. per annum (52 numbers) PREPAID. To all parts of Europe, Australia, New Zealand, India, China, Japan, etc., 26s. per annum.

TENDERS.

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

Table of tenders for various projects like ACTON, ROVEY TRACEY, BRIDLINGTON, BURGH-NEXT-AVISHAM, etc., listing contractors and amounts.

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LICHFIELD.—For erecting six villas at Cherry Orchard, for Messrs. Taylor, Mr. G. W. Barrett, architect and surveyor, Chesterfield-road, Lichfield.—
Smith £2,400 0 Twist £1,955 10
W. Walsance 2,279 0 J. Maddocks 2,095 0
Lowe 2,095 0 Barton 2,020 0
Deakin 2,019 0 J. Walmesley 1,940 0
(Messrs. Taylor provide all gables, baths, tanks, and water-closets.)

LONDON.—For repairs and decorations at "The Mitford Tavern," Hackney, N.E. Mr. H. Riches, architect, 3, Crooked-lane, King William-street, London, E.C.—
W. Irwin £704 T. S. Elkington & Sons £381
J. T. Robey 502 A. W. Derby* 368
T. Osborn & Sons 410

LONDON.—For decorations to shop premises, Chisworth-road, Homerton, N.E. Mr. H. Riches, architect, 3, Crooked-lane, King William-street, London, E.C.—
A. W. Derby £146 0 T. S. Elkington & Sons £128 0
F. Parsons & Sons 128 10 T. Osborn & Sons* 108* 0

LONDON.—For repairs and decorations at "The Galloway Arms," Linthouse, E. H. Riches, architect, 3, Crooked-lane, King William-street, London, E.C.—
J. F. Robey £490 T. S. Elkington & Sons £355
G. Barker 349 Sons* 278
C. W. Stagg 278

LONDON.—For fitting up of two shops, Putney, S.W. Mr. H. Riches, architect, 3, Crooked-lane, King William-street, London, E.C.—
Courtney & Fairbairn* £247 10 0

MACCLESFIELD.—For additions to Nurses' Home at the Fever Isolation Hospital, Moss-lane, for the Health Committee, Macclesfield Corporation. Mr. C. W. Stubbs, Borough Surveyor.—
G. Simpson & Son, Windmill-street, Macclesfield £112

MILLPORT.—For widening and extension of pier, for the Town Council. Mr. J. Cowan, E.C., 179, West George-street, Glasgow.—
G. Haldimay, Ltd., Rothessy* £5,435 4

NORTHFIELD.—For the erection of a public library at Northfield, for the Kings Norton and Northfield Urban District Council. Messrs. Bateman & Bateman & A. Hale, architects, 51A, Edmund-street, Birmingham. Quantities by Mr. C. Sills, 33, Newhall-street, Birmingham.—
R. M. Hughes £1,390 T. A. Cole & Son £1,170
G. Hulse & Sons 1,326 C. Griffiths 1,128
G. Foster, jun. 1,311 D. E. Jackson 1,104
T. Johnson 1,294 W. Jackson 1,091
T. Lamb & Sons 1,291 C. Pegram 1,088
J. Dallow & Sons 1,245 H. J. Pille 1,079
Giles & Sons 1,239 G. E. Tragg, Selly Oak* 1,035
Gowing & Ingram 1,185*

READING.—For Reading sorting-office enlargement—
W. Jones £2,595 Credit
F. J. Stanbury 2,391 24
W. Hawkins 2,479 129
A. Faulks 2,381 85
W. T. Toogood & Co. 2,250 89
R. Curtis 2,165 18
H. W. Godwin 2,137 73
W. H. Hyde 1,886 —
Batten Bros. 2,030 50
G. H. Tucker 2,183 242
G. Pilgrim 1,979 85
O. E. Hughes 1,910 75
A. J. Colborne 1,891 68
Martin Wells & Co. 1,867 167
McC. E. Fitt* 1,774 124

SHEFFIELD.—For alterations to Sheffield County Court.—
Dawson, Jones, & Co. £2,770 0 210 0
Dennis, Gill, & Son 2,635 0 10 0
H. Boot & Son 2,430 0 20 0
J. Eschely & Son 2,405 0 10 0
G. Lonsdale & Sons, Ltd. 2,430 0 30 0
E. & W. Osley 2,350 0 —
J. Fidler, Ltd. 2,353 10 29 0
J. & H. Whelan 2,197 0 —
Ash, Son, & Biggin, Ltd., Furnival-st., Sheffield 2,200 0 13 6

SHEFFIELD.—For alterations to the "Barrel Inn," Broad-lane, Sheffield, for Messrs. T. Rawson & Co., Ltd. Messrs. Hall & Featon, architects, 14, St. James's-row, Sheffield. Quantities by architects.—
Marrin £769 0 F. Drake £875 0
Hughes 2,769 0 G. H. May & Sons 673 12 0
H. Boot & Son 734 0 0 W. W. Meers 662 10 0
W. Freeman 725 0 0 E. & W. Osley 659 0 0
W. C. Mander 659 0 0 M. Hancock 647 10 0
H. White 687 7 7 T. Margeson —
G. Allen 680 0 0 Church-street, Deco on shield* 645 12 6

SHEFFIELD.—For alterations to premises at corner of London-road and Cemetery-road, Sheffield, for the Directors of the Birmingham District and Counties Banking Co., Ltd. Messrs. Hall & Featon, architects, 14, St. James's-row, Sheffield. Quantities by architects.—
J. Estley & J. Fidler, Ltd. £658 0 0
Son £765 0 0 T. Margeson 644 0 0
O. Allen 735 0 0 B. Powell & Son 642 0 0
G. Malpass 682 0 0 E. & W. Osley 639 0 0
W. W. Meers 673 10 0 H. Boot & Sons —
J. Martin & Son 659 0 0 Moore-street, D. O'Neil & Son 661 0 0 Sheffield, E.C. £20 0 0
* Accepted subject to various deductions.

SUNBURY-ON-TRAMS.—For 2,250 yds. of 12-in. cast-iron sewage main, 2,294 yds. of 4-in. cast-iron air main, and 30 yds. of 18-in. cast-iron air main, for the Urban District Council. Mr. H. F. Coates, Surveyor, Council Offices, Sunbury. Quantities by Surveyor.—
Smith & Co., 27, Tottenham-road, Westminster* £2,025 0 0
* Lowest.

TRETFORD.—For enlargement of Tretford School, for the Local Education Committee. Mr. A. F. Stott, architect, Castle Meadow, Norwich.—
E. J. Smith £2,270 0 0 T. H. Byth £2,000 4 6
Holden 2,155 14 7 Scales & Co. 1,998 0 0
Atherton 2,138 10 0 Robins 1,968 0 0
Scates, Bros. 2,128 0 0 Downing Bros 1,959 0 0
Boughton & Son 2,123 3 7 A. D. Boddy & Son 1,932 0 0
J. S. Smith 2,118 0 0 Son 1,873 0 0
J. Youngs 2,075 0 0 Buller, R. S. Hanks —
Son 2,075 0 0 Chatters* 1,820 0 0
Wilmut & Son 2,037 0 0

VICTORIA LACE FACTORY, DRAYCOTT.—In our issue for December 23 we printed a list of tenders for this work, but the lowest bid, one tender was omitted, i.e., F. W. Youngman, Station-road, Draycott, £4,140. The mistake was not ours; we printed the list as it was sent to us.

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See Advt. p. xxviii.

Asphalte.—The Sossel and Metallic Lava Asphalte Company (Mr. H. Glouin), Office, 47, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouses floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

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The Builder.

VOL. XC.—No. 3254.

JANUARY 13, 1906.

ILLUSTRATIONS.

Proposed Church House, Manchester.....	Messrs. Smith & Matley, Architects.
Nos. 45 and 47, Wigmore-street.....	Mr. Frank M. Elgood, A.R.I.B.A., Architect.
The Mansion House, Doncaster.....	Measured and Drawn by Mr. E. Helsworth Walker.
1. Elevation and Sections.	
2. Details.	

Illustrations in Text.

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English Gothic Architecture.—II.



CONTINUING from last issue our review of Mr. Bond's important work on this subject, we may just note that his Part II., entitled "An Analysis of the Mediaeval Church Architecture of England," commences with a chapter on early Christian basilicas and their influence on English mediæval plan, with some very useful sheets of comparative plans to one scale, and the subject of planning generally is considered in the succeeding five chapters, ending (Chapter XIII.) with an analysis of the various forms of plan adopted in parish churches, of which, as the author says, the most common is the three-aisled nave with a long chancel and a western tower. It is the simplest and most symmetrical form of plan—a little too symmetrical and straightforward perhaps, at any rate it is obviously felt to be so now, as in most modern churches of the aisled nave and long chancel type the architect prefers to place his tower at the side or at the angle of the plan. Mr. Bond suggests that but for the collapse of church architecture at the Reformation, the further step would probably have been taken of removing the aisles, reducing the church to the type of the University chapel. This would have been no doubt a practical step towards bringing the church into the condition of an auditorium; but

then it was only the influence of the Reformation which led to this new ideal of a church service (if indeed the Reformation went so far as that), and our impression is that the three-aisled nave would certainly have continued had there been no Reformation. Both architectural effect and historic association were on its side.

But we must quit these larger questions, as our intention was in this article to go a little into a consideration of the details of English Gothic, to which a very large proportion of Mr. Bond's book is devoted. And whatever differences of opinion there may be as to the respective merits of French and English Gothic considered in its broader aspects, there can hardly, we think, be any question that in detail English Gothic is in the main superior to any other. The exception would perhaps be in regard to decorative figure sculpture, of which there is a much larger amount remaining in France; and indeed so much of our English Mediaeval sculpture was probably destroyed at the Reformation that the comparison can hardly be fairly made. Even in this class of work, however, we have occasional examples in England, such as the angels inside the Chapter House door at Westminster, which are equal to anything to be found elsewhere (the Resurrection Series at Wells we do not count, because we are convinced that it was the work of foreign artists). But apart from figure sculpture, English Gothic can hold its own against any other phase of the style. In the important chapter of mouldings this is emphatically the case. As before

mentioned, Mr. Bond gives a liberal illustration of sections of mouldings; twenty-eight sheets, grouped under the headings of piers, arches, strings, bases, etc.; each sheet showing all its examples drawn to the same scale. There is a variety, a beauty, and a force of effect in English Gothic mouldings which cannot be found among those of French Gothic. Not only is their surface effect so good, but even their sections show a beauty and refinement of line which seems to have been studied for its own sake in the drawing; and, allowing for the difference of possible refinement between mouldings in marble and stone, those of English Gothic come nearest to the refinement of section of Greek mouldings, and when considered in respect of fitness for climate and the material in which they were executed, may be put on a level with Greek work, as exhibiting an equal perfection for their purpose.

In the matter of compound piers, as the author points out, we must acknowledge a foreign origin. As he puts it, when the Normans began to build their great churches in England, the compound pier had already a long pedigree. In regard to this question of the compound pier we do not quite agree with the author as to the slight importance he attaches to the system of bringing the vaulting-shaft down to the floor. He seems rather inclined to think that the architects were in the right who cut off the shaft on a corbel above the springing of the nave arcade, his reasons being that the shaft disturbs the continuity of the pier capitals;

that it does not really support the vault (which would apply equally, however, to the shaft stopped on a corbel), and that it practically narrows the space on the floor. "So much was this felt at Lincoln, that when the present stalls were placed in St. Hugh's choir, his vaulting-shafts were chopped off from the piers." All these are points for consideration, no doubt; but after all that can be said, the fact remains that there is an architectural completeness of design in bringing the vaulting-shaft down to the floor, which to our thinking compensates for any practical or logical objection that can be urged against it. And in regard to the fact of its cutting through the ground-arcade capitals, is that not rather an advantage in composition than otherwise? The main tendency in Gothic is to verticality of line, and the breaking through of the vaulting-shaft just prevents the capitals from presenting too marked a horizontal division when seen in perspective succession. We quite agree with the author, however, in preferring the corbelled vaulting-shaft to the system more often found in France, and occasionally in our Norman churches, of starting the vaulting-shaft from off the edge of the capital of the main arcade, with a little base to itself standing on the edge of the capital. It is a system at variance with the true spirit of Gothic architecture, and always has rather a makeshift appearance.

The adherence of the French to the square abacus capital, long after it had been abandoned (save in some exceptional instances) in England, and the prevalence in France down to a comparatively late date of the square abacus form and of a design of capital directly and obviously derived from the Roman Corinthian capital, is one of the most important notes of distinction between French and English detail. We all recognise the great beauty of many of these French capitals of quasi-Classical form; but there is more of originality in the carved Early English and early Decorated capital with its conventional rounded-lobed foliage growing out of the bell of the capital, than which no finer form of carved architectural ornament has ever been evolved; and it is far more exactly suited to stone treatment than the French form, and more in accordance with the general feeling of Gothic architecture. In regard to the important distinction between this and the naturalistic foliage of a later period in England Mr. Bond is perfectly sound. The naturalistic capitals of Southwell Chapter-House, beautiful in a sense and evidently done with enthusiasm by the carver, have the fault of having entirely lost or masked the idea of architectural support below the abacus; they are as if tied round the bell as applied decoration, instead of forming an efflorescence from it; and moreover, they invite a direct comparison with nature which must be to the disadvantage of the work. As the author truly remarks, "in all this work, workmanship had gone ahead of design. Design indeed there was none. What credit there was belonged to the mason; and to nature, who fashioned the leaf, the fruit, and the bloom."

The chapter on the development of

window tracery from what has been called "plate" tracery follows in the main the usual lines on which we have been in the habit of regarding the development of this characteristic of Gothic work, but the author suggests that the origin of plate tracery may be earlier than has been usually assumed; that even in the Anglo-Saxon towers of Northumberland it was not uncommon to pierce the spandrel of the baluster windows with a quatrefoil or some such aperture; he cites Billingham as an example, but gives no illustration; the earliest example figured is that of St. Maurice at York, with its two round-headed lights under one label, and a small circular opening in the spandrel. Two of the bays of Peterborough triforium, side by side, form a curious instance of that experimental character which is found in other details also at Peterborough; one spandrel pierced with a small round opening, the other with four smaller ones arranged as if on the arms of a cross. A suggestion as to the final abandonment of groups of lancets, so graceful in themselves, is that the desire for harmony in bay design may have been one prompting cause: "with one bay and two windows, as in Salisbury aisles, or three as in Salisbury clearstory, there was a lack of harmony. What was wanted was one bay, one window." There may be something in this, which as far as we remember is a new suggestion:

"Here and there, too, the builders may have been feeling their way to the realisation of the ideal of the Gothic building, as one whose vault could be made to stand without the support of walls; an ideal realised early in such chapter-houses as those of Westminster and Salisbury. In such a building it was unnecessary to confine the glass within the jamb of narrow lancet windows; the whole space from buttress to buttress could, if desired, be glazed. But if glazed, the glass must have mullions and bars of stone to support it; in other words there must be tracery. From one cause or other the tracery window was inevitable."

In the case of geometrical tracery Mr. Bond makes a division of it into two types—those with centre-pieces and those without. The former, we may observe, are both the more numerous and the best in effect; geometrical tracery naturally lending itself to the centre-piece treatment. We are not sure that we agree with the author as to the superiority of curvilinear tracery, though we agree that this and its cousin the French Flamboyant have come in for a good deal of uncalled-for reprobation. The advantage in point of design in geometric tracery is that tracery-bars and spaces alike form symmetrical design; in curvilinear tracery the true design is only in the bars, the spaces are what their design will leave. It is true that geometrical tracery gives many meeting-points awkward to deal with; but this is counterbalanced by the fact that curvilinear tracery cannot in most cases be made to fit naturally into the space enclosed by the window arch, but the design seems to be cut off by it, while geometrical tracery can readily be designed so as to fill symmetrically the space of the arch. On the whole it may be said that geometrical tracery is the more architectonic form: We do not observe that the author anywhere notices what is one of the great architectural advantages of tracery, viz.:

that it carries the masonry design over the windows, instead of leaving them, as seen externally, mere openings. We are glad to find that he has a good word to say for the Perpendicular window which unquestionably is the finest of all for the exhibition of stained glass, but which also has, in its masonic design as seen externally, a quality of architectural repose combined with richness which is worth a great deal. There may be less poetry about it than we find in the earlier tracered windows, but it has an architectural fitness that cannot be denied.

Doors, to which of course a chapter is devoted, have always been a weak point of English churches and cathedrals, not because they are not beautifully and richly treated, but because they are on so small a scale; except at Peterborough, with its great portico unique in England, there is no attempt to give appearance of scale and pomp to the entrance, as in the French cathedrals, by providing a great arched framework with sculpture in the tympanum, and limiting the actual door-head to the level of the springing. In England, as Mr. Bond's illustrative examples show, the arch is generally the actual doorway, and is but of small dimensions. This may be said to give scale to the building, but in the bolder French method the size of the actual door gives the scale of the human figure, and the deep and richly sculptured and recessed arch over it gives a dignity which English church and cathedral doorways for the most part sadly want.

On the question of towers, Mr. Bond refers on an earlier page, in his chapter on "Transepts," to the question whether the central tower preceded the transept, i.e., was the transept only a structural necessity for abutment to the tower? It is often regarded in this sense, and we are inclined to think rightly. Mr. Bond is against it, and asserts that transepts existed long before there were central towers; but the transepts of the double-aisled basilicas of Rome in the 14th century, to which he refers, can hardly be called transepts in the mediæval sense. The author makes a further suggestion on this point; viz.: that where the four roofs met, nearly always not all of the same height, there was a difficulty in arranging their junction, and that a simple way would be to carry the four walls up, above each of the crossing arches, sufficiently high to abut the roof against them; that this was the origin of central towers, and hence the low elevation of the earliest towers. There may be something in that, but the low elevation might be sufficiently explained by the unwillingness to load the crossing piers and arches more than could be helped. Our feeling is that the mediæval transepts and central tower developed *pari passu*, and were as much the result of a desire for an effective architectural centre as anything else. In the chapter on "Towers" there are some interesting remarks on the possible original intention of the tower where the transepts formed a *crux commissa*; i.e., were close up to the apse, in very early churches. The author thinks there is no doubt about it; Gregory of Tours speaks of the

central tower as *domus aræ*, the lantern over the altar, and that the lantern in the upper part of the tower was to pour down a flood of light on the altar. Mr. Bond mentions an existing interior, St. Eusebe, Auxerre, where a similar arrangement has, he says, come about "fortuitously," and where "the contrast between the brilliant late Gothic choir with clearstory soaring out of sight and the low and dark nave is strikingly effective"; but from the reference to "the choir" this can hardly be an example of the *cruc. convissa*, which presupposes only an apse east of the crossing. On the whole, we prefer the architectural to the ritual origin of the centre tower; and as to the roofing difficulty, if the transept roof were the same height as the nave (as it generally would be), there would be no particular difficulty in stopping the lower choir roof against the east side of it. The interposition of the tower is certainly a practical convenience in this respect, but we hardly think that so important and costly a feature as even a low tower would be introduced merely for that reason. Mr. Bond admits indeed, ultimately, that the central tower was "of supreme artistic value," but that a heavy price had to be paid for it:—

"In most cases, however, the central tower was erected; by the cautious only so high as to provide a ring of windows, as at Beverley, Münster, Westminster, Winchester, and Bristol; by the bolder so as to be of imposing height and bulk, as at St. Albans, St. David's, New Shoreham, and Tewkesbury; by the venturesome crowned with a wooden spire, as originally at Ripon, Hereford, and Lincoln; by the rash surmounted by a spire of stone, as at Norwich, Chichester, and Salisbury."

A list is given of some that have collapsed, as indeed Salisbury unquestionably ought to have done; and the putting of that lofty spire above those small piers was one of the rashest and most risky things ever done. But the subject ought not to have been mentioned without a mention of the manner in which all such danger was avoided at Tewkesbury, by the monumental seating of the tower on masses of solid wall extending east and west between the crossing and the nave and choir arcades; a remarkable piece of business-like construction; no driving in of the arcades there, at all events. The critical remarks on the subject of towers are very good; on the necessity for depth of window opening, and how much the character of the tower depends on the treatment of the angles. "If it is to overawe, the tower may rise in sheer verticality from pavement to cornice, like the campanile in the piazza [or that was in the piazza] of St. Mark's But the cornices are the weak points of towers. We [in England] did not like to lose the help of buttresses." It depends on the character that is wanted. Mr. Bond distinguishes between four types of towers: (1) without ornament; (2) with equally diffused ornament; (3) ornament concentrated in the ground story and belfry story; and (4) ornament concentrated at the summit. Of these we may remark that 2 and 4 are the best types. The Victoria Tower is a splendid example of the second; among church towers Mr. Bond selects Wrexham, of which a separate plate is given, nor could there be a finer example of its class. But to our thinking nothing, on a large

scale especially, equals in effect the 4th type, plain substructure with ornament concentrated at the top. Perhaps the generally rich treatment, with a line slightly set back as it ascends, best suits the repose proper to a church or cathedral. But it is in the 4th type that the full grandeur of a tower erection is realised.

While thinking of this question of the transeptal plan and the central tower, it may be suggested whether there is not something new to be done, architecturally, with this type of church, in a plan and design framed on the general lines of a mediæval building, but with a new treatment in detail. A transept church has been so almost universally treated in modern times as a mediæval church, that it hardly seems to have occurred to any one that the same general architectural scheme might be susceptible of a perfectly new and different treatment in detail. The experiment would be worth trying.

THE APPLICATION AND INCIDENCE OF THE LONDON BUILDING ACTS (AMENDMENT) ACT, 1905.

BY BERNARD DICKSEE, F.R.I.B.A.

THE articles published in this journal upon the subject of this Act have dealt with its various requirements; it is now proposed to consider the application and incidence of those requirements.

For our present purpose the requirements may be classed under two heads:—A, cases in which power is given to the Council to require "such means of escape in case of fire as can reasonably be required under the circumstances of the case"; B, cases where definite provisions have been set out in the Act.

Class A will include sect. 7: Provisions for new buildings being either "high buildings" or "twenty persons buildings"; sect. 9: Provisions for existing buildings being either "high buildings" or "twenty persons buildings"; and sect. 11: Provisions for living rooms over premises used for storage of inflammable liquid.

Class B will include sect. 10: Rules for projecting shops, and sect. 12: Rules for access to roofs.

The administration of this Act differs in many respects from that of the London Building Act, 1894, on the one hand, and the Factory and Workshop Act, 1901, on the other; it also differs in the case of the various provisions of the Act itself; it will therefore be convenient to consider the administration of each provision under the classification indicated above.

Class A, sect. 7: Before commencing any "new building," being either a "high building" or a "twenty persons building," the "owner" is required to deposit with the Council such particulars as will have to be subsequently included in the building notice to the District Surveyor, together with a copy of the "plans" of the building, showing, so far as may be necessary for the purposes of the Act, the means of escape proposed to be provided. The Council may within one month (extended to two months in

the summer vacation) approve, refuse to approve, or approve subject to conditions, stating fully all their reasons for any refusal or conditions; but if they fail, within the time, to notify their refusal or their conditions, such failure is to be deemed an approval. If dissatisfied with the requirements of the Council, the "owner" may within two months appeal to the Tribunal of Appeal (sect. 22). It is noteworthy that no such appeal is provided under the Factory Act in the case of new buildings, nor was any appeal provided for against requirements of the Council under sect. 63 of the London Building Act, 1894, in respect of buildings exceeding 60 ft. in height.

No building within the provisions of this sect. 7 may be occupied until a certificate of the Council has been granted that the building has been provided with the means of escape required, but such certificate must be issued within fourteen days of notice to the Council of the completion of the building, and an appeal lies to the Tribunal against the refusal to grant such certificate. Any alteration of, or addition to, a certified building (including a change of user or circumstances) that would materially increase the "risk of fire" can only be made with the assent of the Council or, on appeal, of the Tribunal.

Sect. 9: The procedure in the case of "existing buildings" is somewhat different; the Council are by sect. 17 first to request in writing the District Surveyor to ascertain and notify to them such buildings within his district, or any part thereof, as in his opinion comes within the provisions of this section dealing with "existing buildings" being either "high buildings" or "twenty persons buildings." From and after January 1, 1907, the Council may, if in their opinion the building be not sufficiently provided with means of escape in case of fire, serve on the "owner" a notice requiring him to provide such means of escape as can reasonably be required under the circumstances of the case. The "owners" may, however, within twenty-one days submit alternative proposals for the sanction of the Council; and the whole matter is subject to an appeal to the Tribunal; but when a final decision has been arrived at, the "owner" must execute the necessary works, and, should he fail to do so, he will be liable to penalties, and a Petty Sessions Court may make an order prohibiting the occupation of the building or part of a building affected.

Sect. 11 prohibits the use as a living room, workshop or workroom of any room over or directly connected with any part of a building in which certain inflammable liquids are kept for sale or trade, in such quantities or in such manner as to be liable to cause fire or explosion, without the provision of safeguards and means of escape to the satisfaction of the Council; subject by sect. 22 to an appeal to the Tribunal. In this case there is no provision for a preliminary survey by the District Surveyor, or for the service of any notice as to the requirements of the Council, though, of course, no conviction could be obtained against any person until some notification of the requirements of the Council had been given to him. It is also noteworthy that in this section the

obligation is not placed upon the "owner," but the person who uses or permits to be used the room contrary to the section is liable to penalties.

In all cases under Class A the Council are required by sect. 16 (2) to furnish particulars of their requirements to the District Surveyor, whose duty it is to supervise the work and to ascertain that the means of escape are properly provided, and to report to the Council any failure to provide the same.

It is evident that in all cases under Class A it is intended that the Council shall make their requirements and serve notice of them upon the "owner" or other person upon whom the obligation falls, and that the District Surveyor shall supervise the execution of all consequent works; but it is not so clear who it is intended shall take proceedings for the recovery of penalties for any neglect to comply with the requirements of the Council when made. The duty of taking such proceedings is not imposed upon any authority in particular, and may therefore be exercised by either, though in all probability it will be exercised by the Council.

Class B: The rules for projecting shops and for access to roofs, being similarly administered, may be considered together, but the application of those rules compulsorily to an existing building necessarily differs from their application in the case of a new building or work voluntarily undertaken by the owner.

When the Act left the House of Commons it contained a definite provision for the service of a notice to be enforced in like manner as a notice of irregularity under the Act of 1894; but in the House of Lords that provision was struck out, leaving the procedure much less clear.

In an existing building, therefore, as there is no provision for the service of a notice requiring the compulsory alteration of the building to make it comply with the provisions of sects. 10 and 12, proceedings will be by a summons against the "owner" under sect. 24 (1), for the recovery of continuing penalties; such proceedings may be taken at any time subsequently to January 1, 1906, the commencement of the Act, and without any previous notice to the "owner"; the mere existence of the building in its original condition is an offence under the Act. The law is undoubtedly harsh in this respect, but in practice, no doubt, the District Surveyor will, as a matter of courtesy, notify the owner before any proceedings are taken. The duty of taking these proceedings has not been specifically imposed by the Act upon the Council or upon the District Surveyor, such proceedings may therefore be taken by either authority, or indeed by anyone; but as the approval of the District Surveyor is a factor to be dealt with, it is difficult to see how any proceedings can be taken without him. The District Surveyor is required by sect. 16 (3) to report to the Council any building that he finds not to be in conformity with either of the sections, but beyond provision for the payment by the Council to the District Surveyor of a fee for the work of ascertaining what buildings

come within the sections, the Act gives no directions. The most convenient course will probably be a joint action by the Council and the District Surveyor, the former taking proceedings and the latter making the necessary surveys and giving evidence in like manner to the Dangerous Structure procedure, which has been found to work well. The Council have power to dispense with all or any of the provisions of the sections, and an appeal from their decision lies to the Tribunal.

When, however, the work has been commenced (either as the result of any proceedings against the "owner" or on the initiative of the "owner" in erecting a new building or altering an existing building) the execution of such work is, by sect. 16 (1), subject to the supervision of the District Surveyor in like manner as any work done to, in, or upon the building under the provisions of the Act of 1894. If, therefore, during execution of the work any irregularity, whether of omission or commission, be committed, procedure will be by service by the District Surveyor on the builder of notice of irregularity as under the Act of 1894; followed, when the notice has not been complied with, by a summons for a magistrate's order requiring the builder to comply with the notice. Should the builder fail to comply with the magistrate's order he will be liable to the penalties provided in the Act of 1894 for such neglect; but such penalties are distinct from those imposed by the new Act upon the "owner" for failure to comply with the provisions of the sections.

It is worthy of note that every offence against the Act is a continuous offence, and that the liability to the penalties continues for every day on which the offence continues; consequently proceedings may be taken at any time within six months of any day on which the building continues to be not in accordance with the Act (*M. B. W. v. Anthony*, 49 J.P. 229).

The responsibility of complying with the requirements of the Act falls in the first instance upon the "owner" as defined in sect. 6, being the person entitled to receive the "rack rent"—i.e., a rent being not less than two-thirds of the full annual value, based on the assumption that the tenant pays rates and taxes, and that the landlord bears the cost of repairs and insurance; the annual value will, therefore, be the gross assessment value, whereas under the Factory Act the annual value is equivalent to the rateable value.

Having complied with the Act and paid the expenses of executing the necessary work, such "owner" may, by sect. 20, apply to the County Court, and the Court may issue a summons "requiring the several persons entitled to any estate or interest in the building" to appear and may make an order apportioning the expenses among the various parties interested, as may be just and equitable in the circumstances of the case. This provision is the same as that contained in the Factory Act with the addition that regard is to be had to the terms of any lease or contract affecting the building. This difference is more apparent than real, as in the case of *Mosk v. Arnold* (1902) 1 K.B. 761,

decided under the Factory Act, it was held that the County Court is bound to take into consideration the contract between the parties, but, unless there is something in the terms of the lease to make it unjust and inequitable that he should apportion the amount between the parties, he has jurisdiction to do so; it would therefore appear that the additional words in the Act we are considering merely give effect to that judgment.

There is, on the other hand, a provision (sect. 21) that where the occupier claims to have sustained any damage directly and solely caused by any works under the Act, such claim is to be referred to arbitration; so that we may have two sets of claims arising out of the same work, the claim of the "owner" against the occupier for contribution, referred to the County Court, and the claim of the occupier against the "owner" for damage referred to arbitration. This double reference does not seem likely to work satisfactorily in practice; it certainly would have facilitated the working of the Act had the same tribunal been appointed in respect of both claims.

The actual cost of the work of altering existing buildings is by no means the full extent of the burden upon those affected; the inconvenience and disorganisation of trade will be of much moment; and, in the case of projecting shops, the loss of light will not be the least important factor; but careful forethought will doubtless mitigate the hardship. Means have in some cases already been devised of constructing a self-supporting flat of concrete and steel over the existing flat, so obviating the nuisance caused by drippings from wet concrete, and allowing the trade to proceed undisturbed during the work. The difficulty of light may in some cases be met by constructing the fire-resisting roof or flat at two levels, a flat 6 ft. wide at a higher level, close up to the main front wall, affording the opportunity of a vertical light between the front edge of that flat and the rear edge of that on the lower level.

PAYMENT OF DISTRICT SURVEYORS.

THE letter which we print in another column, addressed by the President of the District Surveyors' Association to the Chairman and members of the London County Council, raises important questions with regard to the recommendations of the Building Act Committee, whose Report on the question of payment of District Surveyors by salaries was published in our issue of December 16 last. Unlike other municipalities, London has hitherto been fortunate in securing for the work of supervision of buildings under the Building Acts the services of independent men who for the most part have received a liberal professional education; the majority of the District Surveyors have been practising architects (only restricted from working for private clients within the areas of their respective districts), and not a few have been men of high position in the profession, such as—to mention only those deceased—Edward

PAnson, Thomas L. Donaldson, John Whichcord, George Godwin, Robert Kerr, Banister Fletcher, T. Roger Smith, and Charles Fowler.

It may be said that the public who build do not want Past Presidents of the Institute and Royal Gold Medalists for this work of supervision; but the fact nevertheless remains that the building public have obtained, at an expenditure of about 50,000*l.* per annum, the services of fifty-seven highly-trained professional men, and the same public, under the new scheme now suggested, will continue to pay 50,000*l.* per annum—but into the coffers of the London County Council. The difficulty that the members of the Council, whatever their qualifications may be, are, neither by training nor experience, qualified to earn professional fees is to be met by sub-letting the job, and the work which at present is divided among fifty-seven Surveyors is now to be done by thirty-three officers, who are to receive by way of salary not 50,000*l.* per annum, but 28,000*l.* per annum. The difference in the gross total is to be expended in establishment charges, wages to an army of assistants, and, if it should fall out that the forecasts of the Building Act Committee prove correct, "there would be a balance in the favour of the Council" of about 2,000*l.* per annum.

That is all very well, but the balance in favour of both the building public and the rate-paying public is farther to seek. The following questions would seem to require an answer:—Will the public be willing to pay to the Council the same professional fees they have hitherto paid for this service? Will the Council, paying the men who do the work little more than one-half of the fees those men earn, be able to ensure that efficient and high-class service which the public has a right to expect? What guarantee have the ratepayers that this work, which it has hitherto taken fifty-seven men to do, can be continued without a break-down by thirty-three men? The London County Council are accustomed neither to overwork nor to under-pay their staff, therefore, if it be found necessary to increase the number thirty-three by the appointment of five or six additional men, how far will the "estimated profit" of 2,000*l.* a year go to prevent this service, like some other services of the London County Council, becoming a charge upon the rates? Is there not rather a strong probability that the ratepayer will find himself called upon to share with the building-owner a burden which hitherto the building-owner alone has had to bear? Unless a satisfactory reply to these questions is forthcoming, we think that, with a County Council Election impending next year, the present Councillors will be wise to leave well alone.

BUILDING IN LEEDS.—A return of the building operations in Leeds for the nine months ending December 30, which was presented at a meeting of the Building Plans Committee of the Corporation on the 29th ult., shows that, in spite of the outcry that Leeds is overbuilt, the builder, speculative and otherwise, has been fairly active. During the period there were completed 20 villas, 70 semi-detached residences, 626 through houses, 600 back-to-back houses, and 4,285 miscellaneous buildings; while there are in hand at the close of the year 17 villas, 49 semi-detached residences, 537 through houses, 322 back-to-back houses, and 1,575 miscellaneous buildings.—*Leeds Mercury.*

NOTES.

Building By-laws in Rural Districts. THE recent discussion of the subject of Building By-laws in Rural Districts and the supposed difficulties which they put in the way of cottage building (difficulties which, as before said, we believe to be much exaggerated) has had the effect of inducing the Local Government Board to address a circular to the Rural District Councils on the subject. The gist of this circular is that the series of Urban Model By-laws were not necessary nor intended for a district or part of a district of quite rural character; and the Board think it probable that amongst the rural districts in which the Urban Model By-laws are in force there are many parishes or other districts which cannot be said to have "urban" characteristics, "and in which the by-laws in some respects impose undue restrictions on building and are more onerous than the circumstances require." The following quotation indicates the action which the Board wish the Rural District Councils to take in respect of this subject:—

"The Board would be glad if the Rural District Council would carefully review the circumstances of their district for the purpose of seeing whether any modification of the present by-laws is desirable, and whether any part of the district might more suitably be placed under a series based on the Rural Model, or, if this is not thought suitable, by such a series supplemented by a limited selection of clauses from the Urban Model. In some cases relaxation has already been given by a clause exempting detached dwelling-houses from certain of the restrictions as to the construction of walls. Even where it is considered that the full code of by-laws should be retained, the existing by-laws, unless made very recently, might with advantage be reviewed in connexion with the latest form of the Urban Model. This contains many additions and modifications based on the experience of the working of the old model, and at the same time is framed so as to give more elasticity in the administration of the by-laws.

The Board wish to be informed of the result of the consideration of this letter by the Rural District Council."

It seems to have been inevitable that the Local Government Board should have taken some action in consequence of the public outcry that has been raised, and perhaps the tentative course indicated in the above paragraph is the best they could have taken under the circumstances. They have, however, set the Rural District Councils a sufficiently difficult task in asking them to endeavour to define the limits at which "urban" character merges into "rural" character; limits not only difficult of determination at the moment, but liable, in some parts of the country at all events, to frequent alteration. However, the suggestion is a very well-intentioned one, and perhaps some practical enlightenment on the subject may result from it; but we should think that, in order to give any practical reply, the Rural Councils would be under the necessity of formulating some definite standard of circumstances which may be held to distinguish a "rural" district from an "urban" one.

The Charing Cross Inquest.

By the evidence given by Sir Benjamin Baker and Sir John Wolfe Barry, at the adjourned coroner's inquest, held on Monday last, it is made quite clear that the cause of the recent disaster at Charing Cross was simply the failure

of the main tie-rod in the first roof truss from the southern end of the station. The facts recorded in our recent article as to the condition of this rod are amply confirmed by the statements of these experts. It is now evident that the bar had an original defect at the centre of a weld, although, so far as could be judged after the accident, the metal had originally been continuous at the outer surface. The examination made by Sir John Wolfe Barry showed that the flaw in the tie-rod extended over two-thirds the area of the rod, and was in itself an ample reason for the failure. In his opinion nothing but a laboratory experiment could have revealed the presence of the flaw, and it is very satisfactory to find in this evidence proof of the fact that the railway company's inspectors are not to be blamed for not having discovered the flaw in the course of their periodical examinations. All the expert witnesses examined were positive on the point that the mishap was in no way due to deterioration of the ironwork generally, and the estimate made by Sir Benjamin Baker was that, in its forty years of existence, the roof had lost only about 6 per cent. of its original strength. This computation may be open to question, but it is no doubt the case that the strength of the ironwork had not been seriously diminished by corrosion. The evidence of Mr. Percy Tempest and his assistant shows that a good deal of attention has been devoted to the cleaning, painting, and repairing of the Charing Cross roof during the last few years, and we are glad to find that in returning the verdict of accidental death the coroner's jury attached no blame of any kind to the officials of the railway company. The most important lesson to be drawn directly from the accident is that a roof like this ought not to depend for safety upon a single tie-rod. Sir Benjamin Baker said that in modern practice there would be two tie-rods "so that if there were an invisible flaw they would have another to fall back upon." This confirms the opinion expressed in our note of December 9 last, but we must point out that as long ago as 1851 Mr. Berkeley designed the Fenchurch-street station roof with duplicate ties, a good example that was not followed by Sir John Hawkshaw, and has not been adopted by many of his successors. No doubt really practical and careful engineers actually employ two tie-rods in roof trusses, but we are sorry to say that the practice is by no means so general as it ought to be, even in the present day.

Demolition of Charing Cross Roof.

At the present time and during the next week or two our readers will be able to witness at Charing Cross one of the most interesting and extensive processes of demolition that has been conducted in the Metropolis. The contractors are now busily engaged in disconnecting and lowering the roof principals and other parts of the station roof by the aid of timber staging built up from rail level to the first remaining truss at the south end, and a massive travelling gantry, to be equipped with four powerful cranes, is almost completed for dealing with the other principals in succession. An

inclined roadway leading down to the embankment affords convenient means for carting away the old iron work and other materials without causing inconvenience at the north end of the station, or interference with traffic in the Strand. As the public are admitted freely to the space in front of the station platforms, anyone desiring to observe the progress of the work can do so quite conveniently. It is not often that a great engineering operation of the kind is conducted in our midst, and the present opportunity is one that ought not to be lost.

ALMOST every aspect of this important subject has been thoroughly threshed out in various treatises, papers, and articles in the technical press, and it is extremely difficult for anyone to write upon it without going over ground that has been repeatedly trodden by others. However, in a paper read by Mr. J. F. Reade at the last meeting of the Civil and Mechanical Engineers' Society, a useful summary of the present position is given. After dealing with the various difficulties that first arose in determining the best means for adoption, and discussing the results ascertained by chemists and bacteriologists as to various systems of purification, the author referred to the controversy that has arisen between advocates of the septic tank and the contact bed systems, and pointed out that neither system alone was able to accomplish all that was originally claimed for it. For instance, the septic tank does not completely liquify the solid constituents of sewage, and sludge disposal has still to be effected. Contact beds, again, are apt to choke and to become useless until they have been renovated. It is a fact that no simple process has yet been discovered which will give an effluent perfectly satisfactory from a bacteriological standpoint, and suitable for discharge at all times into unpolluted streams. Passing on, the author gave an analysis of the various Reports issued by the Royal Commission on Sewage Disposal, which is quite deserving of perusal. At the present time the attitude of public bodies is not particularly marked by any evidence of the desire to make changes in existing methods of treatment, and we agree with the author in the opinion that, until the establishment of the central authority and subsidiary river boards advocated by the Commission in their Report of 1903, it is improbable that local authorities will undertake any schemes involving considerable expenditure except such as are shown to be absolutely necessary.

THE Committee on Science and the Arts of the Franklin Institute, having undertaken to inquire into the merits of the Shuman concrete pile, report that after due consideration they recommend the award of the John Scott legacy premium and medal to the inventor. The invention to which we refer comprises two parts—(1) a tool for the formation of holes in the ground to contain concrete; and (2) several devices for filling the bole with concrete and for holding the material in compact position in loose or permeable soil. The tool consists

of a hollow shank having a steel point of larger diameter, and shaped somewhat like a shell used in gunnery. The point is riveted to the shank, and is made so as to favour the admission of air below it when being withdrawn. Under this patent the process of forming piles is conducted by driving a preparatory tool or mould into the ground, and then by filling the opening with concrete, which, when hardened, forms the pile. Owing to the use of an enlarged point the tool is very readily withdrawn, and, in some cases, it is said to be advantageous to substitute a solid concrete head for the steel point, and to leave this head at the bottom of the hole. A large number of piles formed in the way described have been used in the United States, and some 2,000 of them were driven not long ago at the Washington Barracks, and tested to the satisfaction of the United States engineers in charge of the works.

A SCHEME brought forward for the erection of a transporter bridge as part of the project for connecting Middlesbrough and West Hartlepool by means of a light railway does not appear to meet with the approval of the Tees Conservancy Commission. The grounds for the opposition in question are certainly not unreasonable, for, while the clear headway proposed by the promoters of the bridge undertaking is only 120 ft., vessels are built on the Tees with masts rising to the height of 170 ft. above water level. If that were the only difficulty we presume the promoters would agree to increase the height of the bridge rather than face opposition. Another point urged is that the inconvenience to vessels caused by the passage of the car, and the risks to shipping during stormy and foggy weather and on dark nights, would seriously affect navigation and trade. As the undertaking of the Commissioners represents a capital of more than a million pounds, it is quite right that their views should receive consideration, but we fear that they overrate the obstacles likely to be offered by the use of a transporter car. Experience of transporter bridges at other seaports certainly does not lead to the conclusion that any serious injury would be caused to shipping on the Tees, providing the height of the connecting girder were adequate.

It is now several years since Sir Alexander Kennedy reported to the London County Council on the various systems of electric traction and recommended the "open conduit" system. At the time, if we remember aright, the only practical "surface contact" systems were the Westinghouse and the "Claret-Vuilleumier," and in our opinion neither of these was as good as the system adopted by the London County Council. At the present time, however, when it is proposed to spend large sums of money in electrifying the Northern system of tramways, it is highly desirable that the merits and demerits of "surface contact" systems should be again considered. For this reason we welcome the clearly written and well-illustrated paper on this

subject by Mr. Noble Twelvetrees which appeared recently in the *Engineering Review*, and is now issued as a pamphlet. We agree with him in thinking that an objection to the Lorain system is that a stud may be left alive after the car has passed over it; and although it does not often occur, yet the mere possibility of it will make careful people in Wolverhampton avoid stepping on a stud when crossing the road. Mr. Twelvetrees gives deserved praise to the Kingsland contact systems, the earliest forms of which we described in these columns a good many years ago. We understand that the new electric tramways in Lincoln will be run on the Kingsland system, and the working will be studied with interest by all interested in the future of electric traction. The rapid development of new methods of electric traction naturally makes municipal authorities and financiers chary about expending large sums in installing the track. The "antiquating factor" of this part of the undertaking is undoubtedly serious, and it is therefore desirable that the relative advantages of open conduit and surface contact systems should be carefully considered.

AN executive committee is formed to consider the proposal which has been made for the establishment of a national naval museum and to open a fund estimated at 100,000*l.* Inasmuch as Gwydyr House will at no distant date be vacated by a branch of the Board of Education upon the completion of the new Government Offices in Parliament and George streets, it is suggested that the house should be demolished for the erection of a national naval museum, to be supplementary to the adjoining Royal United Service Institution. Gwydyr House, the first home, until 1840, of the Reform Club, was built in 1795-6 upon Crown land by John Marquand, Surveyor to the Woods and Forests, for Sir Peter Burrell, Surveyor-General of Land Revenues, who was advanced Lord Gwydyr in 1796, and had obtained a thirty-one years' lease of part of the old Privy Garden of the Palace at Whitehall. After Lord Gwydyr's death in 1820 the house was inhabited by his widow, Priscilla, in whose favour was terminated the abeyance of the ancient Barony of Willoughby de Eresby, and subsequently by their daughter Elizabeth, Countess of Clare, who rented it in 1842-69 to the Commissioners of Woods and Forests for departmental purposes. Gwydyr House has since been the offices, in turn, of the old Poor Law Board (Local Government Board), of the Charity Commission, and of the staff for administering the City of London Parochial Charities Act. In 1884-5 the Office of Works converted the attics into a top floor; the one-storied wing added in 1898 projects on to the site in the Privy Garden of the dial constructed by Edmund Gunter for Prince Charles, and for which in 1622 Nicholas Stone made the pedestal: see his MS. "account-book" in the Soane Museum.

THE rehabilitation of the beautiful little Church of St. Peter Hungate (the Hundred-way), on Elm Hill, Norwich, is

The Sewage Question.

The Proposed Transporter Bridge over the Tees.

Surface Contact Traction.

Concrete Piling.

Church of St. Peter Hungate, Norwich.

to] be carried out under the directions and superintendence of Mr. Weir. The demolition of the fabric was contemplated some months ago, but the Consistory Court agreed to delay a grant of the faculty in response to the requests of Prince Frederick Dhuleep Singh and the Society for the Protection of Ancient Buildings. The church, cruciform on plan, having a western tower and a porch with parvise, was rebuilt in 1460 by John and Margaret Paston. The nave and transepts are faced with flint; in the nave wall are squints directed towards the side chapels; some of the original glass and window tracery remain, together with the fine hammer-beam roof. The church is cited in the Paston Letters, and Margaret Paston made bequests of money for the services by the priest and to "each household of the parish that will receive alms."

The Carfax Gallery. At the Carfax Gallery is a collection of paintings by Members and Associates of the Royal Academy. We do not know how many of them are new or first exhibited; some certainly are not; Sir L. Alma-Tadema's portrait group (7), for instance, we have seen before; but there are some fine examples of some painters at their best. Mr. North's "Brightest Days" (3) is one of these, a sparkling landscape of sunlight and colour, with two foreground figures very effectively put in. Mr. Hacker's "La Cigale" (4), if a new work, represents a change in his practice in colour effect; it is a piece of exceedingly rich and warm colour shown in the treatment of a half-length draped figure. One of the most interesting works is a small but highly finished view of "Bam-borough Castle" (6) by Sir E. Poynter, one of the finest of his small landscapes that we have seen. Mr. Solomon exhibits a recumbent "Psyche" (15) which is an admirable piece of drawing, but his life-size head of "St. George" (21) is very weak in conception, and looks more like the head of a woman. Among other things is a clever sketch of a nude figure by Mr. Tuke, "Sun and Sea" (31) (the first time we remember to have seen a female nude study with his name to it); a fine little pastel of an evening landscape and cattle (11) by Mr. H. W. B. Davis; two fine sea pictures (14 and 29) by Mr. Napier Hemy; a bold sketch of two figures of children lighted by fire-light (19) by Mr. F. Bramley; a landscape with foreground figures, "Molecatchers" (35), by Mr. Swan, which looks good, but was lighted by artificial light and therefore difficult to estimate as a landscape; and a good Thames scene by Mr. Wylie, "Towing past the City" (24), with a steamer and barges in the foreground. Sir W. Richmond's curious fantasy called "Phaeton in the Mid-day" (1) is at all events a very successful attempt to represent the actual flash of light from the wheel of the solar chariot.

The Fine Art Society. At the Fine Art Society is a collection of water-colours of "Animal and Pastoral Subjects" by Mr. J. C. Dollman. A considerable number of them are studies of different types of horses, all good, that called "Trespassers" (16)

being perhaps the best; and better even than these is one of a lion lying on its side (11), which is quite masterly. Kittens also are well represented in more than one frame; and a monkey looking curiously at a penny held in its hands, and entitled "Pourquoi?" (33), is a capital bit of humour in animal painting. The collection includes also some charming little landscape sketches; "Summer" (19), "September" (22), "The Happy Valley" (24), and "Hazy Afternoon" (34).

The New Academicians. The Royal Academy have elected Mr. S. J. Solomon, A.R.A., as R.A. As a most accomplished technical executant Mr. Solomon is fully entitled to the honour, though we cannot say that we find his works very inspiring in an artistic sense; but that limitation may apply to some older Academicians. Herr Josef Israels, the great Dutch painter, and Mr. St. Gaudens, the American sculptor, were elected Honorary Foreign Academicians. The first of these two elections will only excite surprise that it comes so late; the second will perhaps serve to attract more notice in this country to the works of Mr. St. Gaudens, which, however, as far as we know them, appear to us to be more remarkable for vivacity of intention than for elevation of style. Mr. Edward Stott and Mr. Pomeroy have been elected Associates—the latter name will be more universally approved than the former, though Mr. Stott has earned the distinction; and Mr. Frank Short and Mr. W. Strang have been elected, according to the daily press reports, "Associate Engravers." If this is to be their title, and not only a journalistic way of putting it, we must say that we cannot see why these two artists, who are original artists in black and white and not mere engravers of other men's work, should not be A.R.A. *sans phrase.*

THE INTERNATIONAL SOCIETY AT THE NEW GALLERY.

THE "International Society of Sculptors, Painters, and Gravers," whose sixth exhibition is open at the New Gallery, have done wisely in placing the sculpture exhibits in the Central Hall in the first pages of their catalogue, for but for the sculpture the exhibition would not be much worth a visit, and moreover it is the sculpture hall alone, in which M. Rodin, M. Bartholomé, and the late Constantin Meunier are represented by important works, which gives it any good right to the title of "International." As far as the pictures are concerned, there is a certain proportion of foreign works, but none of them of any importance. The Society deals largely in promises and in the circulation of anticipatory paragraphs (some of which we have prudently declined to print), but their performances contrast singularly with these documents. We heard not long since that this exhibition was to include a representative collection of modern American painting, for which special arrangements had been made. There are eight pictures from America, only one of which, Mr. Brush's "Mother and Child" (214) is a work of any importance; this, like six more out of the eight, are lent by the Pennsylvania Academy; but this certainly is hardly a representative exhibition of American painting.

M. Rodin's group on heroic scale, "Le Baiser" (1), has been illustrated over and over again, and is one of the best of his recent works; were all his work like this, in passionate suggestiveness and in modelling, there would be more excuse for the attitude of adoration which contemporary critics and society babblers assume in regard

to him; it is really an impressive thing, though detail is much slurred over in some portions. At the opposite end of the hall a colossal Adam and Eve by M. Bartholomé (3) is also a very fine group, both in expression and modelling; it is after The Fall, and Eve is consoling Adam, whose face is hidden in his hands; the figure of Eve is of fine and ample modelling, worthy of the mother of mankind. M. Bartholomé also exhibits a graceful figure of a kneeling girl—"Jeune Fille se Coiffant" (2). But this sculptor has never equalled, in poetic feeling and originality, the wonderful group of the man and woman looking into the tomb, which first made him famous. M. Rodin's smaller work, "Paolo and Francesca" (69), is in the centre of the South Room; this, however, is one of those rather fantastic groups of figures which seem only half disengaged from the marble, or as if made in some substance which has half melted down, of which this sculptor has set the fashion; but these will not retain their position in the art when the temporary taste for this kind of work has toned down. Of the works of Meunier, who was in sculpture a good deal what Millet was in painting, there is a considerable collection, all of high interest and power of a certain kind. Among the work by English sculptors Mr. Havard Thomas's little bas-relief of a figure from real life, "The Camomile Gatherer" (16), is very clever and far superior to the "Lycidas" about which such a talk was made last year. Mr. Alfred Drury exhibits his study for a head of St. George and the head called "The Spirit of the Night" (42 and 43), both of which, if we remember right, have been seen at the Academy. Mr. Paul W. Bartlett, a sculptor with an English name but who dates from Paris, exhibits two cases of bronzes (40 and 45)—lions' heads, figures of lions, and other small works, which (whether intentionally or not) have a kind of air of being antiques, and a small-scale figure of a "Man Crouching" (68), which is a good piece of work.

The pictures commence in the South Room, where the presence of such a work as Mr. Neven Du Mont's "John Jorrocks, Esq., M.F.H." (72), lent by the Cologne Museum (how did it get there, of all places?) indicates that the Committee have been obliged to be not too particular in taking what they could get to fill the walls. A life-size portrait of a lady by M. Boldini (79) shows this artist's usual clever vulgarity of style. M. Desnard's "Au Bord du Lac" (89), an impressionist view of a family bath, occupies another centre position in a not very interesting manner; but this painter has realised two fine and powerful cloud effects in his two coast scenes (88 and 90). The fourth centre position is occupied by Mr. Greiffenhagen's portrait of Mrs. Greiffenhagen, as sombre in key as the Boldini opposite to it is loud and flashy, but it is an interesting portrait study both in colour and design. M. La Touche's iridescence of colour is illustrated in his picture of "Le Mariage de Riquet à la Houppe" (81); Herr Schuster-Woldau, of Munich, exhibits a portrait of a little girl (112) quite obviously "made in Germany," both subject and treatment; and among the landscapes in the room is a small American work "Sheep Pasture" (84), by Mr. H. W. Ranger, very pleasing in colour and light; a "Woodland" (77) by a Dutch artist, Herr Schregel, which seems to owe something to the inspiration of Diaz; a not very good view of "Notre Dame, Paris" (78), by M. Rafaell; and a good "Moonrise on the Seine" (94), by Mr. R. Macaulay Stevenson.

Sir James Guthrie holds the place of honour in the West Gallery with a very fine and heroic-looking full-length of "The Marquis of Tullibardine" (137), faced by Mr. Lavery's portrait group of two ladies (160), where blue and white dresses and lighter blue sunshade make a most effective colour combination. The centre of the north wall is occupied by the late Robert Brough's fine portrait of Lord Justice Vaughan Williams; so that Scottish art is rather pre-eminent in this room. On the south wall we have a large and new picture by Herr Israels, entitled "Indoors and Outdoors" (124), looking on to the landscape from inside a cottage door; but—as is too often the way with Dutch painters, even of the calibre of Herr Israels—the outside scene seems to have no

more brightness or colour than we get inside the doorway, and the figures are not of the highest interest. Among the best works in this room is Mr. Bertram Priestman's gloomy and powerful landscape, "A Stormy Evening" (144). Mr. Millie Dow's "The Enchanted Wood" (131) is a poetic twilight landscape spoiled by a too large and unnatural-looking moon. Mr. Paterson's small landscape sketches, "Autumn" (133) and "Wind in the Trees" (135), are suggestive little compositions; Mr. Morrice's "Marine" (139) is a pleasant sea-piece; Mr. H. Goodall's "Camber Castle" (140) is a vigorous splash of windy sky and trees; and Mr. Oliver Hall's "Outskirts of Parham Forest" (164) is a good example of landscape composition. Mr. William Strang, in "The Sea Pool" (147), surprises us by producing a quite classically designed nude. What seems to pass for landscape at Munich is curiously illustrated by Herr Frank's large work, "The River's Mouth" (159), as flat and airless as if it were cut out of wood.

The North Room contains some of the curiosities of the exhibition; among them two or three of the utterly unlovely and repellent figure studies by Manet which it is the fashion to admire, and a perfectly hideous nude study (if such a thing can be called a study) by M. Legrand, "Le Bain" (236), an ill-drawn awkward posed figure, plastered over with paint laid on thick without an attempt at truth of colour or texture. Into the much-abused Royal Academy such a work would not have a chance of admission, which is at least one thing in favour of the Academy; and the same may be said of Mr. Conder's ridiculous "Croquet Players" (225), which one might suppose to be exhibited as a joke, but which in the present state of "art-criticism" (?) will no doubt find its admirers. M. Charles Cotte's "Au Pays de la Mer" (171), a triptych which has been seen, if we remember right, at the Salon, is here, and is an example of the artist's work before he took to painting figures in the hard black style which he has recently affected. Mr. Cameron's "Glencleugh" (176) is a good landscape; M. Cézanne's "Nature Morte" (199) a good Still Life painting; Boudin's "La Plage" (183) shows a good sky; Mr. Neven Du Mont's "Souvenir de Romney" (219) is a pretty figure sketch answering to its title; Mr. W. Nicholson's portrait of a lady seated at table (232) is graceful and spirited; and Mr. Sydney Lee's large and solid painting, "The Stone Bridge" (254), has a great deal of merit as a picture of a class of architectural subject which is seldom treated in painting on so large a scale and in so happy a manner. But the pleasure to be derived from the picture part of the exhibition, taken as a whole, is but of a doubtful and chequered description.

We observe that at the luncheon given by the Society at the Savoy Hotel on Wednesday, a long letter was read from M. Rodin explaining the objects of art (he alone, apparently, being supposed to understand them), in the course of which he remarked that the great sympathy shown for their Society perhaps arose from the fact that "au fond tout le monde attend ces artistes simples et humains, on montreron de leur force claire que la beauté n'est pas l'exception, qu'elle est partout." Those who are of a cynical turn of mind may perhaps find a certain amusement in studying these words in the presence of some of the paintings exhibited. The real meaning, nowadays, of the sentiment that "la beauté est partout" seems to be that there is no difference between the ugly and the beautiful.

DRAIN-PIPES AND MOTOR TRAFFIC.—Dr. Walter Blyth, the Medical Officer of Health for the Borough of Marylebone, in his Monthly Chronicle for November, 1905, remarks in regard to this subject:—"The vibration from heavy motor traffic and from underground railways is affecting this district, and indeed the whole metropolis, more or less seriously along the main channels of traffic. There have recently been instances of absolutely new drainage becoming defective from fracture of the pipes, and in the writer's opinion in certain situations in which vibration is to be expected the only safe way will be the construction of iron instead of earthenware drainage. Drainage is a costly matter, and when once put down should not require renewal for at least a quarter of a century."

ROYAL ACADEMY LECTURES.

ON Monday afternoon Mr. Clausen gave the first of his set of four lectures to the Royal Academy students, the subject being "Drawing." Something seemed to have gone wrong with the Royal Academy management, for the numerous visitors were kept standing in the Hall till nearly the time for commencing the lecture, when they were bidden to come up the main stairs and enter through the Exhibition rooms; and on Mr. Clausen taking his place at the lecturer's desk he had to inform his audience that the lantern had been forgotten and he would be unable to show any illustrations; a kind of mismanagement which is not very creditable. The illustrations which should have been given at this lecture were promised for the next one.

Drawing, Mr. Clausen said, was a convention; there were no boundary lines in nature; the forms of surfaces were defined by difference of tints. Yet the expression of form by lines seemed to be a process that nature herself recommended itself; all primitive art was expressed by outlines, and was in early stages regarded as a sufficient method of expression; modelling the surfaces by shading was a later development. Drawing was a means of expression, and this view of it enabled us to realise that there might be an expression, perfectly intelligible to its originators, in some forms of drawing to which we had not the key. The forms of Celtic drawing, which seemed strange and meaningless to us, had no doubt a distinct meaning to those who drew them and those for whom they were made. Even now children were satisfied with exceedingly crude representations of objects, and primitive peoples were in this respect in the position of children. Two types of drawing might be distinguished—the old symbolical type and the modern realistic type. Blake's drawings, which were full of meaning, were nevertheless to a great extent symbolic rather than realistic. Rembrandt might be said to represent the opposite extreme; the mere representation of form as influenced by light. Drawing appealed to the intelligence first in the search for form; secondly, in the effect of light and colour on form.

In the drawings of old masters we saw the scaffolding on which their finished works were built; and it was worth notice that these old drawings were all made with a definite purpose, not, as in the modern work in the schools, for mere study of the form and the old system of pupillage, when the student was employed on work in progress, and its advantages over the mere school study for the purpose of obtaining aptitude. The old drawings of the figures were definite; ours were tentative; we reposed too much on the model. School work was only a means to an end, and sometimes led to the consequence of the draughtsman being helpless with the figure unless he had a model before him.

There were few drawings by the early painters known and accessible. But we had unfinished pictures, such as one by Piero della Francesca in the National Gallery, in which we could see the lines of the first drawing on the panel. The older Italian drawing was, like the Flemish, rather angular in manner, but the figures were of a finer type; a difference partly racial, the Italians being a finer type of humanity than the Flemings, but partly also owing to the tradition of the antique, which had never been quite lost in Italy, while the Flemings had no ancient art to support them. They aimed at truth to nature and precision of line, as the works of Van Eyck and Dürer plainly showed. A study of Dürer's for the hands for his Adam and Eve carried precision and attention to nature as far as it was possible to carry them. Early German work was thorough in this sense, but mannered; there was a tendency to make the lines "curly," not like the severe line of the Italians. We could see this to some extent even in Holbein, but not in his best work, especially his well-known drawings of heads. Here he was entirely free from mannerism; and it might be observed that in the highest type of drawing, such as these, we were never reminded of any other style. In short, the object of the drawing of the northern artists was observation only, while the Italian artists had a standard, and a greater sense of beauty. Why the one was beautiful

and the other was not would lead into the very abstruse question, what was beauty; which they could not go into now. He thought that practically the Greek artists had, after long effort, fixed a standard of beauty of the human figure, which had been accepted and had influenced subsequent art. The modern painters who had called themselves neo-Raphaelites were, he thought, largely influenced by Flemish art; their early drawings were very well worth study, those of Millais especially, in book-illustrations, which were equal to Holbein. Returning to the Italians, we found in the drawings of Leonardo da Vinci even greater evidence of genius than in his few finished pictures. His anatomical studies showed how he aimed at obtaining a full knowledge of the construction of the figure; and with this certain knowledge, thus acquired, his line was always precise. The drawings of Raphael might be considered to represent the high-water mark of figure-drawing; they were given with the greatest economy of means, and the construction of the figures was always well expressed. Among his modern followers there was perhaps no one equal to Ingres in these qualities. (Several beautiful small-scale figure-studies by Ingres were hung on the wall, balanced by some of Leighton's on the other side.) Ingres might be said to have recreated the academical spirit in drawing, in its best sense. He was one of the greatest draughtsmen who ever lived, and one never wished his line otherwise than it was. Leighton's drawings showed the same fine tradition. The main point about these, as about the drawings of Michelangelo, was that they showed the human figure as it exists. Most of these drawings probably occupied no more than half an hour in execution; they showed the swift application of great knowledge. To gain this power one should not merely imitate the model (in the life school), but learn from it. "Watts's drawings, then in the exhibition, were an instance of this; they were studies of the figure not from the picturesque but from the constructional point of view—outlines drawn with the quiet authority of a master. Mr. Clausen mentioned also the drawings of Alfred Stevens, who was decorator, sculptor, and painter, as worth attention, and also those of Millet, some of which were as fine as the work of Watts; and all were permeated by the same object—expression by definition of form through knowledge of construction.

Ought we to try, in drawing from the model, to express surface gradations of contour? He thought not; the study of the form was difficult enough in itself; and besides, if one began expressing surface gradations, this could only be done through difference of tone, and then the tone of the whole surroundings—the background, etc., must come in, and further complicate the problem. It was better to think of the form only, the firm basis of the artist's work, in the first instance, even if he had eventually to give it a second place. Mr. Clausen read a very interesting and frank letter from Whistler to Fantin-Latour, written in 1867, in which Whistler lamented the temptation he had yielded to, of getting over problems of drawing by facility in the use of colour, saying "what a painter I should be now if I had studied form more carefully," or words to that effect. The influence of Courbet, he said, had been very injurious to him (not so much that he disliked Courbet's art as that he disliked his method); and he added, "Why was I not a pupil of Ingres? How healthy his influence would have been." This testimony of Whistler was valuable. Mr. Clausen said, because as far as Whistler was an influence the qualities in his work that were now imitated were those that were not the best in it. Should we take any particular artist's manner in drawing as an example to follow? If so, Ingres and Watts were the best examples; try to imitate their qualities—accuracy and simplicity. To take

* We heard of an able teacher at the Slade School saying one day to a pupil at work from a cast— "You are doing that, you are to draw it"; an admirable distinction.

† We may remind our readers that we have already called attention to this quality in the Watts drawings in our article on the Loan Exhibition, that they are outlines taken from various points of view in order to get the construction of the figure.—Ed.

the manner of some particular artist of earlier times was very likely only to lead to a "pose." But it was largely a question of temperament; each man expressed himself best in his own way.

THE BRITISH SCHOOL AT ROME.

The first open meeting of the British School at Rome for the current season was held at the School on Thursday, January 4, and was attended by the British Ambassador (Sir E. H. Egerton, K.C.B.), the Swedish Minister (Baron de Bildt), Professor Körte, First Secretary of the German Institute, and other foreign scholars, and by many British residents in Rome.

The Assistant-Director (Mr. T. Ashby-jun.) read a paper upon "XVIIth Century Engravings, Illustrative of Roman Sculpture." He began by pointing out the importance of the subject in relation to the catalogue of the municipal museums, which the School has undertaken. Much might be learnt from early engravings as to the condition of sculptures when found before they have undergone restoration, as to the date and locality of their discovery, and as to the various collections through which they have passed.

Though the majority of XVIIth century engravings which are influenced by the antique do not reproduce it with sufficient accuracy for the present purpose, there are a certain number of actual representations of famous statues among the engravings of Marc Antonio and his school; and of these many—especially from the hand of Nicolas Beatriset—came to form a part of the collection known as the *Speculum Romanæ Magnificentiæ*, published by Antoine Lafréry, which, however, was quite eclectic as regards sculpture, and included views of all sorts relating to Rome of both the Classical and the Renaissance period.

The first collection of engravings of sculpture exclusively was the first edition of the work of Joannes Baptista de Cavalieris (*Antiquarum Statuarum Urbis Romæ Uber primus*), published before 1570, in which year a reprint of the original undated edition appeared in Venice. It contained fifty-two plates only, and dealt with a small number of collections. The noteworthy omission of the Vatican was due, no doubt, to the practical inaccessibility of the collection under the anti-humanist, Pius V. The first edition of a larger work (100 plates) appeared after his death, but before 1573, and was reissued in 1585. The first twenty-five plates of the original were, for some reason, not used, but new plates were engraved. The original plates reappeared, however, in subsequent publications of the XVIIth century.

The third and fourth books (100 plates) appeared in 1595, and were arranged according to subjects rather than collections. The engravings were inferior in style, but showed independent research, which was not the case with the album of Lorenzo della Vaccaria (1584). In the meanwhile, collections of busts were issued by Achilles Statius (1569) and Fabricius Arsinus (1570), both published by Lafréry.

Mr. Ashby then gave a short description of the wood block plan of Venice of 1500 (which was really something between a plan and a bird's-eye view), a copy of the first edition of which he had recently acquired. It was in six sheets, measuring altogether about 10 ft. by 5 ft., and was perhaps the finest work of the kind in existence. The accuracy and fulness of detail were remarkable, and in these points it was far in advance of any of the plans of Rome of the XVIIth century. The author was unknown; it was often attributed, but without any certain proof, to Jacopo de Barbari.

The second paper was read by Mr. A. T. Wace, Librarian of the School. He discussed two Roman historical reliefs in the Louvre, one representing an *extispicium* before the temple of Jupiter-Capitolinus, the other showing the sacrifice of two bulls. These were formerly in the Borghese collection, and at the end of the XVIIth century in the Capitoline collection. He proved that the first relief was found about 1540 in Trajan's forum by reference to some sketches of Antonio da Sangallo the younger. Sangallo gave a full description of the pediment of the temple which was now lost, but of which several XVIIth century drawings survived. He connected with this a mention by Flaminio

Vacca of the finding of some historical reliefs in Trajan's forum, including a relief showing a Dacian rider swimming a river. Vacca's statement that these reliefs were in the house of Prospero Boccafaduli was confirmed by a note of Pierre Jacques Wace, therefore, conjectured that the Louvre reliefs, the Dacian, and other relief fragments (now lost, but drawn in the famous *Cordex Orsinianus Vaticanus*, 3439) were all found together in Trajan's forum about 1540. The Louvre relief represented the *nuncupatio veterum* before Trajan set out on his Dacian campaign. It thus fitted in well with the Dacian battle scenes on the arch of Constantine. The other Louvre relief, with the fragments drawn in the Orsinianus, represented, perhaps, the Parthian triumph of Lucius Verus and Aurelius in 166 A.D. This agreed well with the style, which was totally different from the Trajanic reliefs, and much more like the Aurelian panels on the arch of Constantine. Thus it seemed likely that Trajan's forum was not completed during his lifetime, but was finished and decorated by Hadrian and the Antonine emperors. All these reliefs, with perhaps some others, were probably in the collection of Prospero Boccafaduli, who was in charge of the building of the capitoline palaces from 1555 onwards. He probably kept them there hoping to sell them to the Municipality. On his death, or before, the two Louvre reliefs passed to the Borghese collection, and the Dacian to the Villa Medici; the rest of his collection of reliefs has disappeared.

Professor Hülsen, Second Secretary of the German Institute, made some remarks on the last paper, emphasising the importance of the discovery of the provenance of the Louvre reliefs, especially as regarded the architecture of Trajan's forum.

MAGAZINES AND REVIEWS.

The *Burlington Magazine* heads its issue with a plate of the Rokeby Velasquez, and an editorial article on this highly unsatisfactory topic, the end of which we have now little doubt will be that the picture will be lost to England. The position as put in the article is that England is somewhat in the case of Italy in the XVIIIth century; she has great possessions in works of art, such as no other European country can match, but she is surrounded by countries in which money is being made more quickly, and from a buyer of works of art has become a seller, to such an extent that in a few years the choicest of her treasures will have vanished for ever. But is it exactly the case that England has less money to spend than formerly? Is it not rather that the class who have chiefly owned great pictures have lost money, and therefore want to realize; and among the people who now have the money there is not sufficient interest in art to spend money on it. Neither an English Parliament nor an average Englishman can understand that the retention of great works of art in the country is an object worth paying for. It will take at least half a century to educate Parliament and the Englishman up to that, and by that time the finest pictures will be gone. There are several good suggestions in the *Burlington* article, and we especially agree on the importance of endeavouring "to save for the National Gallery, at any cost, some twelve or fifteen pictures of the highest importance which, if once lost, could never be replaced." As we might remark, the value of a permanent collection goes by quality rather than quantity; "three or four masterpieces in a gallery make it important; twenty or thirty make it a famous place, which all students of art must visit." All this and much more in the article is quite true, but it will produce no effect; the average Englishman will pass by on the other side. Professor Baldwin Brown concludes his article on "How Greek Women Dressed." In Part IV. of "English Architectural Leadwork" Mr. Weaver deals with lead fonts, of which some fine illustrations are given, especially of the Brookland and Pycombe fonts, the former the more archeologically interesting, the latter the more decorative. An article on "The Furniture at Windsor Castle" (a review of Mr. Laking's book) is the occasion for the production of some illustrations of French highly elaborated furniture of the Louis Quatorze and Louis

Seize periods, with its exquisite detail of the most artificial and, one might say, soul-less character; for that is the impression that this class of French work produces—the desire for finish of workmanship rather than for real beauty.

The second number of the *Magazine of Fine Arts* (which is dated "December," but appears to be issued near the end instead of the beginning of the month) devotes an article to Piero della Francesca, as "the most modern of the pre-Raphaelite painters," and according to Mr. Housman, the author of the article, the first painter to discover light as a pictorial subject; but we are rather sceptical about these kind of special attributions, which always strike us as being a part of the furniture or stock-in-trade of modern writers on art. Piero della Francesca is a painter worth study, but not one to arouse enthusiasm. More interesting to us is the article on and the numerous illustrations of the work of the great French sculptor Barye, the Michelangelo, one might say, of animal sculpture, though his "Thesens and the Minotaur" shows how powerfully he could also treat the human figure. He at least is an artist about whom there can be no doubt; the eight illustrations of his works given here are enough in themselves to show his extraordinary versatility of power. M. Geoffroy, who contributes the article, does not quote the highly characteristic anecdote, worth repeating here, of Barye and Thiers; when Barye had been modelling an eagle seated on a branch, for some official commission, Thiers (officially) came to see it, and was peevishly criticising the position of the bird's claws, which he said was not correct; "an eagle grasped thus"—and was proceeding to illustrate it with his hands, when the sculptor, who had had enough of it, cut him short with—"Enfin, M. Thiers, vous n'êtes pas un aigle"! We are glad to see an article by Sir J. D. Linton on "The Art of William Etty," a painter who deserved more recognition than has been accorded to him of late years. "Woven Fabrics of Sicily," "French and German Champlevé Enamels," and "The Landscapes of Rubens" are among other articles in the number; the last named exceedingly interesting subject is treated by Mr. Robert C. Witt. We entirely agree with him in his estimate of the value and importance of Rubens's landscape, especially remembering, as Mr. Witt reminds us, how little had really been done in landscape before his day.

The *Architectural Record* (New York) contains an illustrated article on "Japanese Houses," with full descriptions of their building methods, and a reproduction of an old Japanese sectional working drawing which was used in the construction of several houses; for of course the methods of construction and design vary little. Some other interesting drawings from an old Japanese book are also reproduced. In an article on the Minnesota State Capitol, which had been sympathetically described in a previous issue, Mr. Russell Sturgis takes exception to that building and to the admiration for it, mainly apparently on the plea that the dome is only a kind of copy of the dome of St. Peter's, not so good as the original, and merely "one more added to the host of public buildings copied from the neo-classic architecture of Europe"; and he suggests that at this rate one might as well have copied St. Peter's dome entirely, as the result would have been better. There is something in this, though it is surely rather late in the day to begin objecting to American adoption of European classic forms, after the amount of French Academic architecture which has been produced by leading American architects. After all, the centre dome has a certain long association with State and municipal architecture on a large scale, and one can sympathise with city councillors who say that they want their building "to look like a Town Hall." The Minnesota dome seems a graceful one; our complaint against the published design was that it wanted more emphasising at the ends of the façade. We may suggest, however, that it is perfectly possible to employ the dome on a State Capitol without employing borrowed Renaissance detail with it, and Mr. Sturgis's criticism may do some good if it suggests to any American architects to recollect that the dome, as an architectural feature, is not after all the exclusive property of the Renaissance style, though it happens

to have been most largely developed under Renaissance influence. The First National Bank of Chicago, to which an article is devoted, seems to be a truly palatial building internally, ruined externally by greed of gain. As the writer of the article says, there are two alternatives for a bank which proposes to build for itself on expensive land in a large city—either to build a one or two-story block for its own exclusive occupancy, or to build an immensely high building and let off fourteen or fifteen stories. It is pretended that financial reasons have nothing to do with the selection of either method; but it will be difficult to make any rational person believe that. The First Chicago Bank managers have chosen to erect a building like a cotton-mill at the meeting of two streets, and use the basement as the bank; it looks in the photograph as if it were an acute angle, which would make the appearance still worse; whether it is so or not is impossible to say with certainty, for it is a singular thing that although one professional publication seems intended as a serious professional publication for architects, a plan seems to be one of the last things it thinks of giving. In any case one can only come to the conclusion that the First Chicago Bank is a building with a sumptuous architectural interior, completely ruined and reduced to commonplace internally by this erection of a grid-iron building over it, and moreover its whole architectural character as a bank destroyed. Imagine the Bank of England treated in the same way, with a building of thirteen stories erected over it. Its "Bank" character would be gone at once. In this sense the First National Bank of Chicago is an object-lesson and a warning.

The *Berliner-Architekturwelt* this month is mainly occupied with decorative detail and furniture, some of which is very interesting. Five designs for stained glass, by Herr Franz Eissing of Charlottenburg, though they will seem rather odd to English eyes, are worth attention because they suggest a kind of decorative treatment which provides for rich colour effect in conventional foliage, etc., in a manner which is new and not connected with any past style, either Gothic or classic. We cannot tell of course what the colour may be from these monochrome reproductions; but we can see that, granting an eye for colour, the nature of the design gives plenty of scope for it in a manner suitable to the character of stained glass. The illustrations of furnished rooms show that there are fortunately some Berlin architects or furniture-makers who still design furniture in a sensible and reasonable manner, instead of twisting it all into ugly and unexpected curves. The *Architekturwelt* also issues a large special number devoted to the life and works of Herr Messel; to this we shall return.

In *The World's Work* the writer under the name of "Hone Counties," who thinks he knows more about architecture and building than he really does, is holding forth this month on "building without a builder." He is perfectly right in condemning the contract system, which is the curse of modern architecture, though his reasons for condemning it are quite different from ours. The paper proceeds to the sneers at architects which are now popular with English magazine writers (no French magazine would insert such articles—the French public knowing better what an architect means), and unearths the old absurdities of the *Quarterly Review*, which have been exposed and done with for a quarter of a century. But one can understand that the digging up of such a diatribe is a godsend to a writer who was ready to champion such ineptitudes as Sir W. Grantlath's cottage plans, which were published in *The World's Work* as something remarkable. With critics of this class, anything in architecture is right which is done by ignorant people, whether of the upper or lower class; and every sneer at the educated architect is a bid for a cheap popularity.

"Matter, Motion, and Molecules" is the title of an article in the *Cornhill* by Mr. W. A. Shenstone, F.R.S., is a popular exposition of the scientific attitude of to-day in regard to matter and energy, and is very well calculated to awaken the mind of the general reader on this subject. There is one point that seems rather illogical in the way

of putting it. In considering whether a piece of stone which has fallen and lies motionless on the ground is "bankrupt of energy," the writer says: "In the first place the stone may lie on a hill side, and in that case obviously it possesses energy of position, which would become kinetic if we set it rolling down the hill." Surely that is the energy of the earth, not of the stone.

The *Century* gives illustrations of Mr. D. C. French's groups of sculpture, representing the four quarters of the globe, intended for the main front of the new Custom-House in New York. They are good architectural decorative sculpture; but, like most American sculpture so far, rather notable for energy than for style. The same magazine contains also an article on "The Treasures of Pre-historic Moundville," the circle of mounds on the Black Warrior River, in Alabama. The article is by Mr. H. Newell Wardle, of the Academy of Natural Sciences of Philadelphia, and gives illustrations of some very interesting early Indian work. An article on "Up Town, New York," contains some picturesque sketches of the outskirts of New York.

The *Antiquary* contains a long article by Mr. J. Herbert Slater on that very curious phase of mediæval study, the pursuit of the supposed possible elixir of life. The history of the repeated research after this elixir, which, if it were once discovered, would relieve its possessor from the dread of death, is both curious and in a sense pathetic, so many wild hopes were founded on it. A book might be written on the subject; we are indebted to Mr. Slater for a brief outline of it. "The Heraldic Glass in Brasted Church" is the subject of a long article by Dr. W. E. Ball.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE PRESENT POSITION OF THE SEWAGE QUESTION.

A MEETING of the Civil and Mechanical Engineers' Society was held at the Caxton Hall, Westminster, S.W., on Thursday last week, when a paper was read by Mr. J. F. Reade, A.M. Inst. C.E., on "The Present Position of the Sewage Question."

He said that the number and kind of processes which had been advocated for the purpose of the purification of sewage were very great and various; yet, notwithstanding the fact that many of these had been tried, the present position remained indefinite, in so far as no one of them had been found to be universally applicable and satisfactory. As to the disposal of sewage by applying it to the land, it was early suggested that here was not only a ready, scientific, and economical way of its disposal, but of making a profit as well. But the reasoning was by no means correct. It was based upon the idea prevalent until the discoveries of Pasteur and others that the assimilation by plants of organic matter presented to them in the form of manure was an entirely chemical process, depending on the presence of oxygen; whereas it was now known to be primarily a biological one, also dependent on oxygen. Public opinion took some exception to this means of disposal, on the ground that extensive irrigation with sewage must be injurious to health, but the advocates of sewage farming, and experience, had shown such fears to be not well founded. Present opinion did not condemn properly managed farms as being directly dangerous to health. The promises held out of sewage proving a source of wealth seemed so feasible and proved so fascinating that people clung to it with great tenacity, and even now, when extensive and costly experience had proved it to be very rarely capable of fulfilment, the idea was abandoned only with reluctance. In its practical application the purification of sewage by treatment on land could not always be carried out within reasonable limits of cost. Owing to physical or geological surroundings, a sufficient area of suitable land could sometimes not be got in a convenient position near towns contemplating sewage works. Difficulties such as this, and analogies drawn from the rapid advances made in chemical industries, seemed to open out an excellent prospect to inventors that a solution of the sewage question could be discovered by the aid of chemistry. A vast amount of time and thought had been given to research in pursuance of this idea, but

with only a small amount of success. Indeed, it might be said with much truth that the application of chemistry to sewage purification had been a singular failure, because purification, in the sense in which it was understood at the present day, had never been effected by any practical chemical process. The researches of chemists in this direction had, however, not been fruitless. Some valuable processes had been discovered by which precipitation of solid matters held in mechanical suspension and partial solution might be effected, the sewage clarified and deodorised. Such, for instance, were the methods of treatment by lime, by lime in addition to sulphate of alumina, by sulphate of iron and burnt magnesium limestone, by hydrochloric acid and chloride of lime, by sulphurous acid and carbonic acid with magnesia and lime, and by sulphate of iron and lime. All these, in various degrees, caused changes in the physical constituents of sewage which appeared to the eye and had frequently been mistaken and described as a real cleansing of foul water. That some further advance might be made in the chemical and physical cleansing of sewage was possible and recent investigations into the physico-chemical nature of solutions had proved fruitful in the acquisition of new knowledge concerning them, and might possibly lead to better methods of dealing with waste water. But chemical treatment gave rise to sludge difficultly, and the clarified liquid, drawn off after precipitation of the solids, contained a considerable quantity of impurity, and in that state could not be considered sufficiently free from noxious matters to allow of its being discharged into streams. It was, however, quite a natural step to combine the process of clarifying the liquid by chemical means and its further purification by applying it to land in either of the two ways known until lately as "broad irrigation" and "intermittent downward filtration." Some very good results had been and were at present obtained by means of a combination of chemical and land processes. The chemical treatment was employed to eliminate the grosser constituents, the land afterwards completing the purification of the clarified liquid. But it had been proved that sewage could be purified on land without having undergone any previous chemical treatment; hence, where land of the right kind was available, and if worked intelligently and within the limits of its capacity, chemical clarification was in no way essential to purification. It was soon discovered that sewage could be purified by land without growing any crops; and the original idea of the direct consumption of manurial matter by surface plant life as the only factor in the cleansing process was upset. The passage of sewage through a certain depth of land, from, say, 3 ft. to 9 ft., as a limit, was a process of filtration which under favourable circumstances could be made a very efficient one and by repetition capable of giving almost any degree of purification. Strangely enough, these facts did not seem to have induced anyone to search for further explanation. It was not until the discovery of the function of micro-organisms in breaking up the organic matter in soils that new light was thrown on the subject and the way opened for further advance.

At the present day what was known as the bacterial treatment of sewage very nearly engrossed the attention of sanitary engineers, but much hesitation was displayed regarding the details whereby this valuable principle of bacterial agency might be applied. One of the most noteworthy of positive facts discovered was that sewage and all waste substances of organic origin under natural conditions contain within themselves the micro-organisms necessary to break them down into the more simple inorganic compounds. This demonstrated that the cultivation of special organisms was, at all events so far as present knowledge took us, superfluous. Therefore, if sewage was allowed sufficient time, it would effect its own purification. The sewage problem of the present day resolved itself into the discovery of the best means whereby the great natural force—i.e., the vital activities of bacteria—might be made to exert itself with the maximum result to effect purification, though this statement did not exclude land treatment nor clarification by chemical means. The methods of bacterial treatment were various, and differ not

alone in detail, but in principle as well. The greatest divergence was probably that illustrated by the two methods, one of which employed two distinct stages to effect the process, and the other made use of one stage only. The first was exemplified by the septic tank system, and the second by the contact bed arrangement. Much controversy had arisen between the advocates of these two methods regarding the relative merits and efficiency of their proposals. It was, however, now recognised that neither system would alone do all that was originally claimed for it. The septic tank did not completely and indefinitely liquefy the solid part of sewage, and sludge had still to be disposed of. Contact beds sometimes choke and become useless until they have been remade, and a simple process had yet to be discovered which would produce an effluent universally satisfactory according to a moderate bacteriological standard and admissible at all times into polluted streams. The important feature to be noted in connexion with the advance made in the developments of bacterial methods, whether carried out naturally on land or artificially in tanks or beds, was their capability of producing effluents which would not subsequently putrify when admitted into streams. This was the crucial test of all purification processes at present. It was not sufficient to sterilise the liquid if putrescible matter was allowed to remain, because under natural conditions it would very soon become foul. Sewage having undergone treatment and reached such a standard might be classified amongst sound, but not of course safe water. By means of the well-known methods of sand filtration, as practised in town water supplies, water containing considerable organic impurities could be made to attain a very high degree of purification both chemically and bacteriologically by repeated operations. It would be perceived that a link was thus established between the two valuable, concentrated, natural processes of bacterial purification and ordinary sand filtration. They were no doubt intimately related to each other, but in practice it would be impossible to purify raw sewage by sand filtering, and an unfiltered drinking water could scarcely be made fit for use by passing it through a septic tank installation. But it was only a matter of time and cost to cause sewage to pass through successive stages until it reached a degree of freedom from organic and bacterial impurities that it could not be distinguished from ordinary drinking water. There was no doubt that these recent developments had increased the responsibilities of engineers, and careful designing and a full appreciation of the circumstances of each particular case were at the present time more than ever necessary. It was to be hoped that the present Royal Commission would indicate at least some broad principles which should govern the choice in any circumstances, since in developing more powerful and efficient means of dealing with sewage the complexity of the problem had been at the same time increased. A large quantity of literature in the shape of reports, evidence, etc., had been published by the Royal Commission on Sewage Disposal which was appointed in 1898, but the final report, which was eagerly expected, and which, it was hoped, would be more conclusive than what had been heretofore published, had not been issued.

Millions had been spent on efforts to purify sewage, and a large sum was annually required to pay interest on capital expenditure and to maintain and operate the various works established. Notwithstanding this, purification was by no means universally successfully accomplished. Moreover, the effluents were scarcely ever of a uniform character, and were sometimes discharged, even from most efficient works, only very partially purified.

The lecturer then touched on the difficulties which had to be faced in such works, i.e., sudden heavy rain storms, and in certain localities the sudden discharge of vats or tanks containing waste liquid from manufacturing processes. He also briefly reviewed the reports and conclusions of the Royal Commission, and concluded as follows:—

"From this comparison it would appear that artificial processes should ultimately be extensively introduced either to help or supersede land treatment. Where inferior land has been in use this is no doubt going

on. But, as pointed out before, hesitation on the part of public bodies is at present more characteristic of the position than any active tendency to make changes, and until the river boards are established and in operation, and working standards of purity laid down, it is improbable that towns will undertake schemes involving considerable expenditure of public money."

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The fifth general meeting (business) of the session was held on Monday, when the chair was taken by Mr. Edwin T. Hall, vice-president.

The minutes having been taken as read, the Chairman moved "That the council be instructed to enter into negotiations concerning a site for new Institute premises, and to report to a general meeting."

Mr. John Slater seconded, and the motion was carried unanimously.

The following gentlemen were then elected as members:—

- As Fellows.*
- | | |
|--|---------------------------------------|
| Reginald Blomfield, A.R.A., M.A., Oxon., F.S.A., London. | Ernest Newton, London. |
| Walter Cave, London. | Segar Owen, Warrington. |
| H. Chatfield Clarke, London. | A. M. Poynter, London. |
| R. Burns Dick, Gosforth, Newcastle-on-Tyne. | E. S. Prior, London. |
| W. Hawke, Cape Town, and Norbury, S.V. | Halsey R. Ricardo, London. |
| G. C. Horsley, London. | C. J. Tait, London. |
| H. S. Jacobs, Hull. | E. J. Thomson, Wimbeldon. |
| Professor W. R. Lethaby, London. | T. H. Thorpe, Derby. |
| M. E. Macartney, London. | W. Turnbull, Wellington, New Zealand. |
| W. C. Marshall, M.A., London. | H. Thackeray Turner, F.S.A., London. |
| E. J. May, London. | E. F. Johnson Warren, F.S.A., London. |
| J. H. Morgan, Carmarthen. | L. A. Westwick, Mansfield. |
| | F. A. Whitwell, London. |
| | W. H. Woodroffe, London. |
- As Associates.*
- J. A. Lucas, Exeter. | W. D. Quirke, London.
- As Hon. Corresponding Member.*
- Martin Nyrop, Member of the Royal Academy of Arts, Copenhagen, Commander of the Dannebrog, etc.; of Gyldenløvesgade 4, Copenhagen.

AMERICAN BRICKWORK.

The first impression of the English bricklayer, after commencing work in the United States, is the keen competition among his fellow-workmen; unfortunately not in the direction of quality or neatness, but of speed alone.

The bricks are all kiln burnt, have no frogs or hollows of any kind to serve as key for mortar, are very small, averaging 8 in. by 4 in. by 2½ in., as compared to the London 9 in. by 4½ in. by 3 in., and are consequently lighter to handle; the gauge for face work is about four courses to 10 in., and for rough work about nine courses to 2 ft., there being no standard gauge in the writer's experience.

The lime used is very fat and white, the chief cement being "Rosendale" (corresponding more or less to our Roman), of a dark brown colour, which is very much used in sewers and waterworks because of its hydraulic qualities, and it will take more sand than our "Roman." Tubs are used instead of mortar-boards, and



Fig. 1.

are about 2 ft. 6 in. square, with sloping sides, and about 8 in. deep.

The bonding of the brickwork is of the most elementary description, such a thing as sectional bond not being even dreamed of. The rough work usually consists of five, seven, or even nine courses of stretchers to one course of headers, the walls being built from one side only, the overhead side being built first in a series of steps (Fig. 1), the lower headers being used to stand on, and the upper ones as ledges to place the bricks ready for the overhead course. Starting from a quoin, no closer is used, two headers with a cross-joint breaking-joint about ½ in., as the rough bricks are about 8½ in. long and 3¼ in. wide, and no care is taken in the bedding course to guard against "straight joints."

In house or shop building, when not built with a steel skeleton, the inside walls are all carried up independently of the front, "blocking courses" (Fig. 2), instead of

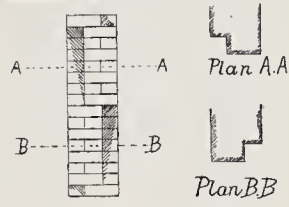


Fig. 2.

"toothings" and "anchors" (tie-irons), being the only provision for bonding the front to the cross walls.

The front is usually built by "lumpers," or piece-workers, and is generally in half-bond (Flemish bond being very rarely used), tied in at rare intervals with a "clip course" (Fig. 3)



Fig. 3.

perhaps every fifth, seventh, or ninth course. The best bricks used for front work are known as "Philadelphia pressed," red in colour, with a very true arris, and are laid in fine, pure white mortar with a joint of ½ in., being only "battered," and not bedded solidly. As the mortar squeezes out on the front when the brick is laid it is left till it gets stiff, and is then cut off with the trowel, thus doing away with the liability of smearing the face of the brick, which would occur if the mortar were cut off in a soft, wet condition. As the bricks are laid they are given a slight overhanging tilt, which enables the work to proceed more rapidly, as less care is needed than if the work were left perfectly straight and true, for when looking up the face of the work there is no projecting under edge of a brick to be seen, and it looks perfectly smooth, but when looking downwards, which, of course, is not the way a building is viewed, the face appears to be a series of ledges. The joints are finished with a small trowel, cut off top and bottom, and correspond to our tuck-pointing work, without the artificiality of red stopping.

There is one specially fast style of laying bricks which is not universally known, and is called the "Boston Stroke," no doubt because it originated in Boston, and which is chiefly used on rough work (sewers, etc.). It consists of picking up one brick and enough mortar for that one brick at a single operation, and as no mortar is spread, but the brick pressed home in the mortar with the hand only, it is obviously very labour-saving, as compared to the usual method of stooping for mortar only, then spreading the bed for perhaps three or four bricks, stooping separately for each brick, and by the time the third or fourth brick is laid the mortar is stiff and the brick is laid with great difficulty.

The scaffolding, being of a very simple

character because of the overhand work, is built up on each floor, and consists of "horses," which are really elongated carpenters' stools, about 4 ft. 6 in. high and 5 ft. wide, while the scaffold "boards" consist of 9-in. by 3-in. planks in about 10 ft. lengths, two "horses" to each length. This system would be used for three tiers in height, and then, if necessary to go higher, standards, ledgers, and putlogs would be built up to make a platform for the "horses" to be used again. These standards, ledgers, etc., would be composed of rough timbers to hand, and not resembling in any way the poles, putlogs, and boards so dear to the London scaffolder. J. A. W.

Fifty Years Ago.

FROM THE *Builder* OF JANUARY 12, 1856.

On the 3rd inst. Professor Cockerell commenced his course of lectures on Architecture, at the Royal Academy, to a smaller audience than we would have seen there, mainly owing, as we believe, to the want of proper notice to the public. The now veteran Professor apologised for his reappearance for the third time since his announcement of a successor who would give to the students his new lights and a fresher activity, suited to our times, especially after a fifteen years' prosecution of these lectures, through the same hands and enunciation; but his appointment had not yet been concluded in the slow

progress of academic changes. With respect to academical provisions, he must say that the comparison of our own architecture with those of France showed us to be wholly deficient—that paternal government contrasted with our orphan government most advantageously for our instruction. It might be called the comparison of the system of protection and the voluntary and free-trade system, which might do much that was good, as the Institute and others, but there must be much that perished in the wearing. Concentration and a systematic order and administration, as in France, of all education—of this, as of other departments—was most desirable. We had learnt, by fatal experience, what the neglect of such administration was in war—it could not be doubted that it might be so in peaceful occupations, if put to the test, no less to our disadvantage; and it was the deliberate opinion of the scientific English members of juries in France that the French protective system of culture, encouragement, and honours, was fast leaving our own orphan and desultory system in the rear. The architectural drawings of the *monuments historiques*, and of the *grands prix de Rome*, greatly surpassed our national productions in diligence, style, and beauty, and were examples to follow.

RENOVATION OF CLUB PREMISES, BRADFORD.—The premises of the Bradford Liberal Club have recently been repainted and redecorated. The whole scheme was carried out by Messrs. E. Harland & Sons, under the direction of Mr. B. D. Fairbank, architect.

Illustrations.

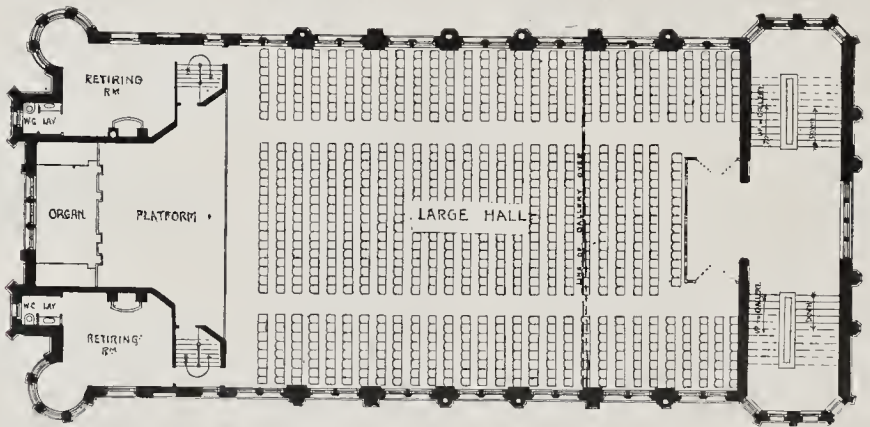
PROPOSED CHURCH HOUSE, MANCHESTER.



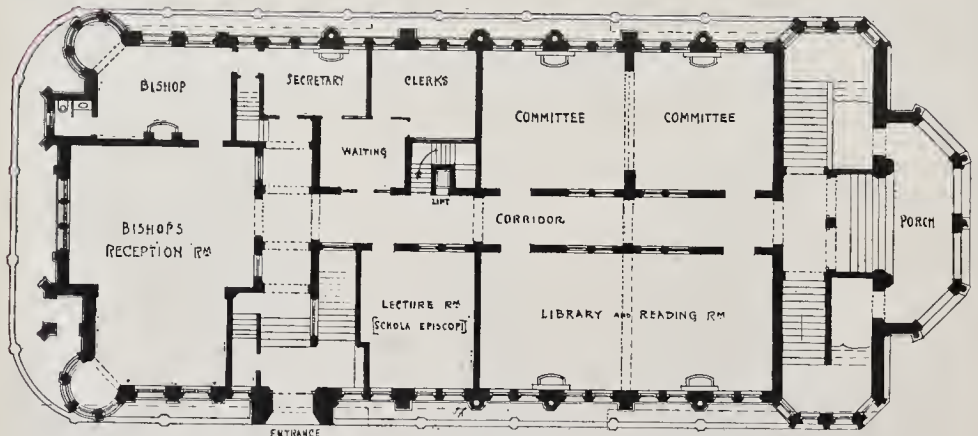
THIS design was made with special reference to occupying the site of the present church of St. Peter's, situated in St. Peter's-square, now proposed to be removed. A portion of the present site has been added to the surrounding streets for the benefit of traffic at this point, which is very considerable. It is an "island" site, and even if the whole of it were allowed to remain open, some at least would probably have to be taken for the purpose of road widening.

The main entrance is at the Peter-street end, and is in the form of an angular porch. The upper floor is occupied by a large hall to hold 1,200 people, available for public meetings, lectures, or sacred concerts, with suitable platform and organ. A smaller hall is provided on the lowest floor to hold 250. Accommodation has been provided for the requirements of the Bishop of the diocese, for the Church Conference, Bishop's Commission Scholæ Episcopali, as well as for diocesan societies, home and foreign missions, Church Defence and other institutions, library and reading-rooms, etc.

The building is proposed to be executed in stone, and the style of architecture adopted is Perpendicular Gothic freely treated. The architects are Messrs. Smith & Matley, of Ridgefield, Manchester.

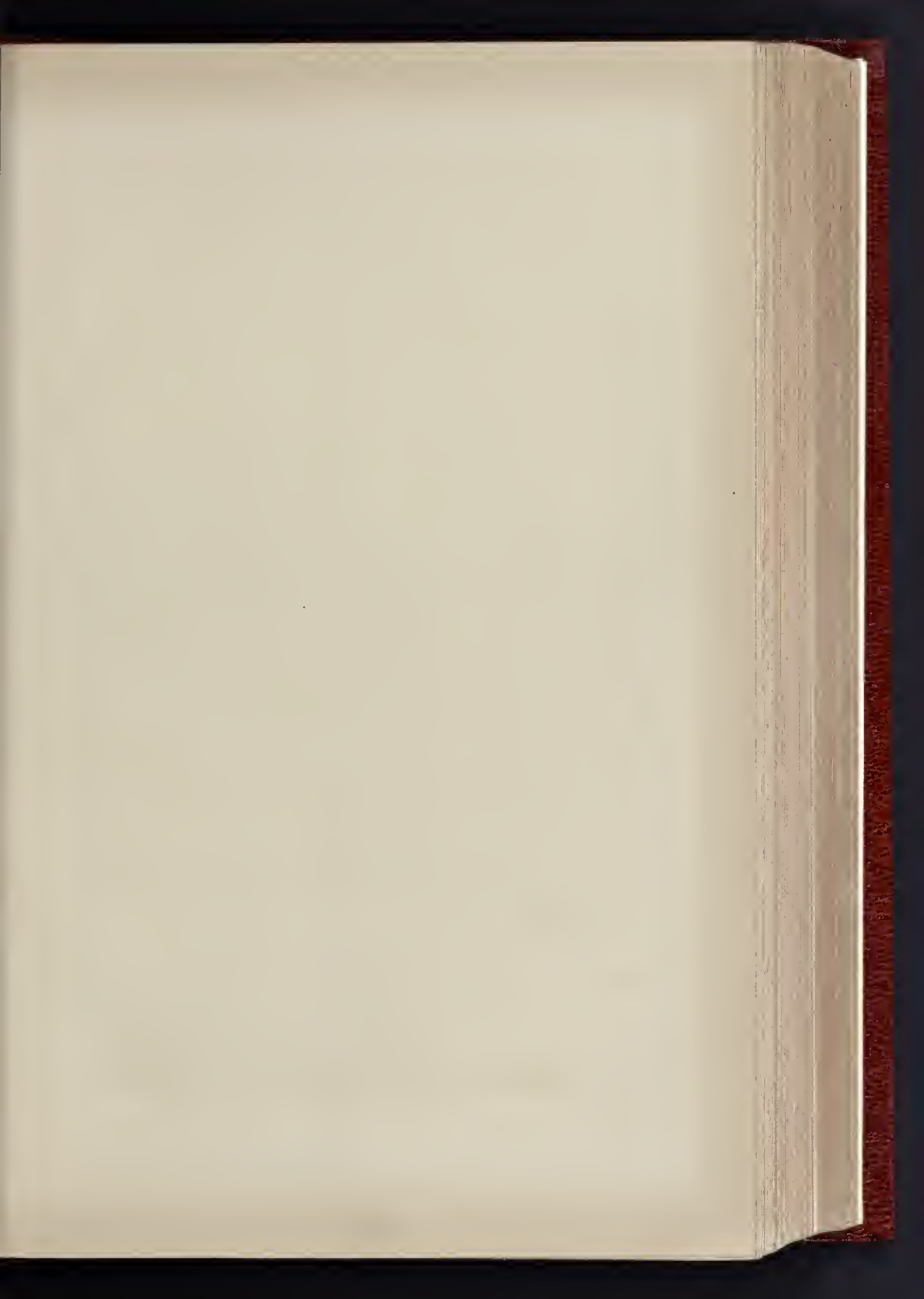


First Floor Plan.



Ground Plan.

Proposed Church House, Manchester. Plans.





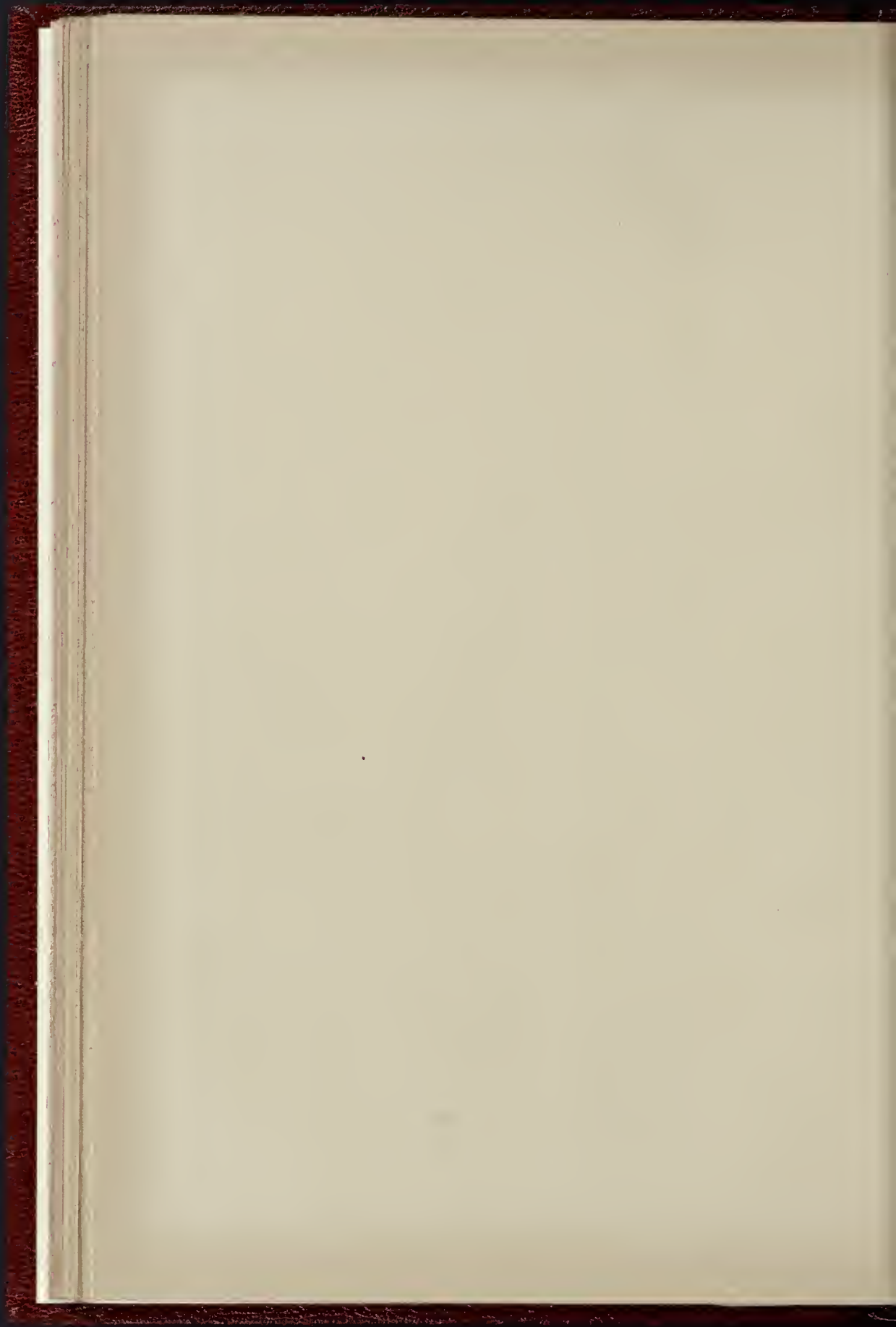
A. W. SMITH ARCHT
25, ST. MARKS PLACE
DEPT. ST. PETERS
MANCHESTER

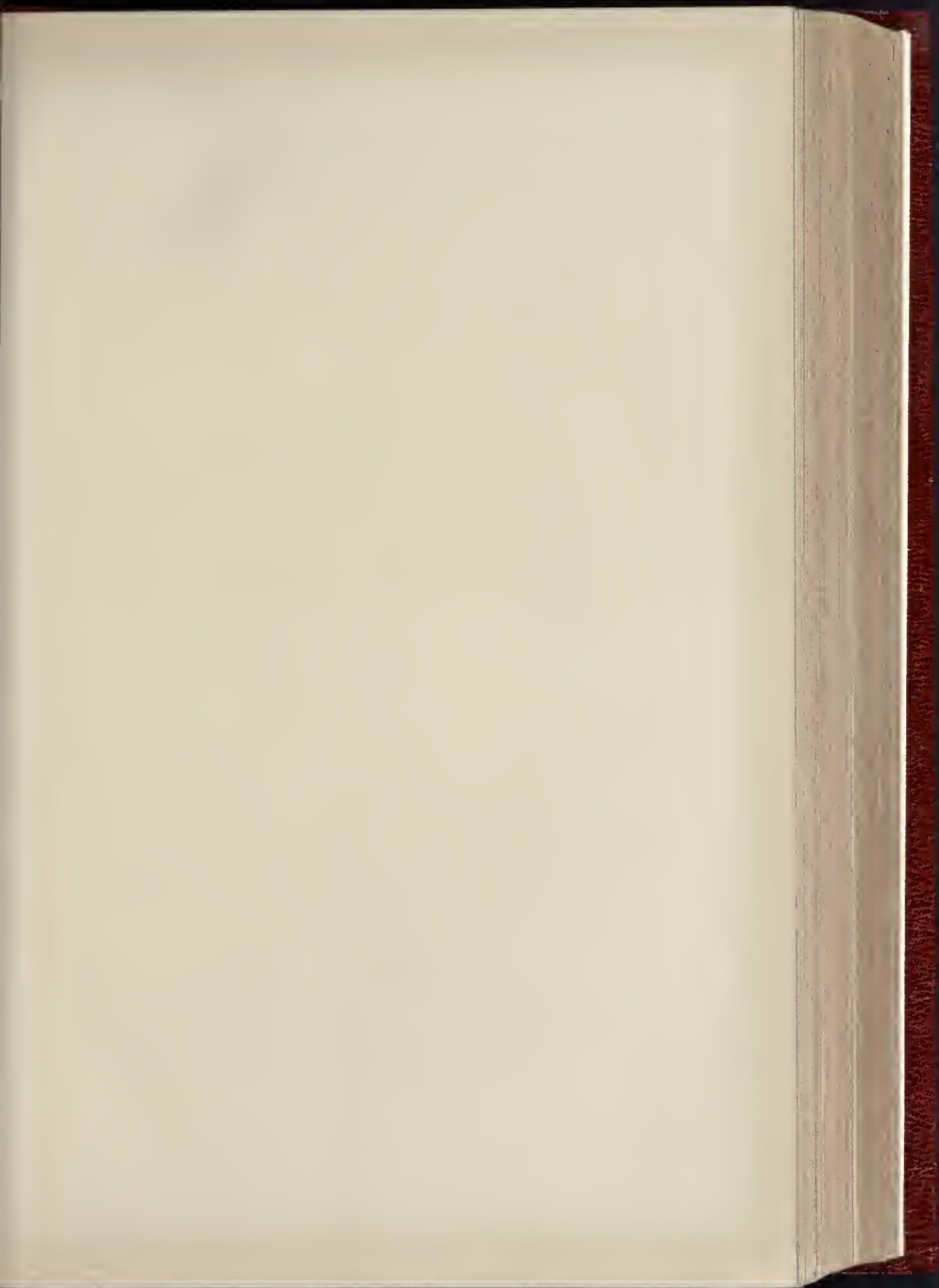
PROPOSED CHURCH HOUSE, MANC



"INK-PHOTO" SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

R.—MESSRS. SMITH & MATLEY, ARCHITECTS.

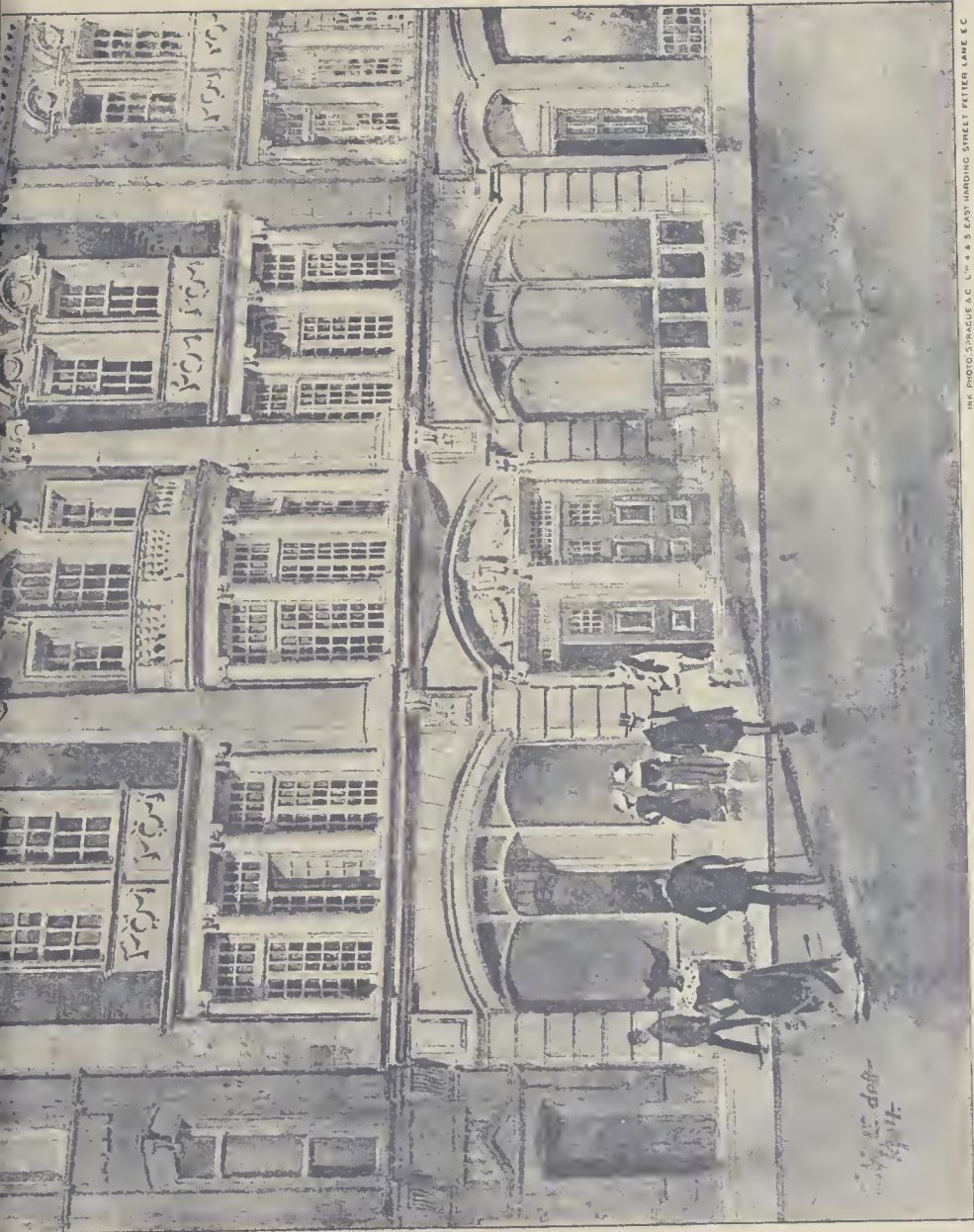




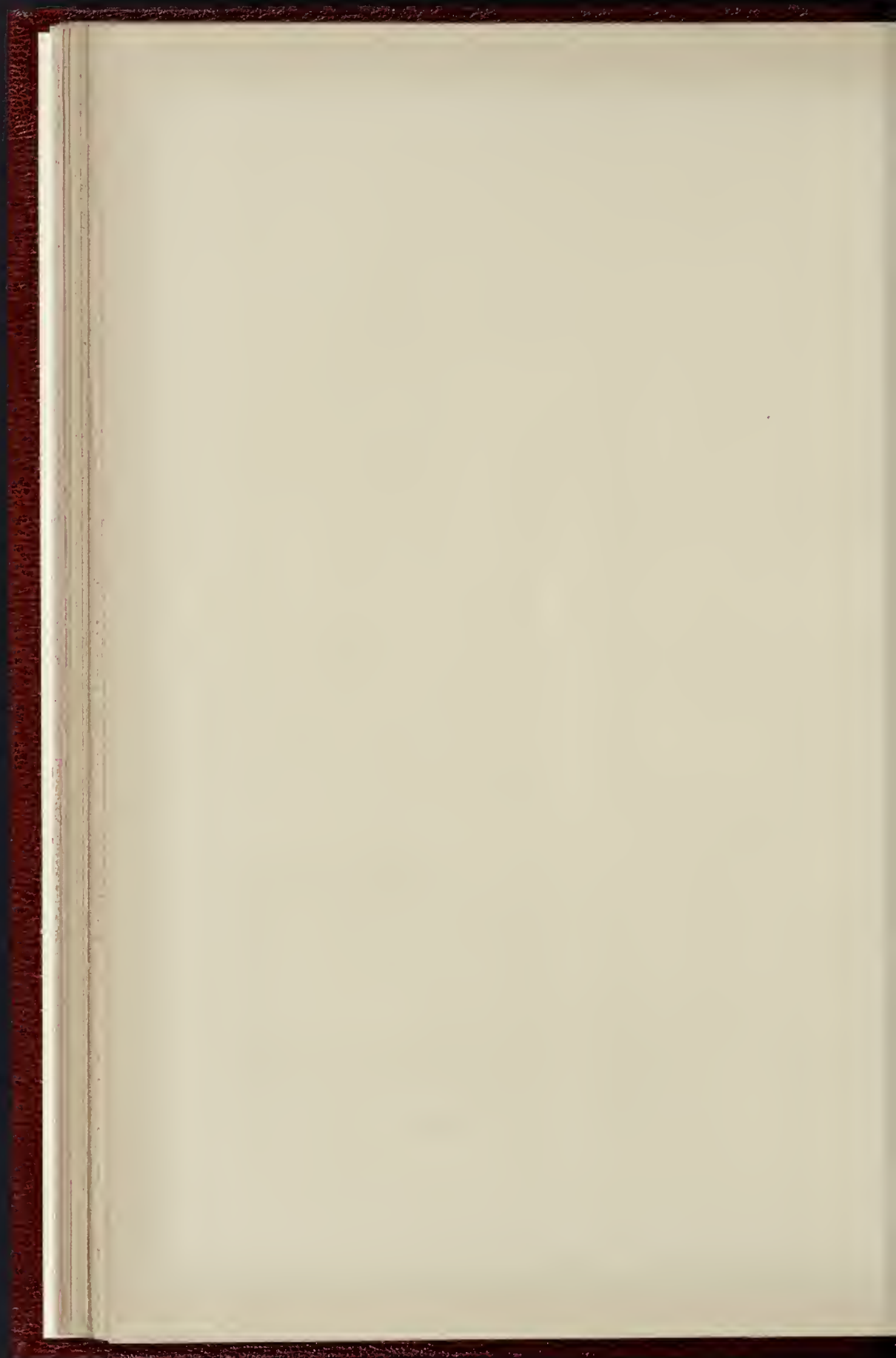
THE BUILDER, JANUARY 13, 1906.

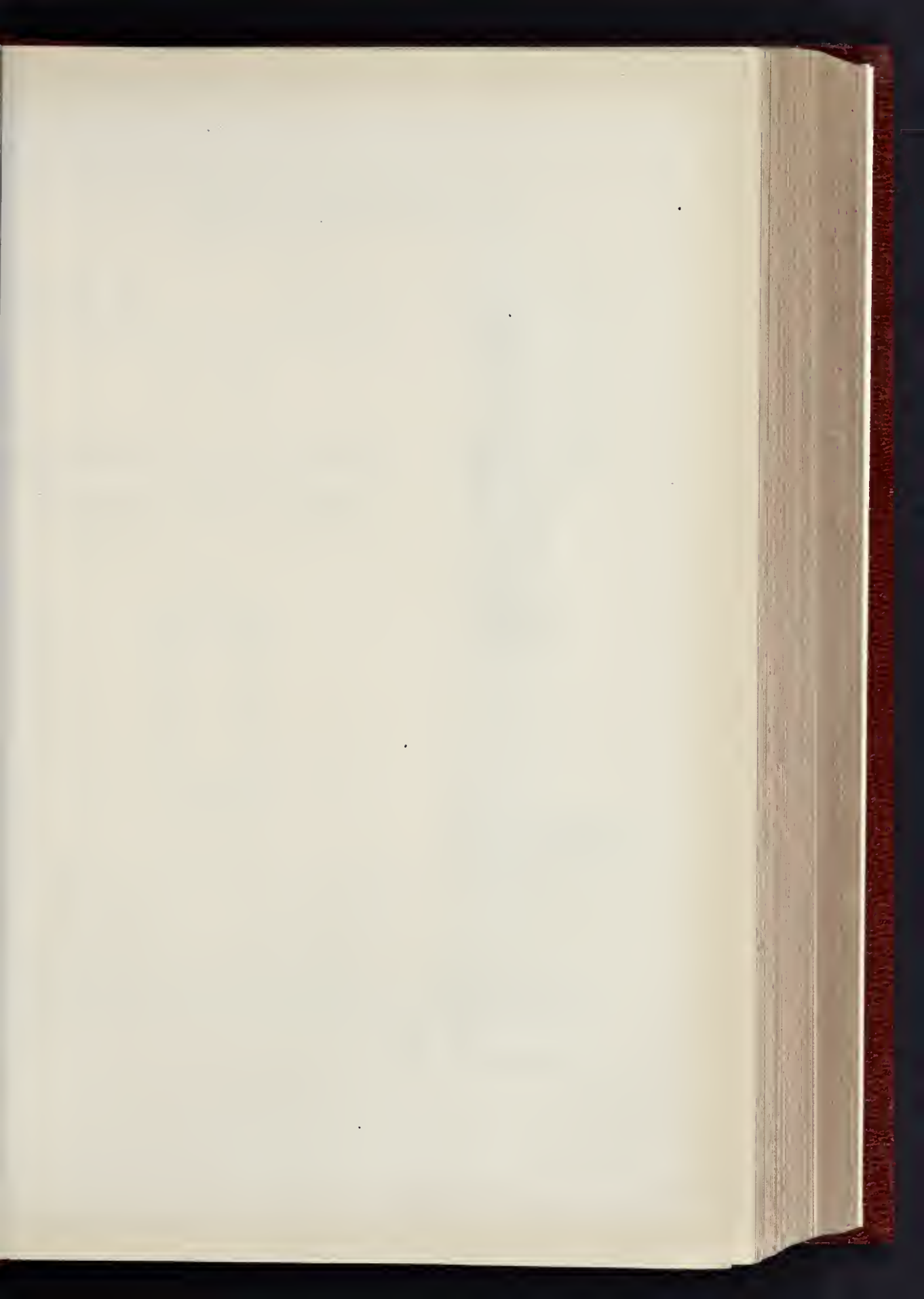
NO 45247 WIGMORE ST.
FRANK MELGOD, ARCHT
1885 ARCHITECT 1887





INK PHOTO, SYRACUSE, N. Y. L. 4 5 EAST HARDING STREET PETER LANE E. C.

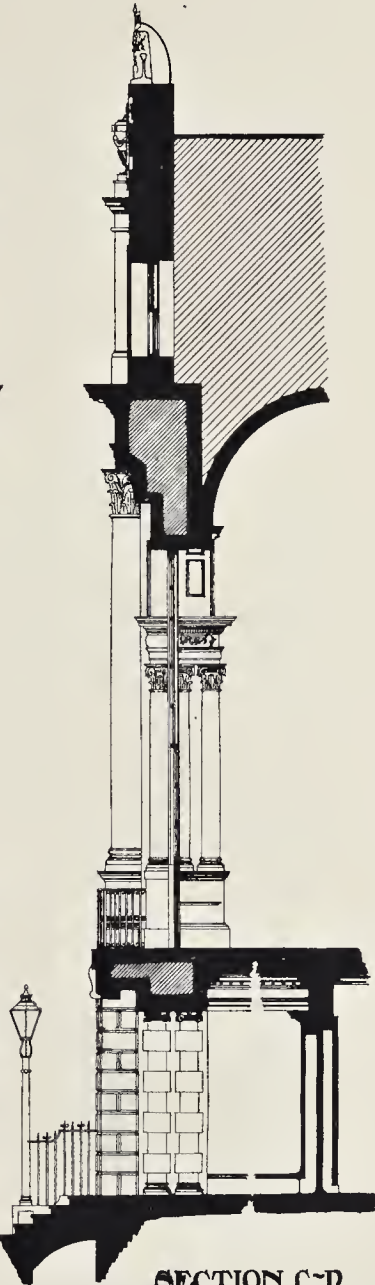




THE MANSION HOUSE DONCASTER



JAMES PAINE &
ARCHITECT 1743



INCHES 0 5 10 15 20 25 30 FEET.
SCALE OF FEET.

SECTION C-D

measured & drawn
by Arthur W. Walker.

THE MANSION HOUSE DONCASTER

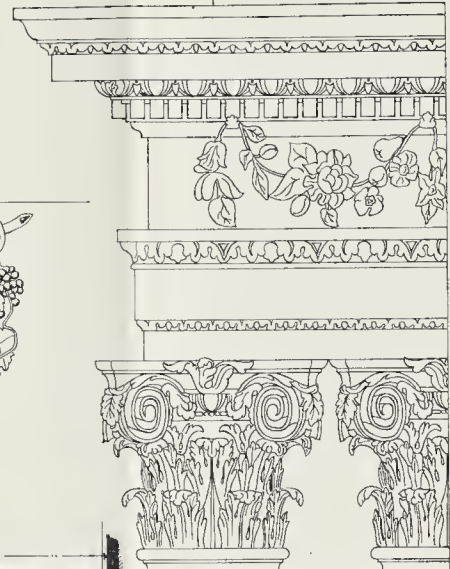
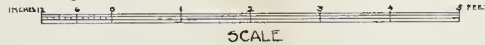
JAMES PAINE 
ARCHITECT 1745



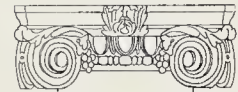
CAP TO MAIN
COLUMNS



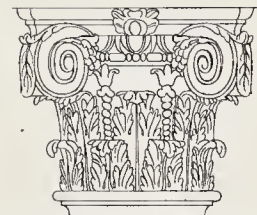
ORNAMENT UNDER MAIN CORNICE



INTERNAL ENTABLATURE
& CAPS TO 1ST FLOOR

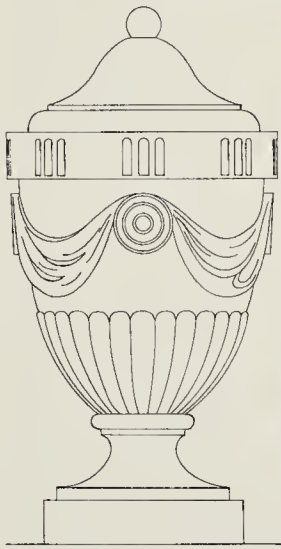


CAP TO COLUMNS
IN VESTIBULE

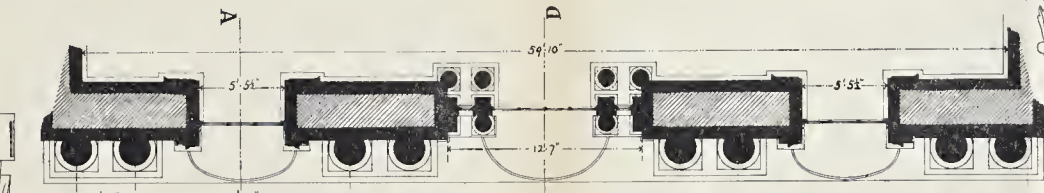


EXTERNAL CAP TO
CENTRAL WINDOW 1ST FLOOR

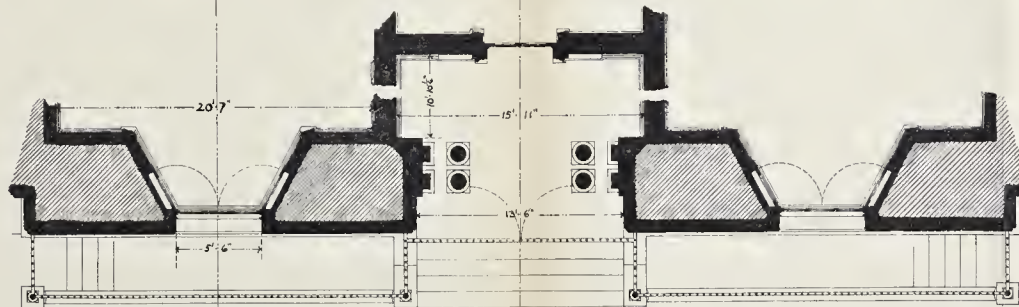
*Measured & drawn
by G. Holzworth & Salter.*



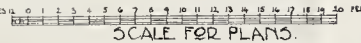
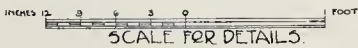
URN ORNAMENT

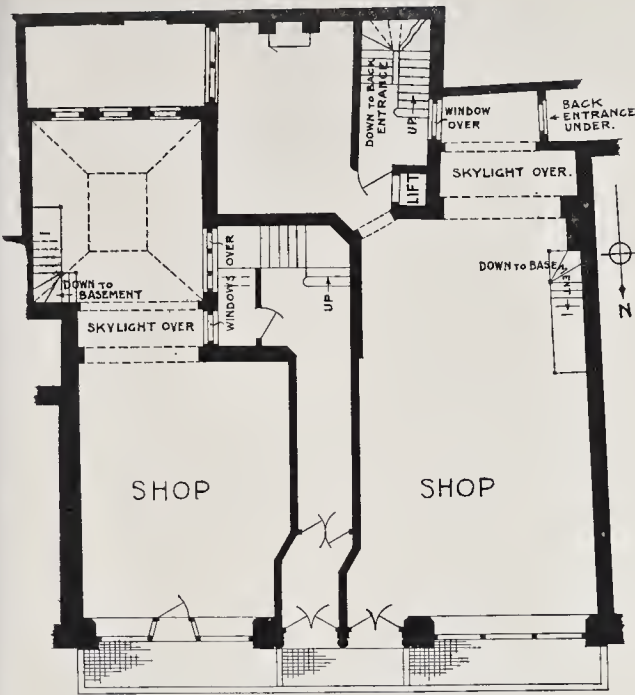


FIRST FLOOR PLAN



GROUND FLOOR PLAN





PLAN OF GROUND FLOOR

SCALE OF 0 5 10 15 20 25 30 FEET.

Premises, Nos. 45 and 47, Wigmore-street.

NOS. 45 AND 47, WIGMORE-STREET.

These premises have recently been rebuilt in this increasingly important thoroughfare, and are arranged for business purposes on the ground, first, and second floors, with a residential flat on the third floor, and another flat on the fourth and fifth stories. The front is faced with Lawrence's rubbers and Portland stone, the builders being Messrs. James Simpson & Son, of Paddington-street and the architect Mr. F. M. Elgood.

THE MANSION HOUSE, DONCASTER.

This is said to be the oldest mansion house in England, being erected prior to those of London and York. The drawings here shown are from measurement of the building as at present existing. In Paine's original design it was intended to add wings on either side, which would have added considerably to the imposing character of the building.

James Paine published in 1751 a book with the plans, elevations, and sections of the mansion house, and in which appears the following somewhat quaint Preface describing the origin and purpose of the building:—

"The Corporation of the antient Town of Doncaster in YORKSHIRE, being honour'd at their Entertainments with the Company of frequently in great Distress for suitable Rooms to receive them in, and therefore determined, in the Year 1744, to build a Banqueting-House. And in Case any Mayor was inclined to keep his Mayoralty in it, Care was taken to provide convenient Apartments to receive a Family. Having at that Time the Honour to be engag'd in several Gentlemen's Buildings in that County, I was made Choice of for their ARCHITECT. The Designs were accordingly prepared, and the FOUNDATION-STONE laid in the Spring of 1745. But the Rebellion breaking out the latter Part

of that Year, the Work was stop'd early, and the Walls were cover'd. Before the Spring following, the Corporation was pleas'd to desire me to undertake it according to the Estimate deliver'd in. To which agreeing, I proceeded with the Building, and finish'd it in the Year 1748, with the Approbation of the Gentlemen who engag'd to inspect into it, on Behalf of the Corporation, and to the general Satisfaction of that worthy Body."

The illustrations are from measured drawings by Mr. E. Holsworth Walker, of Manchester.

"UNDER THE TEMPLE PORTICO."

In my note on this drawing last week there is a correction to make; the amount of entasis of the Parthenon column should have been printed "66 in.," not "56"; perhaps '67 is nearer according to Penrose's proportions, but in fact it would have been quite near enough to have written "3 in." Penrose's extreme particularly about decimal fractions of measurements is really rather an affectation; if every column in the Parthenon had been whole and unjured, and could have been measured separately, there would probably have been found differences between one column and another which would hardly have required decimals to express them.

While on the subject, I may add that I very much doubt whether the entasis of the Parthenon columns was really set out as an arc of a hyperbola. If we knew the truth as to the manner of working, we should possibly find that it was arrived at by a much simpler process.

H. H. S.

WILLING'S PRESS GUIDE.—The 1906 issue of this guide—the 33rd annual issue—has been sent us. The work is one of the best-arranged and most convenient guides we know of; it is a handy little book and the information required can easily be found. The guide is published at No. 125, Strand.

THE SAXON PORTLAND CEMENT WORKS.

In the early days of Portland cement the chalk and clay of the Thames and Medway were used almost exclusively for the manufacture of this material. Among other deposits utilised at later dates were the Cambridgeshire marls, but the product yielded gained a somewhat unenviable notoriety, which has only been dispelled within quite recent years. At the present time the cement produced from this source is fully equal, if not superior, to the best Thames and Medway brands. The Saxon Portland Cement Company, of Cambridge, have played an important part in demonstrating the suitability of the Cambridgeshire marl as a raw material, and since the completion of their works, some four or five years ago, the Saxon brand of cement has justly acquired a reputation for high quality and reliability, and, owing to the greatly increased demand, it has become necessary to build and equip additional works, which are described below. The main feature of the new works is that the machinery and plant have been arranged so that the product will pass through the entire process of manufacture without handling, thus ensuring a considerable economy in labour cost. Raw materials are conveyed by a cableway from the quarry to the drying-house, where there are two sets of double crushing rolls with a capacity of about 10 tons an hour. The material is next conveyed to two rotary drying-drums, supplied with hot gases from the kiln-house, the raw material passing from the lower end of the drums perfectly dry and ready for conveyance to a grinding-house furnished with a battery of seven Griffin mills, from which the powdered marl is elevated to mechanical mixers, and, after having passed the requisite chemical tests, is delivered into a silo holding some 200 to 300 tons. From this silo the powdered marl is elevated to hoppers over each of the five rotary kilns, being slightly damped so as to give the necessary "bind." Each rotary kiln consists of a slightly inclined steel cylinder, 60 ft. long and 6 ft. in diameter, mounted on rollers and slowly rotated by gearing. The powdered coal used for fuel is introduced into the kilns by a jet of hot air, issuing under a pressure of about 60 lb. per square inch. The marl mixture is delivered into the upper end of the cylinder, and, descending gradually, meets the incandescent gases from fuel fed into the cylinder from the opposite end. Becoming heated to redness as it approaches the centre of the cylinder, the material assumes the form of small round balls, which reach a nearly white heat in the lower third of the kiln, and finally emerge as clinker in balls about the size of a pea. The hot clinker is cooled by five rotary coolers, through which cold air is drawn by the coal-blast fans, and the heated air thus obtained is utilised for the kilns. In the clinker grinding-house a battery of nine Griffin mills reduces the clinker to the required degree of fineness, and from them the Portland cement issues as a marketable product. The new stores have a capacity of 10,000 to 15,000 tons, the lower part being in the form of a large hopper with sloping sides, arranged so that the cement can be discharged through openings into a tunnel, along which it is carried by a screw conveyor to the loading-house. The cement is here elevated into hoppers over two automatic weighing-machines, and at this point the sacks of cement are mechanically weighed in readiness for delivery. Railway sidings with a length of nearly one mile adjoin those parts of the works where materials are loaded and unloaded. We may add that the coal used in the rotary kilns is dropped from trucks on the sidings into a hopper, whence it is elevated to a 400-ton storage hopper, being conveyed thence to the dryer, which is fed by waste gases from the kilns. When the coal is perfectly dry it is automatically conveyed to the coal grinding-house, where it is reduced to an impalpable flour by a battery of three Griffin mills. The coal-dust is then conveyed and elevated to hoppers ready for delivery to the kilns. The new works of the Saxon Cement Company have been designed by the company's engineer after exhaustive examination of the latest methods adopted on the Continent and in America, and we are informed that, while no definitely ascertained

improvement has been omitted, great care has been taken to avoid the adoption of any insufficiently tested process or apparatus.

APPOINTMENT OF DISTRICT SURVEYORS.

The following letter has been addressed to the London County Council on this subject:—
"To the Chairman and Members of the London County Council.

MY LORDS AND GENTLEMEN—

I am desired on behalf of the District Surveyors of London to address you on the question of certain proposals which have been submitted to you by your Building Act Committee involving very serious and important changes in the terms of the appointment of District Surveyors. From the report of the Council's proceedings as printed, to which your attention has been drawn in the public Press, it would seem that the changes suggested would include:—

1. (a) A reduction in the number of districts from 57 to 33.
- (b) A consequential increase in the size of the districts.
- (c) A corresponding diminution in the number of qualified professional men acting with statutory authority.
- (d) A consequential devolution of a large portion of the work of supervision to a number of assistants.
2. A dual system of payment of District Surveyors
 - (a) by salary in respect of the duties they perform under the London Building Act, 1894, and
 - (b) by fees in respect of their duties under the Amendment Act of 1905.
3. The payment of building fees to the Council in respect of works executed under the Act of 1894 and to the District Surveyor in respect of works executed under the Act of 1905.

It will be manifest that changes such as these may easily lead to confusion and misunderstanding, and tend to increase the difficulties of efficient administration of the law.

The District Surveyors respectfully submit that the supervision of building operations has been carried out by highly-trained men—many of whom have occupied the highest positions in their profession—that the public has grown accustomed to pay professional fees for professional services thus adequately rendered, and it is at least doubtful whether the suggested payment by salary will attract educated men of the first ability; from a professional point of view therefore the reflection suggests itself that changes in the direction indicated above may not be in the interests of the best and most efficient administration of the Building Laws.

The District Surveyors do not wish to suggest that there may not be points of detail in the present system which may with advantage be altered, and they desire me to add that they will be happy by conference or otherwise, to assist the Council in its efforts to improve a system which, in the opinion of many, has hitherto worked to the public advantage,—I am, my lords and gentlemen, yours faithfully,

THOMAS HENRY WATSON,
President of the District Surveyors' Association.

9, Conduit-street, W., January 8, 1906."

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The fifth meeting was held at 13, Tufton-street, S.W., on Wednesday, January 3, Mr. E. W. M. Womacott in the chair.

Mr. Philip J. Turner, A.R.I.B.A., read the following paper on the "Houses of Parliament":—

"My principal reason in selecting the 'Houses of Parliament' as the subject of my paper was the opportunity afforded me by Mr. Charles E. Barry (the grandson of the architect of Westminster Palace) of bringing such interesting drawings as you see here this evening.

In dealing first of all with the site and the old Houses of Parliament it should be remembered that for many hundred years Westminster, from the time of the Conqueror, appears to have been the Metropolitan seat of Government, the principal palace of the King, and the Court of Judicature of the kingdom. The ancient Royal Palace of Westminster covered, in fact, the ground now occupied by the two large courts known as 'Old Palace' and 'New Palace' yards. William Rufus erected Westminster Hall in 1097 as the nucleus of an extensive Palace he proposed building, which, though destroyed by fire, was almost entirely rebuilt by Richard II. in 1394-97. King Stephen founded St. Stephen's Chapel, which was

rebuilt in 1364, and, though it was destroyed in the fire of 1834, its memory is still retained, the name St. Stephen being synonymous for the Houses of Parliament themselves. This chapel seems to have been a perfect and magnificent specimen of the style in which it was built. The chapel was fitted up for the House of Commons in the reign of Edward VI. After the ancient Palace had been almost wholly destroyed by fire in 1512, Henry VIII., in 1530, bought Whitehall, and the Palace from this time became deserted by Royalty. All that now remains of the old Palace is the great hall and the crypt under the Chapel of St. Stephen.

For many years previous to the destruction of the old Houses of Parliament by fire, various plans had been suggested for enlarging and improving the buildings, and negotiations for building a new House of Commons were actually in progress in 1834. Previously, in 1739, William Kent had submitted plans for new Houses of Parliament and Law Courts. The general idea of the two Houses separated by a central vestibule in his scheme resembles that adopted in the present buildings. The elevations remind one very much of the Horse Guards. Sir John Soane's designs, dated 1794 and 1769, for various improvements to the old Houses are to be seen in the Soane Museum. After the fire of 1834 Sir Robert Smirke roofed and refitted the Painted Chamber as a temporary House of Lords, the Commons occupying the Court of Requests. Instructions were also given to him to prepare plans for a new building, but this was finally abandoned for an open competition. The claims of the Gothic style were now in the ascendant, and when, in June, 1855, the terms of the competition were published, the instructions to competitors stated that the style to be adopted was to be 'Gothic or Elizabethan.' Four premiums of 500*l.* each were promised, and six months allowed for preparing designs—surely far too short a time for such an important building. Ninety-seven designs were sent in, and the Commissioners' Report, dated February 29, 1856, recommends that the successful architect's drawings "shall be submitted from time to time to competent judges of their effect, lest from over-confidence, negligence, or inattention in the execution of the work we fail to obtain the result to which our just expectations have been raised."

A good definition of what we should look for in the design of a Parliament House is given by Mr. H. H. Statham in his book on "Modern Architecture." He says:—"A Legislative Palace should be the symbol of the greatness of the nation in regard to wealth, artistic taste, and political power." "The character of the architectural design should have something distinctly and recognisably national about it—something which could not well be found on any other soil."

The general idea of the plan, a large central hall connecting the two chambers, is well known and seems to have been adopted by almost every national Parliament House since built. In studying the accepted design it must be remembered that the architect had not an absolutely free site, but was governed by the existence of Westminster Hall and the Law Courts and the Crypt of St. Stephen's Chapel. The lowness of site was a great drawback, and the erection of a great terrace, as at Somerset House, was proposed, but never pressed, owing to the great cost involved and other drawbacks. The site is irregular, being wedge-shaped on plan, and the existence of Westminster Hall and the Law Courts make a continuous elevation on the land side impossible. Mr. Barry, in the competition perspective made in 1836, intended that the Courts should be removed, and continues his design right up to the north-west corner of the site, thus enclosing New Palace-yard.

There is little doubt that Gothic and Perpendicular Gothic was the right style to adopt, rather than the alternative, viz., Elizabethan. As Westminster Hall would either ruin any design or make a special feature of it, Mr. Barry decided to make the hall his great public approach, and by building St. Stephen's Hall over the old chapel crypt access was obtained to the centre of the site. The principal floor of the Palace is all on one level, with not a single step except to Westminster Hall and the altered lobbies of the House of Commons.

The plan has been described as a Classic

design with Gothic detail, and many, including Mr. Pugin, would have preferred a more picturesque treatment, but the architect always contended "the symmetry and regularity were essential to unity and grandeur." The spire, 266 ft. high, over the central hall, was not part of the original design, but added to meet the requirements of Dr. Reid's ventilating schemes. St. Stephen's porch is also an addition, made by Mr. Barry on being appointed to carry out the work. The central hall was intended to be much higher than it now is, but was lowered in execution to meet Dr. Reid's requirements in his ventilation scheme. The House of Lords was lavished with decoration, it being not merely a place of business, but also the Court of the sovereign. In this decoration Mr. Welby Pugin took an important part. The size, shape, and acoustic properties of the House of Commons have always given rise to considerable criticism. There is only a small average attendance of about 300 members, and no doubt this and the advice of the authorities of the House led to the chamber being made of the smallest possible size. The requirements of Dr. Reid for his schemes of ventilation entailed alterations to both plan and design. Dr. Reid's appointment being independent of the architect complicated matters considerably. His scheme never met with Mr. Barry's approval, and were always the subject of repeated controversy between them until the cessation of Dr. Reid's connexion with the new Palace.

In comparing the original design of the river front with that executed a different treatment is discovered. Some means being required for breaking up the monotony and comparative bareness of this long front, Mr. Barry decided to further raise the centre portion, to make towers of the flanking masses, and to introduce visible roofs and turrets. The windows of the two principal stories were formerly set in arched recesses, but these were abolished, together with the pointed heads of the windows. The general character of the front to Old Palace-yard is the same as the river front, except that the alternate bays are advanced and the front is divided into three floors instead of two above the basement.

The great Victoria Tower underwent various alterations. Originally designed 100 ft. square, it has been reduced to 70 ft. The present fine arches, 53 ft. to the apex, replace an entrance of quite moderate dimensions. The numerous studies Mr. Barry made for this tower show that it must have caused him enormous trouble. The tower is 336 ft. high to the top of the pinnacles, and over 400 ft. to the top of the flagstaff. The flagstaff is of rolled sheet-iron, bolted together, and is 110 ft. long and 3 ft. in diameter at the base. The design of the Clock Tower must have given even more trouble, as drawing after drawing were made and rejected by the architect. The clock in this case had to be the prominent feature on the topmost story and of immense size, and the idea carried out of projecting the clock story beyond the body of the tower was at last adopted.

The elevations, in a general way, have been criticised as being overloaded with ornament and small detail, but Sir Charles Barry's contention was that detail could not be excessive in amount if continued consistently in every part of a building.

The whole Palace covers a site of about 8 acres, the river front being 840 ft. in length. The House of Peers is a double cube, being 80 ft. long and 45 ft. high and broad; the House of Commons is 75 ft. long by 45 ft. wide. The work of the river wall was begun in 1837, and from the outset of the work unforeseen troubles were met and expenses incurred. The Royal Commission, appointed to select the stone to be used, reported that Bolsover Moor should be adopted. Unfortunately, it afterwards appeared that the quarries could not meet the demand, and a limestone from North Anstone was used, which has not proved itself able to resist the London atmosphere satisfactorily. The interior walls are built with Cowley bricks and faced with Caen stone. An iron and brick construction was adopted in the floors; the roofs were constructed and roofed with galvanised iron, so that the entire building is of fire-resisting material.

The first stone was laid on April 27, 1840, and the works were rapidly proceeded with

under the contractors, Messrs. Grissell & Peto. The architect seems to have been hampered from the beginning, and in 1844 a Commission of Inquiry was appointed, in which the Duke of Newcastle, then First Commissioner of Works, urged that Mr. Barry should be allowed a freer hand. Before the Fine Arts Commission of 1841 Mr. Barry laid his views regarding the best way of encouraging painting and sculpture in connexion with the new building. Briefly, he recommended the adoption of decorative historical paintings, the use of British marbles, encaustic tiles for paving, and that the windows be doubly glazed with stained glass. Westminster Hall was to be used as the depository of naval and military relics of former wars. A suggestion made by Sir Charles Barry was of forming a "campo santo" between the hall and the proposed additional buildings enclosing New Palace-yard.

Between 8,000 and 9,000 original drawings and models were prepared for the works, in the preparation of which Mr. Welby Pugin ably seconded Mr. Barry. The former was appointed superintendent of the wood-carving; he also supervised the execution of the woodwork, stained glass, and tiles. The head carver was Mr. John Thomas. The scaffolding for both towers was designed by the architect, and dispensed with the use of external scaffolding. In February, 1847, the House of Peers was occupied for the first time, and in 1852 the Royal approach was finished, and finally the towers, last of all being the Victoria Tower, incomplete at the architect's death in 1860. The original estimate was 707,104*l.*, the amount expended being nearly two millions. The main item in this increased cost was the cost of the fittings, decoration, and sculpture required by the Fine Arts Commission. The cost per foot cube is about 2*s.* 6*d.* Various schemes have been suggested for providing extra accommodation, notably a fine plan submitted by Mr. Barry in 1855 for extending the buildings westward along New Palace-yard and southward to St. Stephen's Porch, thus enclosing the whole square. This would have given a fine public entrance at the north-west angle of the site. Mr. Pearson's work in the restoration of the hall was carried out in Kelton stone, which seems to have stood well. Of the various suggestions made for enlarging the House of Commons, that of lateral extension, proposed by the late Charles Barry in 1893, seems to be by far the best.

The paper was illustrated by original drawings, kindly lent by Mr. C. E. Barry, and by lantern slides.

Mr. R. H. Weymouth, in opening the discussion, pointed out how much better the exterior detail was than the interior detail. The terrace, though a fine feature, he thought inferior to a water frontage. The latter was warmly discussed by other speakers, as also the justice of the criticism that it was a Classic plan with Gothic detail. Mr. Fyfe suggested that all great buildings should have a museum of drawings and models open to the public.

Mr. H. H. Statham, in summing up the discussion as Special Visitor, said that the position of the Houses of Parliament close to the river, in spite of the low site, was he believed partly selected for political reasons, and on the advice of the Duke of Wellington, who thought that the House of Legislature should never be so placed that it could, in any time of tumult, be surrounded on all sides by a mob. The existence of the building was one illustration of the advantage of architectural competition for national buildings. According to his recollection, the choice of style for the competitors was Tudor or Elizabethan, which would be quite right, seeing that these two phases of architecture were both distinctly English and national. In regard to the question of symmetry, Fergusson held that the building should have two symmetrical towers, two Victoria Towers as it were, instead of two of different design; but he did not agree with that, as the two towers were for perfectly different objects, one a state, the other for the practical purpose of carrying a clock, they were therefore rightly treated differently. Their position at the two extremities of the building was a good point, as it showed the extent of the plan from a distance; and the centre spire, marking the centre octagon, was one of the happiest of afterthoughts, and in this case the

architect might be considered to be indebted to the ventilating engineer for the requirements which led to it. He had not heard of any new scheme of ventilation being suggested recently, though there might have been some improvements in detail. He had gone all through the ventilation system of the House some years ago, and believed it was on the whole one of the best ventilated buildings in existence, and that complaints to the contrary effect only emanated from a certain class of members of Parliament who would never be contented with anything; but he thought the admission of the air through the floor was a bad point, as it tended to carry up dust from the floor with it. Barry's objection to bringing forward the centre of the façade of a great building was a general principle with him, and the objection to it was remarkably illustrated at Versailles, where the centre of the garden front was brought out a long way in front of the main line of the building, with the consequence that from no point of view could the whole extent of the façade be taken in. Barry's proposal to carry the architectural design of the building round Westminster Hall and enclosing Palace-yard, thus making the architectural treatment homogeneous, was he thought entirely right; the west side of Westminster Hall had been entirely destroyed externally, and the restoration that had been made was valueless because only conjectural. He could not agree with Mr. Weymouth that any more irregular plan was desirable to be in accordance with Gothic feeling; the existing plan was really the essence of the design, and the finest thing about it; but he agreed that the river front would have had a finer effect had it risen straight from the water without the intervention of the terrace, though the terrace no doubt was a great practical convenience. He felt quite sure that no spire had ever been intended for the Victoria Tower, and it certainly would be no improvement; the tower was quite complete as it stood. What Mr. Weymouth and Mr. Fyfe had said about the interest of the drawings of such a building being available for inspection was very true; the best suggestion of the two, he thought, was Mr. Fyfe's of having a museum-room of drawings and models in the building itself. The small area of the actual "Houses" in the plan of the building was no doubt remarkable; but it was a practical question of keeping the Chambers small enough for a speaker to be heard without undue effort; and after all, the proportions in the plan represented Parliamentary life, for every hard-working member would say that it was not so much attendance in the House as work in the Committee-rooms which formed the real labour of Parliamentary life. He differed entirely from the suggestion that the Victoria Tower would be improved by another story; he considered it a perfectly proportioned tower. He was one of the greatest admirers of the architectural aspect of the Houses of Parliament, having for many years lived close to them, and having found the varying aspects of light and atmosphere, a constant source of enjoyment. He might mention that one very effective view of the Victoria Tower was that which was to be seen from the "Little Cloister" of Westminster Abbey. He considered that Mr. Turner had made a very good summary, within necessarily brief limits, of a great subject.

On the instance of the Chairman, votes of thanks were passed to the author, to Mr. C. E. Barry for his kind loan of drawings, and to Mr. Statham for his attendance amidst the pressure of business.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At the general meeting of the Birmingham Architectural Association, held on Friday last week, the Vice-President, Mr. J. L. Ball, in the chair, Mr. Mowbray Green, A.R.I.B.A., read a paper on the "Architecture of Bath of the XVIIIth Century," which was illustrated with a large number of lantern slides.

PROPOSED CLUBHOUSE, OGMORE DOWN.—Plans for a new clubhouse for the Ogmere Down Golf Club have been prepared by Messrs. Linton & Barker, architects, of Newport. The building will consist of one story, with an attic floor above, and the work will be carried out in stone.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—With the permission of Mr. Vincent W. Hill, General Manager of the South-Eastern and Chatham Railway, a visit of this Institution took place on Saturday afternoon, the 6th inst., for the inspection of the methods adopted in supporting the end of the Charing Cross Station roof after the recent disaster, and of the operations which are now in progress and which are proceeding night and day for the removal of the entire structure. Upwards of 200 attended. Mr. G. Ellison, of the Engineer's Department, and Mr. J. W. Nisbet, who is in charge of the work for Messrs. John Aird & Sons, fully explained all the features of interest to be observed, including the steel ropes connecting the feet of the three end principals to relieve the strain on the tie-rods, the two wooden towers and connecting timbering and the travelling stage now in course of construction for taking down the entire roof. The members also had the opportunity of ascending the timber towers, and seeing closely how the principals are supported at seven points, and how the removal of portions of the roof is being accomplished.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting on Tuesday, the 9th inst., Sir Alexander Binnie, President, in the chair, two papers were read—namely, "The Elimination of Storm-water from Sewerage Systems," by Mr. D. E. Lloyd-Davies, Assoc.M.Inst.C.E., and "The Elimination of Suspended Solids and Colloidal Matters from Sewage," by Lieut.-Colonel A. S. Jones, V.C., M.Inst.C.E., and Mr. W. O. Travis.

The scope of the first paper was limited to a description of experiments and investigations into the subject of the discharge of storm-water from populous districts. A formula was framed for the estimation of storm-water discharge likely to obtain in underground channels from various defined areas, and this formula was proved by means of tables and diagrams compiled from experiments in the sewers of Birmingham, extending over twelve months, together with figures obtained from various other sources. An endeavour has been made to prove the accuracy of the various instruments used for the experiments, and the validity of the calculations adopted. The paper concluded with a description of a new type of storm-water overflow chamber constructed in 1904 in Birmingham. The importance of constructing bell-mouths on outlets from man-holes in surface-water culverts, and of making the connexion above the highest flood-water level when the velocity in the main exceeds that of the affluent, was emphasised.

In the second paper attention was drawn to the fact that the solids in suspension in sewage, and the sludge resulting therefrom, have monopolised general attention, to the entire exclusion of the colloids and the sludge to which they give rise. The presence of colloidal substances in sewage was established, and it was shown that, though variable in amount in different sewages, and in the same sewage at different times, they may be safely estimated as at least one-half of the organic constituents of settled or filtered sewage. The importance to be attached thereto, however, was demonstrated to be not so much a question of quantity, as of behaviour in, and method of elimination from sewage. It was shown that ordinary tank operations, though they will cause the deposition of the suspended solids, and the formation of that sludge which has always been regarded as the crux of the sewage-disposal problem, will have practically no influence upon the colloids, which will require to be brought into intimate or prolonged contact with material upon which they become particulate, forming a hitherto unrecognised and consequently disregarded sludge. Observations and experiments were adduced to substantiate the contention that sewage is clarified by the physical operations—deposition of suspended solids, and abstraction of colloid and other substances as solid matters from solution and pseudo-solution—and that the bacterial influence is secondary and subservient thereto. So that whether sewage be discharged into the sea, or a river, or on to natural or artificial filtration areas it is clarified in virtue of the elimination of solids, and not by reason of the biological character of the operation

which has attended the liquid in its passage. The secondary nature of the bacterial action was evidenced by the fact that the organisms are occupied in dealing with the solid matters which have been separated from the sewage, and which therefore are, in so far as the original liquid is concerned, out of consideration. Its subservience was illustrated by the existence of large accumulations which necessitate removal, proving that the ratio of deposition is in excess of bacterial resolution. The accumulated solids were demonstrated to be much greater in amount than is commonly supposed, and to have, in all parts of the treatment area, the characteristics of, in fact, to be identical with, ordinary sludge. These statements were substantiated by the results of nearly seven years' work in connexion with the triple contact beds at Hampton-on-Thames. These triple contact beds were adduced as a striking object lesson, not only as regards the retention of organic solids, but also as an example of the protracted, if not inadequate, character of the bacterial operation. In addition, they point to the necessity for the greater protection of artificial filtration areas from the intrusion of depositable matters. In land treatment this necessity was demonstrated to be not so manifest, and certain data being assumed, tanks, etc., which have had a long practical trial are described and illustrated. On the other hand, where artificial processes are adopted, the more perfect elimination of suspended solids and colloidal matters becomes imperative, and means for ensuring such removal must be provided. A means to this end was described, and illustrations of the hydrolytic tank system, with the results of ten months' working, were given.

It was announced that forty-eight Associate Members had been transferred to the class of members—viz., Messrs. C. W. Anderson, J. T. N. Anderson, G. S. B. Andrews, R. J. Angel, Eduardo Argenti, Herbert Ashley, C. J. Batley, Harry Becher, C. E. Brenner, C. J. Brown, James Brown, F. A. Campion, J. P. Copland, W. R. Copland, jun., H. G. Coventry, F. J. R. Dixon, W. B. Dawson, A. L. Dickie, J. R. Dixon, R. J. Durley, G. E. Fedden, F. C. Fovle, J. W. F. Gardner, David Gravel, T. A. Hall, H. J. S. Heather, C. Q. Henriques, D. W. Herbert, Arthur Hill, Frank Howarth, J. L. Joken, W. O. Leitch, jun., F. H. Longhurst, J. A. McPherson, D. E. Marsh, Frank Massie, H. J. Morton, James Munce, H. E. Oakley, Hugh Oldham, F. G. Royal-Dawson, W. B. Shaw, A. M. Tippet, C. B. Trye, William Waddell, L. A. B. Wade, J. E. Wilcox, C. B. Williams.

It was also reported that twenty candidates had been admitted as Students—viz., J. P. R. T. B. Bacon-Phillips (London), M. A. Beg (Manchester), W. D. Donkin (New South Wales), E. P. Hill (Manchester), A. L. Lawrence, B.A. (Cantab.) (London), W. D. McLaren (Glasgow), A. B. Marshat (Rockdale), K. P. Peddie (Coopers Hill), J. E. Pullen (Wolverhampton), M. K. Rice-Oakley (London), R. A. Routh (Coopers Hill), S. A. Sayer (London), W. Sharp (Coopers Hill), D. Shepherd (Edinburgh), S. T. Stubbs (London), A. J. Venables (London), H. D. Wheeler (Norwich), A. Williams (Wrexham), C. M. Wilson (London), F. W. Wilson (Malvern Wells).

The monthly ballot resulted in the election of three Members—viz., C. E. Dupois, M.A. (Cantab.) (Sudan), R. F. W. Hodge (Howdon-on-Tyne), G. Jones (London); and of twenty-eight Associate Members—viz., D. Anderson, B.Sc. (St. Andrews) (London), H. Anderson, Stud.Inst.C.E. (Bombay), J. B. Benjamin (Lagos), J. C. Collett Stud.Inst.C.E. (Sudan), W. W. Coster (Cape Town), D. J. Daruvala, L.C.E. (Bombay) (Bombay), J. A. Davidson (Cape Town), T. M. Davies, B.A. (Cantab.) (London), J. L. Dixon, Stud.Inst.C.E. (London), W. E. Fox, B.E. (Royal) (Eastleigh, Hampshire), A. H. Gibson, B.Sc. (Victoria) (Sowerby Bridge), J. M. Granzer (Cape Town), W. F. Hole, B.E. (Sydney) (Johannesburg), E. F. Homer (Swanage), W. J. A. E. Horne (Cape Town), F. W. R. Hurt (Transvaal), J. H. Inglis (Cape Town), H. W. Minnitt (Devonport), L. Morgan (Cape Town), A. E. Paul, B.A. (Cantab.), Stud.Inst.C.E. (London), O. B. Rattenbury, Stud.Inst.C.E. (Malta), E. A. Salt, Stud.Inst.C.E. (London), P. A.

Thompson, B.A. (Cantab.) (Penarth), A. F. Trederoft, Stud.Inst.C.E. (Searforth), S. G. Turner, Stud.Inst.C.E. (London), A. V. Venables, Stud.Inst.C.E. (Bengal), H. S. Watson, Stud.Inst.C.E. (London), A. Whittington-Cooper, Stud.Inst.C.E. (London).

COMPETITIONS.

OFFICES FOR HOLBORN BOROUGH COUNCIL.—The Establishment Committee of Holborn Borough Council reported on Monday having gone into the question of the best course to adopt to obtain suitable preliminary plans for the new offices of the Council. The Council is in possession of a certain site, but it is possible that an architect, having the requirements of the municipal authority before him, may be able to utilise a portion of this only and leave a residue for sale. The Committee was of opinion that the competition should be limited, and had resolved, subject to the usual sanction, (1) that no more than six architects be invited to submit preliminary plans for the Council offices, and that they be paid an honorarium of twenty guineas each; (2) that when the plans are ready the Committee will consider them and submit a further proposition on the matter; (3) that it be an instruction to the competing architects to give attention to the economical use of the land.

LIBRARY, PLEASLEY.—Mr. Ernest R. Sutton, F.R.I.B.A., of Nottingham, has been appointed to act as assessor of the competitive plans which architects have been asked to send in for the proposed new library buildings at Pleasley.

Books.

The London Building Acts, 1894 to 1905. Edited by BERNARD DICKSEE, F.R.I.B.A. Second Edition, revised and enlarged. (London: Edward Stanford, 1906.)

ALL prudent architects practising in London may, as regards their relation with the building laws, be divided into three groups. First, those who bring with them to their drawing-boards a King's Printers' copy of the statute and their own common-sense; next (and this group is becoming larger in proportion as the multiplicity and complexity of regulations increase), those who prefer to consult a specialist; and, thirdly, there is that majority of professional men who, relying wholly neither on their unaided though robust common-sense nor on information obtained in consultation, elect to keep for reference a well-annotated edition of the various Acts with a sufficiently comprehensive index. Impudent practitioners, but these seldom survive, are they who let their artistic fancies have free course until a little "notice of irregularity" in an official envelope razes to the ground their castle in the air.

The aspirant to any one of the three first-mentioned groups should have, for the first class, a more than ordinarily clear understanding of legal phraseology and a more than common common-sense; for the second class he must know the best man to advise him, that is to say, one who has made a special study of the subject; whilst for the third, one good book with its matter well arranged, with its comments not too long but really illuminating, and its table of decided cases concisely but precisely "digested," one such book is worth half a dozen handbooks designed perhaps primarily to air some particular view or to criticise some regulation which has already been placed on the Statute-book, and is therefore beyond effective criticism.

It is our pleasant duty to record our opinion that Mr. Dicksee's book possesses all those qualities which the majority of architects will find desirable in order that they may be aided in their obligatory studies of the recently amended Building Acts.

Our readers will not need to be informed of the scope and incidence of the new Act, which has already been analysed in these columns; it will be sufficient if we proceed to point out in detail some of the points in the work under notice which seem to call for special commendation, and at the same time to make one or two suggestions as to possible improvements which the Editor may consider when preparing the next edition.

As regards the old Act, Mr. Dicksee has in his notes preserved that character which made the first edition of this book deservedly

popular among professional men and others. The notes are concise, the cross-references are adequate, and the decided cases have been brought up to date so as to include the decisions in the following important cases, amongst others:—Leadbitter v. Marylebone Borough Council (1904), Horner v. Franklin and another (1905), and the case which recently attracted some attention—known as the Fulham-road Building Line Case—in re London Building Act, 1894, and the London County Council (1904).

In his treatment of the new London Building Acts (Amendment) Act Mr. Dicksee has also been commendably concise, nor has he fallen under the temptation, in the necessary absence of decided cases, to overburden the text with notes, the vague uncertainty of which is scarcely concealed by the question-begging phrase, "It is submitted that."

There is however plenty of definite information as to rules and regulations cognate to the Building Acts; for example, we have here the regulations as to procedure made by the Tribunal of Appeal, a reprint of those sections of the Factory and Workshop Act, 1901, which are pertinent to building material, the requirements of the London County Council as regards means of escape in case of fire under the text with a reprint of the Public Authorities Protection Act, 1893, and the important decision of Mr. Justice Farwell in *Sharplington v. Fulham Guardians* (1904) is noted.

We think the usefulness of the work as a book of reference would be increased if Mr. Dicksee could see his way to include the by-laws as to water-closets under the Public Health (London) Act, 1891, and the drainage by-laws under the Metropolitan Management Act, 1855; we also think that the thirty sections of the Arbitration Act, 1889, might well find a place here, as this Act is needed with reference not only to Part VIII. of the Act of 1894 (Rights of Building and Adjoining Owners), but also to Part IX. (Dangerous and Neglected Structures).

We have said enough to indicate our appreciation of the practical usefulness of Mr. Dicksee's book; now for one word of criticism.

To punctuate an Act of Parliament may or may not be commendable, but why it should be thought necessary to indicate by inclusion within square brackets [] such portions of the Acts as were not contained in the former and superseded Acts, we altogether fail to understand. To historians of the law it may be interesting enough, but to most of Mr. Dicksee's readers it can, we imagine, be a matter of small moment to know that subsect. 4 of sect. 103 of the Act of 1894 was not included in the Metropolitan Building Act of 1855. Moreover, this bracketing where it occurs in the middle of a clause is a positive stumbling block, for example in the schedule of materials deemed to be fire-resisting we read:—

In the King's Printers'

Copy:—

Flagonettes when used

for floors over arches, but

such flagonettes not to be

exposed on the underside

and not supported at the

ends only.

BOOKS RECEIVED.

RATING OF LAND VALUES. By Arthur Wilson Fox, C.B. (P. S. King & Son, 3s. 6d.)

THE HISTORY OF AMERICAN PAINTING. By Samuel Isham. (Macmillan & Co.)

LOCKWOOD'S BUILDER'S AND CONTRACTOR'S PRICE-BOOK: 1906. (Crosby Lockwood & Son, 4s.)

TRADE CATALOGUES.

THE Electro Motor and Dynamo Company, London and Manchester, send us their electrical hoisting catalogue, which contains particulars and illustrations of specialities for various types of hoisting machinery. Among the direct motor-driven gears, two simple and neatly-designed winches are shown. One of these is of the friction type, with raw hide motor pinion and machine-cut spur wheel and friction wheel with turned grooves, driven by a completely enclosed motor and mounted on a self-contained bed-plate. This machine is made in four sizes to lift weights up to 10 cwt., at a speed of 110 ft. per minute. Another is a spur-gear winch, specially designed for warehouse cranes, with raw hide motor pinion, machine-cut gear with guards, and an enclosed slow-speed motor, the whole being mounted upon a cast-iron bedplate in the smaller sizes, and upon a riveted steel base in the larger sizes. This machine is made in fourteen sizes, the maximum load being 3 tons and the speed of 200 ft. per minute. Near the middle of the catalogue several very compact patterns of gears are illustrated, these being suitable for goods and passenger lifts of all kinds. A good assortment of controllers for cranes, hoists, and lifts is offered by the same firm, who also give particulars of automatic lift gate locks, magnetic brakes, electric pulley-blocks, and travelling hoists and crabs. The catalogue is a useful guide to the selection of electric hoisting apparatus such as is very generally employed in buildings of all kinds, and in the execution of building and other contracts.

We have received from the Simplex Steel Conduit Company, Ltd., of Norfolk-street, Strand, a small pocket list giving details of their well-known system of conduits for electric wiring, both of the ordinary and the screwed type. We notice that several novelties are described. In particular, we may mention an ironclad type of water-tight wall plug, which seems to us to be well adapted for workshop or outdoor use. The catalogue is of a very convenient size.

Messrs. Gibbons Brothers, of Dibdale Works, Dudley, send us their catalogue of band conveyors for the local transport of building materials, minerals, grain, and other substances. Although containing a good deal of useful information, this catalogue is not arranged so well as could be desired. For instance, careful study and constructive reasoning are necessary to reveal the fact that the firm make four types of conveyor, three with deep trough, shallow trough, and flat bands respectively, and the fourth a "slat" conveyor, in which the band is replaced by strips of wood fixed to chains or india-rubber bands, for the transport of boxes, barrels, sacks, and other bulky packages or materials. Illustrations and prices are given of all essential parts of conveyors and accessories, and some photographic views depicting representative installations. The value of conveying plant is suggested very clearly on p. 5 by a table stating the capacities of different bands in tons per hour, when run at the speeds most suitable for the materials carried.

Correspondence.

RE STANDARDISING OF QUANTITIES. Sir,—If you have space for the continuation of this discussion, I would like to point out that in my opinion it is not so much a standard bill that is required, but, as put forward by Mr. Pease, surveys should be agreed as to what labours should be measured and the mode of measurement; especially should they be unanimous on the measuring of labours of stonework, for nearly everyone has his own particular method with this work, and I venture to say that many could not efficiently take these off, and even when taken off very many builders do not trouble to price them in detail.

Providing that a standard bill were required, it must needs be an exceedingly bulky one if it is to contain all that would be necessary on any job of every nature; and even then many of the old school with established practices would not turn from their present methods.

One point in favour of such a bill would be that provincial surveyors and those adopting the Northern practice might prepare their bills in a similar manner to that adopted by their London colleagues, as this is where the great dissimi-

larity occurs, for every day terms in London are practically unknown by many in the provinces. Assuming a provincial job is done by a London surveyor, it is more difficult for some of the local builders to estimate for, and therefore a speculative price is the result on certain items, of which the descriptions, etc., vary from local customs; again, several items are given in Northern practice which are unknown in London.

One great drawback to a standard bill would be that it would considerably simplify our work, thereby causing far more competition, and would enable anyone with an elementary knowledge to prepare a set of bills which would on the face look correct, but if gone into would be found hopelessly wanting.

As regards the statement made by Mr. Pease that "surveyors' fees are so reduced," they have no one to blame but themselves for this unhappy state, for why cannot they agree amongst themselves to accept only the recognised fee? This would then place all on an equality, instead of the present manner, which is fast turning the profession into a pure business, when, as is often the case, the one who will do the work at the lowest rate (whether he is competent or not) gets the job.

If this could be brought about, it would enable them to employ competent assistants, instead of as now, at any rate in the Midlands, having a large part of the work done by juniors, some of whom do not understand the most elementary terms.

I heard the other day of a man over thirty years of age offering his services as a thoroughly competent draughtsman, experienced in quantities and details, etc., for the princely salary of 2l. per week. What may one expect for that amount?

I believe it has been discussed by the Quantity Surveyors' Association, and that it is their aim, if possible, to make their members accept only the recognised fee. STEWART G. MUMBY.

Withington, Manchester.

THE "PARIS IN LONDON" SCHEME.

Sir,—I notice that in your issue of the 30th ult. you refer to me on page 710 as joint architect for a "Paris in London" scheme. Will you allow me to correct this? Mr. G. D. Martin, of 3, Pall Mall East, is the joint architect with the author, M. Génard, whereas I am only acting in conjunction with Mr. Martin. DETMAR BLOW.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—II.

Mathematical and Technical Symbols.

IT is convenient to draw a distinction between signs and symbols, and to regard the former as marks pointing, where necessary, to the alphabetical characters constituting the latter.

Some mathematical symbols are employed in accordance with clearly-understood rules, and a few have universally accepted meanings.

For instance, in algebra the first letters of the alphabet, a, b, c, and others, are generally used to denote constants or coefficients, and the last three letters, x, y, z, to symbolise unknown quantities. As examples of symbols having invariable meanings or values, we may mention g = gravity or the velocity of a falling body, and π = the ratio of circumference to the diameter of a circle.

Unfortunately, writers of mathematical books do not always keep to generally-understood symbols. As an example, we may point to the use of M to denote moment of resistance as well as bending moment, thus losing the distinction between these equivalent, but not similar, moments. If M = bending moment and R = moment of resistance, then the equation $M = R$ conveys a meaning. But it is absurd to have $M = M$, because this intended meaning is not thereby conveyed. Instead of R, some writers use μ to indicate moment of resistance, and there is no objection to this. Some confusion is caused, however, when μ is employed to denote bending moment and also Poisson's ratio. For, if $M = R = \mu$ the last of these symbols cannot correctly be used for Poisson's ratio, or the ratio of longitudinal extension to lateral contraction, as this is quite a different thing.

We need not refer at length to the perplexing inconsistencies of mathematical nomenclature. Some of them arise out of the fact that the letters of the alphabets

commonly adopted are not sufficiently numerous to provide distinctive symbols for the ever-increasing needs of modern science. Writers pick out characters to suit themselves, and seem to care very little for the practice of their contemporaries. Consequently we have now arrived at a stage when standardisation is urgently wanted, and not merely national, but international standardisation.

In the following lists we have included symbols employed in those branches of mathematics of direct interest to architects. It would have been easy to extend the category very materially, but the additional symbols so collected would have been of little practical use, except for the purpose of showing the glorious state of confusion which is sufficiently demonstrated by the tabulation of the more generally used symbols.

The subjoined lists include, in addition to purely mathematical factors, various symbols and abbreviations employed in different branches of technical work. These are intended for the convenience of readers who are not familiar with the precise meaning of expressions such as "A.C. generator," "I.W.G.," "B.Th.U.," "r.p.m.," and others frequently to be found without explanation in engineering papers and books.

(1) General.

- a = abscissa, angle, area, axis, constant.
- b = br aila, coefficient, constant, known quantity, ordinate.
- c = coefficient, constant, known quantity, conductivi y, correction.
- cg = centre of gravity.
- d = deflection, density, depth, diamet r, differential, discharge, distance, known quantity.
- e = base of Napierian natural or hyperbolic logarithms, coefficient, known quantity.
- f = force, function, unit stress, constant or coefficient, known quantity.
- g = gravity; the velocity of falling bodies, which in British units = 32.168, and in Metric units = 9.8124.
- h = height, head.
- i = inclination or slope.
- k = coefficient, constant, reciprocal of the modulus of a logarithmic system.
- l = length.
- m = mass, modulus, modulus of common logarithms, moment.
- n = number, one or more functions.
- o = zero.
- p = parameter, perimeter, unit pressure.
- q = quantity, unit pressure.
- r = radius, ratio.
- s = sectional area, surface.
- t = temperature, difference of temperature, thickness.
- u = deflection, length.
- v = velocity, volume.
- w = weight or load.
- x = abscissa, unknown quantity.
- y = ordinate, unknown quant y.
- z = surface or area, unknown quantity.
- A = Angle, Area, Axis.
- B = Barometric Height, Breadth.
- C = Circumference, a Constant, or Coefficient, Curvature.
- D = Density, Depth, Diameter, Differential Coefficient (sometimes written d.), Discharge, Distance.
- E = Elasticity, Coefficient or Modulus of Elasticity, Energy.
- F = Factor, Force, Function.
- G = Gravity (centre of).
- H = Head, Height.
- I = Inertia, Moment of Inertia.
- K = Constant or Coefficient.
- L = Length, Loss.
- M = Mass, Modulus, Moment, Bending Moment.
- N = Number.
- O = Zero.
- P = Parameter, Perimeter, Power, Pressure, Force.
- Q = Quantity, Force.
- R = Radius, Reaction, Refraction, Resilience, Resistance, Moment of Resistance, Resultant of any System of Forces, Revolutions.
- S = Sectional area, Space, Stress, Surface.
- f = the sign of integration, a modified form of S, standing for sum, the integral being the sum of the differentials placed at the top and bottom of the sign, thus: \int_a^b
- T = Temperature, Thickness, Time.
- U = Unit.
- V = Velocity Versed Sine, Volume.
- W = Weight or Load, Work.
- Z = Modulus.
- α (Alpha) = angle, coefficient.
- β (Beta) = angle, coefficient.
- γ (Gamma) = inclination.
- Δ (delta) = Finite Differ nce.
- δ (delta) = distance variation.
- ϵ (Epsilon) = extension, base of Napierian or hyperbolic system of logarithms, reciprocal of E.
- ζ (Zeta) = abscissa, coefficient, width.
- η (Eta) = efficiency.
- θ (Theta) = angle, absolute temperature.
- λ (Lambda) = latitude, longitudinal extension, strain.
- μ (Mu) = Moment of Resistance, Poisson's Ratio.
- π (Pi) = ratio of circumference of a circle to diameter = 3.14159265358979323846264338327950 + (usually taken at 3.1415).
- ρ (Rho) = radius, ratio, ratio of circumference of a circle to radius (usually taken at 6.2832), resistance.

Σ (Sigma) = Summation, the Sum of Finite Quantities.
 σ (Sigma) = coefficient, Poisson's ratio, volume.
 φ (Phi) = angle, or the supplement of an angle, arc, entropy.
 Ω (Omega) = Megohm (see Electricity).
 ω (Omega) = angular velocity.

(2) Materials and Structures.

a = area.
 b = breadth, width of a beam.
 d = deflection, deflection of a beam, depth, depth of a beam, diameter.
 e = extension or stretch per unit of length in an elastic strain, coefficient of expansion.
 f = coefficient of friction, unit stress, extreme fibre stress in a beam, modulus of transverse rupture, rise of an arch.
 h = height, distance from neutral axis to the surface of a beam.
 i = inclination or slope.
 k = radius of gyration.
 l = length, length of span between supports of a beam or abutments of an arch.
 p = unit stress, or intensity of stress.
 q = intensity of tangential stress.
 r = radius, radius of gyration, rise of an arch.
 s = strain.
 t = thickness.
 v = vertical component of a strain.
 w = unit weight or load.
 A = Area.
 B = Breadth.
 C = Crushing Strength, Modulus of Rigidity or Shear Modulus.
 D = Deflection, Depth, Diameter.
 E = Coefficient or Modulus of Elasticity, i.e., the Modulus of Longitudinal Extensibility, Young's Modulus, or the Stretch Modulus.
 F = Force, Tensile Force, Tensile Strength, Total Stress, Factor of Safety.
 G = Centre of Gravity of a Figure.
 H = Height, Horizontal Thrust at Support of an Arch.
 I = Moment of Inertia.
 K = Coefficient or Modulus of Cubic Compressibility or Bulk Modulus.
 L = Length, Length of Span Between Supports of a Beam.
 M = Modulus of Transverse Rupture, Bending Moment, Moment of Resistance.
 P = Pressure, Force, or Thrust, Normal Stress, Vertical Force, Load on a Column, Reaction at One Support of a Beam.
 Q = Horizontal Force, Tangential Stress, Reaction at One Support of a Beam.
 R = Moment of Resilience, Moment of Resistance, Radius of Curvature, Resistance of a Column.
 S = Shearing Stress, Span of an Arch or Beam.
 T = Thickness, Modulus of Torsion.
 V = Vertical Component of Strain.
 W = Weight or Load on a Beam or other Member, Breaking Weight, Weight.
 Z = Modulus of a Structural Section of Material, a Geometrical Quantity Depending upon Shape and Size.

δ (Delta) = central deflection of a beam.
 ε (Epsilon) = moment of inertia.
 λ (Lambda) = longitudinal strain.
 μ (Mu) = bending moment, Poisson's ratio.
 σ (Sigma) = Poisson's ratio.
 B.M. = Bending Moment.
 B.W.G. = Birmingham Wire Gauge.
 S.W.G. = Standard Imperial Wire Gauge.
 I.W.G. = Standard Imperial Wire Gauge.
 O.G. = Ogee.
 c.g. = centre of gravity.
 s.g. = specific gravity.
 r.s.j. = rolled steel joist.

(3) Heat, Water, and Air.

c = coal consumption per second, specific heat.
 d = diameter, density.
 f = coefficient of friction.
 g = gravity, grate area of a boiler.
 h = head, loss of head, heating surface of a boiler.
 k = coefficient of contraction, or discharge.
 p = pressure.
 r = coefficient of contraction, or discharge.
 t = temperature, temperature of hot air or water, difference of temperature.
 u = unit of heat (see B.Th.U.).
 v = velocity, velocity of hot air, volume.
 A = Area.
 B = Barometric Height.
 C = Centigrade Coal Consumption per Hour, Cubic Feet, Specific Heat.
 D = Density, Discharge, Hydraulic mean depth.
 F = Fahrenheit.
 G = Gallons Discharged, Grate Area of a Boiler.
 H = Head, Heat, Height.
 M = Monometric Efficiency.
 P = Pressure.
 Q = Quantity Discharged.
 R = Radius.
 S = Surface, Heating Surface of a Boiler, Stroke of Engine Piston.
 T = Temperature, Temperature of Cold Air or Water.
 U = Unit of Heat (see B.Th.U.).
 V = Velocity, Velocity of Cold Air, Volumetric Efficiency.
 W = Coal Consumption, Weight, Work.
 θ (Theta) = Absolute temperature.
 φ (Phi) = Entropy.
 B.T.U. = British Thermal Unit.
 B.H.P. = Brake Horse Power.
 I.H.P. = Indicated Horse Power.
 N.H.P. = Nominal Horse Power.
 R.P.M. = Revolutions per Minute.

(4) Electricity.

a = ampere, area.
 c = current, strength of electric currents.
 e = efficiency, electromotive force.

k = heat conductivity.
 m = strength of a magnet pole.
 ml = moment of a magnet pole.
 n = number of turns.
 q = quantity of electricity.
 r = specific resistance of metal.
 s = section and area.
 t = temperature, difference of temperature.
 v = volt, ratio of electrostatic to electromagnetic unit of quantity.
 w = Watt, measure of resistance.
 A = Ampere, Asynchronous.
 B = Magnetic Induction.
 C = Current, Strength of Electric Current.
 D = Duty.
 E = Difference of Potential or Pressure, Earth, Electromotive Force.
 F = Force, Frequency, Power absorbed in Electrical Work, Magnetic Moment.
 G = Gramme.
 H = Heat developed, Intensity of Magnetic Field.
 I = Impedance, Intensity of Magnetisation.
 J = Joule.
 K = Heat Conductivity.
 L = Inductance.
 M = Magnetomotive Force.
 N = North pole of a magnet, Magnetic Flux.
 O = Neutral, or Earth Potential.
 P = Potential.
 Q = Quantity of Electricity.
 R = Resistance, Ohmic Resistance.
 S = South pole of a magnet, Second, Sectional area.
 T = Time.
 V = Volt.
 W = Watt, Work.
 Γ (Gamma) = ampere.
 μ (Mu) = magnetic permeability.
 ρ (Rho) = resistance.
 Υ (Upsilon) = Milliamperes (10⁻³ A).
 Ω (Omega) = Megohm.
 ω (Omega) = Ohm.
 A.C. = Alternating current.
 B.T.U. = Band of Trade units = 1,000 Watt-hours.
 C.C. = Continuous or direct current.
 C.G.S. = System of measuring electricity, the unit of which is one dyne.
 D.C. = Direct or continuous current, the Centimetre Gramme Second.
 E.H.P. = Electrical horse power = 746 Watts.
 E.M.F. = Electromotive Force.
 K.W. = Kilowatt.
 M.G.S. = The Metre - Gramme - Second system of measuring electricity. (The M.G.S. = 100 dynes).
 P.D. = Potential difference.

(5) Metrical Abbreviations (Paris Conference, 1881).

Linear Measure.	Cubic Measure.
km = kilometre.	km ³ = cubic kilometre.
m = metre.	m ³ = " " " "
dm = decimetre.	dm ³ = " " " "
cm = centimetre.	cm ³ = " " " "
mm = millimetre.	mm ³ = " " " "
Square Measure.	Weight.
km ² = square kilometre.	t = tonne = 1000kg.
m ² = " " " "	q = quintal = 50kg.
dm ² = " " " "	kg = kilogramme.
cm ² = " " " "	hg = decagramme.
mm ² = " " " "	g = gramme.
ha = " " " " hectare.	dg = decigramme.
a = " " " " are.	cg = centigramme.
	mg = milligramme.
Capacity.	
M = hectolitre.	
l = litre.	
dl = decilitre.	
cl = centilitre.	

OBITUARY.

MR. HENRY JOHN YOUNG.—We regret to announce the death, at the early age of thirty-six, of Mr. Henry John Young, jun., eldest son of Mr. H. Young, of Messrs. H. Young & Co., Nine Elms, with whom he served his apprenticeship, and on whose staff he has since been occupied in the design and execution of constructional engineering work. In this some of the most important buildings in London were included. At the time of his death he was engaged as Consulting Engineer for the new Piccadilly Hotel buildings now in progress, and a distinguished professional career seemed to lie before him. He leaves a widow and three children. Being Past-Chairman of the Junior Institution of Engineers, a number of the members were present at the funeral, bearing testimony to the esteem in which he was held. To perpetuate his memory a fund has been opened with the object of placing a bronze medallion portrait in the reading-room of the Institution.

BUILDING IN GRIMSBY.—Generally speaking, builders and contractors have experienced a quiet year, and they are fervently hoping that a revival may characterise 1906. The absence of any particularly large schemes has had the effect of making labour more plentiful than work, and but for the fairly extensive erection of house property the year would have been abnormally disappointing to the building and kindred trades. Practically the enlargement of Messrs. Marshall's mills in Victoria-street and the new "Tivoli" corner are the only important schemes that have occurred during the year, though the improvement of "Palmer's corner" and the completion of the Sheffield Arms have given a good deal of employment.

GENERAL BUILDING NEWS.

SCHOOL, STRATHDON.—A new school has been built near the Bridge of Poldulloch, Strathdon, from the designs of Mr. George Bennett Mitchell, architect, Aberdeen, and the contractors for the various works were:—Mason, Mr. James Gerrie, Cambus Mays; carpenter, Mr. Thomas G. Archibald, Huntly; slaters, Messrs. S. Christie, jun., & Company, Dyce; plasterer, Mr. William Rust & Company; plumber, Mr. William Lesak, Alford; and painters, Messrs. W. Duguid & Son, Ballater.
 ENLARGEMENT OF BOSTON HOSPITAL.—A new wing which has been added to Boston Hospital at a cost of 1,000, was opened on the 22nd ult. The new wing is situated at the north-west corner of the existing building, and has been erected from plans by Mr. Samuel Marjorson, architect, of Boston, by Messrs. H. W. Parker & Son, contractors, Boston. The clerk of works was Mr. Rossington. The additions consist of duplicate sets of wards, kitchens, sick-rooms, bath-rooms, lavatory, etc., accommodation on each floor. The exterior is faced with white bricks, has stone dressings and red-moulded brick to harmonise with the old building. The interior walls have green and white glazed tile and brick dados, with circular glazed tiles at junction of walls and floors. The first floor is of fireproof construction, formed of steel joists and concrete. The corridors are paved with terrazzo mosaic paving and the rooms are paved with encaustic tile paving. In addition to the new wing a new lift, by Messrs. Waygood, of London, has been erected.

THE GRANITE AND BUILDING TRADES OF ABERDEEN.—The building trades of Aberdeen have been less fully occupied during last year than in its predecessor. Within the city, as the records of the Burgh Surveyor's Department show, the number of new erections, and the alterations and additions to existing premises have been fewer than in 1904, and not only in that year, but for a considerable time past. Still it would be wide of the mark to say that 1905 has witnessed depression. It would be more accurate to affirm that the previous years had witnessed an undue expansion, and that the gradual decline in the totals of late mark a return to a more cautious policy and a wiser regard for the requirements of the city. In the quantity of unoccupied property—the assessable value of which is nearly 29,000,—the proofs of the overbuilding that has taken place in recent years, and in fact needed halt is now being called in this direction, therein is a sign not necessarily of stagnation, but of a return to a normal and healthier view of the situation. Under the head of new dwelling-houses, alterations to existing houses, and extension of business premises, there are an aggregate of 419, and the value of these operations is stated at 253,681. It is true that, compared with the figures for 1898—the year of the "boom," when the total was 514,113,—the difference is striking; but set alongside of 1904—a juster comparison—the decline in 1905 is only some twenty-three buildings, and in value only about 4,000. Naturally, fewer builders have been required. On an average there have been about 300 fewer masons engaged in the building sections than has been the case during the past year or two. These, however, have not remained unemployed. While probably not earning so much as they would have done at their own business, they have been able to turn their hands to other jobs—such as carting, and labouring in some of the departments of shipbuilding; while a good many have gone to America. The local prospects, however, are not bright. The public buildings at present on hand—the extension of Marischal College and the new theatre—are nearing completion; and the coming year will witness the discharge of probably between one and two hundred men.—*Scotsman*.

BUILDING TRADE IN DUNDEE.—Little work of importance has been inaugurated in the building trades, and it would appear as if the new year were to be equally quiet, although the cry of the unemployed is not nearly so accentuated as at this time last year. The only works entered upon by the Corporation have been new public washing-houses in Miller's Wynd and the extension of Craig-street Market. James United Free Church congregation are erecting a new building in Arklay-street, in the Clepington district. The only other work of a public kind completed is in addition to the Victoria Hospital for Incurables, consisting of cancer wards. The residential property built has, for the most part, been of the tenement class.

NEW ISOLATION HOSPITAL, WALTHAM ABBEY.—The buildings comprise entrance lodge, administrative building, an isolation block with four beds, diphtheria block with eight beds, scarlet fever block with twelve beds, and laundry and mortuary block. The whole are surrounded with a fence 6 ft. high, except that the lodge and administrative block are on the line of the fence. All other buildings are not less than 40 ft. from the fence and from each other, and are grouped round a lawn in the rear of the administrative building. The isolation block consists of nurses' duty room and two wards, each entered from a verandah, so as to be as completely as possible isolated from

each other. The diphtheria block is situated to the west of the lawn, and consists of nurses' room, bathroom, two wards (male and female) with four beds each, and the usual offices on the ground floor, whilst over the nurses' room is a linen and cistern room. This block follows the almost invariable plan adopted throughout the country for the pavilions of isolation hospitals. The scarlet fever block is situated to the east of the lawn, and is similar to the last, but with six beds in each ward. It has on the first floor a large convalescent room. The laundry block is situated at the south-west corner of the quadrangle formed by the last four mentioned buildings. It consists of the laundry, with washing and ironing room fitted with the most modern appliances for a hand-labour laundry by Messrs. Summerscales; it also includes the disinfecting station, which consists of one room from which the infected goods are placed in the disinfectant (of Dr. Thresh's) and another room from which they are removed when disinfected. There are also in this block a large coal store, a mortuary, shed for ambulance, and a large store shed. Except for some half-timber work and rough-cast introduced, the buildings in general are faced with local red bricks and covered with Brossley tiles. Internally the walls are finished with the administrative block, the lodge are plastered and are fitted with a material hard and capable of being finished with a smoother face than ordinary plastering, and are coated with Hall's washable distemper. In the ward blocks skirting are omitted and all corners rounded so as not to harbour dust. The floors of the wards and nurses' room are pitch pine, polished, the bathroom and lavatory are tiled. The sanitary fittings have been supplied by Messrs. Morrison & Ingram. The wards are warmed with Messrs. Shortland's ventilating grates and stoves, and the remainder of the rooms with open fireplaces. As there was no sewer available, sewage purification works have had to be constructed, and consist of a series of septic tanks and a bacteria tank fitted with one of the Automatic Sewage Distributor Company's revolving sprinklers. The architects are Messrs. Walter Starr, of Chingford, and Herbert Tooley, of Buckhurst Hill; and the contractor Mr. J. Bentley, of Waltham Abbey. The contract price was 7,100.

NEW ASYLUM.—The New York City Council are erecting an asylum at Naburn. The new buildings are of red brick with stone dressings. The plan of the building, which was designed by Mr. A. Creer, the City Engineer, is in accordance with the requirements of the Commissioners in Lunacy, and is, roughly, fan-shaped. The main facade is to the south and extends for a distance of 140 ft. from north-east to south-west, the depth from north to south being 430 ft. The chief entrance is by a broad avenue from the main road from York to Naburn. The entrance-hall is flanked by the principal administrative offices, committee-rooms, and so on, the wings being formed by the ward blocks, of which there are six, three for males being on the north-east side, and three female blocks occupying the south-west side. The present accommodation is for 362 patients, but the facilities for extension will admit of the erection of a female block to accommodate 74 inmates, while the male accommodation may be increased to another fifty, giving a total of 284 females and 200 males. The accommodation is divided on each side into epileptic, chronic, recent and acute, sick and infirm. In addition to offices for the medical superintendent, assistant medical superintendent, clerks, storekeepers, etc., there is a bakehouse furnished with modern appliances, a laundry, a store, engine-house, boiler-house, and work-shops where employment will be found for the artisan patients. Each ward is furnished with larders and pantries adjacent, and lavatories. Hydrants are placed inside and around the building. Fire alarms and telephones are placed all over the building. Corridors communicate from the administrative block to every part of the institution. The first floor is made of fire-resisting materials, while under each corridor is a subway along which the steam pipes, water pipes, and electric lighting cables all radiate from the engine-room. The heating will be by means of exhaust steam from electric lighting engines and pumps. A feature of the building is a water-tower, six ft. high, surmounted by a tank with a capacity of 18,000 gallons. The hot water supply is generated by means of two tubular heaters fixed in the pump-room. The whole of the institution will be lighted by electric light generated on the premises. A dining-hall and recreation room with stage, proscenium, etc., has been provided, capable of seating 600 persons. This apartment is heated and ventilated on the plenum system. A chapel in the Early English style has been erected in the grounds facing the road. A residence for the medical superintendent has been built in the grounds, and also a lodge and several cottages for the attendants. The estimated cost of the institution, fully equipped, is 135,000. Of the total cost, the building contract absorbs 90,453; the land and incidental costs of the purchase, 14,034; furnish-

ing, 17,000; isolation hospital, 9154; planting and fencing grounds, airing courts, etc., 473. The cost works out approximately at 280, per bed, exclusive of the land, the sum representing the cost of the contemplated future extensions to an accommodation of 488.

FOREIGN.

FRANCE.—The Académie des Beaux-Arts have elected Mr. Whitney Warren as Corresponding Member in the Section of Architecture, in place of the late Signor Sacconi, of Rome. Mr. Warren, a former pupil of the Ecole des Beaux-Arts, had obtained a premium in the competition for the Baltimore State House, and is architect of the New York Yacht Club House and the principal railway station there. The Municipal Council of Paris have passed a vote of 1,200,000 francs for the arrangements and beautifying of the Champ de Mars and the making of approaches to it. When laid out as proposed, it will form a park twice as large as the Parc Monceau. M. Theunissen (sculptor) and M. Savignac (architect) have been commissioned to carry out a monument, to be erected at Lamarche (Vosges), in honour of Colonel Renaud, the inventor of the navigable balloons. The jury in the competition for a group of schools at Saint-Cloud have awarded the first premium to MM. Félix and Emile Plat and Auguste Roy. A bridge is to be made over the Seine, between Levallois-Perret and Courbevoie. The jury in the competition for new schools at Pré-Saint-Gervais have awarded the first premium to M. Bovière. Important works are to be executed at Havre for the improvement and enlargement of the port and docks, at an estimated cost of near 6,000,000 francs. Important street improvements are to be carried out at Poitiers, at an estimated expenditure of 1,000,000 francs. The municipality of Nîmes-Bains intends to devote a sum of 2,200,000 francs to various buildings and street improvements. A Roman piscina with marble revêtement has been discovered at Nîmes-Bains. The municipality of Carcassonne is about to open a competition for a new hospital. The death is announced, at the age of thirty-eight, of M. Marcel Berger, a former pupil of M. Guadet. He carried out some important works in collaboration with Maistrasse, and was architect for the Hôtel de Ville d'Argenteuil, the Trouseau Hospital, and various business buildings in Paris. **SOUTH AFRICA.**—At Durban Sir Benjamin Greenacre laid the foundation-stone of the new premises to be erected for the Ladies' College. The building is to consist of three stories, and will be completed about July next. Messrs. Payne & Payne are the architects and Mr. W. F. Johnstone the builder. Sir Henry de Villiers (Chief Justice), Sir John Graham, and Mr. C. H. van Zyl have been appointed by the Cape Government a Committee to investigate, in conjunction with Mr. Mervyn Macartney, and to decide upon the competitive plans for the new Law Courts, and to make a selection from the various designs. At a meeting of the Cape Town City Council the proposed regulations for the erection of needle scaffolding were referred to the Master Builders' Association, and also, on the suggestion of Mr. Baxter, to the City Engineer. When the last mail to hand left Cape Town tenders were being invited by the architects (Messrs. Reid & East) for the erection of a cottage hospital at Worcester.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Henry Ough, M.Inst.C.E., architect and surveyor, of 64, Basinghall-street, having retired from business, has transferred his practice to Mr. J. Moir Kennard, A.R.I.B.A., of 13, Railway Approach, London, Bridge, E.C. **DIARIES.**—We have received from Messrs. Hudson & Kearns (Hatfield-street Works, Stamford-street, S.E.) specimens of their diaries for 1906. These prepared for the use of architects, surveyors, civil engineers, etc., are Nos. 12 and 13—one and two pages to a day respectively, specially ruled and printed and with index—and excellent productions of the kind they are, including the facts usually to be found in a diary and, in addition, a great deal of information of use to professional men, such as: Cases decided in the Superior Courts of Justice during the legal year from November, 1904, to August, 1905, of interest to the profession; a professional practice and charges of architects; complete list of metropolitan surveyors and districts, with official and private addresses, and list of architectural surveying and engineering institutions, with their presidents, etc. No. 11 is the builder's diary—two days to a page—and it contains: A series of practical tables of daily use in the office, a series of tables on the valuation of property, leases, life interests, insurances, etc., estimate tables, a wages table, tables of scantlings, etc.,

for floors and roofs, method of cubing, with illustrated diagrams. These excellent diaries are well-printed and bound, and have been brought well up to date, for they contain a list of the new Ministry and principal officers of State.

THE LATE MR. RUDOLF LEHMANN.—The late Mr. Lehmann, who died on October 27, has left an estate of which the gross value amounts to 34,491l. 15s. 6d., and the net personality is sworn at 34,343l. 8s. 3d. He bequeathes his picture—"May We Come In?"—to the Tale Gallery trustees, and his collection of musical instruments, etc., to the Hamburg Gewerbe Museum (already deposited there in last June); his trustees are directed to consult Sir Edward Poynter, P.R.A., Sir L. Alma-Tadema, R.A., and Professor Seymour Lucas in appraising the intrinsic value of his collection of pencilled portraits of celebrities signed by their subjects, and then, in the first place, to offer the portraits at that valuation to Professor Sidney Colvin for deposit in the prints and drawings department of the British Museum.

STATUE OF QUEEN VICTORIA, WOOLWICH.—The statue of Queen Victoria, recently unveiled at Woolwich Town Hall, was sculptured in Carrara marble by Mr. F. W. Pomeroy, and is a replica of his bronze statue executed for the city of Chester, representing the Queen in her robes of state.

MAPLE FLOORING.—According to Messrs. Foy, Morgan, & Co.'s annual report on the timber trade, steadily business continues to be done in this article, the merits of which are becoming more and more appreciated by all classes of users. Prices have slightly advanced during the past year, and it is not unlikely that they will go still higher in the near future; but even a further moderate rise in price would not make maple an expensive flooring when the lasting qualities of the wood are taken into account.

MANCHESTER IMPROVEMENTS.—Among matters which were proceeded with during the year was the purchase of properties for the widening of Cateaton-street, the widening of Hanging Ditch, Corporation-street, and a portion of Cannon-street, and the widening of Church-street, at the corner of High-street. Then there were the rebuilding of Minshull-street bridge, and the widening, paving, and making-up of Charles-town-road, Blackley, Water-street has been widened by the removal of the old bridge carrying the London and North-Western Railway Company's goods line over that street and the substitution of a modern steel bridge having a span of 48 ft.; and Prince's bridge, after rebuilding was opened for traffic by the Lord Mayor and the Mayor of Salford on August 3. The new street between Ardwick station and Fairfield-street, now known as North Western-street, is complete. The formation and making-up of Higher Sheffield-street, the straightening and continuation of Holywell-street, the widening of Temperance-street, the widening and completion of Walter-street, and other improvements in this immediate locality have been carried out by or at the cost of the London and North-Western Railway Company, except that a proportion of the cost of the new North Western-street is being borne by the Corporation, in accordance with the provisions of the company's Acts sanctioning the widening and extension of their railway between Ardwick station and London-road. There has been an extension of Station-road, Crumpsall, to Clarendon-road, which gives the residents in Clarendon-road and the locality a direct route to the station, which has hitherto had to be approached by vehicles by a detour to the north and through Bury Old-road, Seymour-road, Lansdowne-road, and Crumpsall-lane. Four new roads were formed, opening out the district of Clayton Vale and forming connexions between Newton Heath and Clayton. These works, though previously contemplated, were continued and the roads formed with a view to giving employment to unemployed citizens. A new trunk road connecting Slade-lane with Wilmslow-road is in course of formation. The sewerage and other works are now in progress. When this road is completed it will form a continuation of Wilbraham-road, and will be a direct route between the main roads assumed thence by Albert-road to Stockport-road in an easterly direction and in a westerly direction by Wilbraham-road to Chorlton. This new road is to be made 18 yds. in width. The widening and improvement of Middleton-road, Blackley, between Sheepfoot-lane and the Three Arrows public-house was undertaken with the view of giving employment. A new trunk road, known as Victoria-avenue, which is about one and a half miles in length, is being made up as a builder's road by the Corporation across the estate of the Earl of Wilton, at a cost of about 10,000l., the greater part, of which cost will be borne by the Earl of Wilton. When this work is completed it will form a main thoroughfare from Rochdale-road, Blackley, to Middleton-road, near the Heaton Lodge entrance to Heaton Park. The Corporation have obtained Parliamentary powers to construct tramways in this road when the road is finished. Among the most costly improvements at present under consideration is

that of the widening of Cross-street. Two-thirds of the property required for this improvement has been purchased during the year, and the negotiations are now proceeding with a view to the acquisition of the remainder of the property.—*Manchester Courier.*

BRITISH GOODS AT CAPE TOWN AND CHICAGO.—The Board of Trade desire to draw the attention of the commercial community to the fact that Mr. E. J. Cattell, their correspondent at Cape Town (who is also the Secretary of the Cape Town Chamber of Commerce), and Mr. A. Finn, H.M. Consul at Chicago, are prepared to receive samples from British manufacturers, at the manufacturers' risk, but free of expense to them except as noted below, and to exhibit such samples, respectively, at the Chamber of Commerce and at the Consulate. Prices should be attached in sterling f.o.b., or c.i.f., or if possible in currency, landed, duty paid. No charge is proposed at Cape Town, but at Chicago a small fee of 8s. per square foot occupied by the exhibitors has to be made for any period not longer than a year.

BIRMINGHAM ART GALLERY AND UNIVERSITY.—The late Mr. John Feeney, who in his lifetime presented to the Art Gallery some examples of Rossetti and Sir E. Burne-Jones, with fine collections of Oriental armour, Japanese enamels, and ivories, etc., has bequeathed 50,000, to the Art Gallery, and 20,000, to the University for the endowment of a professorship for lectures upon subjects having a direct bearing upon the local trades and industries.

THE LATE MR. A. W. MILLS.—A sum of 21,000, to the Manchester and district charities and numerous legacies to his dependants are bequeathed under the will of the late Mr. Mills, architect (of the firm of Messrs. Mills & Murgatroyd), whose estate is valued at 92,000. The bequests include 8,000, to the Manchester Society of Architects, 500, to the Architects' Benevolent Society, 4,000, to Owens College as permanent endowment, and 3,000, to Manchester Grammar School to found scholarships tenable at Oxford or Cambridge.

PROPOSED SALES OF CHURCH PLATE.—At a sitting of the Consistory Court in Exeter Cathedral on December 20, Mr. C. E. H. Chadwick-Healey, K.C., Chancellor of the Diocese, refused to grant a faculty for the proposed sale by the rector and churchwardens of Churchstanton of a silver chalice bearing the inscription "Churchstanton, 1660," and what is presumed to be a local hall-mark. It was desired to apply the proceeds towards the fund for a repair of the parish church, but the learned Chancellor was of opinion that, other objections apart, the donor of the chalice did not intend that it should be converted to such a purpose. On the other hand, Dr. Tristram, K.C., Chancellor of the Diocese of London, has just directed the issue of a faculty authorising the sale of a disused silver flagon, part of the Communion plate of Cowley parish church, near Uxbridge. The flagon, of early XVIIIth century workmanship, was given to the church by one Haynes, a parishioner, and an offer of 136s. is made for it. Dr. Tristram agreed to the appropriation of the proceeds of the sale, firstly, to the purchase of a smaller flagon, and, secondly, towards the erection, at an estimated cost of 600s., of a parish club and mission room, for which a site has been presented.

S. PETER'S, BUDLEIGH SALTERTON.—Messrs. Percy Bacon & Brothers have just executed another window of three lights in this church, as a memorial. The lights contain the figures of S. Edward the Confessor, in the left light; S. George in the centre, and S. Alban in the other. There is also a memorial brass beneath the window.

OPEN DOMESTIC FIRE GRATES.—We have received from Dr. Pridgin Teale a very interesting and courteous letter in which he takes exception to a statement of ours in our issue of December 16 ("Tests of Open Domestic Fire Grates") about fire grates "of the well-known type recommended by Dr. Teale." The type to which we referred is, of course, that which is first recommended by Dr. Teale and is now generally associated with his name; it is known by its splayed sides, forward-sloping back, conical, and vertical front bars. Dr. Teale reminds us that "the fireplace in which the fire is sunk below, or rather beneath, the hearth, so as to substitute the hearth raised above the grid for front bars, was invented by my son and myself," and adds that "the various sunk fireplaces are more or less a copy of his patent and were brought out a considerable time avant his invention." We had not forgotten this later grate invented by Dr. Teale and his son and patented by the latter; but we still think that our reference to "the well-known type recommended by Dr. Teale" was not misleading. The grate invented by himself and his son, and known, not as the "Teale" but as the "Front Hob Fireplace," obviously belongs to the class which we described as "a more modern kind without front bars." Dr. Teale's name is so honourably associated with the reform that has taken place in domestic fire grates in recent years, that we should be very sorry indeed to say anything which might in any way detract from the credit due to him.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

19,469 of 1904.—A. R. HUBBARD and R. FLAY: *Kitchen Ranges.*

This relates to kitchen ranges, and consists of a fire grate constructed with teeth, cast upon two parallel horizontal shafts or axes, the teeth being formed with two of their sides of greater length than the third or top side, the three sides being convex in end view, and the two lower sides terminating in a point at the bottom and presenting a greater surface for the air to travel through in its passage to the fire, the two shafts being carried through from the front to the back of the fireplace and arranged to revolve in bearings in the latter, and geared together so that when one of the shafts is turned more or less, the two shafts with their teeth are caused to rock, and the fuel resting upon them is agitated to any desired extent.

19,470 of 1904.—A. R. HUBBARD and R. FLAY: *Boilers for Kitchen Ranges and the like.*

This relates to a boiler for kitchen ranges and the like, consisting of a hollow metal ring placed horizontally at a short distance above a fire pot or grate below, so that the flame and hot products of combustion beat the bottom and inner side of the hollow ring, through which they pass, and are then conveyed away to a chimney and a circulating pipe supplying water to the interior of the boiler.

3,941 of 1905.—W. G. HARRISON and T. WORRELL: *Locks and Latches, such as Rim and Mortise, which are Adapted to be Operated by a Key from either Side of a Door.*

This relates to locks and latches, such as rim and mortise, which are adapted to be operated by a key from either side of a door, and consists of a bridge fixed about midway between the front and back plates of the case, beyond which the key-bit cannot be passed in inserting the key within the case prior to turning it therein, in combination with a bolt, which may be moved by the key, as the key-bit is simply turned round at either side of the bridge after the bit has been inserted into the case up to the bridge only, from the corresponding side thereof.

4,584 of 1905.—H. R. ANTELIFF: *Fasteners for Windows, Doors, and the like.*

This relates to a fastener for windows, and consists of a bracket fixed in a line with the top sash of the window frame, said bracket having an inclined piece pivoted thereto, in such a manner that the end of the pivoted piece always bears against a right-angled projecting plate fixed to the other sash, a peg on the plate of the bracket takes a hole in the right-angled projecting plate, the sashes or parts being firmly held together until the end of the pivoted inclined piece is turned free of the right-angled projecting plate when the window is opened, and when the window is being closed the edge of the right-angled projecting plate takes against the edge of the inclined piece, and thus the same free on one side until the right-angled projecting plate is free of the end of the inclined piece, when the same moves into its closed position.

5,799 of 1905.—C. W. TONKS, G. A. TONKS, and E. TONKS: *Pre-payment Locks for Closets and the like.*

This relates to a pre-payment lock for closets and the like, and consists of a device, which, as the latch bolt is moved in by the closing of the door, is thereby caused to press upon the coin and ensure that it will fall clear of the mechanism in case it does not otherwise fall, and such bolt is moved in.

6,107 of 1905.—H. WILSON: *Boilers for Kitchen Ranges and like Purposes.*

This relates to boilers for kitchen ranges and other purposes, and consists of a flue or passage being formed through the body of the ordinary rectangular or like-shaped boiler usually constructed of copper, and fixed behind the fire-grate space of a kitchen range. The flue or passage is preferably of a flattened oval shape, but it may be of round, square, or any suitable form, and extends from the back part of the bottom of the boiler to the front part of the top, thus forming a diagonal flue through the boiler. Instead of one such flue two or more may be employed.

6,168 of 1905.—W. C. KIMBER, H. T. TALLOCK, and W. F. STANLEY & Co., LTD.: *Drawing Appliances.*

This relates to drawing appliances, and consists of a substantial frame having hard wood runners upon right and left hand edges. A metal bar of the length of the frame is mounted upon wheels running upon the said runners, the parallel motion of which is ensured by a endless wire passing over pulleys at top and bottom of frame and crossed underneath, so that the wire from the top of the bar on one side is fixed to the bottom

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

of the bar on the opposite side and vice versa, suitable pulleys being provided under the frame for guiding the wire.

6,526 of 1905.—A. H. NEWBY: *Ventilators.* This relates to ventilators, and is characterised by a quick grooved screw plug working in a collar on a perforated face plate, the one end of the screw plug being attached to a back plate in such a manner that when the screw plug is partly rotated the back plate is caused to recede away from or move towards the face plate.

7,199 of 1905.—J. F. BUCKLEY: *Disinfecting Apparatus in Connection with the Water Waste Preventers of Water-closets and the like.*

This relates to a disinfecting apparatus for water-closets and the like, and consists in effecting the horizontal travel of a slide to discharge the tablets by means of a link connected to the ball lever.

9,050 of 1905.—R. W. SEWELL: *Mortise and other Locks for Doors and the like.*

This relates to mortise and other locks for doors and the like, and consists in the arrangement of a spring latch, the head of which protrudes from and works through a face plate, whilst its stem is carried by and works through and within one or more bent, bifurcated, and elbow-pivoted levers, and which latch is opened by an ordinary rotating or other style knob or handle impinging or acting on said pivoted lever or levers.

10,665 of 1905.—H. F. E. HOPMANN: *Spade.* This relates to a wooden spade having a blade consisting of several parts, and is characterised by the fact that the blade is composed of a number of separate narrow laths or staves, the middle stave carrying the shaft and two edge or side strips, the said staves and strips being shaped to form the blade, and held together by means of anchor wires or tie-rods running transversely through the staves and strips.

11,620 of 1905.—DR. O. ZIMMERMANN: *Formation of Stacks of Tubes Especially Applicable for Water Cooling and Heating Apparatus and the like.*

This relates to a process for the formation of stacks of tubes especially applicable for water cooling and heating apparatus, in which process the tubes are formed by pouring molten metal into the space between the ends of the tubes and the casing surrounding the same, said metal being thus produced firmly cast upon the tube and casing ready for forming the ends of the apparatus.

14,672 of 1905.—T. P. RUDKINS and P. K. O'BRIEN: *Means for Lifting and Otherwise Transferring Goods.*

This relates to a device for lifting and otherwise transferring goods, and consists in the combination with a supporting frame of means for connecting it to a platform, a truck pivotally connected to the frame, a lever or levers for turning an axle or the like, having frame support, and connexion between the axle and the truck.

15,035 of 1905.—C. H. LOVERING: *Gates.*

This relates to a gate comprising oppositely disposed posts, a cross piece connecting the upper ends of the posts, a gate hinged at its lower rear end to each of the posts, pivoted together at their inner ends, a connexion between the outer end of each lever, and the rear of the gate there beneath, and means connected with the aforesaid connexion whereby both gates may be tilted simultaneously.

15,579 of 1905.—J. W. WESTWOOD, C. BARTER, and T. TAYLOR: *Apparatus Forming a System for Combined Hot-water and Steam Warming of Buildings and the like.*

This relates to an apparatus forming a system for combined hot-water and steam warming of buildings and the like, consisting of a steam generator, a hot water heating boiler or part boiler, a tank situated at the top of the building, having two plates in connexion with the flow pipe, distributing return pipes in connexion with radiators, the steam pipe with automatic valve, the injector or steam mixer in connexion with the flow pipe, the automatic float valve in the tank, the controlling weighted safety valve in the tank, a valve in said tank being connected by levers, with the valve in the main steam pipe,

27,308 of 1904.—J. WARD: *Tar Paving.*

This relates to tar paving, and consists in the employment of a bonding tar compound for adhering and holding the pieces of stone together, consisting of distilled tar and ground lime, ground chalk, limestone dust, or like, alkaline powdered earth or substance, compounded by adding the powdered substance to the tar while in a hot state.

5,865 of 1905.—W. HEWORTH-COLLINS: *Construction of Conductors for Containing Electric Cables and Wires and other Tubes, Pipes, and the like.*

This relates to the construction of conduits for containing electric cables, and wires, and other wires, tubes, pipes, and the like, and consists in the combination of a number of rectilinear

sectional lengths to form the sides and part of top and bottom with two T sections, to form the rest of the bottom and the lid.

097 of 1905.—F. M. PROCKTER and J. B. HOWARTH: Apparatus for Supplying Humidified Air to the Intakes of Buildings.

This relates to an apparatus for supplying and distributing humidified air, comprising a shallow vessel for containing the liquid for humidifying the air, and consists of a fan situated in a shaft above it with a deflector intervening between said fan and liquid, and another deflector over-arching said fan.

066 of 1905.—H. SUTCLIFFE: Means for Joining Flushing Pipes to Closet Basins, or for Making like Pipe Connections.

This relates to a device for joining flushing pipes to the flushing horns of water-closets, or for making like pipe connections, comprising a cone having a number of radial leaves, each one of which is slightly twisted in such a manner that when applied to form a joint the said leaves overlap and present a solid or unbroken surface, without interstices.

SOME RECENT SALES OF PROPERTY:

Table with columns for property details and prices. Includes entries like 'ESTATE EXCHANGE REPORT, January 5.—By COOPER & GOLDING, Upton Park—35 to 45 (odd), 65, 67, and 69, Lucas-av., W.1, 92 and 92 1/2, W.1, 327 1/2, 1/2' and 'By WALLEN & CHURCH, Strand.—43, Bedford-st. (Williams' Dining Rooms), L. Yr. 90L'.

TO CORRESPONDENTS.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications. We are compelled to decline pointing out books and giving addresses. Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertising and other business matters should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

FRIDAY, JANUARY 12. Institution of Civil Engineers (Students' Meeting).—Professor J. D. Cornack, B.Sc., on "The Theory of Machines." 8 p.m. MONDAY, JANUARY 15. Royal Institute of British Architects.—President's "At Home." A small Exhibition of Working Drawings is being arranged for the occasion. 8.30 to 11 p.m. Surveyors' Institution.—Mr. A. T. Walmisley on "Modern Surveying Instruments." 8 p.m. London Institution.—Mr. A. Guinness' Broodbank on "The Port of London," illustrated. 5 p.m. TUESDAY, JANUARY 16. Architectural Association Camera and Cycling Club.—Mr. G. Trotman on "Winchester Cathedral." 7.30 p.m. The Institution of Heating and Ventilating Engineers.—Annual general meeting (Institution of Mechanical Engineers, Storey's-gate). Election of officers, etc. Presidential address by Mr. W. Nelson Haaden, and paper by Mr. A. H. Barker on "Colorimetric Methods of Investigating the Loss of Heat from Buildings and Radiators." 7 p.m. Institution of Civil Engineers.—Papers to be further discussed:—(1) The Elimination of Storm-water from sewerage systems," by Mr. D. E. Lloyd-Davies, (2) "On the Elimination of Suspended Solids and Colloidal Matters from Sewage," by Lieut.-Colonel A. S. Jones, D.C., and Mr. W. O. Travy, M.D. 8 p.m. WEDNESDAY, JANUARY 17. The Quantity Surveyors' Association ("The Chinese Room," Holborn Restaurant).—Adjourned discussion upon Mr. F. B. Hollis's paper, "Some Thoughts on the Quantity Surveyor, and his Relation to the Building Owner, the Architect, and the Builder." 7 p.m.

Builders' Foremen and Clerks of Works Institution.—Annual meeting of the members. 8 p.m. Edinburgh Architectural Association.—Mr. W. T. Oldrieve on "What H.M. Office of Works is doing for Historic Buildings in Scotland." 8 p.m. Northern Architectural Association.—Mr. R. G. Hatton on "Jacobean Floral Patterns." 7.30 p.m. Institution of Civil Engineers.—Students' visit to the works of the South Metropolitan Gas Company, 709, Old Kent-road, S.E. 2.30 p.m.

THURSDAY, JANUARY 18. Society of Arts (Indian Section).—Mr. C. E. Duckland, C.I.E., on "The City of Calcutta." 4.30 p.m. Society of Arts (Howard Lecture).—Professor Silvanus Thompson, D.Sc., on "High Speed Electric Machinery with Special Reference to Steam Turbine Machines." 1.8 p.m.

FRIDAY, JANUARY 19. Architectural Association.—Mr. F. Lynn Jenkins on "The Consideration of Sculpture by Architects." 7.30 p.m. Royal Institution.—Professor J. J. Thomson on "Some Applications of the Theory of Electric Discharge to Spectroscopy." 9 p.m. Institution of Mechanical Engineers.—(1) Discussion to be held and concluded on paper on "The Behaviour of Materials of Construction Under Pure Shear," by Mr. E. G. Izod; (2) Mr. Robert A. Bruce on "Worm Contact." 8 p.m.

PRICES CURRENT OF MATERIALS.

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

Table of material prices including Bricks, Glazed Bricks, Rough Stocks and Gravel, Facing Stocks, Shippers, Best Fire Bricks, Best Blue Pressed Staffordshire, Do. Bullnose, Best Scotch Bridge Fire Bricks, Glazed Bricks, Best White and Grey, Stretchers, Headers, Quoins, Bullnose, and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered, Squares, Best Dipped Salt Glazed Stretchers and Headers, Quoins, Bullnose, and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered, Squares, Second Quality White Bricks, Dipped Salt Glazed, Thames and Pit Sand, Thames Ballast, Best Portland Cement, Best Ground Blue Line Lime.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks. Grey Stone Lime 11s. 0d. per yard, delivered. Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

Table of stone prices including Bath Stone, Portland Cement, Nine Elms Depot, Portland Stone, Brown Whilbed, Elms Depot, White Bashed, Ancaster in blocks, Beer, Greenhill, Darley Dale in blocks, Red Corshill, Closebar Red Freestone, Red Mansfield, York Stone—Robin Hood Quality, Scappled random blocks, 6 in. sawn two sides landings to sizes (under 40 ft. super), 6 in. rubbed two sides ditto, 3 in. sawn two sides slabs (random sizes), 2 in. to 2 1/2 in. sawn one side slabs (random sizes), 1 1/2 in. to 2 in. ditto, ditto.

STONE (continued).

Table of stone prices including Hard York, Scappled random blocks, 6 in. sawn two sides landings to sizes (under 40 ft. super), 6 in. rubbed two sides ditto, 3 in. sawn two sides slabs (random sizes), 2 in. self-faced random flags, Hopton Wool (Hard Bed) in blocks, 6 in. sawn both sides landings, 3 in. sawn both sides random slabs, 2 in. do.

SLATES.

Table of slate prices including 20x10 best blue Bangor, 20x12, 20x10 first quality, 20x12, 16x8, 20x10 best blue Portmadoc, 20x10 best Brecka fading green, 20x12, 18x10, 16x8, 20x10 permanent green, 18x10, 16x8.

TILES.

Table of tile prices including Best plain red roofing tiles, Best Broseley tiles, Do. Ornamental tiles, Best Buxton red, brown, or brimled do. (Edwards), Do. Ornamental do., Hip tiles, Valley tiles, Best Red or Mottled Staffordshire do. (Peakes), Do. Ornamental do., Hip tiles, Valley tiles, Best "Rosemary" brand plain tiles, Best Ornamental tiles, Hip tiles, Valley tiles, Best "Hartsill" brand plain tiles, sand faced, Do. pressed, Do. Ornamental do., Hip tiles, Valley tiles.

WOOD.

Table of wood prices including Building Wood, Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in., Deals: best 3 by 9, Battens: best 2 1/2 in. by 7 in. and 3 in. by 7 in. and 8 in., Deals: seconds, Battens: seconds, Foreign Sawm Boards, 3 in. and 1 1/2 in., Fir timber: best middle bur Darnley, Seconds, Small timber (8 in. to 10 in.), Small timber (6 in. to 8 in.), Swedish battens, Pitch-pine timber (30 ft. average), JOINERS' WOOD.

Table of wood prices including White Sea: first yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Second yellow deals, 3 in. by 11 in., Battens, 2 1/2 in. and 3 in. by 7 in., Petersburg: first yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Second yellow deals, 3 in. by 11 in., Do. 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Third yellow deals, 3 in. by 11 in., Do. 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., White Sea and Petersburg: First white deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Second white deals, 3 in. by 11 in., Do. 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Pitch-pine: deals, Under 2 in. thick extra, PRICES CURRENT.—Continued on page 55.

List of Contracts, etc.

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
300 and 350 Gallon Hosed Steam Fire-Engine	Hendon U.D.C.	S. Slater (Grimley, Engineer, Council Offices, Hendon, N.W.	Jan. 15
*ROADMAKING AND PAVING WORKS	do.	do.	do.
Improvement in Smauthorne-avenue	Castledoff U.D.C.	W. Green, Surveyor, Castledoff	Jan. 16
Making-up Streets	Acorn F.D.C.	D. J. Ebbetts, Surveyor, 57, High-street, Acton, W.	do.
Goods and Materials	Plymouth Corporation	F. Howarth, Water Engineer, Municipal Buildings, Plymouth	do.
Fireclay Pipes, Grit Sets, etc.	Lancaster Corporation	J. C. Mount, Borough Surveyor, Lancaster	do.
Infant School, Hawthorn	Pontyprrad U.D.C.	P. R. A. Willoughby, Surveyor, Pontyprrad	Jan. 17
Twelve Months' Supply of Paint, etc.	Manchester Corporation	R. Williamson, Town Hall, Manchester	do.
Infant School at Croydon	Monmouthshire Education Comm.	H. J. Griggs, Architect, Newport, Mon.	do.
Alterations at Mixed School, Crosswell	do.	do.	do.
Alterations to Gates & Paving at Wkham, Crescent-rd., Crimppall	Manchester Guardians	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester.	do.
Cabmen's Shelter, Chandeleet	Hill Corporation	Clerk of the Council, Castle-terrace, Edinburgh.	do.
Painter's Work, Craigleith Poorhouse, Comely Bank	Edinburgh Parish Council	W. Harris, Architect and Surveyor, Gilfach Bargeod	do.
Heating C.M. Chapel, etc., with Hot-water, Gilfach Bargeod	do.	A. H. Malin, Clerk, Oranham	Jan. 18
Granite and Slag	Grantham R.D.C.	C. T. Rathbone, Architect, Bank-chambers, Heathfield-st., Swansea	do.
Granite and Slag	Goss-lane Baptist Church	T. A. Bushwiler, District Surveyor of Highways, Spilsby	do.
*MARRIED COUPLES' QUARTERS AT WORKHOUSE	Sulby R.D.C.	Clerk to Guardians, Fulham Palace-road, W.	do.
Sunday Schoolroom, Fitzthum-embankment, Cardiff	Fulham Guardians	A. Grove, Architect, 15, Clifords-inn, London, E.C.	Jan. 19
Sinking a Well at Gransha, 75 ft. deep	Rev. H. A. Coe	C. C. Doig, Architect, Elgin	do.
Villa to be Erected at the Crofts, Elgin	Londonderry Lunatic Asylum	A. Thorne, Borough Surveyor, Barnstable	do.
Sewer and Paving Works, Bontrivock-street	Barnstable U.D.C.	E. Wilson, 10, Westgate, Galsburgh	do.
Primitive Methodist Chapel and School, Galsburgh	do.	J. Brooke Smith, Surveyor, Church-street-chambers, Cardiff	do.
Renovation of No. 2, Church-street, Cardiff	do.	Rev. H. A. Coe	Jan. 20
Stoneware Pipes and Goods	Tyldesley-W. Shakerley U.D.C.	T. H. Murray, Architect, Cossett	do.
House, Avelley-terrace, Cossett	Shibley Bridge, etc., Gas Co.	A. M. Cross, Engineer, 23, Valentine-road, King's Heath	Jan. 22
Making good All Saint's-road, King's Heath	Middleton Cheney R.D.C.	W. J. Treadwell, District Sur., Middleton Cheney, Banbury	do.
2,200 yds. of Wrought-iron Railing, Franklyn-road	St. Northern Ry. Co., Ireland	T. Morrison, Secretary, Amiens-street, Terminus, Dublin	do.
Harthill Stones, Granite and Slag	Metropolitan Water Board	A. B. Pilling, Clerk, Savoy Court, Strand, W.C.	do.
1,000 or 4,000 Tons of 90-lb. Steel Bullhead Rails	Bangor Corporation	O. Roberts, Architect, The Temple, Dale-street, Liverpool	do.
1,250 or 2,500 Tons of Cast-Iron Chairs	Twickenham F.D.C.	H. H. Samlles, Clerk, Town Hall, Twickenham	do.
700 Tons of 16-in. Cast-Iron Pipes	Croydon Guardians	H. Holt, Clerk, Mayday-road, Thornton Heath	do.
43 Workmen's Dwellings, Saffron-walden, etc.	Dover Town Council	H. E. Stulge, Surveyor, Maison Dieu House, Dover	do.
School Furniture, Trafalgar Schools	West Wylam, etc., Co-op. Soc.	Central Stores, Prudhoe	do.
Unbroken Guernsey Granite	Beckenham U.D.C.	Council's Surveyor, Beckenham	do.
Infants' School, Common-lane, River	Croydon Borough Council	Croydon Engineer, Town Hall, Croydon	do.
Two Houses at Crawbrook	Lancashire and Yorkshire Ry.	F. Pylon, Borough Engineer, Municipal Buildings, Plymouth	Jan. 23
*DEFECTIVE SCHOOL, ETC.	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*BUILDER'S WORK AT STROUD GREEN WELL	Salford Corporation	T. Kershaw, Architect, Lancs. and Yorks. Bank-chs., Halifax	Jan. 24
Stores.	Carshalton U.D.C.	J. Corbett, Borough Engineer, Town Hall, Salford	do.
Widening Railway between Littleborough and Summit Tunnel	Chelsea Borough Council	C. P. Lovelock, Clerk, High-street, Carshalton	do.
*BOUNDARY WALL, NEASDEN	Edon R.D.C.	Borough Surveyor, Town Hall, Chelsea, S.W.	Jan. 25
Residence, Stables, etc., Free School-lane, Halifax	do.	A. Gladwell, Engineer, Council Offices, 160, High-st., Slough	do.
Raking Machinery for Sewage Works	The Managers	Rev. Canon Raven, The Vicarage	do.
Making-up Five New Roads	Technical Instruction Comm.	G. T. Moore, Architect, 1 & 2, Foster-pl., College Gn., Dublin	do.
*ANNUAL CONTRACTS	County Borough of West Ham	Borough Engineer, Town Hall, Stratford, E.	do.
Sewage Purification Works, Burnham	Blackburn Guardians	F. C. Rutledge, Architect, 4, King-street, Blackburn	Jan. 26
4 miles of Pipe Sewers, etc., Burnham	Chipping Norton R.D.C.	R. Entwistle, Surveyor, Charlbury, Oxon	do.
Technical School, Eblana-avenue, Kilmcrauna	Westminster City Council	Works Dept., Westminster City Hall, Charing Cross-rd., W.C.	do.
*ANNUAL CONTRACTS	Hertfordshire County Council	Urban A. Smith, County Surveyor, Hatfield	Jan. 27
*HEATING APPARATUS, ETC., AT WORKHOUSE	West Sussex Education Com.	J. H. Howard, Architect, Lover-street, Haslemere	do.
Granite	Governors of Grammar School	F. T. Malby, Architect and Surveyor, Dorchester	do.
*SEWER WORKS IN CITY OF WESTMINSTER	Warrington Paving Com.	R. H. Engineer and Surveyor, Town Hall, Warrington	Jan. 29
Broken Granite and Slag	Lancashire Education Comm.	H. Litter, County Architect, 16, Ribblesdale-place, Preston	do.
Road at Camblehill, Sussex	Alverstoke Guardians	H. A. F. Smith, Architect, Star-chambers, Gosport	do.
Alterations to No. 40, South-street, Dorchester	Hants County Council	County Surveyor, The Castle, Winchester	do.
Forming and Paving Six Streets and Sixty-six Passages	Nelson Corporation	Poyser & Savage, Architects, King-street, Nottingham	Jan. 30
Public Elementary School, Erwood-road, Levenshulme	Lambeth Borough Council	Borough Engineer, 348, Kennington-road, S.E.	do.
Bathrooms and Hot-water Works at Workhouses, Gosport	F. Sussex, Local Educ. Auth.	County Surveyor, County Hall, Lewes	Feb. 1
*SCHOOL AND HOUSE AT BEAULWORTH	do.	do.	Feb. 2
Villa at Cranmore-gardens, Lishurn-road, Belfast	District Gas and Water Co.	T. H. Martin, Engineer, Nation-road, New Barnet	do.
*FREE LIBRARY	Wilton Corporation	J. Taylor, Sons, & Santo Grimm, 27, St. George-street, S.W.	Feb. 3
*WORKS AT CORNER'S COURT	Municipality of Pretoria	Res. Lowlyne, Architect, Birchmore House, Brixingrove	Feb. 5
*INFANTS' SCHOOL, PORTSLADE-BY-SEA	Bishopthorpe R.D.C.	Mosenthal, Sons, & Co., 72, Basinghall-street, E.C.	Mar. 15
*SCHOOL, ETC., CHIDDINGLY	Irish National Foresters	F. Ware, Clerk, 6, New-street, York	No date
Covered Service Reservoir, Akeley, Barmet	New-on-Type Educ. Comm.	H. Stobart & Co., Ltd., Ebury-st., Durham	do.
Drainage Works, Contract No. 1	do.	J. P. Convery, 29, Catherine-street, Newry	do.
Calvinistic Methodist Chapel, etc., Birchgrove, Llansamlet	do.	A. Goddard, Sec. Educ. Offices, Northumberland-rd., Newry	do.
Handbooker Blue Slag	Mr. H. Bromley	Davidson & Phillipson, Architects, Pearl-bldgs., New-on-T.	do.
Rebuilding, etc., Twenty-five Houses, Chapel-row, Ferryhill Station	Plymouth St. Mary R.D.C.	Baker & Wrightson, Architects, 21, Liverpool-street, E.C.	do.
Forester's-hall, etc., Belfast	Messrs. Norman & Fring	F. A. Clark, Surveyor, 83, Old Town-street, Plymouth	do.
Alterations to Gas-Fittings at Five Schools	Canmore Bowling Club	E. F. Hooper, Architect, 6, Union-road, Painswick, Exeter	do.
Incandescent Light at Five Schools	Elington Guardians	H. C. Fread, A.R.I.B.A., Bank-chambers, Reddington	do.
Shops and Houses, Pier-avenue, Clacton-on-Sea	do.	Gavin & Soutar, Architects, Forfar	do.
Laying Sewer (120 ft.) at Pomphlet, Plymouth	do.	W. Smith, Architect, 65, Chancery-lane, W.C.	do.
Rebuilding The Half Moon Inn, Newton Abbot.	do.	Arthur Cois, "Mogok," Thurlstone-road, West Norwood	do.
Residence, Hansler-grove, Molesey	do.	do.	do.
*TWO BLOCKS AT ST. JOHN'S ROAD WORKHOUSE	do.	do.	do.
*ADDS, ETC., AT GUARDIANS' OFFICES, ST. JOHN'S ROAD	do.	do.	do.
*THREE SHOPS AT SHORTLANDS, KENT	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*LOCAL MAIN ROAD SURVEYOR	Gloster County Council	£80, per annum	Jan. 26
*TWO LOCAL MAIN ROAD SURVEYORS	do.	1657, per annum	do.

AUCTION SALES.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*FREEHOLD BUILDING LAND, STAMFORD HILL.—At the Mart	David Burnett & Co.	Jan. 24
*FREEHOLD BUILDING SITE, CITY OF LONDON.—At the Mart	Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.	Feb. 22

* Those with an asterisk are advertised in this number: Competitions, —; Contracts, iv, vi, viii, x; Public Appointments, xvii; Auction Sales, xxvi.

PRICES CURRENT.—Continued from page 53.

WOOD (continued). Table listing prices for various wood products including Joistern's Wood, Yellow Pine, Fir, Oak, and various types of logs and planks.

JOISTS, GIRDEBS, &c. Table listing prices for Rolled Steel Joists, Compound Girders, Steel Compound Stanchions, Angles, Tees, and Channels, and Flitch Plates.

METALS. Table listing prices for Iron—Common Bars, Staffordshire Crown Bars, Mild Steel Bars, Hoop Iron, Galvanized, Sheet Iron Black, Sheet Iron Galvanized, Galvanized Corrugated Sheets, and Cut Nails.

LEAD, &c. Table listing prices for Lead—Sheet, English, 3lb. and up, Pipe in coils, Soil pipe, Conno pipe, Zinc—Sheet, and various types of copper and brass sheets.

ENGLISH SHEET GLASS IN CRATES. Table listing prices for various sizes of sheet glass in crates, including 15 oz. thirds, 21 oz. thirds, 26 oz. thirds, and 32 oz. thirds.

OILS, &c. Table listing prices for Raw Linseed Oil, Boiled Oil, Turpentine, and other oil products.

VARNISHES, &c. Table listing prices for various types of varnishes including Fine Pale Oak, Superfine Pale Elastic Oak, and others.

TERMS OF SUBSCRIPTION. 'THE BUILDER' (Published Weekly) is supplied DIRECT from the office to residents in any part of the United Kingdom at the rate of 2s. per annum (22 numbers) PREPAID.

TENDERS. Communications for insertion under this heading should be addressed to 'The Editor,' and must reach us not later than 10 a.m. on Thursdays.

ABERYSTWYTH.—For the new Davies memorial laboratories at Buarth Mawr. Mr. A. W. S. Cross, architect, 46, New Bond-street, London, W. Quantities by Mr. W. Windsor, 37, Brown-street, Manchester. H. Willocks & Co., Wolverhampton. £16,164

CAERAI.—For an infectious diseases hospital at Caerai, near Cardiff, for the Llandaf and Dinas Powis Rural District Council. Mr. J. H. James, architect, 18, Quay-street, Cardiff. J. Jones, £12,475 0 0; J. G. Thomas & Sons, £9,818 8 0; & Blight, £11,219 15 0; G. Beams, £6,888 3 0; F. Bond, £10,782 5 3; E. Turner & Sons, £9,613 16 8; A. J. Colborne, £10,715 4 9; W. Symonds & Co., £9,574 11 6; G. C. Dunn, £10,458 2 0; H. Griffiths & Sons, £10,207 6 0; E. K. Evans & S. Shepton, £10,180 2 7; D. W. Davies, £9,340 10 0; Son, £10,155 16 1; Knox & Wells, £9,203 11 9; A. White & Sons, £9,950 0 0; Son, Trade-street, Cardiff, £9,454 2 7; E. Williams, £9,828 12 9; W. Williams, £9,447 15 7; ditto, £9,161 2 5

DOVER.—For laying a sewer in Malsion Dieu-road, etc., and surface water drain in Folkestone-road, for the Town Council. Mr. H. E. Stidge, Borough Engineer, Malsion Dieu House, Dover. Johnson & Co., £3,773 0 0; Muirhead & E. Stokes, £3,734 12 11; G. H. G. & W. S. Long, £3,601 4 0; Matthews, £3,071 15 2; G. Castle & Co., £3,350 14 7; G. Lewis & Co., £2,965 0 0; W. Wright & Co., £3,251 17 3; R. G. & B. Co., £3,245 18 10; J. W. Dean, £3,094 4 10; J. W. Smith & Co., £2,924 10 7; Ltd., £2,924 10 7

GREAT CROSBY.—For outfall sewers, for the Urban District Council, Mr. Walkin Hall, Surveyor, Council Offices, Coronation-road, Great Crosby, Lancs. R. Auhahn, Harrogate. £9,052 17

HAMPTON.—For making-up and paving part of Park-road, Hampton Hill, for the Urban District Council. Mr. Sidney H. Chamber, Surveyor, Public Offices, Hampton Hill, Hampton. R. & W. Swaker, £1,066 16 6; S. Atkins, £1,185 8 10; J. Shillbourne & Co., £1,184 10 0; S. Kavanagh, £1,058 5 3; T. Junor, £1,150 15 11; J. Nowlen & Co., £1,051 0 0; Sons, £1,133 5 3; W. F. Fry Bros., £1,140 0 0; Cunningham & Co., £1,125 3 6; Wharf, Greenwich, £92 11 4

HARROGATE.—For street improvement works for the Corporation. Mr. F. Bagshaw, Borough Engineer and Surveyor, Harrogate. E. Long, 7, Forest-av., Starbeck, Harrogate. £201 6 4

HARROGATE.—For street improvements, Strawberry-square, for the Corporation. Mr. F. Bagshaw, Borough Engineer and Surveyor, Harrogate. E. Long, 7, Forest-av., Starbeck, Harrogate. £201 6 4

HELLINGLY (Sussex).—For underpinning, alterations, and additions to Horsebridge Mill, for Messrs. The Horsebridge Roller-Milling Company, Ltd. Mr. A. H. Burtchaw, architect, Highbury, London, W. Martin & Sons, £450; T. Rich, £318; P. Dennis & Co., £348; W. Burgess, Hellingly £275 [Architect's estimate, £301]

ILFORD.—For private street works, Eltisey, Natal, Sandhyll, and West-roads, for the Urban District Council. Mr. H. Shaw, Surveyor, Town Hall, Ilford. Parsons & Parsons, The Wharf, Ilford. £768 9 6; West-road D. T. Jackson, Barking. £207 9 9; Eltisey-road D. T. Jackson, Barking. £45 1 9; Natal-road Parsons & Parsons

ILFORD.—For 1,107 yds. of fencing, for the Urban District Council. Mr. H. Shaw, Surveyor, Town Hall, Ilford. Murray, Marshall, Godalming, Surrey. £129 3

KIRTON (Lincolnshire).—For erecting an infant-school at the Kirton Church-end Council Schools. Mr. J. Rowell, architect, Church-lane, Boston. £1,042 10; W. H. Parker & Son, Boston. £1,042 10 [Nine other tenders, highest £1,745]

LONDON.—For reconstructing iron roofs and works in connexion therewith at No. 89 and 91, Summer-street, Southwark, S.E. Messrs. Rogers, Chapman, & Thomas, P.S.A., 50, Belgrave-road, Westminster, S.W. W. Harrow, £566 3; Humphreys, Ltd. 597 0

LONDON.—For iron fire-escape staircase and other internal alterations as required by the London County Council, at No. 54, Barkside, 50, Belgrave-road, Westminster, S.W. G. Wright, Ltd., £279 0; Hayward, Bros., & H. G. Measures, 263 17; Eckstein, Ltd., £235 0

LONDON.—For the erection of a new police candidate's section house, at Regency-street, Westminster. Mr. J. Dixon Butler, architect and surveyor to the Metropolitan Police, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son, & Chidgoy, Charing Cross-chambers, Duke-street, Adelphi. W. Evans, £14,765; C. Ansell, £13,731; F. C. Minter, £14,641; Biggs & Hill, £13,640; Lascelles & Co., £14,463; Appleby & Sons, £13,640; Harris & Wardrop, £14,290; F. & H. F. Biggs, £13,544; J. Carmichael, £14,250; Godson & Sons, £13,480; Lovatt, Ltd., £14,000; Fairhead & Co., £13,427; Grover & Son, £13,075; Lawrance & Son, £13,295; Prostag, Co., £13,955; Mowlem & Co., Ltd. £12,980; Lashby Bros., £13,895

LONDON.—For the pulling down and re-erection of No. 15, Great Saint Andrew-street, for Mr. Joshua Morrell, Messrs. Hayward & Maynard, architects, etc., 20, Joint-street, Adelphi, W.C. J. Bentley, £2,940; Patman & Fother, £2,940; J. Bentley, £2,561; Ingham, £2,940; [A contract has since been entered into with Messrs. Patman & Fotheringham to carry out the work for the sum of £2,016.]

LONDON.—For repairs, decorations, electric lighting, and other improvements, at No. 36, Lower Belgrave-street, Belgrave, S.W.—Messrs. Rogers, Chapman, & Thomas, E.S.I., 59, Belgrave-road, Westminster, S.W.:—
Notas & Co., Ltd. £471 0 6 Hibberd Bros.,
Rawlings Bros., Ltd. £413 0 0
Ltd. 465 0 0 E. D. Hook* 410 3 0

LONDON.—For extensions to King's Cross Laundry, Caledonia-street and Netherland-place, N. Messrs. S. J. Reynolds & Herbert Hicks, architects, Regiate and Broadstairs, Quantities by Mr. J. Kennard, Kingston:—
McCormick & Son, £11,550 Martin, Wells, & Goddard & Son, 11,264 Co., Ltd. £10,132
Coils & Sons, 10,880 F. & H. F. Hings, 10,123
J. Simpson & Son, 10,642 E. Lawrence & Sons, 9,381
Perry & Co., 10,550 Woodley & Green,
C. Wall, Ltd., 10,480 H. W. Buxton & Co., 9,381
D. W. Barker, 10,347 holiday* 9,940

LONDON.—For decorations and sanitary repairs and electric light installation at No. 20, Fenway-road, Earl's Court, S.W. Messrs. J. W. Morley & Co., Surrey-st., 176, Earl's Court-road, S.W.:—
G. Basing, £223 0 0 H. Smith & Son £223 0 0
J. Rugg & Son, 251 0 0 H. W. Buxton & Co., 222 9 6
T. W. Heath & Son, 230 0 0

MABLETHORPE.—For erecting a children's wing to the convalescent home, for the Committee. Mr. R. H. Fowler, architect, Louth. Quantities by Mr. J. J. Cresswell, Grimsby:—
Bowman & Sons, £2,465 0 0 F. M. Thompson & Sons £2,933 10 0
A. J. Elmes, 2,137 11 J. Cooper & A. Wood, 1,979 0 0 Son, 1,900 0 0
F. Moore, 1,993 0 0 G. H. Vickers, 1,900 0 0
A. Wood, 1,979 0 0 Mawer Bros., Louth* 1,888 0 0
J. Kime, 1,960 0 0

PLYMOUTH.—For the erection of workmen's dwellings, How-street, for the Corporation. Mr. James Paton, Borough Engineer. Quantities by S. W. Haughton, Plymouth:—
Pearce Bros, £6,833 0 0 P. J. Stanbury £6,189 10 1
Walcott Bros., 6,448 0 0 A. C. Jones, 6,043 0 0
Stevenson & Co., 6,403 0 0 Pearce Bros, 5,946 0 0
& Co., 6,403 0 0 S. Roberts, 5,930 1 8
A. N. Coles* 5,678 18 0

TAUNTON.—School for 600 children in three departments, including science, cookery, laundry, manual instruction, and caretaker's cottage, at North Town, Taunton, for the Taunton Borough Education Committee. Messrs. H. Dare Bryan and F. W. Roberts, joint architects, 2, Hammet-street, Taunton. Quantities by Messrs. Bernard & Son, Baldwin-street, Bristol:—

	General Tender.	Glazed Bricks for Dadoes.	Glazed Tiles for Dadoes.
Pennet, 14,039 0 6	1,322 14 6	365 5 0	
Perkins & Son, 14,000 0 0	339 0 0	159 0 0	
Stephens & Baston, 14,000 0 0	394 16 3	395 4 0	
Wakeham Bros., 13,422 0 0	466 0 0	370 0 0	
Pittard & Son, 13,300 0 0	397 0 0	305 14 0	
Roberts, 12,994 0 0	392 18 8	316 6 8	
Stephens & Sons, 12,803 0 0	685 0 0	327 0 0	
Stanbury, 12,609 17 3	375 19 6	322 10 3	
Pettick, 12,441 0 0	555 0 0	385 0 0	
Moorbridge, 12,430 5 0	170 0 0	330 8 11	
Long, 12,397 0 0			
Pollard, 12,030 0 0	240 0 0	365 0 0	
Pollard & Co., 12,000 0 0	577 0 0	326 0 0	
Coles, 11,875 0 0	418 0 0	285 0 0	
Collinge, 11,870 0 0			
Small, 11,863 0 0	265 8 3	360 19 4	
Blake, 11,650 0 0	486 0 0	326 0 0	
Wilkins, 11,630 0 0	420 0 0	320 0 0	
A. J. Spiller, 11,621 16 0	660 6 0	368 2 0	
Revised Tenders.			
Coles, 9,040 8 9	418 0 0	285 0 0	
Blake, 8,800 0 0	486 0 0	326 0 0	
Wilkins, 8,730 0 0	420 0 0	320 0 0	
Small, 8,700 0 0	328 18 0	360 19 0	
A. J. Spiller, 8,663 0 0	300 0 0	330 0 0	
Pollard & Co., 8,299 0 0	340 0 0	300 0 0	

* Recommended for acceptance, £8,639.
‡ Too late for consideration.

TAUNTON.—For additions to Pool Wall Mills, for the Taunton Manufacturing Co. Mr. F. W. Roberts, architect, 2, Hammet-street, Taunton. Quantities by the architect:—
R. Wilkins, £3,136 0 0 T. Moorbridge £1,812 4 0
H. W. Pollard, 2,116 13 0 H. J. Spiller, 1,880 0 0
F. W. Rowse, 1,984 0 0 Son, Taunton, 1,810 0 0
G. Pollard & Co., 1,946 9 9 J. E. Furse, 1,579 0 0
T. Manning & Son, 1,831 0 0
‡ Increased £180 through delay in accepting a tender when first sent in.

TIVERTON.—For sewage disposal works at the Sewage Farm, for the Corporation. Mr. J. Siddalls, Borough Engineer, Town Hall, Tiverton:—
J. Riley, £4,117 2 8 Woodman & Pettick Bros, 3,204 0 0 Son, 2,773 0 0
J. Shaddock, 3,473 6 4 Pollard & Co., Ltd., 2,706 16 7
Jenkins & W. Shaddock, 3,458 1 8 Ltd., 2,706 16 7
Sons, 3,224 4 0 Smith & Co., 2,706 16 7
Steer & Pearce, 3,124 0 0 Stevens & Son, 116,
W. E. Labor, 2,957 16 5 Forestreet, Exeter* 2,633 0 0
H. R. Gunn, 2,946 10 0

TOTTENHAM.—For erecting a school to accommodate 1,260 children on the Parkhurst-road site, for the Education Committee. Mr. G. E. T. Laurence, architect, 22, Buckingham-street, Adelphi, W.C.:—

Amount to be deducted for Glazed Brick Dadoes and Plastered Walls.

Chessum & Sons, £25,300	£2,334 0 0
Clark & Sons, 19,785	1,473 0 0
Cowley & Drake, 24,395	2,138 0 0
F. J. Coxhead, 20,242	1,269 0 0
Divvy, Ltd., 21,069	1,771 0 0
Fairhead & Son, 20,468	1,545 0 0
Goddard & Sons, 22,282	2,205 7 4
J. Guttridge, 23,281	1,980 0 0
Hull & Co., 23,750	1,791 0 0
Johnson & Son, 19,844	1,345 0 0
Lawrence & Son, 23,000	1,477 0 0
Lovatt, Ltd., 21,442	1,999 0 0
Myall & Lyson, 23,441	1,945 0 0
Newby Bros., 21,835	1,804 0 0
B. E. Nightingale, 21,992	1,870 0 0
Oak Building Co., 23,273	2,000 0 0
Patman & Potheringham, 21,699	1,680 0 0
Pollard & Brand, 22,771	1,960 0 0
A. Porter, 20,850	1,776 0 0
Rowley Bros., 20,760	1,631 0 0
C. Wall, Ltd., 21,000	1,604 0 0
Wallis & Sons, 23,085	1,797 0 0
Whitehead & Co., 22,320	1,823 0 0
Wilkinson & Son, 21,197	1,850 0 0
Young & Son, 21,197	1,850 0 0

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The Builder.

VOL. XC.—No. 3253.

JANUARY 20, 1906.

ILLUSTRATIONS.

Sculpture Panel, Central Library, Bristol.....	Mr. Charles Pibworth, Sculptor.
Doorway in Chapel, Pisa Cathedral.....	Drawn by Mr. Lionel U. Grace.
City of Rochester Technical Institute.....	Messrs. Russell & Cooper, Architects.
Premiated Design, Herne Hill Public Library.....	By Mr. T. Wallis.
Mexborough House, Dover-street.....	Mr. J. S. Gibson, F.R.I.B.A., Architect.

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The Arts and Crafts Exhibition.



It is a pleasure to be able to say that the eighth exhibition of the Arts and Crafts Exhibition Society, at the Grafton Gallery, is the best they have ever held, in one respect at all

events—that it is an exhibition almost entirely free from eccentricities. "L'Art Nouveau" is conspicuous by its absence; there are none of those freaks of design which were the result of a kind of struggle after what is supposed to be originality, and which became a source of not unmerited derision to the Philistine critic. The rooms are full of work nearly all of which is interesting, and much of it beautiful. There may have been in some former exhibitions individual exhibits which were superior in their kind to anything in the present collection; but there is at any rate nothing of any importance to object to. And, partly owing to the larger extent of the Grafton Gallery, the exhibition is better and more effectively arranged than it ever was in the New Gallery; things are not crowded together so much, and there is room to see the total effect. The large gallery, in which are hung most of the exhibits which approach the pictorial side of applied art—designs for stained glass and various forms of mural decoration—is decorated at the top by the continuous frieze designed by Mr. Walter Crane for the British section of the St. Louis Exhibition; a

very graceful design in which groups of conventional foliage are arranged with symmetrical spacing, leaving a considerable amount of white ground between, the whole being very bright and decorative. At the end of the room a kind of semi-architectural screen is formed by Mr. Dressler's large plaster model for the stone carving for the Victoria Infirmary at Newcastle, the main portion of which consists of life-size spandrel figures in bas-relief on either side of a large doorway opening, the whole thing extending across a great part of the width of the room. The figures, whose hands meet in the centre over the arch, symbolise respectively "Hygiene" and "A Crown of Wild Olive." As we shall not return to this again, we may say that while the figures have the spirit and vigour of style which we are accustomed to associate with Mr. Dressler's work, it seems to us that in a decorative sense the effort to make them accommodate themselves to and fill up the space of the spandrel has not been quite happily managed, the two figures being, as one may say, bent at the waist in a manner which, considering them as figures and apart from the setting, is a little awkward and displeasing in line, and conveys too much the appearance of an effort to make them fill the space. A figure designed to fill a special space ought to have the appearance of having naturally fallen into the attitude necessary for that object, while these figures appear a little forced in their attitude and do not produce an agreeable line.

The main object of the Arts and Crafts

Society is set forth by its president, Mr. Walter Crane, in what he calls a "foreword" (an affectation of phraseology, since "preface" is an old and legitimised English word now) as being "a search for increased beauty, refinement, and sincerity in design and workmanship in the accessories of human life, united by an architectonic ideal; and as affording scope, in what may be considered the useful arts, for the artistic expression of individual taste and character in contradistinction and protest against purely commercial, mechanical, and machine production" (there seems a suspicion of tautology in the closing sentence). This definition of the objects of the society should in fairness be kept in mind in judging of the contents of the exhibition, because it will be seen that the main object is to give character and beauty to common objects, as implied by the expression "useful arts," rather than to foster the production of objects of great costliness and elaboration, such as are defined by the adopted French term *objets de luxe*. While we have the greatest possible sympathy with this aim of giving beauty and interest to common things, and admit that it has the wider application, since the number of those who can afford the most costly work is comparatively limited, we cannot help wishing that there were a little more recognition of the *objet de luxe*, which may have its worse or its better taste just as much as the plainer and cheaper object. As we remarked the other day in reference to some French work of the Louis Quinze period, with all its exquisite and costly finish there is a want of soul in it; but

this defect is not necessarily inherent in costly work. On the contrary, provided the artistic spirit in design is present, the more costly and the more finely elaborated is a work of construction, such as a table or a sofa, the more beautiful and valuable it is; there is nothing vulgar in itself in costliness; what is vulgar is costliness without art. The Arts and Crafts Society might perhaps be fulfilling its mission even more fully if it were to encourage a little more the production of furniture of the class which would suit a palace, but with more of the true artistic spirit than is generally found in palatial furniture. As it is, there is a little too much of the feeling that plainness and simplicity are essential qualities in artistic work. They are not necessarily so. The truth runs only so far as this; that simplicity with artistic character is worth more than costliness without it. The impression given by the general character of the objects of use exhibited, on this as on former occasions, is that art is something for the middle and lower class rather than for the prince or the millionaire. Of the two possible alternatives it is perhaps the more wholesome and certainly the more generally useful. Still, why leave the prince and the millionaire out in the cold? They also have, artistically, souls to be saved; they want teaching that man doth not live by money alone. There is a socialistic feeling at the bottom of all this, also wholesome, but—just a little one-sided.

In regard to the influence which these exhibitions have had, however, more we believe might be claimed for the Arts and Crafts Society than the president claims in his preface—we beg pardon, "foreword." In referring to the steady growth and development of the movement, he remarks that "arts and crafts exhibitions have become common throughout our country, and handicraft classes have now generally become a necessary part of any art-school curriculum." He might have gone further than "our country." We have had evidence that the Arts and Crafts exhibitions in England have had a very considerable effect on the Continent, in Germany especially; that exhibitions have been started there on the same lines; and the fact of their connexion with English influence was plainly shown in the remark reported to us the other day of a German shopkeeper, who, in endeavouring to explain to an English customer what sort of building it was that he was showing a photograph of, said "It is a kind of Walter Crane Museum." That is a reputation at any rate; and it is one well earned.

We shall, of course, devote more than one article to the varied contents of the exhibition; but we naturally turn first to furniture, which is in itself a kind of architecture on a smaller scale, governed by the same principles; sound construction to begin with, and decoration based upon and expressing construction. The most noteworthy exhibit in this class is perhaps the "Inlaid Mahogany Sideboard" in the middle gallery, designed by Mr. George Jack, executed by Messrs. Thatcher, Gauntlett, & Millard, and exhibited by Messrs. Morris & Co. This is a truly fine and sumptuous work, noticeable for the harmony of line shown

in the bold, sweeping curve of the front, the bold decorative lines of the inlay, and the monumental effect of the square pedestal cupboard beneath, flanked by shelves which echo the curved line of the main front; even the very simple perforated ornament which is carried round the whole has its value. The octagonal angle shafts are carried up a considerable height above the shelf of the sideboard and expand into circular candle-brackets (for as such they must be regarded, if they are anything), according to a fashion which has obtained lately; this furnishes, no doubt, an effective finish to the shafts, but it is hardly a good practical position for candles or any object which would suffer from being overturned, and as a whole the sideboard would have been better for the omission of these features. The price is not appended to this, as it is to many of the pieces of furniture; it would be interesting to know for what sum it could be carried out. Another piece of furniture which claims special mention is Mr. Sidney H. Barnsley's "Library Table in English Walnut" at one end of the large gallery; a simple but excellent piece of work, in which the supports near each end, which carry small drawers between, have that appearance of steadiness and solidity which is so desirable in a library table. A little very simple inlay decoration is applied to emphasise the principal lines of the design. Having mentioned these two rather prominent objects, we may take some of the rest in order of position. In the octagon-room a small oak table with folding legs, by Mr. Pymont, is good in construction and as a very simple design. Mr. Lethaby's "Writing Table" suggests the question whether it is an altogether suitable disposition of ornament (wood inlay) to concentrate it on the legs, leaving all the rest nearly plain; unless indeed it is assumed that the table would be covered by a cloth and only the legs seen; in that case there is reason in it. The "Mahogany Cupboard" by Mr. Munihane is a highly finished piece of work, but the angle shafts and the framing are rather too much cut up with carved ornament which gives them rather a fidgety look and which is hardly interesting in itself. Mr. Bultitude's "Mahogany Escriptoire" is well constructed and put together, and a good surface effect is obtained by the simple expedient of veneering with lozenge-shaped pieces fitted together with the grain reversed. Mr. Gimson's "Sideboard in Elm" is one of the best things in this room; there is a great deal of character in it, with excellent finish; it is absolutely destitute of mouldings, the edges finishing square—we do not say this is necessarily a virtue, but the whole thing is in keeping. In this and in two or three other examples in the exhibition we notice a method of marking and defining the outline of the drawers and doors by a narrow slip (about $\frac{1}{4}$ in.) of dark wood let in and projecting a little above the general plane, rounded on the top; the effect of this is simple, neat, and permanent. But in this and other examples we notice a tendency to a rather too small and trivial treatment of the loose metal handles, which in this example are flat and hang so close to

the woodwork as to be not convenient to get hold of. In two or three other exhibits, by different exhibitors, there is a form of brass hanging handle something like this, which is certainly not very artistic in character and is uncomfortable for the hand and bad to grasp; it looks more like a kind of thing to be bought by the gross in a shop than a fitting appendage to furniture designed for an art exhibition. In Mr. Barnsley's "Library Cabinet" we notice another



little peculiarity which seems to be a new fancy and is met with in other exhibits of the same class; the treatment of the drawer fronts with a small moulded ledge projecting all round beyond the framework of the drawer and forming a rebate on the inner side, so that when the drawer is closed there is a projection all round which covers the joint and is supposed, no doubt, to keep out dust. We rather doubt its doing so; dust is a very insinuating element; and the result is that when the drawers are closed they present the appearance of a series of raised panels, and the effect is not very good. Among some of the metal articles in this room there is a want of the stability of base which is necessary for an article which is to stand loose on the floor; this is the case with Mr. E. Spencer's "Lectern in Wrought Iron," which is much too unsteady on its base for a lectern; and to some extent though not so much, the same objection applies to Mr. R. Evans's "Floor Standard for Electric Light," which however, with its white silk lamp shades, looks very well as a whole. A "Font of Cast Lead" by Mr. G. P. Bankart is a revival of an ancient type of work, and a good design in itself; but lead is a somewhat grim material for a font bowl, justified only on archaeological grounds, and moreover ornament in relief in the interior of the bowl is out of place; what is wanted there is merely a smooth bowl to hold water. This is or should be a general principle in all things made to hold liquid: the most decoratively treated mediaeval chalices are nearly always smooth inside. Mr. Bainbridge Reynolds's "Lectern in Brass and Leather," which stands in the centre of the room, has the merit of mass and solidity, but is not otherwise very interesting. Mr. Gimson's "Wrought Iron Fire-dogs," which we seem to have seen before, are beautiful pieces of decorative design in this material.

In the middle gallery we are first greeted by a "Stone Sundial" by Mr. H. W. Falliser, curiously planned in the form of a concave quatrefoil, with heads of monsters forming brackets under the projecting arms; an original but not very seductive work. Neither can we feel much pleased with Mr. Ashbee's "Writing Cabinet with Tooled Leather" next to it; the expanse of dull red leather has a heavy effect. Mr. Gimson's "Corner China Cabinet in English Oak," with its simple embroidery of inlay on the bars, is a nice bit of work, but for the cottage or kitchen rather than the drawing-room. A "Chair," designed by a guild of four designers, seems rather a small matter

to have occupied the resources of four designers; but it has original character. Mr. Bultitude's "Writing Cabinet," with no very marked character, has qualities of gracefulness and good finish. A "Writing Cabinet" by Mr. Gimson, with the same flat character and absence of mouldings as his exhibit in the octagon room, is, like that, a good piece of work, but one of those that are rather spoiled by the commonplace hanging handles already referred to. Then we come to a more important work, an "Inlaid Sideboard" by Mr. Lethaby, with an elaborate inlay of conventional floral forms on the front of the drawers, and which is distinguished by having sensible and workmanlike brass handles, convenient to the hand and agreeable at the same time in design. Whether the inlaid round spots on the legs of this piece of furniture are any improvement to its appearance may be questioned. Among the objects arranged on it are an excellently designed metal tea-set by Mr. Beuson, almost devoid of ornament, producing its effect solely by fine line; and two charming earthenware bowls of Mr. Lethaby's design, made by Messrs. Wedgwood & Sons. Mr. G. L. Morris's "Clothes Press in Mahogany" is a refined and highly-finished piece of plain work, a little spoiled by the four square blue stones placed rhomboid-wise in the middle of the circular panels; they seem to have no relation whatever to the rest of the design. Two oak chairs designed by Mr. Daltou point the moral that it is a mistake to be too architectural in furniture forms; the columns and arcades which adorn each are not wooden forms, and are out of place. The "Oak Wardrobe" by Mr. G. Ogilvie rather suggests the idea of being formed on Louis Quizeze lines with the ornament left out; it is not a bad-looking thing, but the two semicircular gablets which crown it are rather a deception, having nothing behind them, and look better in front than when seen edgewise. Mr. Ashbee's "Oak Armchair with Inlay" is a good piece of plain but characteristic wooden structure, contrasting in this sense with the architecturally decorated chairs before referred to. Mr. Penty's "Dresser" and "Cabinet of Drawers," both very plain work, would have been a good deal better for the omission of the commonplace and not very well cut ornament which runs along their top edges, and which was not worth doing at all if it were not done better than that. On the dresser are some delicate and charming painted China plates designed by Mr. A. Powell, and made by Messrs. Wedgwood. Mr. Lethaby's "Painted Dresser" is a curious piece of work; a plain unmoulded erection with square thick legs, entirely painted over with conventional foliage in predominating green tones, the whole of the table top even being covered with a small-scale conventional scroll work in green, not quite so well designed as it might be—there are some bad broken-backed curves in it. It is certainly something new, and looks attractive at present, though we should think its style much better suited for a bedroom washstand than for a dresser in the usual sense of the word; the drawback is that with any kind of daily usage the painted ornament would soon become more or less rubbed

and defaced, and it would then look a rather unhappy object. Mr. F. C. Eden's "Ebony Cabinet" repeats the device before mentioned in another cabinet front, of the semicircular gablet finish at the top; but in this case the semicircular section is carried to the back of the cabinet, and thus the shape of the front really represents the construction. On another occasion we will consider some of the more purely decorative and less constructional work exhibited.

TECHNICAL SCHOOLS AND THE CO-OPERATION OF EMPLOYERS.

ONE of the main difficulties in regard to technical education is the problem of education and employment; in other words, how to enable a young man to combine education with breadwinning, or, at any rate, with the means of breadwinning at a comparatively early age. We have all heard how in the Scotch Universities the sons of farmers would study there for one period of the year, and work on the parental land for another, and how American students have been found as waiters in a restaurant during a large part of the year. These are primitive methods; but the stories, true or not, indicate a very practical difficulty, which, if it can be overcome, will assist greatly in the satisfactory technical education of those who are to spend their lives in the engineering and kindred professions. It is because it exhibits the union of practical technical work with theoretical technical education that a small publication now being issued by the Association of Technical Institutions is so valuable.* The result of the inquiry held by this association appears to show that it is quite possible for young men to obtain precept and practice contemporaneously, provided that employers will go a little out of the ordinary groove to enable technical students to be workers in the shop.

But it is clear that without the goodwill and the co-operation of employers this desirable union of theory and practice is impossible, and those employers and firms who are pioneers in the new movement are, we have no doubt, acting in an enlightened manner and on sound lines.

The Report of the Institution states that the trades to which the scheme of co-operation applies are chiefly those connected with engineering, or to some extent with building. It will be useful to give some examples of the manner of co-operation. At Leicester, for instance, apprentices in the building trade are sent for one afternoon a week by employers to the technical school in that town, and apprentices to house painters for one full day a week during the months of November, December, January and February. Here we have co-operation in a slight and rudimentary state. If we go north to Glasgow, we find a very different state of things, which has resulted in the employment of Glasgow engineers all over the world. "The 'sandwich' scheme for the training of engineering day students has been in

operation for many years, and the whole curriculum of day classes for engineers is based on the assumption that in the case of nearly all students the winter session of twenty-five teaching weeks will be followed by service in works during summer. Hitherto the students have been able to gain admission to works during the summer without difficulty, although no formal arrangement has existed between the college and employers." Here we have co-operation on a broad and simple plan, and it is on the basis of this plan that the difficulties of the problem may, at any rate, be partially solved.

A modified but apparently satisfactory plan is that to be seen in connexion with the Barrow-in-Furness Technical School. In this town are the works of the famous firm of Vickers, Sons, & Maxim, Ltd., 720 of whose apprentices attend the technical school. This is what the Report says of the interesting state of co-operation between this great firm and this school. It appears to show plainly that this question of co-operation has passed out of the experimental stage:—

"All apprentice lads are advised to become students at the local technical classes, and, providing satisfactory evidence is given that attendance of not less than two nights per week has been carried out through the session, such apprentices may, as vacancies arise, compete for entry into the drawing offices."

During the session apprentices attending recognised technical classes will be allowed to commence work at 7 a.m., in place of 6 a.m., on the morning following a class attendance, up to but not in excess of three per week. The principal of the technical classes will make a return of attendance, and any violation of this counts as lost time.

A course of classes extending over four years is suggested, and in order to encourage attendance at the classes the firm is prepared to make increased allowances to apprentices for successes in these or allied technical subjects, provided that they have attended the classes regularly so as to obtain the parliamentary grant, on the following scale:—

	2nd class.	1st class.
	Per week	Per week
Extra pay for each subject passed in 1st year's course	3d.	to 6d.
Extra pay for each subject passed in 2nd year's course	3d.	to 6d.
Extra pay for each subject passed in 3rd year's course	3d.	to 6d.
Extra pay for each subject passed in 4th year's course	3d.	to 6d.

The total number of subjects for which payment is claimed is not to exceed four for any one year.

Apprentices who furnish satisfactory evidence that they have pursued a course of study during the term of their apprenticeship may receive permission to attend a technical college, the time spent at college counting towards the completion of their apprenticeship, on condition that at the close of the college course the apprentice will, if required, agree to serve the firm for a period equivalent to that of the college course, the rate of pay being determined by the value assessed for the service, but being in no case less than:—

For any period under 21 years of age, 20s. per week.
For any period under 22 years of age, 25s. per week.
For any period over 22 years of age, 30s. per week.

The firm undertakes to give such apprentices employment during college vacation at rates of pay corresponding to their year of service, counting such as continuous.

The firm is desirous of giving encouragement to apprentices to attend at a technical college, and points out that facilities exist by which prizes or scholarships may be earned, enabling the student to follow such a course without heavy financial strain on his resources.

The firm will at all times be prepared to favourably consider any modification in the above scheme that will be of assistance in bringing about this result; and, further, that so far as particular conditions appertaining thereto will permit, preference will be given to lads possessing technical training in making appointments of trust in the works. This must not, however, be taken to act to the exclusion of any person who is, in the opinion of the firm, fitted for promotion."

* "Report of an Enquiry as to the Co-operation of Employers and Technical Institutions." Issued by the Association, December, 1905. (London: St. Bride's Press, Ltd., New-street-hill, Shoe-lane, E.C.)

If so satisfactory a state of things is found at Barrow-in-Furness, it is clear that, allowing for the different circumstances of other trades and other places, this plan of co-operation is capable of extension all over England. At present but an infinitesimal number of employers interest themselves in the technical instruction of their workers. But the useful Report which is before us shows that an intelligent and enterprising, if small, minority in different parts of England is awake to the necessity of improving the technical education of the country by means of educational and business co-operation. It may be, in the words of the Report, that "the question of the co-operation of employers is the question of the hour in technical instruction"; it is certain, at any rate, that it is a question of vital importance. We hope, therefore, that this Report will be carefully studied by employers all over the country, for, after all, it is primarily their interest to have workers as well educated in technical matters as possible, and when employers and technical institutions generally co-operate for the same end one great educational problem will be nearly solved.

NOTES.

VENDORS and purchasers of house property should note the case of *Carlsh v. Salt*. The action was brought by the purchaser to recover the deposit and the expenses he had incurred in investigating the title. The premises were freehold, but were in a tumbledown condition, and were shortly likely to be rebuilt. The contract for sale was an open contract and was entered into on October 12, 1904. On November 12th, 1903, a party wall notice under the London Building Act had been served upon the vendor, and on October 10, 1904, the usual award had been made rendering the owners liable to pay a certain portion of the costs of rebuilding the party wall. The purchaser was not informed of this liability when he entered into the contract, and when it came to his notice he claimed compensation, and the vendors subsequently treated the contract as abandoned, retaining the deposit. The Court held that the party wall notice and the award constituted a material fact in the knowledge of the vendor which the purchaser could not be expected to discover for himself, and as such amounted to a latent defect in the title; and the plaintiff recovered his deposit as well as the expenses incurred in investigating the title and the costs of the action. This case has a very important bearing upon the sale of property. As we have frequently shown, liabilities may attach to house property, as, for instance, for street improvement, some time before payment is required; such liabilities cannot be discovered by an examination of the title, however careful, and a purchaser, unless he is informed, may find himself saddled with wholly unexpected liabilities.

THE case of *Wandsworth Borough Council v. Baines* is one of considerable importance to householders in London.

The Borough Council, wishing to institute a daily system of removal of house refuse, had served the respondent with a notice that he must cause the refuse to be placed in a movable receptacle at the edge of the kerbstone or footpath in front of his house. The notice had been given pursuant to a by-law made under sect. 16 of the Public Health (London) Act, 1891, and applied to a considerable area. The respondent occupied a house approached by a carriage-drive and distant some 40 ft. from the highway, and he refused to comply with the notice, and as the Council then neglected to collect the house refuse he proceeded against them under sect. 30 of the same Act. The case involved considerable legal argument, in which it was contended that the by-law was *ultra vires*, but the point decided seems simply to have been that the notice served on the respondent went beyond the by-law. The by-law prescribes that the refuse shall be placed on the kerbstone or the edge of the footpath, "or in a conveniently accessible position on the premises." In this case there was such a conveniently accessible position on the premises, and the householder was willing to place his refuse there, so the Court held that the proceedings against the Council must succeed, and they had without reasonable cause failed to perform the duty cast upon them to remove the dust. The larger question, assuming there to be no convenient place on the premises, as to whether by-law a specified householder can be compelled to have the refuse placed in the public street remains undecided.

THE Board of Trade Report has now been published on the collision which occurred on the District Railway in November last near Mill Hill Park station. On this part of the line the signals are operated on the electro-pneumatic system, and the passage of a train into and out of any locked section automatically places the intermediate signal at "danger" and at "safety," respectively. The signals are fitted with a train-stop apparatus, which, when a signal is at "danger," makes contact with a trigger on the train, thereby opening the valve of the continuous brake, and bringing the train to a standstill. From the evidence given at the inquiry it seems probable that the signal near the site of the collision was at danger when the Ealing train passed it. Major Pringle, the Board of Trade inspector, considers it to be proved that this was the case a few minutes after the collision. Thus a matter for explanation is why the brake trigger on the leading coach was not operated by the train-stop. The trigger actually struck the stop, but the movement given thereby was not sufficient to open fully the brake-valve. One of the railway officials suggested as a reason for this failure that the trigger mechanism had become twisted or otherwise disorganised—a tendency that is inseparable from most automatic arrangements. It is extremely important that automatic railway signals should be absolutely reliable, otherwise the employment of fogmen and ordinary fog signals can scarcely be dispensed with in the interests

of public safety. The railway authorities are doubtless alive to the importance of this point, and we have reason for believing that they are already taking steps to remove the defects brought to light by the Ealing accident.

Iron Roofs and Iron Ships.

THE disadvantage that sometimes attends the use of similes is illustrated by one employed by Sir Benjamin Baker in the evidence given last week at the Coroner's inquiry into the Charing Cross accident. Sir Benjamin then made the incidental remark that, as regarded rust and stresses, the Charing Cross roof was in a safer condition than half the Atlantic steamers. This expression has been taken by some as a suggestion that such steamers were unsafe, an inference which, of course, was never intended to be drawn. Sir Benjamin Baker has now found it necessary to write a letter to the *Times* explaining that he merely meant that, although perfectly safe, most steamers were probably more pitted with rust, and were at the same time subject to higher calculated stresses per square inch on the metal than was the Charing Cross roof. In our opinion it is quite inappropriate to institute any comparisons between a roof and a steamship, for not only are the types of construction entirely different, but the forces to which the two classes of structure are exposed differ most materially, and the risks to which a steamship is exposed are in every way greater and more trying than those occurring in the case of a roof.

Modern Surveying Instruments.

DURING the year 1887 Mr. A. T. Walmisley described in a "Student's Column" series in the *Builder* all the best-known surveying instruments that were available at the time the articles were written. Since that date various new instruments have been introduced which are fully dealt with in a paper read by Mr. Walmisley on Monday last before the Surveyors' Institution, and of which an abstract appears in our present issue. Many of these new instruments are extremely ingenious, and are particularly adapted for use in the Colonies and other countries, but they are less serviceable in Great Britain, because, although capable of effecting great savings of time, the results obtained by their use do not come within measurable distance of those furnished by the familiar and well-tried instruments—the chain, the level, and the theodolite. In preliminary and approximate surveys of extensive regions where land is of little value, and where errors of a few yards, or even hundreds of yards, are not of great importance, much advantage is to be obtained by some of the special appliances described by Mr. Walmisley. On the other hand, in a country like Great Britain, and especially in large cities, where land is divided up into small parcels and is of relatively high value, the utmost possible degree of accuracy is essential, and it is necessary that measurements should be correct within a few inches. This point is one that is well worth remembering, and its importance is duly emphasised in the admirable and exhaustive paper to which we refer.

By-laws and Dust Removal.

The Lincoln Tramways. We find that we were misinformed in saying, in our "Note" of last week on "Surface Contact Traction," that "we understand the new electric tramways in Lincoln will be run on the Kingsland system." They are to be on the Griffiths-Bedell ("G.B.") system. The correction does not affect our argument as to the financial risks involved in expending large sums of money on the track of electric traction systems.

The Resurrection Sculpture, Wells. Mr. ST. JOHN HOPE writes to us, in reference to a parenthesis in our leading article of last week, to know on what grounds we are convinced that the resurrection sculptures at Wells are by foreign artists. We reply, on sculptural grounds. We know of nothing in English mediæval art in any way resembling this work, and no indication that English sculptors of the period had anything like the power of modelling the nude figure which is evident in this series of figures (if we make allowance for the action of the weather); and we speak from close examination of the work when a scaffold was up. We are quite aware that Mr. Hope and other archaeologists are prepared with reasons for maintaining that these are English, but sculptural reasons are more powerful than archaeological. All the archaeologists in the world will not persuade us that these works are done by the same class of men who carved the stiff and unnatural (though highly decorative) draped figures in the lower portion of the façade.

Hellenic Society. On Tuesday afternoon, at the meeting of the Hellenic Society, at the Society of Antiquaries' rooms, Mr. W. C. F. Anderson gave an interesting lecture on the subject of "Greek and Roman ships with Multiple Banks." The lecture was ostensibly a reply to one given last year on the same subject, in which it was maintained that the idea of the existence of ships with banks of oars one above another was a mistake, due to a misreading of references in Greek and Latin literature; that it was impossible and unworkable, and that the meaning of "biremes," "triremes," etc., was to be read to refer to the number of men at each oar. We considered this to be an exceedingly far-fetched idea; and the quotations which Mr. Anderson gave from various authors (which were photographed as lantern slides, so as to be more easily followed), and his exposition of them, went to confirm us in our previous opinion that the generally received idea of the Greek and Roman galleys having banks of oars one above the other is the most natural interpretation of most of the passages in ancient authors bearing on the subject, and that there was nothing impossible in it at all, though we may admit that it seems a somewhat clumsy way of propelling ships, and was rather calculated to ensure power than speed. There seems to be at present, however, rather an inclination to set the face against this interpretation, even in the teeth of what seems very obvious evidence. Mr. Anderson exhibited a photograph of one somewhat crude representation of a galley (we did

not gather whether it was from a coin or a carving), where the two tiers of oars were shown so manifestly that one might have thought it conclusive, and the meeting was rather startled to hear one eminent Hellenist assert that it was only a conventional method of representing that the ship had oars on both sides, to show them both on one side; an explanation certainly more far-fetched than anything that has been urged in favour of what we may perhaps call the popular view. The same member was of opinion that three banks of oars would always be in collision, as the shorter and longer ones would not row at the same speed; but he was reminded that they could always keep time if ordered and directed (as they probably were) by music or some other form of signal. On the whole our decided opinion is that the *triremes* carry the day, and we shall continue to believe in them. The suggestion was made that some wealthy man should be invited to bear the cost of building a restored *trireme*, full size, as a practical test of the problem; which would certainly be an interesting though costly experiment. At the commencement of the meeting Professor Percy Gardner, who was elected provisional President, read a short memorial address in honour of the memory of the Society's late distinguished and lamented President, Sir Richard Jebb.

The President's "At Home." THE smoking "At Home" given by the President of the Institute of Architects on Monday was as well attended as these functions always are. A small but interesting collection of working drawings was hung on the walls, lent by Professor Pite, Sir Aston Webb, Mr. Flockhart, Mr. R. Blomfield, Mr. Ernest George, and two or three others; and in the Old Council Room was a special collection of working drawings of the Cardiff Municipal Buildings, by Messrs. Lanchester & Rickards. In the same room was arranged on the table a very interesting collection of medals of various kinds, some portraits and some including representations of buildings; these are the property of the Institute, but had been almost forgotten, and it was a good deed to bring them to light again. In the meeting-room also was to be seen a collection of casts from ivory sculpture, which had been presented by some one (we could not learn who) to the Institute at some former time; these also were new to the members. One hopes that there may be yet more hidden treasures in the archives of the Institute, to be produced at future meetings of the same kind.

The Wrath of Professor Goodyear. NOT content with circulating a pamphlet against us among English architects, Professor Goodyear has filled whole pages of an American architectural journal with a new edition of his diatribes, in which he has chosen, instead of referring to the *Builder*, to attack by name the person whom he assumes to have been the author of the offending article, a proceeding which we can only characterise as a most unwarrantable impertinence. What would people in England think of a writer who replied to a leading article in

the *Times* by a personal attack on Mr. Buckle? We have of course long been aware, from former experience, that an American critic is always right, and that it is presumption for any Englishman to question his conclusions; but we never saw such a rampant demonstration of it as in this case. No one, we think, could say that our article entitled "The Glamour of Crooked Building" was in any point either offensive or ill-natured, but Professor Goodyear seems to have been so aggrieved at our declining to take him seriously that he has not only lost his temper but ignored the rights of anonymous journalism, and presents the singular spectacle of a man filling pages with violent writing in reply to a critic who he says all the while is beneath his notice. Reasonable persons will, we think, conclude that a writer who spends all this trouble in denunciation of his critic has probably felt himself to be rather hard hit.

The Leicester Galleries. THREE new collections are now on view at the Leicester Galleries, the most important of which is that of the one hundred drawings and sketches by Millet which were the property of the late Mr. Forbes. A good many of these are very slight, memoranda for figures or compositions rather than drawings; but there are others which are fine examples of Millet's work in black and white. The most interesting of all is the beautiful pastel in monochrome showing a later edition of the "Angelus" (82), in which the effect is that of dawn instead of the evening effect shown in the painting; in other respects the composition is the same. Among the larger drawings is the fine and energetic "Départ pour les Champs" (71), known through publication, in which the eager stride of the man, as if no time were to be lost, is a kind of summary, almost pathetic, of the burden of daily toil. In some of the drawings, such as "Une Paysanne gardant sa Vache" (84), Millet's care in the arrangement of his lights and darks is illustrated. There are some fine landscape sketches. "Les Falaises: Environs de Greville" (16) is a remarkable example of bold broad sketching of just the facts of a scene; others, such as "Les Ramasseurs de Varech" (61), are powerful studies of landscape effect. As examples of composition two are especially noticeable—the arrangement of the two figures in "La Leçon de Tricot" (54), and the whole composition of "La Bergère" (62), with its high back and mass of trees overshadowing the figure, contrasted with the clear light on the left; it is characteristic that the only weak point in the drawing is the commonplace and rather hastily indicated face of the shepherdess: Millet made no attempt to idealise his rustics, but the composition was worth a better figure than this. Among the most poetically suggestive of the drawings is "Le Soir" (67), an interior with two figures of seated women facing each other, one with her back to the spectator; it is very little made out, but perhaps all the more suggestive on that account. In the adjoining room a collection of water-colours by Mr. Lee Haukey, under title "Idylls of the Country," deals with a

class of subjects akin to those of Millet, and in a somewhat similar spirit. The pictures show a good many repetitions of the same *motif*—mother and infant variously posed, and the style of execution is rather too indefinite for our liking—a sponge seems to have gone over them all; but there are fine qualities both of feeling, composition, and colour in many of them; and the one on the largest scale, "We've been in the Meadows all Day" (33), is the best of all; there is a complete harmony both of colour and composition in it, and the mother's face is very beautiful, which cannot be said of many of the faces in other drawings. The little one called "The Meadow Farm" (47), however, where a girl in the foreground leans her back against a fence, is a bit of pure beauty. There are also some fine little landscape studies, of which the heath scene entitled "Stormy Weather" (65) is the best, and is a work of great power. The third element in the galleries is a small but very interesting collection of French illustrated books of the XVIIIth century, arranged in cases in the ante-room.

ROYAL ACADEMY LECTURES.

At his second lecture on "Drawing," given at the Royal Academy on Thursday, the 11th, Mr. Clausen commenced by showing the slides which he had been unable to show at the first lecture for want of a lantern. The first was from a small drawing by Van Eyck for a picture of the Virgin seated in a landscape, with a great amount of background detail, and he drew attention to the care and minuteness with which all this detail was drawn out, in what was nevertheless only a preliminary study. Durer's study for the hands and arms of his "Adam" showed the same minute care, especially in the three repeated studies for the hands. A head by Durer illustrated what might be called the German manner in drawing, which was felt at once on looking at the drawing, though it might be difficult to define in what precise details this manner consisted. A composition by Breughel, "The Blind Leading the Blind," was shown as an illustration of the German angularity in the lines of the draperies. An early study by Millais, for an idea for "The Flood," an indoor group with one figure at a window looking out, was adduced as a very fine example of drawing, equal to anything of the same kind among the drawings of the Dutch masters. Masaccio's drawing of his well-known subject of Adam and Eve leaving Paradise followed; an example of figure-drawing which had hardly been surpassed since. The same painter's head of an old man was an example of precision in drawing and certainty in definition of features. A nude outline study by Raphael followed, and then a figure by Michelangelo (from the picture of the Bathers, if we remember right); a fine nude study by Stevens, and a drawing by Millet of a youth lying on the bank at the edge of a stream completed the series. [This last must have been an early work of Millet's, as he never drew nude figures after his first period.]

Mr. Clausen then said that in this lecture he wished to speak of drawing not so much as recording actual forms, but as recording the effect of form under special lights. This development of drawing from mere record of forms to a record of effect corresponded with the development of painting. The painters of the full Renaissance period had a wider range than their predecessors. With them a figure was not a single problem; each figure took its place in a general scheme of light and colour (which thus also included landscape). This advanced style showed not perhaps deeper insight into nature than was shown in earlier drawing, but a wider sympathy; the artists were interested in more things than the personages they represented. As examples of this he proposed to speak more particularly of the works of Watteau,

Claude, and Rembrandt. Watteau was not so definite in regard to effect as Claude or Rembrandt; he, like Rubens, was on the borderland between the two styles, combining in some degree the elements both of personal interest and of general effect. Claude was not only careful in his definition, but also in effect, arrangement, and lighting. Among illustrations of this more developed school of drawing he commenced by showing a landscape of Titian's, in which the effect of light and shadow in modelling the landscape was illustrated. A sketch of a bear hunt, by Rubens, showed the care which he took in placing his masses of light and dark; the dark horseman against the light ground on the right, the light figure against a dark background on the left. A head by Vandyck was shown as a fine example of the drawing of form only. In Watteau the influence both of Rubens and of the Venetians could be very plainly traced in his colour and freedom of movement, though with a difference—with little graces of manner in his figures which were peculiar to himself and which Millet did not like ("mariottes," he called Watteau's figures). A nude study by Watteau which was shown conveyed a strong sense of the influence of Rubens. Two studies of a man with a guitar, and another study of four figures, showed Watteau in his more usual style; and in the indications of the costume here, and in another study of a mother and child, they could see how the lines and shadows of the drapery represented effectively not what actually was there, but what appeared to the eye, and were treated so as sufficiently to indicate the form beneath. A particularly fine and characteristic drawing which followed this was one representing a figure seated on the ground with the back to the spectator. A landscape of Gainsborough's followed; Mr. Clausen remarking that it was undoubtedly very conventional, as were all Gainsborough's landscapes, but that it showed a very effective arrangement of lights and darks. In regard to Claude, it might be said that he appeared a greater artist in his numerous drawings and studies than in his finished paintings. He had a remarkable power of showing the effect of the sun in a clear sky, and also the receding planes of a wide prospect. In these respects he had never been surpassed, but his finished landscapes had too much the effect of a methodical planning, a look of being "composed," and the classic figures in his foregrounds added to this conventional effect. Conventional landscape of this kind was a thing one got rather tired of. But his drawings of trees and temples were not only prettily arranged, they were real and delightful studies from nature, more attractive than the finished landscapes with the mythical figures. These latter were in the taste of the time; mere landscape as an object for its own sake had hardly been thought of then. The criticism which had been made that he could not draw trees was true of the conventional Claude of the pictures, but not true of the Claude of the drawings. Several slides of Claude's drawings were then shown; a portrait of a tree, obviously a genuine study from nature. Of one showing a hedge, trees, and a river the lecturer remarked that it was a kind of drawing which seemed to suggest the origin of Corot. One showing a half-buried Roman triumphal arch in a tree-less landscape was remarkable for the power of treatment of the foreground. It was Claude's practice in his studies of landscape to make a careful outline and then arrange tints on it. Sketches from nature by the old masters were rarely in colour, and were not coloured after nature; but the balance of light and shade was from nature. It was on record that Claude did occasionally paint a picture entirely from nature, but no such work by him was known to be in existence; and apparently he did not search so much for exact truth of colour as for truth of light and shade. Only one of Claude's known drawings was altogether in colour. Turner's early landscape studies were all in outline, and tinted afterwards; but later he sketched from nature in colours. In modern landscape we were more true in detail of colour, but there was the danger, in seeking that side of the truth, of losing the grasp of the scene as a whole. It was exceedingly difficult to combine success in both points—in truth of detail and in the

grasp of the whole; perhaps Turner came nearer to it than anyone else; but in general it would be found that something must be given up on one side or the other.

Rembrandt's great power lay in his sense of the gradation of light and shadow, and in the human sympathy and dramatic insight which characterised his compositions.

In Keene's black and white drawings we found great care taken to indicate the line or form which shadows took. Phil May's accent in his drawings was determined by line, Keene's was determined by shadow. In Rembrandt's pen-sketches of landscape it would be found that a finer pen was used for filling in the distance. A drawing of Rembrandt's was shown which, with very little work on it, conveyed admirably the effect of a winter scene; also a fine drawing showing the effect of a mass of trees giving a concentrated dark in one portion of the composition. But any method was good as long as nature was followed intelligently. The best method perhaps was to draw in lines first and fill in the light and shade afterwards. In Madox Brown's "The Last of England" they had an example of a picture that was intensified by the separate study of each detail; there was no losing or finding in it. Rembrandt's drawing of "The Shepherds" was an effect got by quite opposite means. The one was like a story told; the second a suggestion—vague but full of human sympathy. Ingres was the opposite of this; he showed the utmost beauty of form; the scientific side of the artist's work evinced by skill in drawing; but we did not trouble ourselves much as to what his beautifully drawn figures were doing, and his pictures could not be said to be interesting. Ingres represented the scientific side of art, Rembrandt the emotional side. Such differences occurred because art was a personal expression. Two scientific men at opposite sides of the world would work out the same problem in the same way; but two artists might treat the same problem quite differently. The Ingres school was too perfect in execution in comparison with the thought expressed; Rembrandt, the man who had something to say, affected us more, even if he worked with less perfection of method. Different aims, however, might each be true in their own way; no one could claim that his alone were true. "Truth to nature" was indeed a phrase often very loosely used; we could not well define in what it consisted. The great thing was for each to best use his own means to attain it in his own way.

Mr. Clausen's third lecture, on "Quality in Colour," which was delivered on Monday, was unillustrated, there being as yet no means of representing colour design by the lantern. He commenced by observing that when we saw an engraving or a photograph of a painting we often found that we got quite a different impression from that which the original picture gave when we came to see it. A work might be effective in black and white, but not in painting, since this depended on the effect of the colour; and colour was a thing full of mysteries. The colours might not be actually those which they stood for in the picture; that, for instance, which had the effect of white in the picture might not be really white, but only something which appeared so in relation to the other colours. That was a question of what was called "value." "Quality" was a different element, which depended mainly on the way in which the colour was put on. If the same composition were painted by two different persons, we might find one looking heavy and dull, the other bright and attractive, though the same pigments had been used; in the latter the colour had been clearly laid on, not churned and muddled; and this was the characteristic of colouring in the finest works. But a picture might have fine quality in colour and yet not be harmonious, harmony consisting in the right colour relation of the various parts; and it might be harmonious as a whole without good quality in parts. In the early Victorian days it was thought that quality was the principal thing to aim at, and there were consequently many works painted at that time of which the quality was excellent, but which showed no true harmony of colour. The existence of good quality was a proof that the artist, in a sense, knew his business—understood how to lay colour on. But what had preserved the reputation of the greatest treasures of art was, more than

anything else, harmony of colour, which appealed to us more strongly than accuracy in drawing. The works of Ingres, Schaeffer, and Gérôme, were all admirably drawn, yet they failed to retain our sympathy on account of their poor colour, and could not stand against the work of Delacroix and Bonington. Manet's drawing was often bad, but he had the feeling for colour which made his work effective. Velasquez was one of the few who had succeeded in combining fine quality of colour with draughtsmanship.

It had been said that "Time and varnish were the greatest of the old masters"; but it was a shallow saying, for nothing could ever make a bad picture into a good one. Varnish might have imparted a certain richness of tone in some cases, but the colour must have been good to begin with. In Crivelli's altarpiece in the National Gallery the figures were as fresh now as when painted; the quality of the paint was beautiful; this had never been varnished, and varnish would only spoil it. The same point would come out in comparing H. Morland's work in the National Gallery with that of Hogarth and other great painters of the period, in the same room; these latter, though darker in parts than H. Morland's work, were brighter and more brilliant in general effect.

Fresco, tempera, and oil had each their special qualities. Oil was the most supple medium, because it could be used in three ways, either as transparent colour, as opaque colour, or as a mingling of the two methods; and in fact most of the greatest works in oil painting had been laid out in this mixture of methods. Consequently, oil paintings were much more various in effect than fresco or tempera painting. Fresco had a far less range of possible colour. On the other hand it had a beauty of surface of its own, arising from the granulation of the plaster into which it was painted, which reflected more light than an oil painting, producing also minute lights and shadows all over the surface which gave it a kind of grey lustre, and assisted to harmonise the colours. A somewhat similar effect was produced from the ground in a tempera painting, and might even be produced in oil when painted thinly so as to show the inequalities of the ground; but varnish filled up the cavities and destroyed this effect. In fresco no alterations could be made; and in tempera, though it was possible to make alterations which did not show as such at the time, they unfortunately showed up at a later period. This could be noticed in Piero di Cosimo's "Procris" in the National Gallery, where there had been a correction made in one of the hands, in consequence of which the colour was muddy there in comparison with the rest of the picture.

As a piece of fine and beautiful colour not often noticed he would mention the landscape background of Michelangelo's unfinished painting of "The Entombment," a bit of thin colouring laid over a white ground, which had all the clear bright effect of real sky.

The painter's method in many early works was the reverse of ours; the lights were transparent and the darks loaded with colour, as they might see in the works of Bellini and other early Italian painters. In modern painting it was more the custom to paint the lights in solid colour, and in fact it was this power of body light which gave oil painting the victory over tempera.

Painting a picture straight off with all the colour laid on at once as it was intended finally to appear, which was done not infrequently in old work, implied a most perfect command of the means employed. No one could do it now; the required balance was obtained by slow degrees and repainting. The old painters were ignorant of many things that we had been obliged to learn; but nevertheless those who could paint a picture with the desired effect straight off, and without retouching, might truly be called great masters. Such examples showed the advantage, no doubt, of knowing exactly what one was going to do, but the problems were simpler; we were more difficult to satisfy now. In the sleeve of the portrait by Titian, said to be that of Ariosto, they had there dark colour, yet it was full of light; in all probability it was painted thinly over a white ground; a process which Titian seemed able to carry out without the risk

of a mistake. In Titian's later works the colour was very simple throughout, laid on in large masses of red, blue, etc.; generally a thin colour over a light ground. If he had to make alterations in any portion of a work it would seem that he erased it down to the ground and built it up afresh. Watts, on the other hand, when he had to make an alteration, painted in a figure, or whatever was required, in a strong black and white monochrome, and then coloured over that, the original work being entirely hidden. Titian's quality in colour was always fine, but to this he joined the element of harmony also, especially in his manner of arranging his lights and darks; and this was the case also with Rembrandt. Though some of Rembrandt's works, single heads especially, were full of regradings and alterations, he at other times painted quite simply. The head of the old lady in the National Gallery was apparently painted straight off at one operation. Glazing and repainting served however practically to increase the range of colours.

Quality in colour was the outcome of perception and feeling rather than of any adherence to rule. To paint the apparent colour at once was good, if they could do it; but there were difficulties; the system would not accomplish everything. One must vary the kind of painting—transparent colour in one place, solid in another place—otherwise a certain monotony would result, as they could see in the works of Franz Hals, the picture now in Burlington House especially. There was a beautiful quality of colour in Watteau and Gainsborough. Watteau showed bits of solid bright colour contrasted with transparent darks. In the charm of lightness of touch Gainsborough was supreme; even Velasquez (if he might venture, to say so) looked a little heavy in comparison with Gainsborough. This had particularly struck him when the Venus by Velasquez had been hanging between two Gainsborough portraits at Messrs. Agnew's Gallery. No artist showed so much of the charm that comes from the sense of ease of execution; it was so clear, such a different kind of paint, one might say, from most other pictures. Many modern pictures got leathery in appearance through the practice of "oiling out," which had quite a different effect from that of mixing colours with oil. Solidly painted pictures, laid on over and over again, were generally heavy in appearance; though when the paint was laid on so thickly as to cause a certain degree of relief of surface, the effect of this would to some extent counteract the appearance of heaviness.*

Wilson, Romney, and Morland were all artists who painted solidly throughout, and their pictures had a rich fat surface. Hogarth's portraits had a somewhat heavy effect from over-painting, being worked over many times. Some of the old painters, as for example Canaletto and Claude, would paint in light thin colours over a dark ground. The result of this was that in process of time the light colour became more transparent and the dark ground showed through it. It was safest to paint equally solid throughout; in that case it was of no ultimate consequence whether the ground was dark or not. This clear and certain touch was one of the secrets of permanent painting; the less one did to the paint after it was on, the better paint it was.

It was eminently desirable for the artist to know exactly what he wanted. One of the best methods of study was one little practised now, viz., that of painting Still Life; flower subjects especially. There was no sense of effort in flowers, and their study was one of the best means to render the hand light and sensitive. Velasquez and Chardin were examples of painters whose work was free and not laboured; and perhaps the treatment of mere painting so as to make it beautiful and attractive in itself, independently of the subject treated, had never been carried further than by Claude.

In old pictures one often found the method of glazing done with warm colours over a thickly painted surface. Should we imitate this? He thought not, because it was a mistake to deliberately adopt another man's method which did not come naturally to ourselves. We could discern

* We might instance Dugre's powerful Landscape, "La Mare aux Oies," where the clouds are loaded on quite in relief, yet the picture could never be called heavy.—Ed.

this method in Reynolds, and could see how he made it serve his purpose, but it was not wise to take up and copy another man's experience ready made. Watts practised this method in his later works, but his early work was very straightforward in character. Velasquez, Vandyck, and De Hoogh were among the best models for method in painting—combined of course with the study of the effects of Nature.

THE SURVEYORS' INSTITUTION.

An ordinary general meeting of the Surveyors' Institution was held on Monday, at No. 12, Great George-street, S.W., Mr. C. Bidwell, President, in the chair.

Mr. Percival Currey, hon. secretary, announced that a number of donations had been made to the Library and Library Fund, and, on the motion of the Chairman, a hearty vote of thanks was accorded to the donors.

Modern Surveying Instruments.

Mr. A. T. Walmisley then read a paper on "Modern Surveying Instruments," in the course of which he said that, in 1887, a series of articles descriptive of the use and construction of the best-known instruments employed by surveyors formed the subject of the Student's Column in the *Builder*, and repetition of the explanatory matter in these articles was not, therefore, necessary. In his own experience, there was no survey so accurate as an ordinary chain survey properly triangulated, and the measurement of horizontal distances in levelling operations by the chain was a system unrivalled for correctness. Various ingenious devices had nevertheless been brought forward to attain, not only records of levels, but also horizontal measurements by optical instruments, and for giving greater simplicity of setting up during outdoor work, transport in the field, and other improvements calculated to aid speed, accuracy, and concise records, independently of these influences upon the question of price of an instrument. He proposed to draw attention to a few modern types of instruments with the view to remove the prejudice which exists against the adoption of such new forms as time economisers, where the accessories could be proved to be free from liability to derangement, and easily attached for use. A beginner should start with an instrument supplied by a good firm of manufacturers, although an experienced surveyor, who thoroughly understood the use of an instrument with which he had to work, might be well able to attain accuracy with a less perfect instrument. For a beginner, a 14-in. dumpy level, without the addition of a compass (which only increased the cost), and with comparatively heavy tripod legs for stability in the field, would undoubtedly prove the most suitable, but an experienced surveyor could work equally well with a 12-in. or even with a 10-in. telescope, supported upon lighter tripod legs.

In speaking of various forms of levels and their arrangements,* the author said that Mr. Blochins and Mr. Lyne Freeman connect the parallel plates of new instruments by vertical screws having a deep pitch, through which works a second screw, having a fine thread, and terminating in the locking plate; the fine threads work within the deep thread screw, and a small clamp is provided upon the upper plate for use if either one of the deep pitch screws should adjust too quickly for the attainment of a level bearing. When adapting this device to an existing instrument, a second set of parallel plates, connected by parallel plate screws having greater pitch than the existing screws of the instrument, were added. This additional set of parallel plates was attached to the tripod head, and the original set of parallel plates which carry the instrument were connected to this apparatus by a bush, the size of which was dependent upon the requirements of the instrument. The approximate level was first sought by use of the deep-pitch screws, and the final adjustment attained with the small-pitch screws. In a level made by Mr. Stanley, the centre was cast in hard gun-metal in one piece, with, and directly upon, the telescope body and object end, the cast telescope body being bored out to a suitable thickness so as to provide an instrument combining strength and rigidity, with reduction of weight, compared with

* See our issues, January to June, 1887.

the old form of tubular body, collars, and stage. This instrument was denominated the new Engineer's Level, and was fitted with clamp and tangent adjustment, tribrach levelling, and locking-plate, so that it could be used on a wall or masonry coping, as well as on the tripod.

In most modern dumpy levels stadia lines are now added in the diaphragm set to 1-100, so that in taking the readings, on a distant staff by means of these subtense lines, the surveyor reads every 1-100 foot (or metre) upon the staff as being equal to 1 ft. (or metre) of the distance from the centre of the instrument, adding to the reading a constant for any distance shown. This constant was usually given by the maker of the instrument, and could be checked experimentally by the surveyor.

In Brightmore's collimation adjustment for use in the telescope of a level, a sliding plate was attached at the back of the eyepiece, on the face of which cross hairs were stretched, the sliding plate being caused to move in a groove in the diaphragm by a screw pressed against its support by means of a spring. It was made by Messrs. Elliott Brothers, and could be fitted to theodolites for adjustment in one or two directions at right angles. The diaphragm might consist of (a) webs, (b) platinum iridium points, or (c) lines on glass. Mr. Stanley argued that the use of iridium points obviated the covering of the divisions on a level staff, but Messrs. Troughton & Simms, who had given considerable attention to the construction of optical instruments, adhered to the old form of spider-web diaphragms as preferable, both for reading an ordinary level staff or a special stadia rod. Messrs. Cooke & Sons also maintained the superiority of web diaphragms, except for reversible eye-pieces. The author then described a number of diagrams of instruments. Diagram No. 1 showed a 5-in. theodolite fitted with Ferguson's circles, which gave the semicircle divided into four parts, each octant being subdivided into 100 unequal parts by drawing lines through the centre of the circle through the octant arc to intersect 100 equal divisions of the tangent to the octant, so as to be read in percentage divisions of angular measurement on one half of the circle and in units of a degree upon the other half, thus converting the instrument into a telemeter.

Hoskold's form of transit theodolite was made by Messrs. John Davis & Son, of Derby. Except the bearings, bushes, and screws all possible parts are constructed in aluminium, and the telescope is fitted with a sensitive spirit level independent of the theodolite part. A plan of the instrument was shown, and a plan of a wall plate with clamping arrangements. In this form of transit theodolite, an extra large and sensitive hubble was also attached to the vertical circle. The micrometrical eye-piece reads to one second of arc. The sights above the telescope were removable. The internal vertical axis, which was screwed to the horizontal vernier circle, was made larger than usual, and, instead of being solid, was perforated for its entire length, and had a cylindrical form, the hole through it being about 1 in. in diameter. This axis works in another or exterior vertical axis which was screwed to the underside of the horizontal divided circle, and the axis revolves in a socket which forms the central part of the levelling apparatus. In order to avoid too much friction, the exterior parts of the two axes were, in two or three places, turned down below the general level. A corresponding hole to that in the central axis was made in the centre of the horizontal vernier circle in order to obtain a direct sight through the telescope and centre of the instrument down a shaft or central pier opening. The telescope could be raised through a sleeve or axis collar to clear a horizontal base, enabling standards to be constructed shorter than in most instruments, so as to contribute compactness to the instrument. Some instruments were made with covered limb and turn-up microscopes for protection in conveyance. The instrument was graduated upon silver to read to 15 secs., but had also a micrometrical eye-piece attached reading to single seconds of arc. The arrangement for taking small angular records enabled a subtense process to be adopted, which consists in setting up a rod, say, 20 ft. in length at any distance required

to be known, and measuring the angle between two metal discs, one placed at each end of the rod, and then by the application of trigonometrical calculations finding the distance required.

In Davis's traversing stand, designed for use with the Hoskold Civil and Mining Engineers' Transit Theodolite, when the telescope of that instrument was employed for sighting down vertical shafts, the frame supported by the legs was circular and 12 in. in diameter. This supported a tube across the centre, a corresponding tube, running parallel, being attached firmly to the circumference. Along these tubes a carrier traverses, to which was screwed the usual centring apparatus common to all theodolites. The theodolite was brought approximately over two points fixed at the pit bottom; it was then traversed on the stand, which allowed a movement of 6 in., and it could also be adjusted in any direction for about 1 in. by the centring motion. The centring motion was then clamped, the long traverse was also clamped, and the fine adjustment comes into operation, bringing the vertical spider line into coincidence with the two illuminated marks placed at the pit bottom. Mr. W. G. Bligh, M.Inst.C.E., introduced a vertical adjustable base, with the view of setting an instrument always at a fixed height above a peg, to attain which the instrument, instead of being screwed on to the top of a tripod, was attached to a thick hollow brass rod which, passed through a hollow socket formed in the head of the tripod. This rod, 18 in. in length, could be clamped at any desired height, and at its extremity hangs a chain to which was attached a brass disc, so that when the disc touched the top of the peg over which the instrument was set, the line of collimation in the telescope could be arranged to be some even number of feet or half feet above the level of the peg. Mr. Bligh had also introduced a simple alternative arrangement in which the instrument was mounted on a wooden post which was threaded through a large brass socket formed on the head of the tripod, the purpose of the tripod being to hold the post upright.

In Wells's Improved Theodolite, made by Messrs. Elliott Brothers, the principal advantages claimed were as follows:—1. A method of fixing the locking-plate, whereby the locking-screw was fixed on the outside, and was easy of access. 2. The winding of the plumb line on a drum through the centre of the instrument, providing an easy method of regulating the height of same, and by this means enabling a plumb bob to be used when the instrument was placed on a fixed stand at a minimum depth below it. 3. A new shifting centre which had two definite movements only, viz., a sliding and a rotary movement so as to obtain a wide range of action. The former was to be used when the plumb bob was lowered to the level of the station point, the distance from the same being measured, and the instrument moved a corresponding distance on a scale marked on both sides of the plates which hold in position the sliding-plate. The centre was then clamped with a locking-screw at the bottom of the shifting centre, and the instrument was then revolved on its true centre until the plumb bob comes over the station point. The distance from the station point to the plumb bob, when the instrument was at zero, was the radius of the circle described, so that when this radius was fixed the station point must be in the path of the periphery of the circle so described. The shifting centre being self-contained, was, when the instrument was once levelled, always level, no matter in what direction it was required to bring the plumb bob over the station point. This could be adapted to any ordinary theodolite without altering the main construction of that instrument.

Messrs. Cooke & Sons advocated Littlejohn's patent stand to provide combined centring and levelling arrangements. This could be easily fitted to an old 5-in. or 6-in. theodolite. Mr. Stanley's Dunbar-Scott auxiliary top and side telescope, being interchangeable with the top and side positions, and having the means provided to ensure perfect adjustment with the minimum of trouble, claimed to form a mining transit which would perform all requirements in mine surveying, and so need no correction for eccentricity. The auxiliary telescope was provided with a

centre that might be screwed to the threaded extension of either the transverse axis or the vertical pillars of the main telescope. In either position it was clamped firmly and ranged quickly into alignment with the main telescope by two opposing screws. The diaphragm of the auxiliary telescope had one web only, so placed that it was vertical when on top, and horizontal when at the side. The observation of steep horizontal angles was made with the auxiliary with the use of precipitous vertical angles with the auxiliary on the side. A counter-balance was provided which exactly balanced the auxiliary member, so as to obviate the effect of strain upon the instrument. In Stanley's new model transit theodolite the parts were not built up in separate pieces, but every possible casting was shaped out of the solid into the finished form. For convenience of packing, he (the author) personally preferred the old form of separation in the instrument box to the single type of complete instrument in one piece; but then "use is second nature," and he had been brought up in the old school, and accustomed to pack the telescope, the body of the instrument, and the parallel plates in separate pieces.

Surface levels could be expeditiously compared by the use of an aneroid. The surveying aneroid was held in the hand at a known height over a peg or bench mark, and the incidence of the needle upon the graduated scale of heights was read off on the vernier. Other readings taken in a similar manner over comparative levels to be recorded, due allowance being made for the diurnal wave and local barometrical changes during the time the operations were in hand. Precautions might be taken to neutralise such disturbances by using twin aneroids, two observers being necessary. The one remained stationary in a position as close to the day's operations as convenient, and had one of the aneroids upon a table before him, the reduced level of which was ascertained by connecting it with the incidence of the needle of the nearest peg on the traverse, the level of which was already recorded, and every succeeding half hour the observer read and booked the incidence of the needle on the graduated circle for future comparison with the aneroid used at the same time by the observer in the field. The range of the instruments need only be reduced within reasonable limits, as the result was approximate.

The principle of a tachometer and the effect of the addition of a fixed tube and stop-piece to a theodolite telescope was shown in Diagram O. Considering such an instrument as a transit theodolite with an extra lens added to the telescope to convert it into a telemeter, the use of an anallatic or conveying lens (6½ in. focal length to an object glass of 12 in. focal length) in a tachometer dispensed with the addition to every reading of what was called "the constant" of the instrument, which was always necessary in the case of theodolites merely provided with stadia lines to attain a similar object.

The principle which governed the action of the instrument dominated its construction. In order to overcome the loss of light occasioned by the introduction of the extra lens, the telescope of a tachometer was correspondingly larger than that of a theodolite, while at the same time eye-pieces of higher power were employed, which facilitated the reading of the stadia rod with ease and accuracy. The focal length of the anallatic lens depended in different instruments on the focus of the object glass and the distance the eye-pieces were required to measure. The eye-pieces were made to slide vertically across the eye-end by means of a rack and pinion movement, so as to obtain a better view of the outer pair of lines. A very small movement sufficed for this. The lines on the diaphragm were usually placed so as to provide a ratio of 1 in 50 between the outer pair, and 1 in 100, or 1 in 200, between the inner pair and the anallatic lens served to make these values constant for any distance. For very long distances an omnimeter permitted of greater accuracy than a tachometer, as the range of a tachometer was limited by the distinctive readings of the divisions recorded upon the vertical staff. It was necessary that the position of the anallatic lens with reference to that of the object glass of the telescope should be fixed and unvarying, and hence the adjust-

ment to focus was maintained at the eye-end of the telescope.

The Bell-Elliott tachometer had a powerful microscope permanently fixed at right angles to the telescope as in Eckhold's omnimeter, both the microscope and the telescope revolving upon the same axis. A special staff 10 ft. long accompanied the instrument, and this staff was fitted with two sighting cross-pieces, the lower one being preferably adjustable in vertical distance from the upper one. This tachometer formed a tangent reading instrument, the vertical height and the horizontal distance from the vertical axis of the instrument being calculated from the tangent of angles read upon the staff. The natural tangent of any such observed angle was read direct either from the drum scale or from the drum and tangent scales combined. Hence the use of tables in the field was not needed. The tangent scale could be moved backwards and forwards by means of the micrometer drum-head attached thereto, which in one revolution caused the tangent scale to move a definite number of parts of the radius determined from the axis of the instrument.

Mr. W. H. Wells, M. Inst. C. E., introduced into the diaphragm of a level a second horizontal cross-line, fixed either above or below the central cross-line used for collimation, at such distance therefrom as to bear a relative proportion to sights read through the telescope at a distance of 100 ft. apart. The vertical readings were taken upon the two cross-lines of the diaphragm so as to record the vertical space upon the staff at a distance of 100 ft. from the centre of the instrument. If the second cross-hair was so placed as to record one foot distance vertically on the staff, above or below that read by the centre cross-hair, then the proportion of vertical distance to horizontal distance was 1 in 100, and thus, by this simple contrivance other distances might be relatively arrived at.

Mr. Short's gradient telemeter level, supplied by Casella, also seeks to obtain linear distance gradients for railways, irrigation, drainage works, etc., by the aid of a level staff, without the use of a chain or tape, regardless of rough and broken ground or the intervention of a stream or other water between the observer's station and the distant object.

By the use of such instruments an immense amount of work might be saved in setting out the surface of land for width of slopes or hatters by pegs, over the ordinary system of pegging, by calculation with a theodolite, where each peg required a separate setting of the instrument. In taking cross-sections and all levelling on sloping, uneven ground, the saving of time and labour was also very great, and the work resulting therefrom was sufficiently accurate for trial sections and preliminary investigations.

In Sir George Leach's level a small telescope with a spirit tube on the top was pivoted off its centre towards the object-end on a thin brass circular plate with a weight under the centre to keep the instrument level laterally and the cross-hair horizontal. The level itself was actuated by a small fine-threaded screw directly under the telescope, working freely on the circular plate. The end of the pivot being spherical, and the plate circular, the telescope and level could be revolved in any direction. Adjusting screws were provided to place the level in accurate adjustment, and a levelling staff, rather over 8 ft. long (folding in half for convenient transport) accompanied the instrument.

Mr. Sheldon's suspension level, made in 1893, could be used for taking flying levels between two fixed points, by stretching a fishing-line or tin wire over a distance of about 100 lineal yds. in order that the level of one point might be transferred to another point. When the bubble was in the centre of its run in the centre of the suspended line the extremities of that line were at the same level, and when the ends of that line were at the same level the bubble of the instrument would be in the centre of its run in the centre of the suspended line.

Mr. Stanley had a combined mining dial, level, and theodolite, fitted with sliding stand and Hoffman head with clamp and tangent movement to the limb. The telescope was fitted with stadia points and a gimbal carriage, cranked in form, and

enabled the surveyor to read through the telescope at right angles in two directions.

Messrs. Adie (Westminster) had also brought out a combined level and theodolite. Used as a transit theodolite, the telescope was rendered steady by the attached vertical circle, but when used as a level a German clamp was introduced for the purpose. He did not advocate the adoption of combination instruments. They were very ingenious, but a surveyor generally had notes to make relating to external circumstances, besides recording angles and distances, and he did not need his attention to be distracted by clamp screws which were not required to be manipulated for the special object of the inquiry.

In reflecting hand levels the reflecting plate divided the vision half into a direct or through sight and half with the reflection of a bubble in a mirror. The same process formed the principle of Captain Abney's level. Sir Howard Grubb had sought to improve this arrangement by producing, with the aid of chemical deposition of a specially prepared film upon a plate of glass, a surface rendered capable of reflection, while simultaneously transmitting a large percentage of the light which fell upon it, so that two objects in different directions were presented to the eye of the surveyor either directly or through the object glass of an observing telescope.

In the Grubb miners' dial the object to be observed was viewed through a tube. The sight and object were virtually on the same plane; there was, therefore, no strain on the eyes due to focussing two or more objects at different distances. The eye need not be close to the sight nor in the centre of the sight, as there existed no parallax error in the Grubb instrument. The sight was readily illuminated underground, and might be preferably constructed of a short piece of rectangular brass tube, about $\frac{3}{4}$ in. square 3 in. long, open at both ends. About midway in this tube, fixed at an angle of 45 deg., was a plate of glass, coated with a semi-transparent and highly effective film, chemically deposited on its surface. At right angles to the square sight, and opposite to the reflector, a circular tube was fixed. At one end was a diaphragm coated with opaque material, through which were cut or photographed cross-lines, a star, a scale, or any other convenient device. At the base of this circular tube was an achromatic lens, to a focus suitable to the distance between the lens and diaphragm. This achromatic lens brought into parallelism the luminous rays from the markings on the diaphragm, which rays were bent at right angles by the reflector and directed into the eye of the observer, the result being that the rays from the diaphragm entered the eye under exactly the same conditions as if from the distant object, and the surveyor saw the image or sight-lines virtually superposed on the distant object—that was, at the same distance.

It was not claimed for the Howard Grubb system that it would displace the telescope in standard instruments, such as the theodolite and level, but such instruments were often used for work for which they were not suitable, and in which their accuracy, delicacy, weight, and size were a disadvantage. Portable instruments, such as the clinometer, Abney level, and Prismatic compass might be constructed with the Grubb sight and without complicating the effect of observation; the level angle of declination or direction might be simultaneously observed. The main feature of the Grubb sight was that it sought to eliminate errors due to parallax, as the rays of light entered the eye in parallel lines by the aid of the pair of convex lens introduced in the construction. The demerits of the prismatic compass were the shortness of the line of sight due to the small diameter of the instrument, the tendency to force the needle when the box was tilted in use upon uneven ground, and the effect of weight of the graduated card or rim carried by the magnetic needle, which tended to introduce sluggishness in the movement of the needle.

Puller's new tachymeter sought to obtain the plans and levels of the observed points without the necessity of noting the distances and horizontal angles, and thereby enabled the surveyor to dispense with the labour of calculating and checking the results. This

instrument consisted of a horizontal circular plate, about 16½ in. in diameter, mounted on a tripod. The plate was graduated to read horizontal angles, and at the centre was a vertical axis carrying a telescope upon one side and a projective apparatus upon the other. The arrangement consisted of graduated horizontal and vertical scales connected to the telescope and receiving motion from it, and by means of which the distances and heights were read off, and the observed points plotted, when weather permitted, upon paper stretched upon the horizontal plate by pressing a needle-point into the paper.

The Eidograph had superseded the Pentagraph, as by its principle of construction the friction of the supporting wheels to the Pentagraph was entirely obviated, and there was consequently less damage to the drawing paper involved in its use. A level drawing board or table free from indentations was desirable.

Professor Goodman had patented a planimeter. It consisted of a tracing-rod held in the right hand, and a hatchet held at a point outside the boundary to be traversed, the instrument forming an inverted channel. The hatchet should not be allowed to work on a rough surface—smooth writing or drawing papers were alone suitable. This instrument was simpler than Amsler's planimeter in construction, but was not likely to be so extensively employed for accurate work.

Mr. J. Bridges Lee had shown how photography might be combined with surveying in a manner that should fix the direction of view upon a plan so as to embrace full detail as viewed through a telescope, and he argued that, having all the landscape thus recorded, a surveyor could select at leisure any topographical details he required to be known. A complete description of this photo-theodolite was given by Mr. Bridges Lee in a paper read before the Society of Engineers in 1899. He effected his purpose by adding a fixed focus camera set up on a stand and accurately levelled so as to make the picture plane truly vertical. The line of view was also marked on the photograph, and its position on plan recorded upon an horizontal plate whose centre was vertically under the centre upon which the attached telescope revolved. It was probable that photography would prove quite as satisfactory a process as the method of fixing survey lines by the magnetic needle of a compass for general plans, and that it would come gradually in greater use for assisting the surveyor to record not only the base lines of plans, but the vertical section lines of the surface of the ground. Building plans, in which dimensions were to be stated, must, of course, be correctly measured in the field, but for index or key plans showing general position and surroundings, the value of photography was universally acknowledged.

In the course of the discussion which followed, Lieut.-Col. Sir G. Leach, K.C.B., hon. member, moved a vote of thanks to Mr. Walmisley for his very able paper, which gave such a clear account of the instruments in use for surveying purposes, and which it was desirable that they should preserve for future use. Surveying varied in character very much, and the instruments must be adapted for the purpose of the work to be done. Mr. Walmisley had not alluded to the most magnificent surveying instruments which were ever made, i.e., two theodolites with 3-ft. circle, made a good many years ago by the original firm of Troughton & Simm, one for the Royal Society, and the other for the Ordnance Survey. Of course, no matter what the work was, the instruments were all based on the same principles, but an ingenious man would probably discover little points and make changes, etc., which would facilitate his work. That happened in his own case. One of his hobbies was landscape gardening, and, as they knew in the lay-out of roads, etc., a level was necessary. He wanted a small level, and, as he never felt confident in the work he did with the level, he set to work to invent a small level for the purpose. The characteristic of it was that it could be taken about anywhere, and it was not a playing, but a useful tool, which had been found useful in India and for architectural purposes. The architect had constantly to take levels to determine the site of his buildings, etc., and this little level could be carried

about in a bag, and the staff could be used as a walking stick. The level was very light, and he had done some very accurate work with it. Of course, if they had to level for a railway for fifty or sixty miles, they would want a better instrument. He was one of those engaged in the great levelling work for the Ordnance of the country, and they had no difficulty in getting most accurate work with the ordinary level.

Mr. C. J. Mann seconded the vote of thanks. He said that to use very elaborate instruments. Mr. Walmisley said there was no survey so accurate as that made with an ordinary chain, and he was glad to hear that. He had also been interested to hear Mr. Walmisley's remarks as to the part that photography was likely to play in the future on this matter. The members, especially the younger members, must feel deeply indebted to Mr. Walmisley for the pains and trouble he had taken in the preparation of his paper.

Mr. J. W. Tyler said they did not often use these elaborate instruments. They used the theodolite and the level sometimes. The level with the stadia reading, he had found of great assistance in making preliminary surveys for railway work, and the work could be done with a considerable degree of accuracy. As to the material for the manufacture of surveying instruments, aluminium had been used largely lately, and he gathered that it was not so desirable for the heavier class of instruments.

Mr. D. Gravell said that one was amazed at the enormous number of instruments which had been invented and constructed. The micrometer, as applied to the theodolite, seemed to be the principal invention since the articles in the *Builder*, and it was useful for tunnel work, but for ordinary survey work the vernier arrangement was ample. As to what had been said about the chain being the best method of surveying for arriving at a really good survey, he was surprised that the chain was used at all except for the roughest work. The chain ought to be relegated to the top shelf, where it could not be got at easily. The steel band was, he thought, the only proper method; it required more skill in handling, but for intricate surveys there was nothing like it.

Lieut.-Col. Sir G. Leach added some further observations in reference to the necessity of solidity in some of these instruments. He gave the opinion of Sir G. Airey, Astronomer Royal, as to a 2-ft. circle theodolite, which could not be got to do good work. According to Sir G. Airey, it was a perfectly sound instrument, but it was not solid enough, and that it would never be got to do good work until stronger supports were put in. This advice was acted upon, and the theodolite then did good work. One of the features which characterised the instruments produced by Sir George Airey was their solidity; he did away with all brasswork where he could, and put in cast-iron, and got rid of as much spring as he could. It was desirable to make these instruments as low and as rigid as possible.

The vote of thanks having been heartily agreed to.

Mr. Walmisley, in reply, said that these new instruments were brought to their notice from time to time; they were ingenious and they possessed merits as time economisers. There was no doubt that abroad some of them would be more useful for approximate work than in this country. As to the steel band, he was perfectly well aware of its accuracy, but the chain commended itself to him in some cases. For instance, if they crossed a road where traffic went on, a heavy iron chain would allow a cart to go over without effect, and a chain was not so likely to snap as a steel band. But there were improved arrangements for winding up the steel band, and its merits for accurate work could not be denied.

It was announced that the next meeting would be held on January 29, when Mr. F. Marshall, K.C., would read a paper on "The Value of Machinery for the Purposes of Rating."

The meeting then adjourned.

WAR MEMORIAL, BEAULY, N.B.—A monument has been erected in the square of Beaully in memory of the men of Lovat's Scouts who were killed or died in the Boer war. The memorial was designed by the Hon. Evelard Stourton.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS.—The monthly meeting of the Sheffield Society of Architects and Surveyors was held on the 11th inst. in the Lecture Hall of the Library and Philosophical Society, Leopold street. Mr. Joseph Smith occupied the chair in the absence of the President, Dr. H. Scrimfield, Medical Officer of Health for the city, delivered a lecture dealing with "The Advantages and Disadvantages of Mechanical Ventilation." Some of his points were:—"The air ordinarily contains about four parts per 10,000 of carbonic acid, and it has been found that when the air of a room occupied by human beings and not artificially lit contains as much as six parts per 10,000 of carbonic acid it begins to smell. When the carbonic acid in such a room reaches eight parts per 10,000 the air begins to be distinctly foul. An average human being gives off 6 cubic ft. of carbonic acid per hour. He will therefore load 1,000 cubic ft. of air to the extent of six parts per 10,000 in an hour, and 3,000 cubic ft. to the extent of two parts per 10,000. As four parts per 10,000 is the amount normally present in the atmosphere, and six parts per 10,000 is the limit of good ventilation, it follows that 3,000 cubic ft. of fresh air per hour must be supplied for each occupant in order to maintain the ventilation of a room efficiently. If the room is lighted by gas, oil, or candles, the amount of carbonic acid cannot be taken as an index of the impurity caused by human occupation. A gas burner, for example, which burns 3 cubic ft. of gas per hour forms $\frac{1}{2}$ cubic ft. of carbonic acid, or more than that given off by two persons. The problem to be achieved by good ventilation is to provide 3,000 cubic ft. per hour of fresh air for each individual.

If each individual has a cubic space of 1,000 cubic ft., the air must be changed three times in the hour, if 150 ft., only the air must be changed twenty times in the hour. It is generally agreed that in this country during the colder months a change of air more frequently than about three times in the hour cannot be borne unless the incoming air is warmed. Mechanical ventilation has been introduced, on account of the difficulty of changing the air of a building sufficiently often to maintain good ventilation without intolerable draughts, by ordinary means, such as open fires, and the provision of inlet and outlet shafts and openings through which the air is moved by differences in temperature, and the law of the diffusion of gases. Extraction fans also answer satisfactorily for single rooms, such as restaurants, hotel dining-rooms, etc. I think that churches (which, by the way, are apparently not supposed to require ventilation) and public halls might readily be ventilated by the provision of extraction fans and plenty of inlets equipped with radiators for warming the incoming air." In a summary of the lecture Dr. Scrimfield says he thinks that where the cubic space allowance is small, as in our elementary schools with 120 to 150 cubic ft., mechanical ventilation is the only system which is capable of giving really good results as regards the purity of the air; but that where the cubic space allowance is large, as in hospitals with 2,000 cubic ft., its introduction is probably undesirable. In the second place, he thinks that if mechanical ventilation is decided upon for a building the fact ought to be realised that by its means the air of the building can be changed at least twice as frequently as by other methods, and that its introduction is equivalent to doubling the cubic space of the building, and that it is therefore well worth while to pay for as perfect an installation as can be obtained. In the third place, the contract to what air changes are to be accomplished by the method should be carefully drawn, and after the work is completed careful tests by chemical analyses of the air and the anemometer should be made in order to ascertain that the terms of the contract have been fulfilled. In the fourth place, the person responsible for the management of the building should thoroughly understand what are the capabilities of the system, so that it may not be expected to perform impossibilities. For example, mechanical ventilation will keep the air in the classrooms of an elementary school good for a matter of eighty minutes, but if the classrooms are not emptied and filled with fresh air at the

breaks the air in them will be just as bad at the end of the morning or afternoon school as the air in the classrooms of a naturally ventilated school just before the break.—At the conclusion a hearty vote of thanks was accorded on the proposal of Mr. E. M. Gibbs, seconded by Mr. J. J. Bingham, and supported by Messrs. J. B. Mitchell-Witbers, H. L. Paterson, T. Winder, and the Chairman.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society on Thursday, the 11th inst., a paper was read on "The Better Housing of the Artisan Population" by Mr. W. P. Rylatt, who won the prize for an essay on the subject. Mr. Rylatt said: "The question of the housing of our artisan population is one of the greatest problems of the present day. Ever since 1851, when the attention of Parliament was first drawn to the disgraceful state of the houses of the artisan classes in London and in other large cities, Acts have been passed and measures taken to improve the condition of these dwellings. A very great fact in the health of the people, physical and mental, is a cheeriness of surroundings and a pleasant outlook obtained by providing plenty of open spaces, laid out as gardens, such as is carried out on the Millbank estate in London. Many difficulties are met with in carrying out schemes of workmen's dwellings in large cities, one of which is the high price of land, and another is the increase of recent years, of the cost of materials and labour. Every advantage should be taken of cheaper methods of building, and perhaps a more reasonable application of the by-laws by the local authorities would allow more latitude in this respect. In a workmen's dwelling scheme everything should be cheap and simple, consistent with good workmanship. The most economical plan of tenement buildings is a parallelogram, two rooms deep, and with a common staircase, everything, as far as possible, fire-resisting. All staircases, landings, and passages should be reduced to a minimum. To bring a little brightness into the lives of the tenants the buildings might be planned round a paved court or quadrangle, opening into a street by one or more archways, and laid out with flower-beds. This court might be overlooked from balconies on each floor. Much might be done by providing cheaper and quicker means of transit by electric car and railway to enable the better class of artisan to live in the suburbs, and so leave more dwellings in the congested parts of the city for the lower class of workman.

In providing dwellings for the artisan class private enterprise has signally failed and there are acres and acres of jerry-built property in the suburbs, which probably in a few years will fall into a condition almost as bad as that of the wretched dwellings now being cleared away in our stumps. The problem of the housing of the agricultural labourer in the country naturally does not attain the vast proportions of the same problem in the city. In this case a cottage, costing from 100l. to 150l., everything included, is needed. To effect this, purely local materials and labour should be utilised as far as possible."

MANCHESTER SOCIETY OF ARCHITECTS.—The seventh meeting of the students of this Society was presided over by Mr. Charles Potter, who, after a few preliminary remarks, called upon Mr. Gerald Solomons to move the following resolution:—"That the revival of the ancient styles of architecture be encouraged by architects." The resolution as above expressed failed to be carried, for it was held that the Renaissance style and other styles in an analogous state were the development of styles, and not the revival of them, the "revival" at this meeting being taken to mean (as literally it does) the actual reusing of the styles in their purest state, showing no innovations, all proportions being equal, and applied as it was applied when discovered. One speaker referred to the Renaissance as being an ancient style, which remark was interrupted by another speaker, who called the ancient styles only such as Classic and Egyptian, and the Chairman, in endeavouring to save the remarks of the former, included both in the class by constituting it as follows:—"Ancient architecture is other than modern." Thus both speakers were allowed to proceed. In this debate St. Paul's Cathedral was held to be in style "a

development of the Classic architecture," and not, as is generally expressed, a revival of Classic architecture.

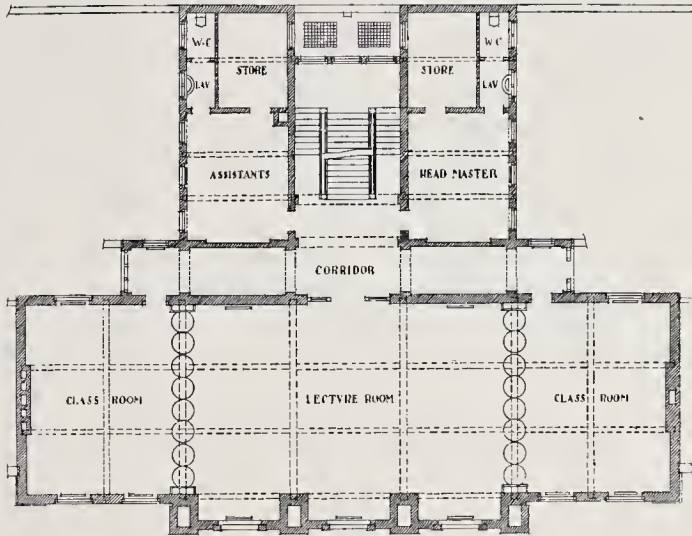
Fifty Years Ago.

FROM A LETTER IN THE *Builder* OF JANUARY 19, 1856.

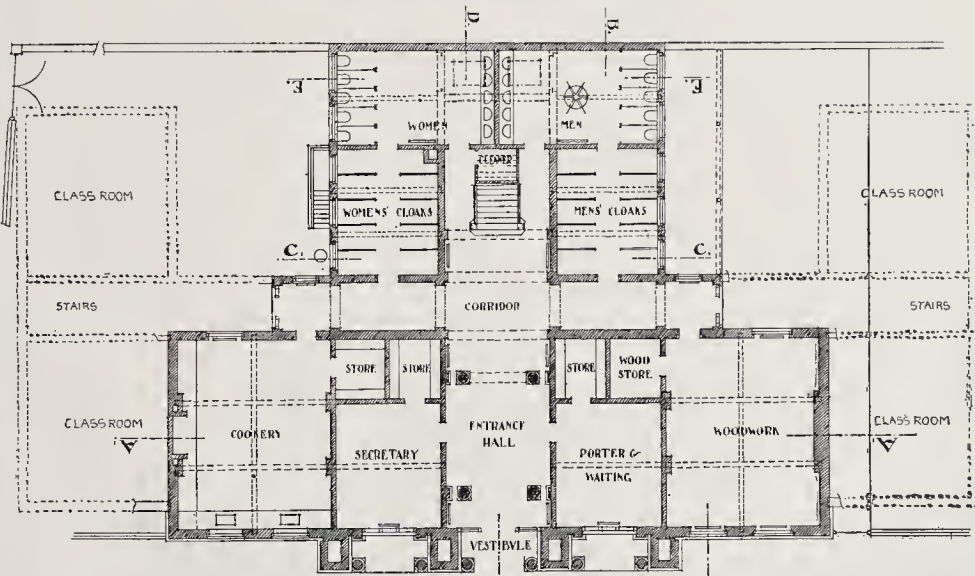
If there exist fools enough in the world to give work to those who do not possess even elementary knowledge, a diploma system would not prevent them from obtaining it.

It might, perhaps, induce those to study who have not yet practised, in order that they might pass the examination with honour. It would, perhaps, ensure a certain amount of practical knowledge in the coming generation, but would it increase talent by offering it a more enticing remuneration? In my opinion it would not, by reason of its proving no check upon the influx of new members into the profession. Some would say, establish a system of collegiate education, and raise the qualifications to a higher standard; but there are evils inseparable to the system. You compel young men to go through a course of training which is as likely to be bad as it is

to be good, and is certain to be expensive. The management may also, through interest or routine, fall into the hands of incompetent persons, and thus become a repetition, on a small scale, of Government imbecility and incapacity. It is a principle becoming day by day more significant, that every institute should stand on its own merits as a basis, and be self-sustaining. Let architectural education be no exception to the rule. Establish colleges, but let them depend upon the support of the profession. If they are required, they will answer; if not, they will soon be numbered with the things that were. After considering the question of voluntary



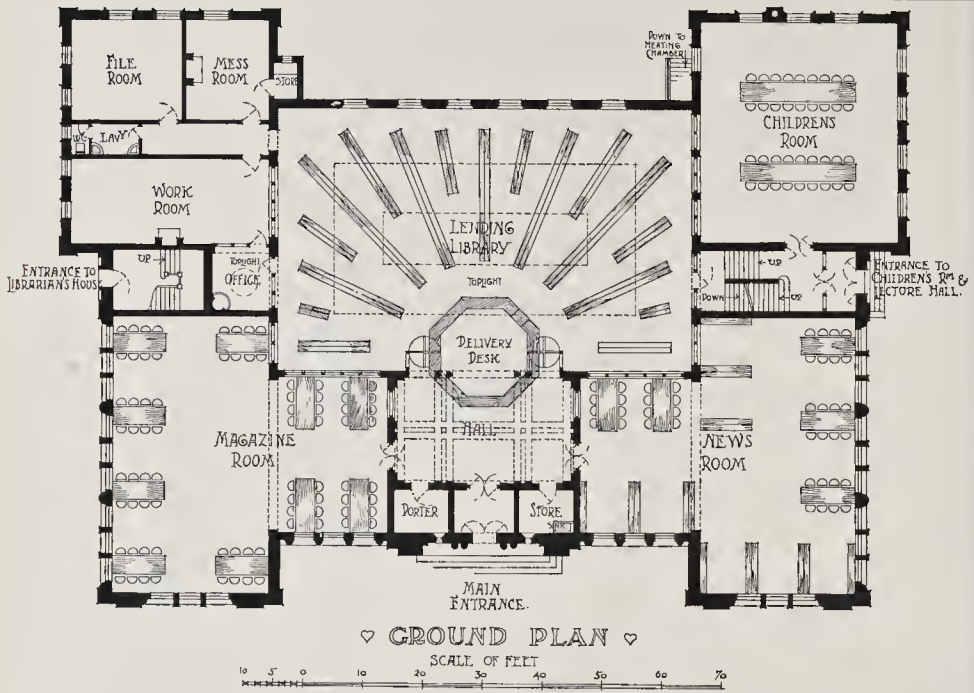
Upper Plan.



The dotted lines show future extension

Ground Plan.

Technical Institute, Rochester. Plans. (See page 68.)



Premiated Design for Public Library, Herne Hill.

examination in all its bearings, the only conclusion I can come to is, that it will be impossible for it to become a moral necessity, that the feeling of the profession will be against it, from the extra trouble and expense incurred, and the dislike of many to let the decision of the great question of their lives, "whether they shall practise or not," rest with any but themselves; that the public, finding many able men among those who have no diploma, will encourage them in preference even to those possessed of one—for the English people, above all things, hold in abhorrence any attempt at monopoly, which the movement would undoubtedly be considered to portend.

PRIZE DRAWINGS BY STUDENTS OF THE INSTITUTE.

To prevent misunderstanding, we think it as well to say beforehand that we are always glad to publish the designs which obtain the Soane Medallion, the Tite Prize, and the Grissell Medal; a statement which may be taken as a standing notice. On several former occasions winners of prizes have expressed their regret at not having their designs published in our pages, having promised them elsewhere, apparently through not being aware that we should be willing to publish them. We have always been glad to do so; but students ought hardly to expect that this journal should take part in a kind of scramble to see who could get their consent first.

TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—At the usual fortnightly meeting of this Society, held in the Technical College on the 12th inst., Mr. Colin Sinclair presiding, Prof. F. O. Bower delivered a lecture on "Dry Rot." The nature of the fungus, its growth in dead wood under favourable atmospheric and chemical conditions, the germination of the spores, which are extremely minute and produced in vast numbers, the process of ferment, and the characteristics of timber attacked by the disease were described in detail and illustrated by lantern views. The Professor thereafter explained the most likely causes of growth, also the precautions to be observed to ensure its prevention and elimination.

Illustrations.

SCULPTURE, CENTRAL LIBRARY, BRISTOL.



HIS panel is one of three on the exterior of the building; the figures, which are life-size, represent King Alfred, four chroniclers, and two wandering bards. Mr. Charles Pibworth is the sculptor.

Mr. Pibworth gives us the names of his characters as follows, taking the figures from left to right of the illustration:—Cynwulf (wandering bard); Nennius (historian); Gildas (historian); King Alfred; William of Malmesbury (historian); Florence of Worcester (historian); Wace (Norman minstrel).

DOORWAY, S. RENIERI CHAPEL, PISA CATHEDRAL.

This small doorway, constructed entirely of marble, in the Crociera di San Renieri of Pisa Cathedral (forming the south transept), is upon the north-west side of the transept, and upon the opposite side to the entrance containing the famous bronze doors of twenty-four compartments which escaped the fire of October 15, 1596.

It is probable that the doorway here illustrated, having been greatly damaged by the fire mentioned above, has been reconstructed with the original portions. Other similar doors in the Duomo show caps upon either side under the lintel. The mouldings are typical of Greek influence. The figure over the doorway is evidently intended to represent one of the Evangelists. The door itself is of sheet iron and bronze toned to a delightful colour by age.

L. U. G.

ROCHESTER TECHNICAL INSTITUTE.

This design was selected out of 113 submitted in an open competition in which Mr. Baggally acted as assessor.

The motive of the plan was to design the present requirements in such a way that the extensions required could be added in a simple manner, interrupting the work as little as possible, and leaving both the

present and ultimate building with a complete appearance.

The road in front is to be private to the Institute, Eastgate House Museum, and the future library. The building is designed to harmonise with Eastgate House, though the type chosen is not Domestic Elizabethan, a style considered by the architects to be unsuitable for modern school requirements. The school will be devoted mainly to art teaching, and the special rooms for that purpose are placed on the second floor.

The materials to be used are red and stock bricks, with Ancaster stone dressings, and tiles for the roof.

Tenders will be received this month, and it is expected that the building will be completed in a year.

The architects are Messrs. S. B. Russell & T. Edwin Cooper.

PREMIATED DESIGN FOR PUBLIC LIBRARY, HERNE HILL.

This design, by Mr. Thomas Wallis, is one of six that were premiated in the competition, though it was not the one selected for execution.

The planning of the Library was specified in the instructions to be on the Free Access system, and this design was planned for that system, though we understand that it was abandoned in the actual erection of the Library.

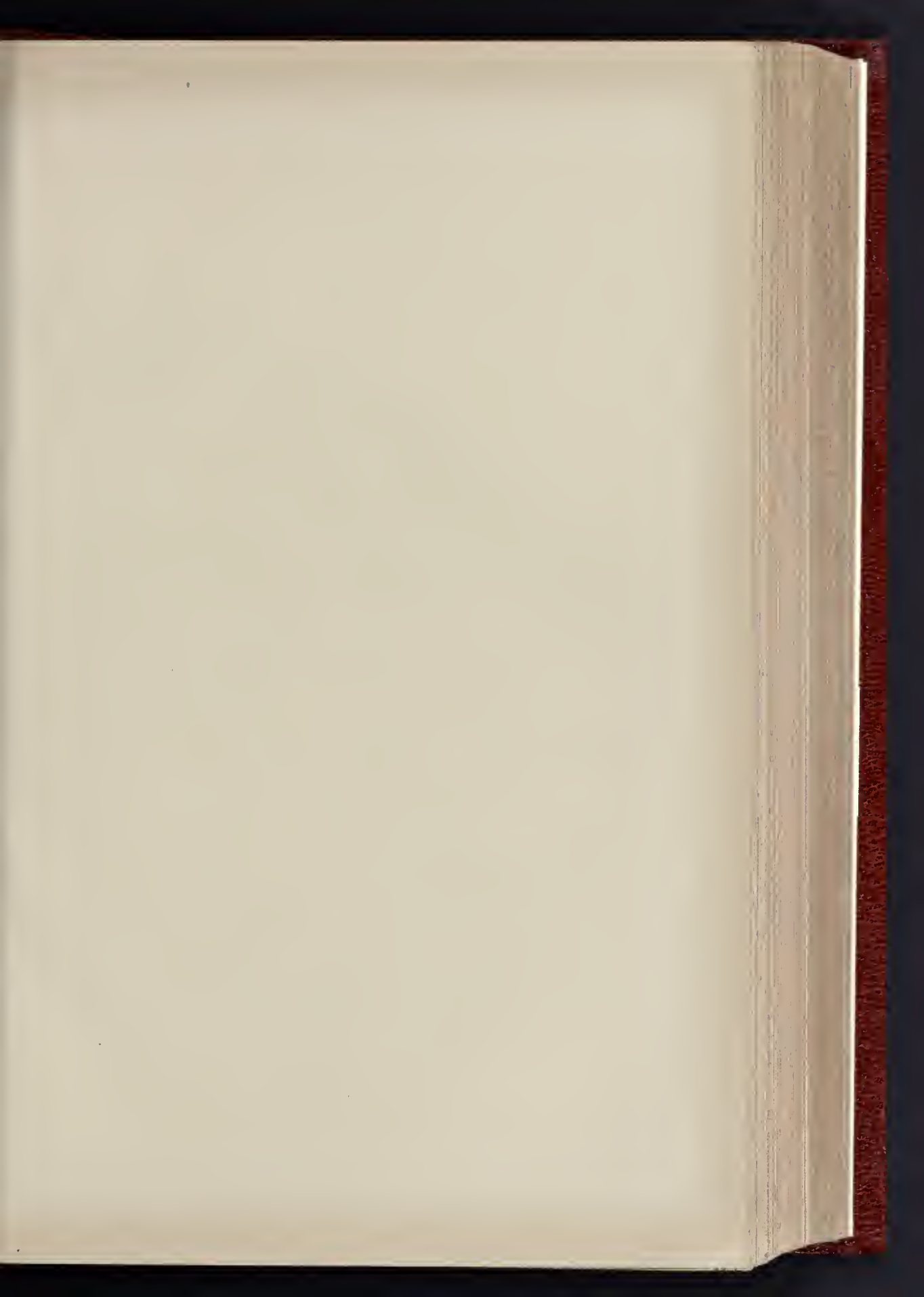
The buildings were to be of red brick, with terra-cotta facings, roofed with green slates; the cost not to exceed 10,000.

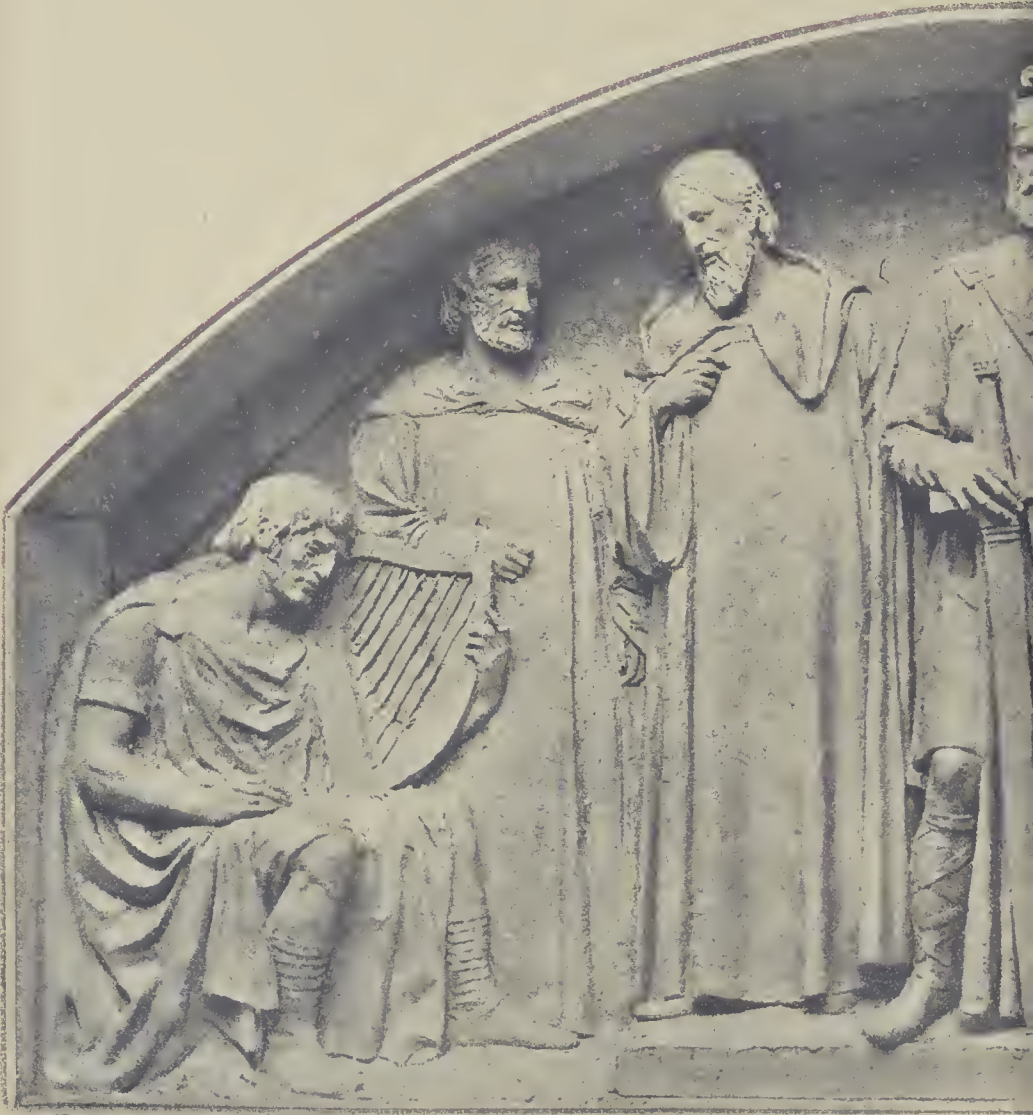
MEXBOROUGH HOUSE, DOVER-STREET.

This building is erected on the site of the town house of Lord Mexborough, and consists of two large blocks of buildings, having frontages of about 40 ft. to Dover-street and Berkeley-street.

The old house had some fine carved doors and over-doors, dado and other panelling, which have been preserved.

The new buildings will be known as Mexborough House, and are planned as residential flats on the upper floors, each flat consisting of hall, sitting-room, three bedrooms, and bathroom. The service will be from a common kitchen, and the tenants will



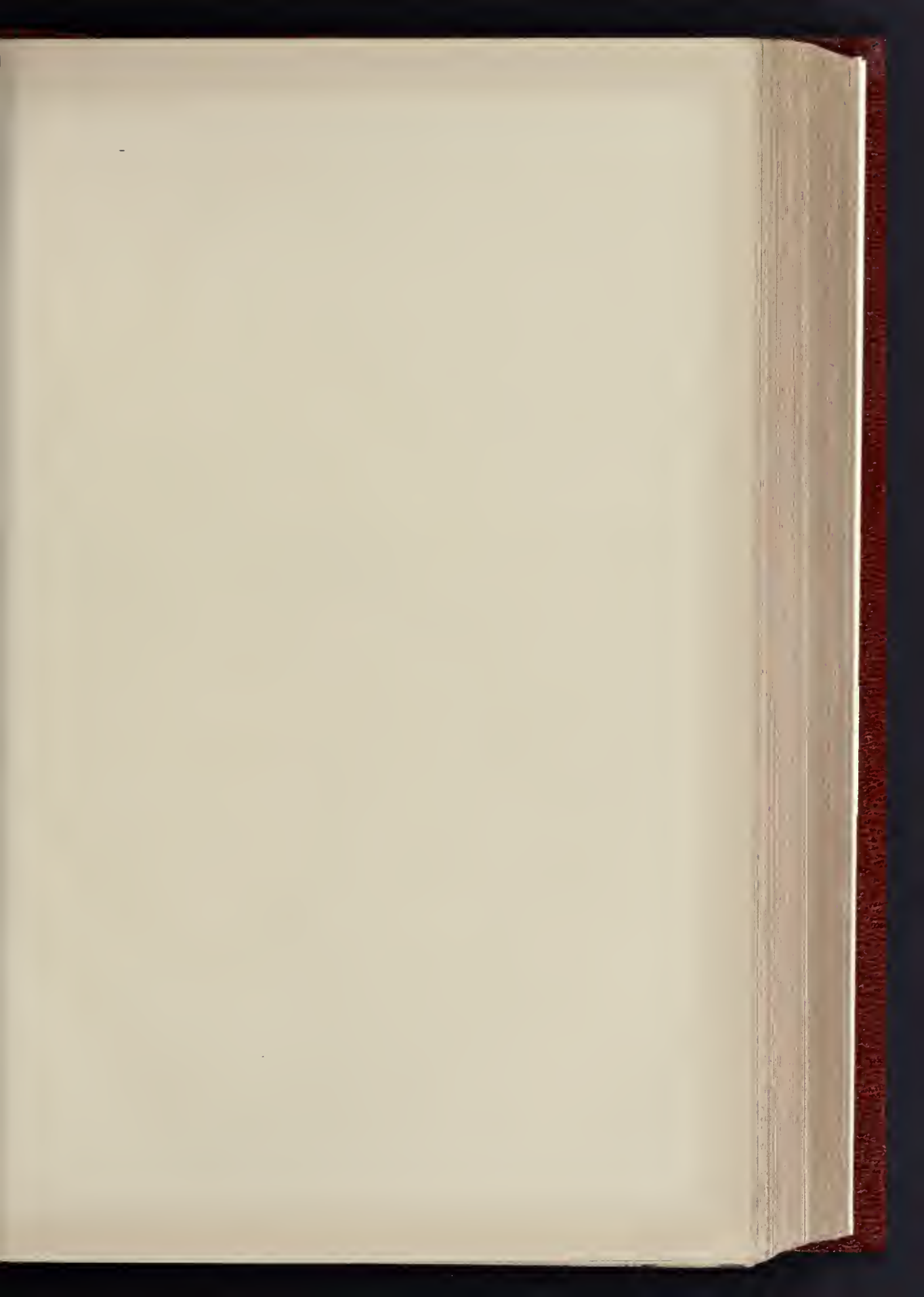


SCULPTURE PANEL ON EXTERIOR OF NEW CENT



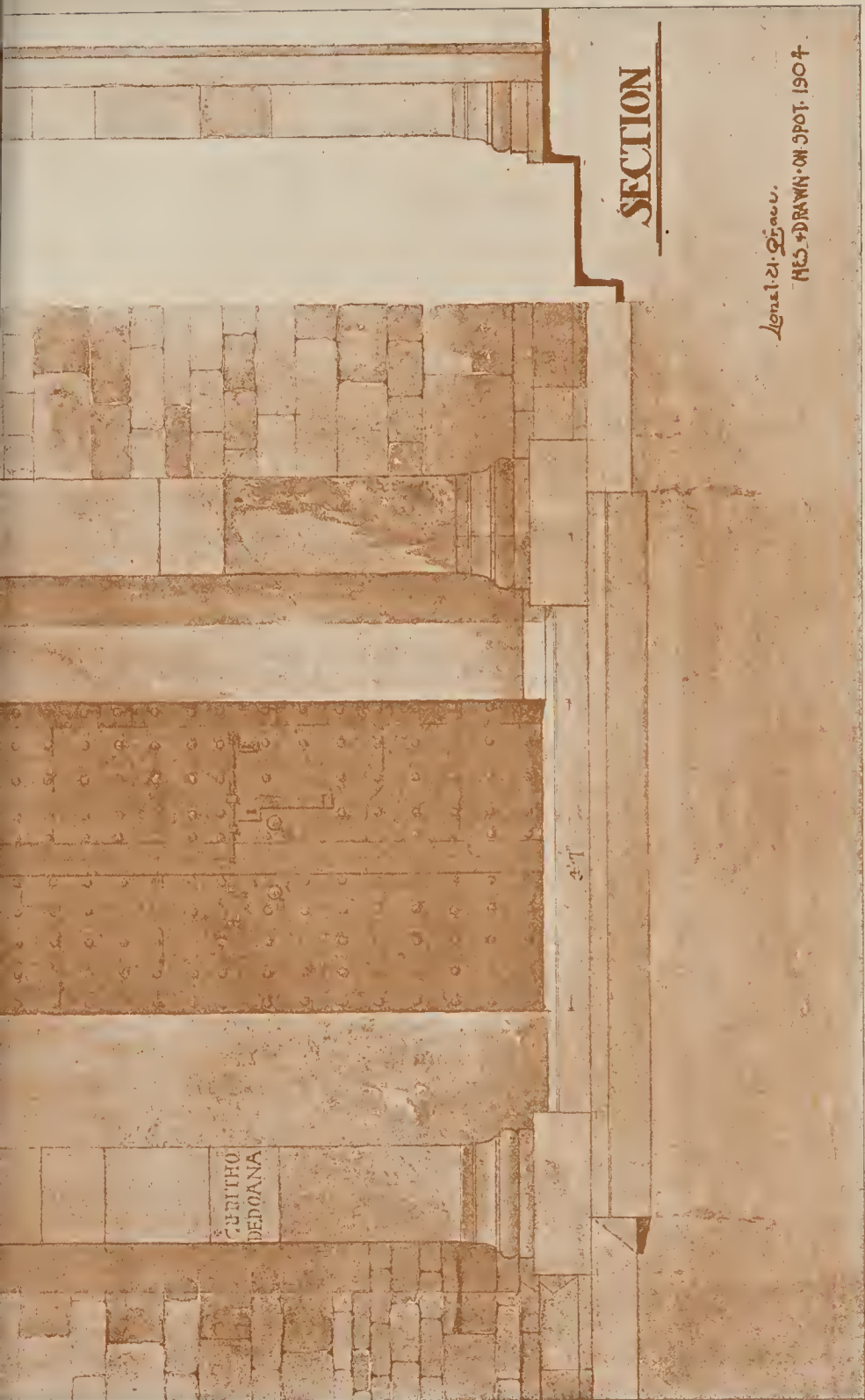
INK PHOTO SPRAGUE & CO. L^{TD} 4 & 5 EAST HARDING STREET FETTER LANE E.C.

BRARY, BRISTOL.—MR. CHARLES PIBWORTH, SCULPTOR.



SCALE DETAIL OF DOORWAY
TO ST RENIERI CHAPEL,
PISA DUOMO





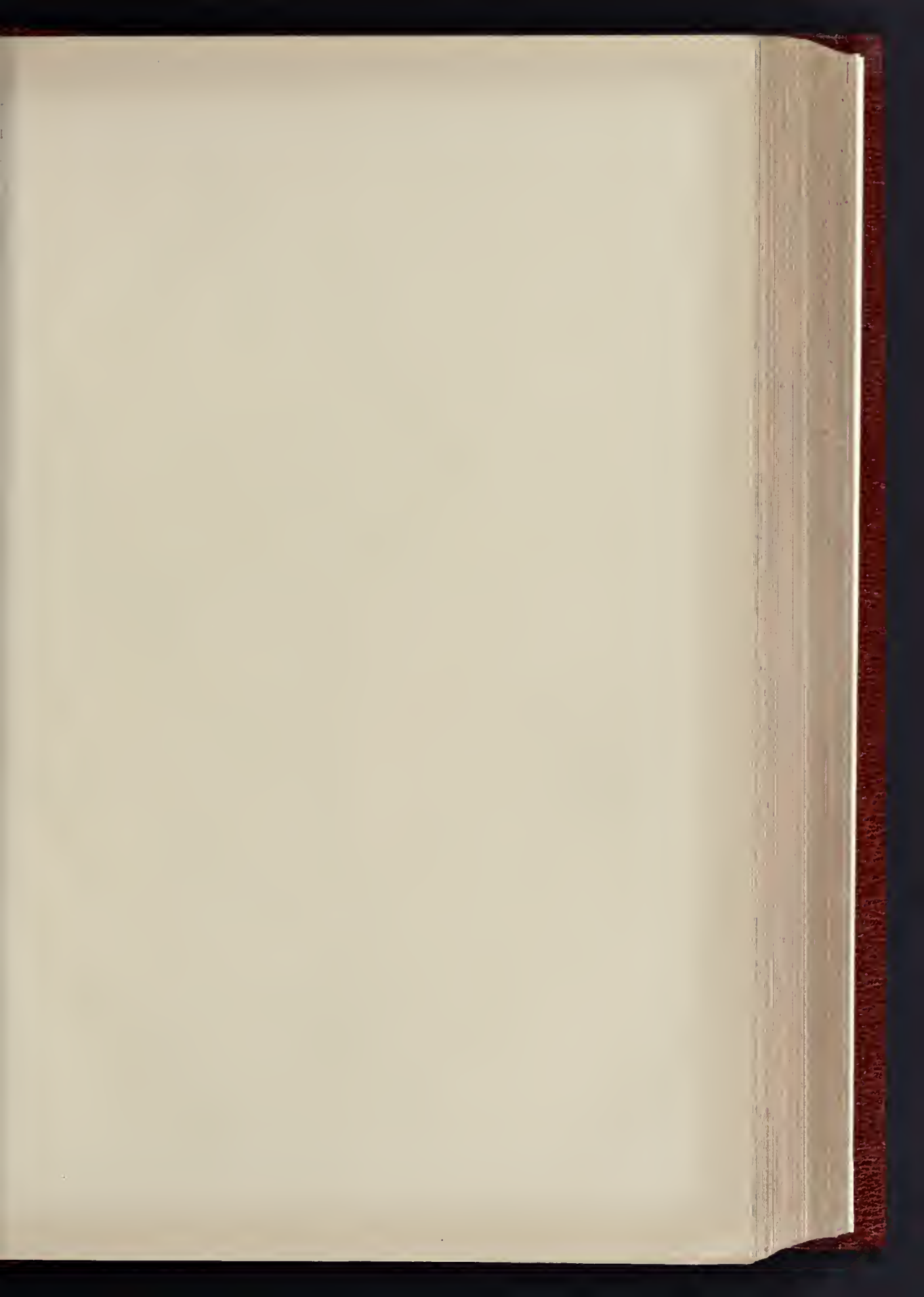
CERTHO
DEDONA

SECTION

Genal di Ziaou.

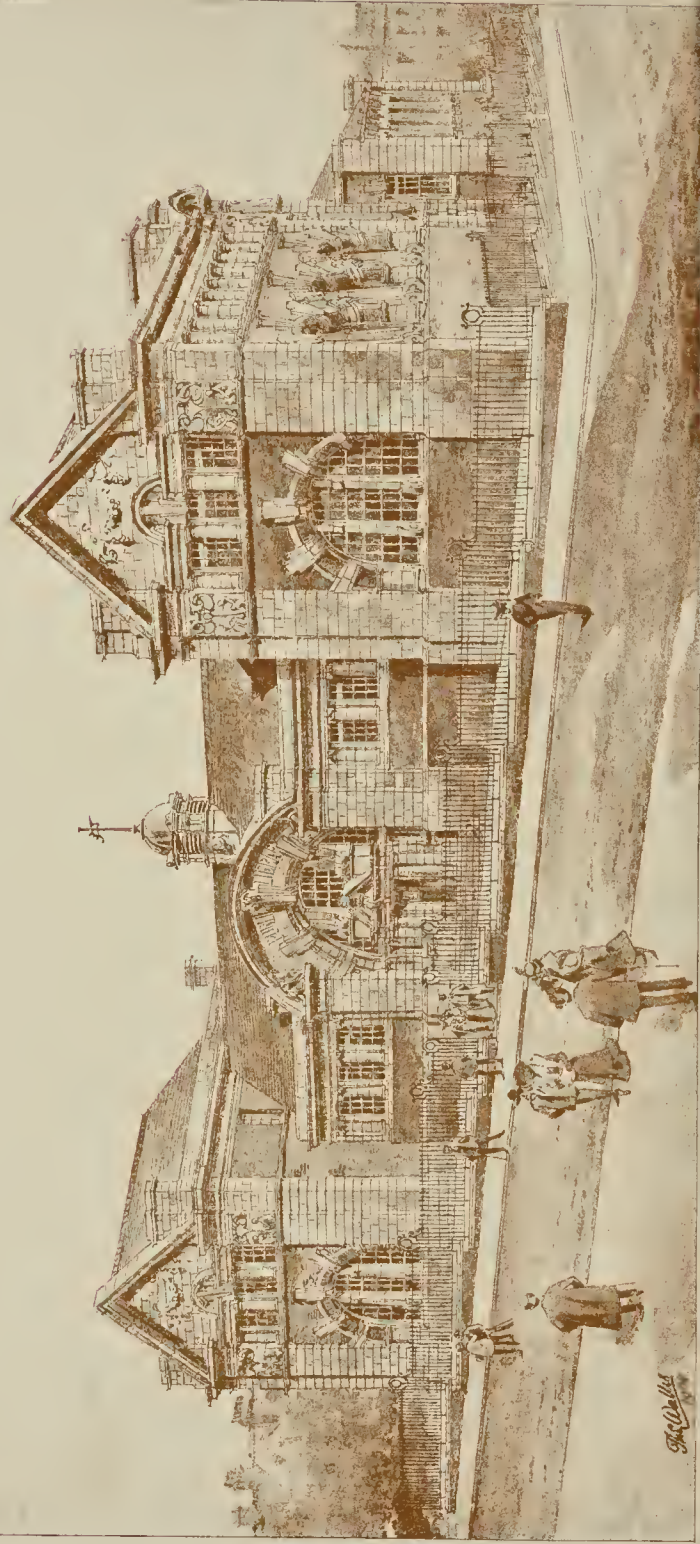
HEB. DRAWN ON SPOT. 1904.

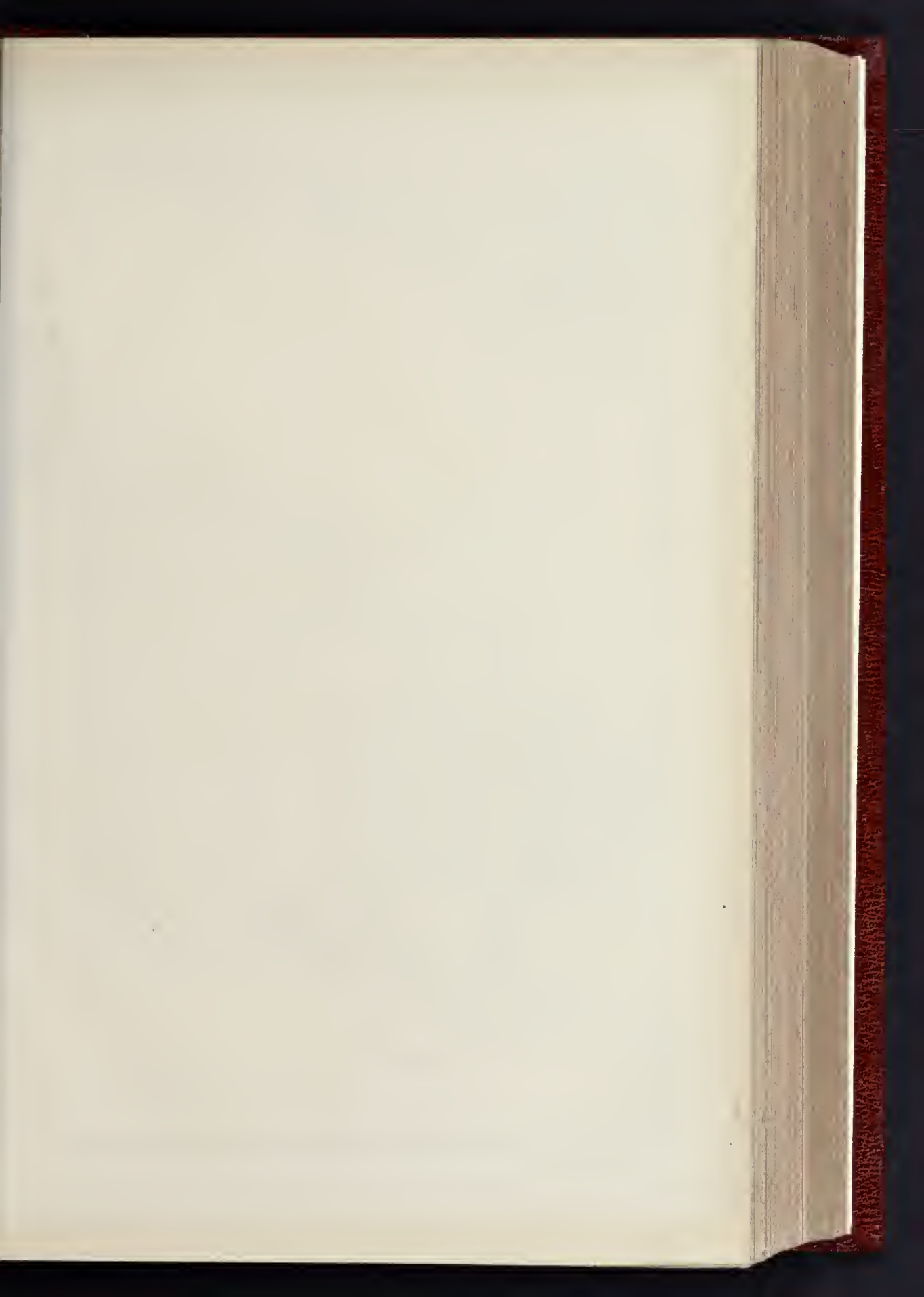
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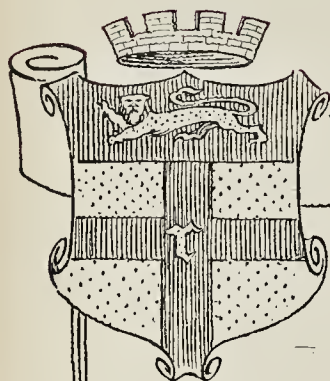


HERNE HILL
PUBLIC LIBRARY
PREMIATED DESIGN

THE BUILDER, JANUARY 20 1906



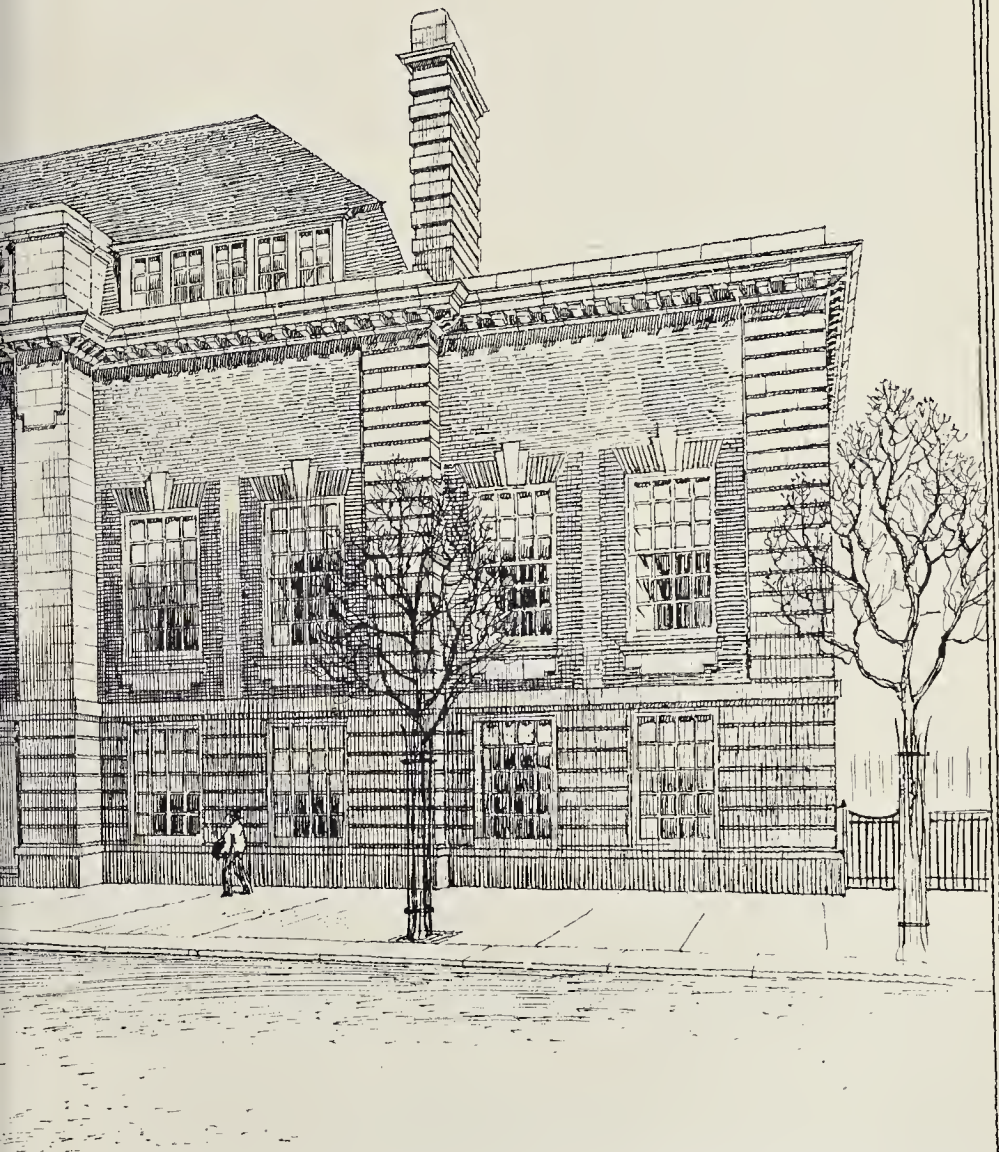




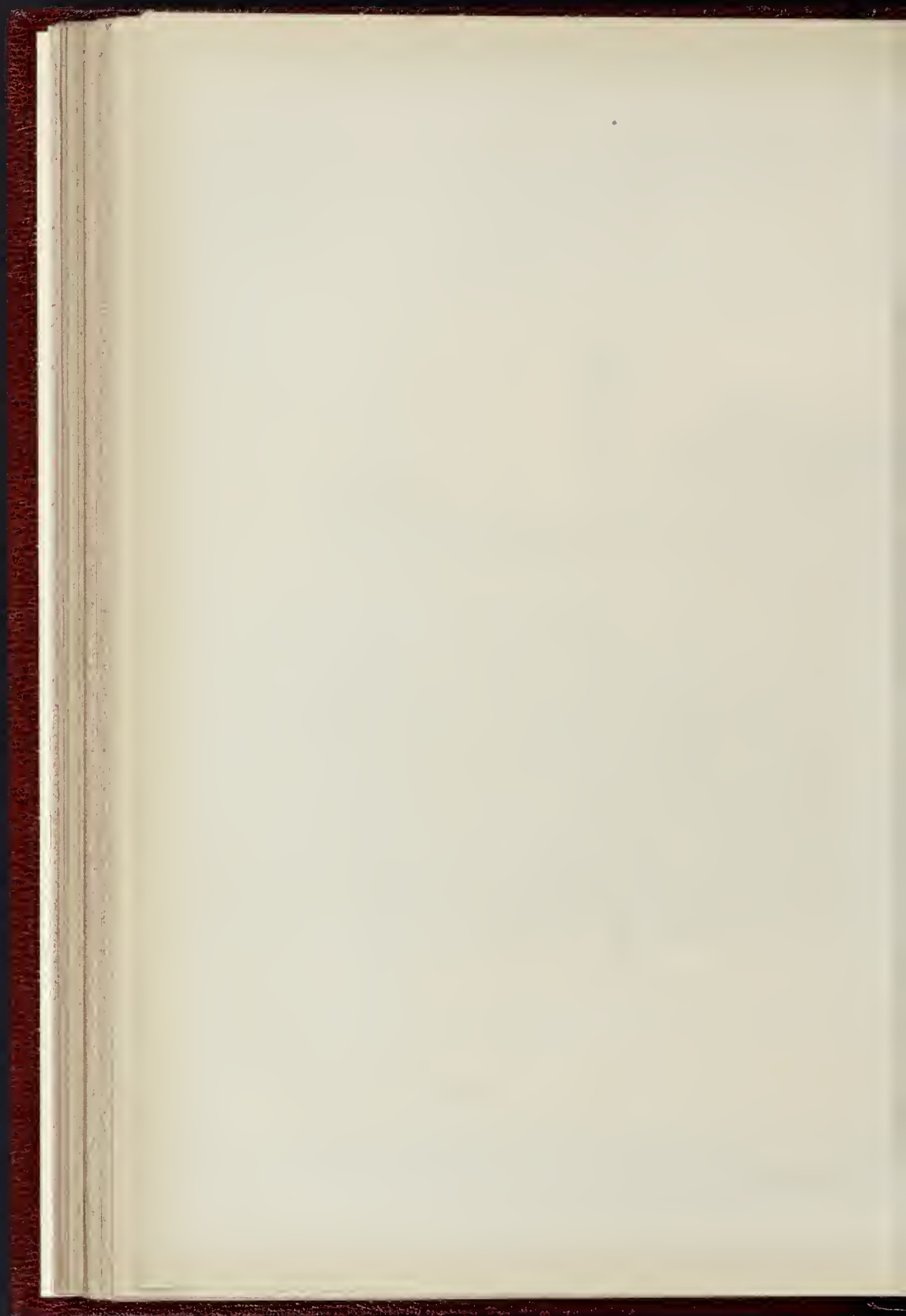
CITY OF ROCHESTER

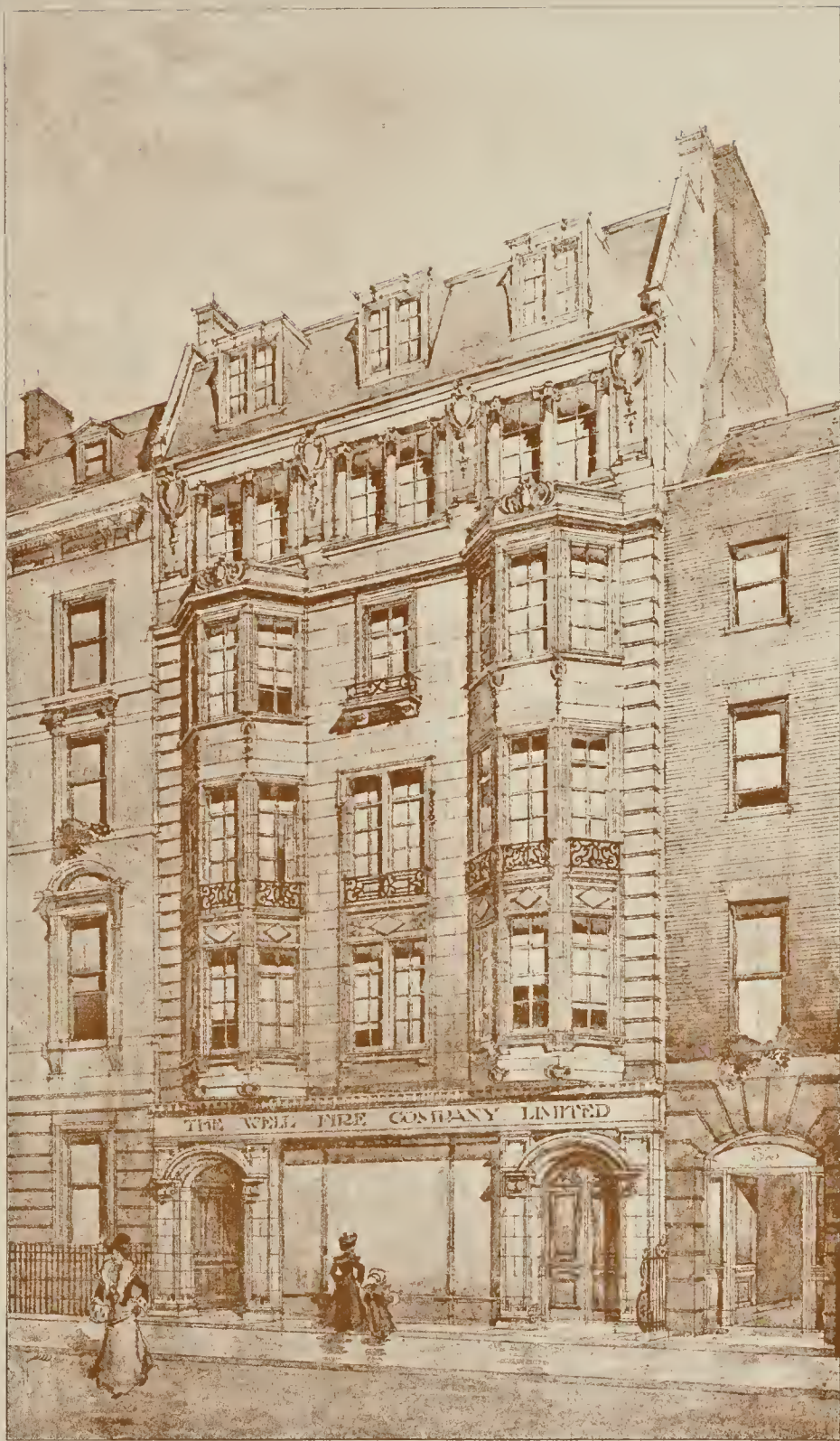


TECHNICAL INSTITUTE 1906



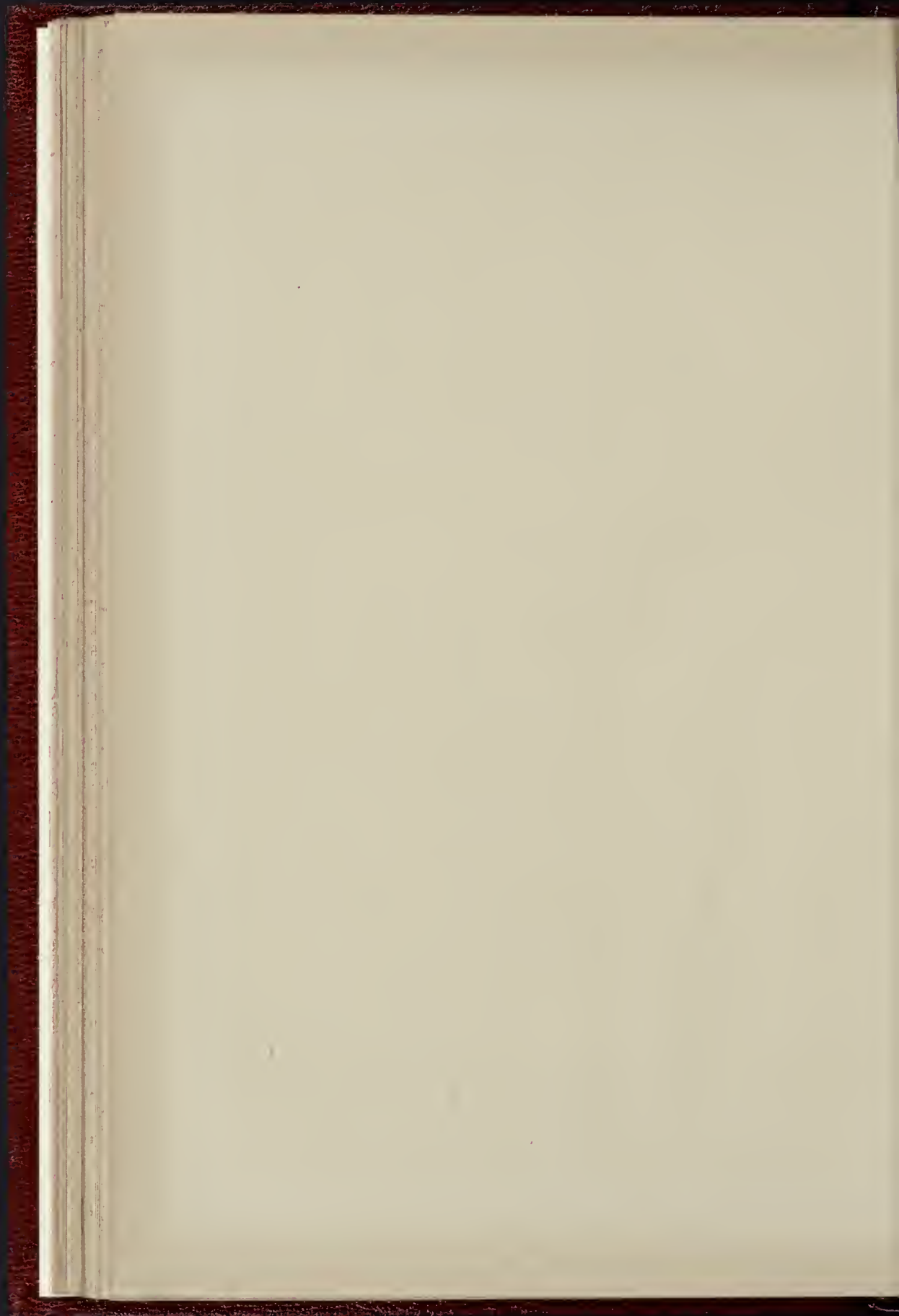
RUSSELL & COOPER F.F.R.I.B.A.

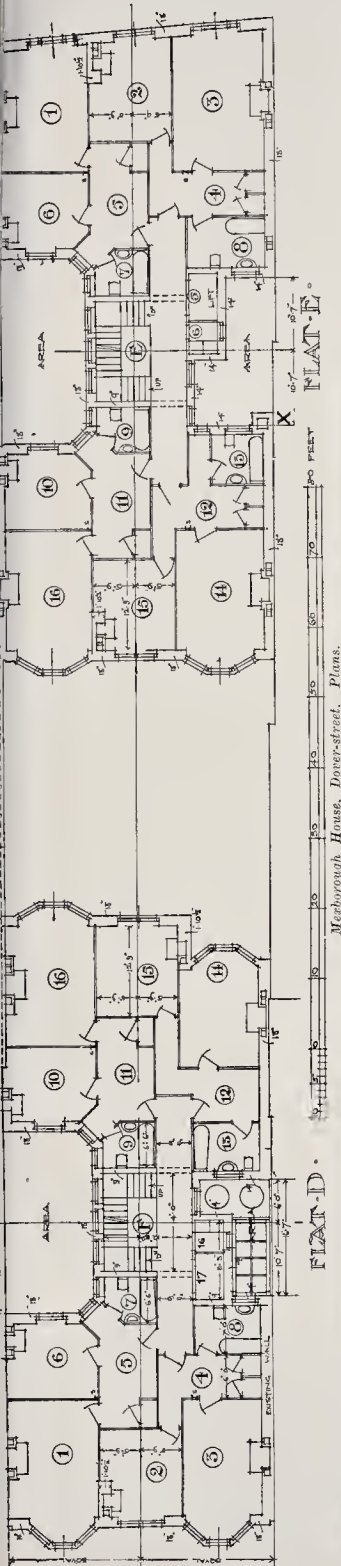




INK-PHOTO-SPRAGUE & CO. L^{ts} 4 & 5, EAST HARDING STREET FETTER LANE E.C.

MEXBOROUGH HOUSE, DOVER STREET—MR JAMES S. GIBSON, F.R.I.B.A., ARCHITECT





be supplied with all meals on a fixed tariff, and also with all domestic services.

The frontage to Dover-street is designed for business premises on the ground floor, now occupied by the Well Fire Company, and having unpolished grey granite to the first floor level and Portland stone above, with metal casements to the window openings.

The frontage to Berkeley-street is treated with red brick and Portland stone dressings.

The whole of the buildings are of fire-resisting construction, and the finishings throughout are of first-class materials.

The contractor is Mr. James Carmichael, and Mr. P. Watkins has acted as clerk of works.

JAMES S. GIBSON.

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THE QUANTITY SURVEYORS' ASSOCIATION.

A MEETING of the Quantity Surveyors' Association (Incorporated) was held on Wednesday in the "Chinese Room," Holborn Restaurant, when the adjourned discussion was resumed on the paper read by Mr. F. B. Hollis, on December 6 last, entitled "Some thoughts on the Quantity Surveyor and his Relation to the Building Owner, the Architect, and the Builder."

The chair was occupied by Mr. A. J. Gate, Vice-President.

The minutes having been read and confirmed, Mr. F. B. Hollis, Hon. Secretary, read some correspondence arising out of his paper.

Mr. H. Smith (London) wrote saying that there were two points to which he would call attention. Mr. Hollis, in his definitions of "Quantity Surveyor," mentioned that the quantity surveyor should have intimate acquaintance with the law of dilapidations, etc., light and air cases, and value of property for mortgage and other purposes. He (Mr. Smith) agreed that they should have intimate and full acquaintance of such matters, but, from personal experience, he found that a "quantity surveyor" had but very little standing in the eyes of the law on these matters. He had been engaged upon very many cases of such description to give expert evidence, and he had found that nothing but the term "building surveyor" would satisfy the law that one knew what one was talking about and was capable of giving expert evidence; and, although a quantity surveyor might be fully capable and able to give first-class evidence, he was discredited because he was a quantity surveyor and not a building surveyor, and in many instances of important cases he had been engaged upon he had been compelled to use the term "building surveyor" to get any importance attached to his evidence. In the question as to whether quantities should form part of the contract, he said "Yes, providing that the quantities, being a part of the contract, did not invalidate the responsibility of the quantity surveyor for errors." He did considerable work in both private and public buildings, and he could say that in not one solitary case had the quantity surveyor's work been allowed to form part of the contract; and why? simply because it was thought—and somewhat truly under the present conditions—that if the quantities formed part of the contract it invalidated the question of responsibility as to the accuracy. One of the many reasons he had given was that "if the quantity surveyor's work be accepted as part of the contract, then the provisions usually included by the architects for 'contingencies and extra work' cover also any omission, if any, on the part of the quantity surveyor." How many architects carried out a job of any sort without the "contingency provision"? Not many, he feared, and if not put into actual lump sum amount they insisted on having an item measured for provision of brickwork or digging and concrete, etc.; and why? simply as a cover to allow for any matter which, according to the plans and specification, might require altering or adjusting as the work proceeded, and they liked those provisions entirely for their own use. He admitted that it was desirable in the practice of an architect, where alteration works or uncertain party-wall works, etc., occurred to include something to deal with to cover matters that arose when old work was exposed, as that usually happened

where one had so many to satisfy where more than one person was interested. He knew that this question on the point of provisions was a very delicate one, and until that point could be dealt with to the architects' satisfaction they would, he feared, not give the quantity surveyor any recognised position in the contract. He used the architect's name in this matter because he was the man that prepared the contract on behalf of the employer. Another serious clause in quantities which did not tend to improve matters, and which was often used by supposed "qualified men" was "that the quantities have been prepared with care and accuracy as far as possible to obtain same, but the contractor must satisfy himself as to whether they are accurate or not before he signs the contract, as no claim will afterwards be considered if any error or omission be found." It was this sort of clause that made the contractor dissatisfied and the employer suspicious, and especially when they had to pay full price to a man who was uncertain whether he was competent or not. That sort of quantity surveyor was not the man to head his bills of quantities thus: "That these bills have been carefully prepared and are guaranteed correct by the quantity surveyor." He had spoken to many architects as to why they object to quantities forming part of the contract, and the answer invariably was: "No thank you; we get quite enough trouble without giving ourselves more." As to the employment of the quantity surveyor direct by the employer, he was of opinion that the employment direct would be a great mistake both as to the surveyor's side of the question and to the architect's side. It certainly meant "chiselling" down prices, and allowed of incompetent men being pushed on to the architect, and he need not discourse on the many drawbacks that would arise to those who were experienced in the matter of the present competitive rules and ways of getting work. Certainly one question the employers would be sure to insist on was that no fees ought to be paid to the surveyor till the job is complete and account settled to the building owner's satisfaction. What a time for the poor quantity surveyor!

Mr. Acheson Bergesen (Belfast) said he quite agreed with Mr. Hollis's definition of the relations of the quantity surveyor to the architect and the building owner, which must in reality mean that the latter was the principal and the former his agent. Therefore, it followed, as a matter of course, that if the principal, or the building owner, allowed the bill of quantities to form part of the contract he fully admitted his responsibility, and the Association's clause 13 did no harm. This reasonable course was not adopted in many cases owing to the principal, or building owner, refusing to allow the quantities "to form part of the contract," thereby shifting his responsibility to the shoulders of the building contractor, who in turn passed it over to the quantity surveyor. At this stage clause 13 became operative, and, if acted on, would not only compel the quantity surveyor to take a risk other than that laid down by law, but also to pay the debt of his principal for a shortage in quantities, which he, the principal, alone should pay for, as he alone derived the benefit of the same; surely there was something wrong in a clause that would operate so unjustly. The remedy he suggested was to amend clause 13 to read as follows:—"Any member of the Association who shall supply bills of quantities may hold himself responsible for their accuracy as a whole, or in cases where the quantities are not intended to form part of the contract he may insert an item in same to cover any risk the building contractor is obliged to take by having to accept the bill of quantities to be correct as a whole." If this were adopted the building contractor could protect himself by an insurance policy, and the insurance company could protect themselves by stipulating that the bill of quantities should be prepared by a member of the Association. He thought that every reasonable effort should be made to get a charter as soon as possible, and the amendment of clause 13 would, in his opinion, clear the way.

Mr. A. Lawrence Cox, of Manchester, said he was of opinion that a quantity surveyor should be designated by his true title and not merely as a "surveyor." The house agent, amongst others, was much too

* See our issue for December 9 for a report of the meeting.

fond of annexing this title. The crying abuse of the use of the title "quantity surveyor" by men who issued quantities containing such choice items as those quoted in the paper called for serious and immediate consideration. He thought it desirable that the Association should continue in the good work of educating the public by the publication and discussion of papers bearing upon the peculiar intricacies and arduous nature of the work of quantity surveyor and the necessity, as a matter of justice between owner and contractor, for the work to be solely in the hands of skilled and qualified practitioners. He thought that they would all be of opinion that the profession should be "protected" from unskilled and unscrupulous competition. The best form of protection would be some form of compulsory registration, and he should be glad to hear that the executive had this goal before them.

Mr. B. Laine Pearson said, as to the latter part of the fifth section of the definition of a quantity surveyor, which states that he should be a man having an acquaintance with the value of property for mortgage or other purposes, this appeared to be more the business of valuation surveyor or house agent, as, although there were many quantity surveyors in London who occasionally did this kind of work, he believed by far the greater number did not engage in it, and rightly so, as a quantity surveyor proper was a man of detail rather than of piecemeal valuation. Second, as to the difference in modes of measurement of London, the Midlands, and the North, as a man who had had considerable experience in measuring up works, and also of estimating, and bills of quantities in a great many different towns in the North and Midlands, he had found that, with a few exceptions, their chief systems were a want of system, practically no two men following the same procedure, and all having one system—viz., that of shortening detail. Even in cities like Manchester and Leeds, where there were printed modes of measurement agreed between the architects and the builder, each man had followed his own method, and, although there had recently been a lot said about standardising mode of measurement, he was afraid it would have to take the form of perfecting the London system only, as on the one hand the men who prepared quantities in the North and Midlands would mostly be unwilling to change, and on the other hand there were only a few improvements that could be culled from their practice, the chief of them being the running of extra double course at eaves and cutting and waste in slating and tiling, and the number of tees in iron and copper pipes. In view of a probable perfecting of the London system among the members of the Association, he mentioned a few of the items it seemed to him desirable to revise—i.e., concrete in deep trenches should have the distance below surface stated; drains should be stated as digging and laying commencing at a certain depth below surface; brick facings to external and internal angles, also to reveals to doors and windows, should be measured per foot run, stating width and girth, and in the case of external angles making a deduction of the girth of the quoit. Brick arches sadly need revision, so as to be able to fix an accurate price. Wrot stonework should, in his opinion, always have the labours measured separately, and in the case of some of the millstone grits, which were not usually sawn, should have all beds and joints measured, and those of these latter that were sawn should have the rough stone measured run.

Mr. H. J. West having made a few remarks,

Mr. Theo P. Pietersen said, as to the quantities forming part of the contract, he thought that it would be an excellent thing if such a course were to obtain that all quantities should form part of the contract. He was quite sure that all errors were not made by qualified men. Slight clerical errors there might be for which he thought it would be most unjust to hold a surveyor responsible, and, although this clashed with clause 13 of the articles of association, still he could not help thinking that on the whole it would be beneficial to the profession if quantities were always made part of the contract. He knew of one public body who made quantities part of the contract, and

they stipulated that any errors made by the surveyor should be paid for by him, and *vice versa*. Such an arrangement got over the difficulty of, at all events, the possible charge that a surveyor will take the quantities out more fully in order to increase his fees.

Mr. B. S. Smith said he had seen it suggested that quantities should be standardised.

The Chairman said that standardising quantities was impossible. If an immense volume should be prepared, with every item possible in it, it would be a little bigger than the "Encyclopaedia Britannica."

Mr. E. A. Wylie said that he believed that bills of quantities should form part of the contract. He also agreed with clause 13 that the quantity surveyor should guarantee his quantities.

Mr. T. W. Biggs having spoken on various points dealt with by Mr. Hollis,

The Chairman, in putting the vote of thanks to the meeting, said that Mr. Hollis suggested that the first, second, and third requisite for the quantity surveyor was accuracy. He should be sorry if that was all; the really successful surveyor should be a good deal more than accurate. The first thing he required was brains, the second industry, and the third tact. A man with those three qualifications would, if he exercised them all, have a reasonable hope of getting near enough to the top of his profession not to have to carry out work at some of the prices which were now offered. A man with accuracy only, remained a drudge all his life.

Mr. Hollis, in the course of his reply, said that the principal points touched upon by the gentlemen who had spoken were briefly:—Whether or not the bills of quantities should form part of the contract; clause 13 of the Association; and uniformity of fees. As to the first point, Mr. Cross, who opened the discussion, contended that such a course was an evil one, inasmuch as it tended to lower the status of the quantity surveyor, and to make him careless as to whether his bill was a good one or otherwise. He (the speaker) would not go so far as his friend had in his assertion, as he thought that the production of one bad, or even indifferent bill, would do a quantity surveyor more harm than twenty good ones could neutralise, in the opinion of the employer or the architect for whom he was working. He was still of the opinion that making the bills part of the contract would tend to a more thorough consideration of doubtful points in the specification and plans, as with the bills part of the contract they would be even more carefully prepared than at present, seeing that so much more depended upon their accuracy. Now, as to clause 13, Mr. C. John Mann demurred very much to going beyond the law of the land in the matter of a quantity surveyor being liable, or rather making himself liable, for the inaccuracies in his bill of quantities. But this idea was of the "Eogey" description, and must, in a great measure, be due to a mistaken conception of the law as it at present stands in its relation to a quantity surveyor's liability. Did not the clause merely emphasise the law? As he understood the law in its relation to this, it was that the party who paid for the bill of quantities had a claim in common law against the surveyor who prepared it if it contained inaccuracies directly due to negligence. That was all that they as an Association insisted upon the offender doing, if the case was brought before the Association officially, and, of course, the only authority they possessed to compel the person complained of making the necessary restitution was the threat of expulsion in the event of his non-compliance with such rule, after it had been duly gone into by the Association. Mr. Sanders thought that the quantity surveyor's liability should be limited to the amount of his fees in the matter in dispute. This, of course, was opening up the whole question of a surveyor's liability, and he could only say that if such an amendment to the Articles of Association was duly proposed by a member that the machinery existed for ascertaining the wishes of the majority of the members upon the question. At present he knew of no such general feeling amongst the Association. As to a schedule of fees for any

particular class of work, public or private, from a humble cottage to a lordly mansion, it was a most delicate and difficult subject to deal with. A "Fees" sub-committee had been appointed by the Council of the Association, and he was sure that if they could formulate any scale of fees, or assist in any way the object they all had in view as regards this, they would do so. Some would take work at a fee which made it impossible that good work could result, but how to stop such practices was a very difficult matter even to suggest, not to say undertake. A district council, in advertising for tenders for preparing bills of quantities for a proposed building, had stipulated that the surveyor should be a member of the Association. When more public bodies were like this one in that respect then uniformity of fees came within a measurable distance of becoming practicable. As to writing the specification, he considered the architect the best person to do this, but he also agreed with Mr. Mann that a quantity surveyor could do so, perhaps in greater detail from his dimensions, and he was sure that no member of the Association but would be glad to give his architect all the assistance in his power in this respect. The question of supplying a copy of the dimensions to the successful firm in tendering for the work had been touched upon. It was one thing to answer the request of a builder for information upon any one particular point and to supply him with a copy of the dimensions bearing upon that individual item, and quite another matter to permit him to have a copy of the whole of the dimensions, and he agreed with Mr. Mann that such a course placed a weapon in the hands of a person with which the architect might be unduly harassed. With regard to the question of quantities being ordered and paid for direct by the employer, he could not quite agree that the quantity surveyor should be paid direct for them. This course might possibly result in the work being more evenly distributed amongst the members of the profession than was at present the case, and would doubtless prevent some architects from placing all their work in the hands of one quantity surveyor, but, from his experience of architects, the majority preferred to have a quantity surveyor who was cognisant of their methods and style, and the course suggested might lead to incompetent men being employed. He could not quite agree with Mr. West that, because a man was a measurer, he was a quantity surveyor. He agreed as to the utter impracticability of issuing standard bills of quantities. He was also glad to gather from the remarks of Mr. Pietersen and others that there was such a general opinion that bills of quantities should form part of the contract. He agreed with all that the Chairman said, but he must defend his reference to the first requirements of a quantity surveyor being accuracy, the second accuracy, and the third accuracy. Mr. Gate objected to this, and said that accuracy was only a habit, and that he should have added as a chief requirement brains. He submitted that no man could be accurate without brains. He was glad the Chairman condemned the frequent reference that had been made to inaccurate work caused by hurry. There could be no half measures in a bill of quantities.

Upon the motion of Mr. L. G. Cross, seconded by Mr. H. J. Camp, a unanimous vote of thanks was passed to the Chairman, who responded, and the proceedings terminated.

COMPETITIONS.

BAPTIST CHURCH AND SCHOOLS, WALTHAMSTOW.—Acting on the advice of their assessor, the Building Committee have adopted the designs of Messrs. W. D. Church & Son, submitted in a limited competition. The building is to cost 7,500l.

BAPTIST SUNDAY SCHOOLS, ILFORD.—In a limited competition for these schools, the designs of Messrs. W. D. Church & Son were placed first by the assessor, and the Committee have instructed them to proceed with the work. Messrs. F. & A. Willmott, of Ilford, are the contractors.

SHIREHALL, NORWICH.—At the quarterly meeting of the Norfolk County Council, held at Norwich Shirehall, the Shire-

house Extension Committee reported with reference to the proposed enlargement of the Shirehall. They stated that they engaged the services of an expert, Mr. A. J. Wood, of 22, Surrey-street, to advise them, and had selected three sets of plans for the awards of a first premium of 100*l.*, second 50*l.*, and the third 25*l.*, the designs being marked respectively M, G, and D. The architect of design M estimates the cost at 8,850*l.*. Mr. Wood's estimate is 13,820*l.*; the estimate of design G 13,210*l.*, Mr. Wood's estimate 13,640*l.*; of design D 9,500*l.*. Mr. Wood's being 15,400*l.*. It is probable, therefore, the Committee says, that the cost of the extension will in the end be 14,000*l.*. It was stated that the following had won the premiums for the best plans submitted.—1, Mr. E. J. French, Upper King-street, Norwich, 100*l.*; 2, Mr. W. Waddington, Cheapside, 50*l.*; 3, Mr. J. W. Durhan, Opie-street, Norwich, 25*l.*

BOOKS RECEIVED.

TABLES OF IMPERIAL, METRIC, INDIAN AND COLONIAL WEIGHTS AND MEASURES. Compiled by Alfred J. Martin, F.S.I. (T. Fisher Unwin, 2s. 6d.)

AN INTRODUCTION TO OLD ENGLISH FURNITURE. By W. E. Mallett; with Illustrations by H. M. Brook. (Country Life Offices, 5s.)

THE CATHEDRALS OF ENGLAND AND WALES. By T. Francis Bumpus. Second Series. (T. Werner Laurie, 6s.)

GAS AND OIL ENGINE MANAGEMENT. By M. Powis Bale, M.Inst.C.E. Second Edition. (Crosby Lockwood & Son, 3s. 6d.)

THE WRITERS' AND ARTISTS' YEAR BOOK: 1906. (Adam & Charles Black, 1s.)

Correspondence.

ROYAL ACADEMY LECTURES.

SIR,—In the report of my lecture at the Royal Academy on the 8th, which you have kindly sent me, I notice that you comment on the inconvenience caused by there being no lantern. May I be allowed to say that the responsibility in this matter rests with me, and not with the management of the Royal Academy?

I had to make the necessary arrangements, and had done so, but unfortunately the lantern was sent by mistake to one of the other societies at Burlington House, and we waited for it in vain. Hence the delay, etc., which I very much regret.

GEORGE CLAUSEN.

APPOINTMENT OF DISTRICT SURVEYORS.

SIR,—The letter from the President of the District Surveyors' Association to the London County Council, published in your last issue, is of interest, and presents an opportunity for the consideration of other points in addition to those referred to in the letter in question.

It is a well-known fact to architects practising in the London area that the London County Council has for some considerable time past been reducing the position of the District Surveyor to that of a machine.

Generally speaking, they are no longer allowed to think, and are prevented from applying their knowledge and experience to dealing on their own responsibility with the various and many points that arise from time to time due to the inconsistent provisions in the Building Act.

If it is the intention of the London County Council that without exception the District Surveyors are to see that the Act is carried out with all its inconsistencies, it is simply a waste of the ratepayers' money to have such experienced men. Less experienced men at about 250*l.* per annum could do the work just as well, and the fees now charged could be much reduced. As matters stand at present many things have to be done simply because it happens to be the "law," and not because it adds in any way to the better construction or safety of the work or building, and in most cases is opposed to all rules of common sense, and last, but not least, the unfortunate client has to pay for this state of affairs.

It would be much better if some arrangement was made that in cases where architects lodged drawings with the Council, and the drawings having been approved by them, it would not be necessary for the surveyor to superintend the works, but he would have only to make a final visit to satisfy the Council that the approved drawings had not been departed from, for which a small fee might be charged. In this way the proper functions of the architect would not be encroached upon, the client's pocket would be saved somewhat, and the District Surveyor would have more time at his disposal to attend to the requirements of

the "speculating" builder, where he would be more usefully employed.

I do not suppose for one moment that the Council will venture to dispute the fact that the architects practising in London are just as able to carry out their duties without supervision by the District Surveyor as with it.

The arrangement I have suggested above has been the practice in Scotland for over 300 years, and is administered by the Guild Court. It deals with all questions relating to a building, so that when the certificate to proceed has been granted nothing can prevent the works being completed provided the regulations and approved drawings are not to any extent departed from.

London on account of its size requires more than most places a clear, simple, but thorough system; instead we have the overlapping of Acts dealing with building, light and air, and sanitary matters—a state of affairs that it would be difficult to find equalled elsewhere. AN ARCHITECT.

INDEXES OR INDICES?

SIR,—Referring to the query in your appreciative notice of Vol. II. of the "Architects' Law Reports and Review," my authority for "indexes" is Dr. Morris, who at page 77 of his "Historical English Grammar" (Second Edition, 1875) says—"Foreign words when naturalised form their plural in the ordinary English way, as *indexes, memorandums, automats, focuses, beaus*, etc." He goes on to say that "Some of these have two plurals with different meanings, as *indexes* and *indices*," but he does not state the difference in meaning. Webster, however, while allowing the use of both plurals, makes the use of "indices" imperative for "the figures or letters (in arithmetic and algebra) which show the power or root of a quantity."

Referring to the plans and photographs, these are, of course, the special feature of the Reports, and, as pointed out in the introduction to the first volume, they are reproduced from the drawings actually "put in" at the trial. It will be well, however, to make this possibly a little clearer in future numbers by a note to each illustration.

Your remarks as to review matter are noted with thanks and will be well considered. The aim is in the direction you indicate.

ARTHUR CROW.

** We agree with Dr. Morris and Mr. Crow that "index" is a naturalised English word and forms its plural accordingly. The query inserted by the reviewer escaped the Editor's notice, or it would have been deleted. We find, however, that some English dictionaries of repute give it as optional, "indexes" or "indices"; but we think "indexes" should be accepted as the proper form, regarding "index" as an accepted English word.—Ed.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—III.

Numbers, Notation, and Numeration.

ARITHMETIC may be briefly defined as the science of numbers, and is sometimes considered to be divisible into two branches: *theoretical* or *abstract arithmetic*, dealing with systems of notation and rules of computation, and *practical arithmetic*, devoted to methods of employing computations in science, art, and trade. It is very difficult, however, to draw a clear distinction between the theoretical and practical aspects of the science.

Numbers.

A number was formerly considered as a quantity comprising two or more units. According to this definition, which is accepted by Euclid, the figure or numeral 1 is not a number.

The view of Ramus, which is generally adopted in arithmetic, is that 1 constitutes the lowest number. Modern mathematicians, however, treat 0 as a number, this being the starting-point of positive and of negative reckoning.

In a restricted sense the figure 1 certainly stands for the lowest whole number and signifies unity. Hence it is the lowest whole number that can be divided or multiplied by itself or any other whole number. As all numerical systems appear to have originated from the practice of counting on the fingers, 1 is obviously the first digit, and can be termed quite correctly the first numeral.

Digital calculations still come natural to children, and grown up people cannot always avoid the tendency to make the fingers of some service in the same way. But mathematicians who are able to detach their attention from physical aids to intellectual exercises are quite right in considering 0 as a number, although it

cannot be defined as a digit. In a wide sense 0 can be taken as a number.

When standing alone 0 has no value. It is then neutral, and may be written ± 0 . But if placed at the right hand of another numeral it possesses a positive value, and clearly has a right to be included in the ascending series +0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, etc.

As the starting-point of positive reckoning 0 is distinctly significant. Thus the equations $0 + 1 = 1$, $0 + 6 = 6$ mean that 1 and 6 respectively have been added to 0, and give this numeral a real position under the ordinary rules of addition. Similarly, the equations $1 - 1 = 0$, $6 - 6 = 0$ show that the numeral comes under the rules of subtraction.

In digital calculations 0 is the value denoted when no fingers are held up, and by freeing the mind from the idea that arithmetic has a material or corporeal basis it is not difficult to conceive negative or minus values, corresponding to a state of less than no fingers.

Consequently 0 is the starting-point of negative reckoning and can be properly included in the descending series -0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, etc.

So, to use a simile, 0 may be likened to the fulcrum of a double lever, one arm of which is formed by an infinite series of positive numbers, and the other arm by a infinite series of negative numbers.

To proceed a stage further, it was not difficult for men in the early days of arithmetic to catch the idea that a finger was divisible into parts. Customs prevailing in those times were quite capable of suggesting the physical possibility, and the reasoning capacity of man was no doubt quite equal to the conception of fractional parts of a digit. In the present day we have passed far beyond the stage of regarding a digit as the sum of three joints or parts, and know that the number of fractions into which it may be divided is infinite. Hence an interminable number of values exists between 0 and 1, showing still more clearly that the former and not the latter figure is the starting-point.

Notwithstanding all that has been said above, the figure 1, as the lowest whole number, must be considered for some purposes as the starting-point.

In support of this view we have the fact that 0 multiplied by any number or any number multiplied by 0 is not increased in value. Thus $0 \times 10,000,000 = 0$. Similarly, 0 divided by any number, or any number divided by 0, is not decreased in value. Thus $\frac{10,000,000}{0} = 0$, and also $\frac{0}{10,000,000} = 10,000,000$.

If the abstract mathematical idea of treating 0 as a number were universally applied to arithmetic, we might argue that as

$$50 \times 0 = 3 \times 0, \quad 50 = 3$$

which, in accordance with the classical remark of Euclid, is absurd.

Notation and Numeration.

Notation is the expression of numbers by characters, and numeration the reading of the characters so written.

The system of notation in general use is founded upon the radix 10, the decimal basis having originated in all probability from the method of reckoning by the fingers. There is no reason, however, why any other scale should not be used. As a matter of fact, the duodecimal scale would be preferable for some reasons, since the radix 12 is capable of more complete resolution than the decimal radix, and the duodecimal system is found convenient in certain calculations which have frequently to be made by architects, builders, and others.

Confining attention for the present to decimal notation, we find that the nine digits 1 to 9 together with the cipher 0 enable us to make one group of 10, that groups of 10 can be assembled until 100 is reached, that groups of 100 may be put together until their sum is 1,000, and that the process of grouping can be continued *ad infinitum* in units of 10 or multiples of 10 as may be preferred.

Each digit has two values according to circumstances; the first an absolute and the second a relative value.

The absolute value indicates the number of units expressed and is unchangeable. Thus 5 always means five, although the figure may serve to denote 5 units, 5 tens, 5 hundreds, and so on.

The relative value depends upon the order of the units indicated and upon the nature of the unit of comparison, which may refer to tens, hundreds, or any other groups or multiples of 10. The various multiples of 10 are too well known

in themselves to require enumeration here, but as the interpretation of some of them is not the same in all countries we give in Table I. the British, American, and Continental readings of a few multiples or powers of 10 from 10⁰ to 10¹⁰.

As a power is the result of multiplying a number into itself a specified number of times, the number of ciphers following the figure 1 in any power of 10 is denoted by the index placed at the right hand of the number itself. Thus 10⁰ = 1, 10¹ = 10, 10² = 100, 10³ = 1,000, and so on.

The uses of powers will be discussed later, but at the present juncture we may note the convenience of denoting large multiples of 10 by the aid of an index, instead of having to write a long succession of ciphers. For instance, it is far more economical to indicate a thousand million by the expression 10⁹ than by 1,000,000,000.

TABLE I.—SOME POWERS OF TEN AND THEIR DESIGNATIONS.

Power of Ten.	Power of Million.	British Empire.	United States and Continent.
10 ⁰	—	one	one
10 ¹	—	ten	ten
10 ²	—	hundred	hundred
10 ³	1,000,000 ⁰	thousand	thousand
10 ⁴	—	1,000 million	billion
10 ⁵	1,000,000 ⁰	million	trillion
10 ⁶	1,000,000 ⁰	trillion	quadrillion
10 ⁷	1,000,000 ⁰	1,000 trillion	quintillion
10 ⁸	1,000,000 ⁰	quadrillion	sextillion
10 ⁹	1,000,000 ⁰	1,000 quadrillion	septillion
10 ¹⁰	1,000,000 ⁰	1,000 quintillion	octillion
10 ¹¹	1,000,000 ⁰	1,000 sextillion	nonillion
10 ¹²	1,000,000 ⁰	1,000 septillion	decillion
10 ¹³	1,000,000 ⁰	1,000 octillion	—
10 ¹⁴	1,000,000 ⁰	1,000 nonillion	—
10 ¹⁵	1,000,000 ⁰	1,000 decillion	—

This table shows that a very serious discrepancy exists between the British system of numeration and that adopted on the Continent and followed in the United States. Our own system is derived from that of the Italians, who possessed two methods of numeration for a higher multiples, one proceeding by powers of a million and the other by powers of a thousand. It appears that the French confused the two methods of proceeding, and in adopting the names properly belonging to powers of a million. Consequently so much confusion has arisen that words denoting numbers higher than a million are rarely used in the present day.

In writing numbers of more than three figures it is usual in this country to employ a comma at the left of each group of three figures, thus: 10,000,000, for the purpose of assisting the eye in reading the values. On the Continent and in America it is the general, but not universal, practice to dispense with a separating stop and to arrange the figures thus: 10000000 or 10 000 000.

The comma is sometimes employed on the Continent in accordance with British custom, but unfortunately it is also used as a decimal point. This is a most inconvenient arrangement, and one exceedingly apt to cause serious misconception on the part of British and American readers of Continental technical literature.

For example, the length 1.875 metres is frequently written or printed on the Continent 1,875 metres, which, of course, is a very different thing. In France, the rational use of the full stop and comma is now being introduced, but in Germany the comma is still generally employed as a decimal point. The result is that considerable discrimination has to be exercised by those who read books and periodicals published abroad.

One great convenience of the decimal system of notation is the facility it affords for the division of numbers by moving the decimal point from its understood position at the right hand of a whole number to any other position. For example, 1,000 ÷ 100 = 10.00.

Similarly any number can be multiplied by adding ciphers at the right hand with a corresponding movement of the decimal point, as 10 × 100 = 1,000. The same operation can be performed with mixed numbers or those consisting of a whole number and a decimal fraction. Thus 105.62 × 10 = 1,056.2.

People have become so accustomed to the decimal system that it is not obvious to all that

calculations can also be performed to any scale of notation.

Any radix other than 10 might have been adopted, as, for instance, 2, 3, 4, 5, 6, 7, 8, 9, 11, or 12, corresponding with the binary, ternary, quaternary, quinary, senary, septenary, octary, nonary, undecenary, and decenary, or duodecimal systems of notation.

Of these the duodecimal system is used to a certain extent in our own country, owing to the fact that 12 inches are contained in 1 foot and 12 pence in 1 shilling. But to suit the scale for employment in a general way it would be requisite to assign new symbols for the numbers 10 and 11 so as to avoid confusion. This will be made clear by inspection of Table II., comparing the decimal and duodecimal numbers up to 12 in each case.

TABLE II.—COMPARISON OF DECIMAL AND DUODECIMAL SCALES UP TO 12.

Decimal System.	Duodecimal System.
1 = 1	1 = 1
2 = 2	2 = 2
3 = 3	3 = 3
4 = 4	4 = 4
5 = 5	5 = 5
6 = 6	6 = 6
7 = 7	7 = 7
8 = 8	8 = 8
9 = 9	9 = 9
10 = (1 × 10)	(10) = (10)
11 = (1 × 10) + 1	(11) = (11)
12 = (1 × 10) + 2	10 = (1 × 12)
—	11 = (1 × 12) + 1
—	12 = (1 × 12) + 2

When we write 1 ft. 11 in., or 1' 11". Or, as it is, there is no difficulty or confusion. But to write 111 as an expression for (1 × 12) + 11 would be misleading, for that is the proper way of denoting (11 × 12) + 1; and to write 1 (11) for (1 × 12) + 11 would be clumsy. Hence the need for new symbols in the duodecimal system.

The application of duodecimals to architectural practice will be discussed later, and for the present we shall leave the subject after giving some illustrations showing the manner in which the system is applied under the four simple rules of arithmetic.

Example (1).—Find the sum of 9 and 7 and express the result in duodecimal notation.

When the two numbers are taken together they evidently contain 1 unit of twelve and 4 primary units or (9 + 7) = (1 × 12) + 4. Hence the answer is 14.

The process is analogous to that performed when we add 9 in. and 7 in. Then, as above (9 + 7) = (1 × 12) + 4, and the answer is written 1 ft. 4 in.

Example (2).—Find the difference of 25 and 18 and express the result in duodecimal notation.

Remembering that 25 = (2 × 12) + 5, and 18 = (1 × 12) + 6, it is clear that we must borrow from the second place of 25, 1 unit of 12, add this to the 5 in the first place of the same number, and then subtract 8, leaving 9, which is the difference required.

The procedure is practically the same as that followed in finding the value of 2 ft. 5 in. — 1 ft. 8 in. = 9 in.

Example (3).—Find the product of 9 × 8 and express the result in duodecimal notation.

The product of the two figures includes 6 units of 12 and 0 as remainder, or (9 × 8) = (6 × 12) + 0. Hence the answer is written 60, whereby the proper relative value of 6 is given.

This process is practically the same as that involved in the multiplication of 9 pence by 8, stating the answer in shillings, or 9d. × 8 = 6s. 0d.

Example (4).—Find the quotient of 24 ÷ 4 and express the answer in duodecimal notation.

Here 24 = (2 × 12) + 4, and four divided into this gives 7 with no remainder. Hence the required quotient is 7.

A parallel case is afforded by dividing 4 into 2 ft. 4 in. = 7 in.

Two simple but useful rules arising out of duodecimal notation are:—

- (1) Shillings per foot = pence per inch.
- (2) Shillings per dozen = pence per unit.

OBITUARY.

MR. JOHN WALKER.—We have to record the death of Mr. John Walker, of the firm of Messrs. Walker & Slaters, builders, of Derby. Deceased, who had undergone a long illness, passed away at his residence, Uttoxeter-road, at the age of sixty-four. The late Mr. Walker became a representative of Priar-gate Ward in the Town Council in 1895, and retired last year.

GENERAL BUILDING NEWS.

FABRIK, EDINBURGH.—Among those who received warrants at the Edinburgh Dean of Guild Court on the 14th inst. was the publishing firm of Messrs. Thos. Nelson & Sons for a factory and warehouse at Parkside Works, Dalkeith-road, Edinburgh. This is to be a large addition in the rear of the present works of the firm, and the building will be the first in Edinburgh to be constructed on the Henricque's system of ferro-concrete. It will be made entirely of steel rods encased in concrete—walls, roofs, pillars, and beams. The architects are Messrs. Cousin, Ormiston, & Taylor.—*Scotsman.*

LIBRARY, WREXHAM.—On the 1st inst. the Mayor of Wrexham laid the foundation-stone of a new library for the borough. The architect is Mr. Vernon Hodge, and the builder Mr. George Rowley, of Gresford.

PHOENIX INSURANCE COMPANY'S OFFICES, LEEDS.—In 1903 the Phoenix Insurance Company purchased a valuable site in South Parade, Leeds, for their proposed new offices; the existing buildings were pulled down and a new building has been erected by the Phoenix Company which not only gives accommodation for their own use but also provides several suites of offices for letting-off purposes. The new block faces South Parade and its back elevation faces Bedford-street. In addition to the basement it rises to a height of four stories and is crowned with a Mansard roof. The suite of offices occupied by the Phoenix Company is situated on the ground floor of the front block and comprises a large general office, secretary's private office, and type-writer's office. The remainder of the building in the front and back blocks is planned to accommodate ten suites of offices with all requisite lavatory accommodation fitted up with the most recent type of sanitary fittings. The front elevation and return side is faced with stone from the Selkirk quarries, the eastern side with white glazed brickwork and the back elevation fronting to Bedford-street with red pressed brick. The roof is covered with green slates from the Tilberthwaite quarries. Glazed brickwork and tiles have been used largely in the interior of the building, the former supplied by the Leeds Fire-clay Company, and the latter by Mr. Alfred Whitehead, of Leeds. The whole of the walls of the Phoenix suite of offices are lined with tiles of a deep tone of ivory white, and all corridors and staircases are provided with celadon green glazed tile dadoes, 5 ft. in height. In addition to a wide staircase of concrete steps provided by the Granite Company, a passenger lift, Messrs. Waygood & Co. make gives access to the various floors. The contractors for the building are as follows:—Basement work, Messrs. Chas. Myers & Sons; mason, brick, carpenter, and joiner, Messrs. Henry Atkinson & Sons; plumber and glazier, Messrs. Thos. Storey & Co.; plasterer, Mr. F. Moore; iron and steel, Mr. Leonard Cooper; slater, Mr. J. Season; painter, Mr. Fred Jackson (all of Leeds). The electric light is fixed by Messrs. John Collier & Co. (Manchester). The wood and stone carving have been executed by Messrs. Smithson & Wallis (Leeds); the iron railing and grate over entrance, by Mr. Nelson Dawson (Chiswick); bronze cartouches, electric light fittings, etc., by The Bromsgrove Guild of Handicraft; stained and leaded glass, by Messrs. Pape & Co. (Leeds); and plaster enrichments of ceilings by Mr. G. P. Bankart. The heating system is by Messrs. W. Richardson & Co. (Darlington). The fittings and furniture in the Phoenix suite of rooms have been specially designed by the architect. They are carried out in polished teak and stained and polished Kauri pine, and have been executed by Messrs. T. Horman & Co. (Leeds). Messrs. Elgodd & Co. have supplied locks and ironmongery. The new building, which is in the Renaissance style, has been erected from the designs and under the superintendence of Mr. William Clark, of Leeds. Mr. W. H. Tarran has been the clerk of works. The total cost of the structure, including the fittings, but exclusive of the site, will amount to upwards of 11,000.

THE WOOLWICH TOWN HALL.—The new Town Hall for Woolwich, which was opened on the 13th inst., is situated in the centre of Woolwich, in the vicinity of a group of public buildings, including the Polytechnic, the Public Library, the Police and County Courts, and the Public Baths. The principal facade on Wellington-street is 114 ft. long, and the facade in Upper Market-street 230 ft. long. Around the central hall, which runs up through two stories, the whole of the official departments are grouped together with the Council suite and the suite of Committee rooms. On the ground floor are the Borough Engineer, the Medical Officer of Health, the Borough Treasurer, and the Electrical Engineer, the accommodation of each department being supplemented by an equal number of rooms in the basement. Ascending the principal staircase at the end of the hall a gallery is reached which leads to the suites of principal rooms and the Town Clerk's department. The Council suite includes the Council chamber, the members' ante-room, and lavatory, all intercommunicating,

the chamber being in the form of a Greek cross surmounted by a dome. It provides seating accommodation for fifty-six members and a public gallery for sixty persons. The Central Committee room is a domed apartment divided from the two adjoining committee rooms by movable screens. By the raising of the dividing screens by means of a simple mechanism this suite of committee rooms is transformed into a reception-room 60 ft. long by 30 ft. wide, suitable for mayoral and other functions. Adjoining the committee suite is the Mayor's reception-room and communicating with both is a service-room with an electric lift to the kitchen in the basement. In the tower at the corner of the building is placed the public hall, so designed that it may be shut off for public purposes. The warming and ventilation is on the Plenum system. In the centre of the entrance-hall is a statue of Queen Victoria by Mr. Pomeroy. The interior of the council-room is ornamented with gilded plaster work, and the walls are finished with plaster. The room is in wainscot oak. The windows of the committee suite overlooking Wellington-street are filled with stained glass illustrating historical subjects. In the design of the Public Hall, which accommodates an audience of 750 and a chorus on the platform of 100, an endow of 100 ft. long by 10 ft. wide is placed in the customary long hall of the distance of the back rows of seats from the performers on the stage, and by the adoption of the Greek cross arrangement it is claimed that the whole of the audience is well concentrated round the stage so that all persons have an equal opportunity of hearing and seeing the performance. The large windows of the hall are filled with stained-glass windows commemorating three distinguished natives of Woolwich, viz., Lovelace, Maudslay, and Gordon. Mr. Brunwell Thomas is the architect. The stained glass is the work of Mr. Geoffrey Webb in consultation with the architect and Mr. W. Vincent, the President of the Woolwich Architectural Society. The wood carving and the external stone carving is the work of Messrs. Martyn (Cheltenham); the modelling of the plaster enrichments of the principal rooms is the work of the Bromsgrove Guild (Worcester), and the bronze electrolytes are by Messrs. Singer (Frome, Somerset). The further list of firms employed in the building is as follows:—General building contract, Messrs. J. E. Johnson & Sons (Leicester); heating and ventilation, Messrs. Jeffreys (Westminster); electrical work, the Borough Electricity Department; decorative plaster, Messrs. Tanner (Liverpool); wrought ironwork, Messrs. Starkie Gardner (Lambeth) and the Bromsgrove Guild; marble work, Messrs. Farmer & Brindley (Westminster); locks, etc., Messrs. Cibbons (Wolverhampton); mosaic work, Messrs. Simpson; Casements and lead glazing, Messrs. Hope (Birmingham); strong room doors, Messrs. Tann; safes, Messrs. Ratner; grates, the Well Fire Company; lighting conductors, Messrs. J. W. Gray & Son; clock in tower, Messrs. Smith (Dorset); fire alarm clocks, the Magnet Company; fire alarms, the Pearson Fire Alarm Co.; fire appliances, Messrs. Merryweather (Greenwich); council chamber fittings, Messrs. H. H. Martyn & Co. (Cheltenham); committee suite fittings, Messrs. Hampton & Sons; furnishing, Messrs. Hampton & Sons; Waring & Gillow, Shoobredes, and Martyns (Cheltenham).

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Messrs. Andrew Brown & Co., 110, Cannon-street, E.C., have been appointed the London and district agents for Messrs. Vaughan & Son (West Gorton, Manchester), makers of electrically-driven cranes.

ARCHITECTURAL ASSOCIATION STUDENTS' CONCERT.—The Second Annual Stocking Concert of the Architectural Association Students takes place on February 2, at the Gaity Restaurant. The tickets are 2s. 6d. each, and any surplus is to be given to the Architects' Benevolent Society and towards the foundation of an Architectural Association Musical and Dramatic Society.

GLASGOW ARCHITECTURAL TRAVELLING SCHOLARSHIPS.—A meeting of the Council of the Glasgow Association of Architects, who, along with Mr. John Shields, are the trustees for the Alexander Thomson Travelling Studentship, was held on the 11th inst., when the first prize was awarded to Mr. James Whitelaw, Loanacroft, Uddingston, and the second to Mr. F. M. Craik, 136, Stanmore-road, Glasgow. The prizes are 60l. and 20l. respectively.

BEDFORD BUILDERS' ASSOCIATION.—The Bedford Builders' Association held their annual dinner at the Central Restaurant, Bedford, recently, when Mr. Richard Black occupied the

chair. The loyal toast having been honored, "The Mayor and Corporation" was proposed by Mr. Chas. Negus. The Mayor responded, and said it was thirty-eight years ago since he started for himself in the building trade, and he remembered the first builders' dinner twenty-three years ago. The annual dinner fell through for some years, but had been revived. The Mayor then commented upon the progress, improvements, and low rates of the town. Mr. Valentine in responding, referred to the work of the Buildings Committee, who, he said, were always pleased to see plenty of plans. The trade had been under a cloud in Bedford and most other places, but those before him did not look very doleful, and they would pull through. Let the builders get out good plans, novel ideas, and something attractive to induce people to come, and the Corporation would maintain the good character of the town for good sanitation. Mr. Longhurst said the Corporation, he was sure, would do their best to further the interests of the town, and the building trade in particular. The Rev. W. P. Beckett, in proposing "Success and Prosperity to the Bedford Builders' Association," said the builders had had to contend with shortness of money, keen competition, and the water scare. Another bugbear was the Workmen's Compensation Act. They could hardly get a job without the said man would tumble off a scaffold, with the result that the builder, who would otherwise be doing well, would have to put his hands into his pockets. As the Builders' Association had considerable power, he hoped they would keep the rates low without losing money. He thought there should be more equitable agreement between landlord and tenant. The Bedford tenants were not at all his ideal. They stayed for only a short time, and at the end of three or four years the landlord had to spend a year's rent in doing the house up again. The builders might very well arrange with the house-agents to draw up an agreement in accordance with the practice in London. He had seen lately houses sold at a price which should yield a 10 per cent. rental, but it would be whittled down in the long-run to about 3 per cent. by repairs, etc., whereas in other parts of the country a 6 per cent. rental was considered fair. The Chairman replied, and said that in 1904 the Chamber of Plans passed by the Council was 105, including 52 new houses, but in 1905 there were numerous plans, including 119 houses. He agreed with Mr. Beckett that a fresh tenancy agreement was needed, but it could only be got by united effort. The least they could expect to spend on a three years' letting was a year's rent. Mr. J. B. Richards, in proposing "The Town and Trade of Bedford," referred to improvements carried out in the town during his twenty-three years' residence. He thought the introduction of works employing skilled labour should be encouraged, but they did not want to turn Bedford into a little bit of black country. Mr. J. P. White having retired to a recess, the Chairman, after a few remarks, spoke hopefully of the prospects. He said there were 7,341 inhabited houses, against 5,946 ten years ago. There were not so many empty houses by a long way as there had been.

CHANCEL SCREEN, PARISH CHURCH, MELTON MOWBRAY.—A chancel screen has just been placed in this Church at a cost of about 60l. The screen was designed by Mr. J. Oldrid Scott, and the work has been carried out by Messrs. Thompson, of Peterborough.

RAPID BRIDGE ERECTION.—A remarkably expeditious engineering operation was effected at Beckenham on Saturday last by the erection of a railway girder bridge in less than a single day. The bridge is on the line between Norwood and Beckenham Junctions, joining the South-East and Chatham and the London, Brighton, and South Coast Railways. For some time past the condition of the old bridge has been such that it became evident the structure would have to be replaced, and while the new steel girders were being prepared, it was shored up so as to avoid the risk of any mishap. On Saturday the members of the new bridge were delivered and assembled on the site, and in the evening of the same day, after traffic had ceased, the superstructure of the bridge was taken away and the piers were prepared for the reception of the new girders. These were placed in position by means of two large cranes, and by Sunday afternoon the bridge was ready for the restoration of the permanent way, which was completed in time for the resumption of traffic on Monday.

ARCHITECTS' BENEVOLENT SOCIETY.—The President of the Architects' Benevolent Society (Mr. John Belcher, A.R.A.) has received 60l. from Mr. Howard Chetfield, Clarke towards the 500l. which it is hoped may be raised in accordance with the terms of Mr. Walter Emden's offer of 50l. if nine other gentlemen contribute a like sum. So far, including Mr. Emden, there have been four responses to this appeal.

AN ARCHITECT M.P.—Mr. John Edward Sears, the new member of Parliament for Cheltenham, is the son of the late Rev. James Sears, for nearly twenty-five years minister of the Cottage Green Church, Camberwell. He is a

Fellow of the Royal Institute of British Architects, and he became a member of the London County Council in 1901, and at the present time is Chairman of the Housing Committee.

Legal.

DISPUTE AS TO A BUILDING ESTATE.

An application was made to Mr. Justice Swinfen Eady on the 16th inst. in connexion with an action by the executors of the late Dr. Gurney, of Gosforth, against Messrs. Packman & Sons, Ltd., of Blackpool.

Counsel stated that the plaintiffs entered into a contract with the defendants for the sale to them of the residential estate of Rosewith, at Gosforth, in September last. The purchase was to have been effected by November 11, but despite constant applications the defendants had not yet completed the contract. Notwithstanding the fact that the defendants were not entitled to have possession, they had trespassed on the premises by putting a padlock on the entrance-gate, by removing turf from the lawn, and by putting up a notice that the trees on the estate were for sale, and inviting tenders. If the purchase was not completed very serious damage would be done to the property as a residential estate. The defendants, who had paid 1,300l. out of 13,000l., which was the purchase price, were buying the property simply as a building estate, and had put up a notice intimating that they were prepared to sell plots of the land for that purpose. He asked for an injunction to restrain the defendants from committing the acts complained of until next motion day.

His lordship granted the application, with liberty to serve the defendants with notice of motion for the 19th inst.

CONVERTING A BUILDING.

At the Stratford Police Court on Saturday last week the justices gave their decision in a case in which Ernest F. Selby, a builder, of Hartley-road, Leytonstone, was summoned by the Wanstead Urban District Council during August, 1905, he caused to be converted into more than one dwelling-house a building known as "Canfield," Hermain-hill, originally constructed as one dwelling-house, and refused to send to the Council plans and sections of every floor of such building, contrary to sect. 90 of the Council's by-laws.

At the hearing of the case it was contended by Mr. Mallinson for Mr. Selby that the by-law was bad, because it had not yet been sanctioned by the Local Government Board, and there was uncertainty as to the meaning of it. The alterations carried out did not, it was urged, involve any alteration to the exterior of the house, and the only thing done was to put up a partition inside the house.

In giving the decision of the Bench, the Chairman said they found that By-law 90 was not bad for uncertainty, and, as a fact, Mr. Selby converted the building in question, which was originally constructed as one dwelling-house, into two dwelling-houses. The by-law also applied to a new building as defined by sect. 159 of the Public Health Act of 1875, and the Bench were of the opinion that that section had been infringed. The attention of the Court ought, however, to have been drawn to the case of Hall and others v. Eastbourne Mayor, etc.

A fine of 40s. and 4s. costs was imposed, and the Bench agreed to state a case.—*Tribune*.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

19,903 of 1904.—A. R. HUBBARD and R. FLAY: *Cooking Ranges*. This relates to a cooking range in which a fire contained in a fire place is used for heating a hot plate placed above it upon which different cooking operations can be performed, and also for heating an annular horizontal boiler arranged above the fire place. According to the invention, two rectangular ovens, placed one above the other, are arranged at one side of and adjoining the cooking range, the bottom of the upper one being level with the hot plate above the fire and the bottom of the one below reaching to the bottom of the range near the ground.

27,362 of 1904.—C. E. KONIG: *Doors, Windows, and Shutters*. This consists in connecting the stiles and rails of a window or door by means of tenons, which at the connection of the lower rail with the stiles are made to slope down to the outside, and which are covered by the whole thickness of the wood on the inner side by a shoulder which overreaches the lower rail and slopes upwardly towards the outside, and in front and on the outer side by the sloping of the cheeks, for the purpose of preventing entry of water in the mortice.

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

28,032 of 1904.—G. S. MAYHEW: *Machines for Forming Compound Deals.*

This relates to a machine for assembling compound deals, and consists of a table provided with a series of guides on which is or are mounted a lower clamp or clamps and a series of upper clamps, said lower clamps and series of upper clamps being respectively adapted to be moved together to compress pieces of wood to build up a compound deal and to be moved apart to allow a fresh piece or pieces of wood to be placed in position.

3,120 of 1905.—M. J. ADAMS: *Fire Places.*

This relates to a fire place, and consists in the use of a fire brick so constructed that the lower portion, which is subject to damage by fire, may be renewed without disturbing the upper portion, which is carried on brick or other support.

3,978 of 1905.—R. BLESSIN: *Electrical Alarm Contacts for Door Locks.*

This relates to an electrical alarm contact for door locks, consisting of a handle and cone or plug of insulating material provided with contacts on the outer end and a spring on the side of the cone.

4,824 of 1905.—H. LAWRENCE: *Fender and Ash Pan Fronts.*

This relates to a sheet metal fender or ash-pan front, having a quilled or twist-patterned ornamental metal integral with or fashioned from the metal of the said article.

5,416 of 1905.—C. H. WILSON: *Windlasses.*

This relates to a windlass consisting of a pawl box preferably provided with only one pawl, said pawl being pivoted in the box and having a tail piece which projects outside the box, to which tail piece the rod from the pivoted cross-head of the windlass is connected.

7,457 of 1905.—W. OLDAKER and J. H. OLDAKER: *Window Casements.*

This relates to the method of opening and closing window casements by means of hinges sliding in the head, and sill channel and lever gear so fixed as to be wholly outside the head and sill channel of the casement, thereby preventing any cutting away of the head, sill, or casement, which would cause the casement to be more effectually rain and weather proof, and which opens outwardly with an aperture at the hinged side for cleaning.

9,026 of 1905.—E. L. P. DAVISON: *Grates for Stoves and Fire Places.*

This relates to domestic stoves and fire places having the ash grid or grate resting upon a frame and being capable of having a sliding or shuffling movement imparted to it within the fire grate.

9,067 of 1905.—F. J. GIBBONS: *Hinges for Doors or Windows.*

This relates to a butt-hinge for a door or window, comprising a tubular lining within the socket of each leaf, and a hinge pin adapted to fit the interior of both tubular linings, each tubular lining being enlarged at the end which butts against the other, and one tubular lining being adapted to be longitudinally displaced, an adjustable distance, relatively to the socket within which it fits.

9,409 of 1905.—A. REID and A. HENDERSON: *Disinfectant or Fluid Disinfectant or Detergent Supplying Vessel for Flushing Cisterns and the like.*

This relates to a disinfectant, comprising a container, a discharging tube, an air pipe, and an annulus or hollow ring having jet orifices therein from which the discharging tube and the air tube extend.

9,591 of 1905.—F. W. CROSS and R. BOUGHTON: *Combined Window Fasteners and Draught Excluders.*

This relates to a device forming a combined window fastener and draught excluder, which consists of a lateral bar with screw stem and operating thumb screw housed in the top bar of the lower window sash and adapted to be moved outward into a corresponding groove in the adjacent bottom bar of the upper sash in such a manner as to lock the sashes and prevent draught between these bars.

14,288 of 1905.—F. D. JACOBS: *Building Materials for Roofing and like purposes.*

This relates to a roofing material comprising a base or body portion consisting of a sheet of annealed steel and a protective layer of asbestos sheeting on each side of said piece, said asbestos being united to said base by a uniting material composed of rubber solution and asphalt.

15,132 of 1905.—S. BROADBENT and A. STEPHENS and F. D. JACOBS: *Chimney Pot or Top.*

This relates to a chimney pot or top of the kind in which an outer cover is supported over an inner pot or top in such a manner that the air or wind can enter through the bottom and pass up through tapered air passages between the inner pot and the cover, and consists in forming the square lower portion of the inner pot with claws or lugs at its corners to support an outer cover,

and with inclined air admission conduits or apertures between the said claws or lugs.

22,310 of 1905.—S. E. PAGE: *A Socket for Securing Bolts in Walls.*

This relates to a socket for securing bolts in walls, and consists of a bolt anchor section formed with a plurality of interiorly transversely corrugated portions and a plurality of exteriorly corrugated portions, said portions being alternately disposed, the exteriorly corrugated portions being of the greater diameter.

2,629 of 1905.—J. SOUTHERN: *Receptacle or Vessel for Use in Supplying Disinfectant in a simple and Economical Manner to the Water Discharges or Flushes from Cisterns of Water-Closets and the like.*

This relates to a receptacle or vessel for supplying disinfectant to water discharges from cisterns of water-closets and the like, consisting of a bottle of glass or other non-porous material formed with an aperture or apertures on or near the shoulder of the bottle and with or without a perforated cap or stopper.

13,164 of 1905.—J. CRAWFORD: *Interlocking and interchangeable Hollow Blocks for Breakwaters and the like, and Means for Connecting them together.*

This relates to an interlocking and interchangeable hollow block having upon the exterior faces thereof projections in the form of dovetails, half dovetails, or squares, provided with ducts or grooves and ports or slots, by which the blocks may be connected together.

17,602 of 1905.—J. NISBET: *Construction of Composite Beams and Columns for Use in Connection with Fire-proof Building or other Fire-proof Constructional Work.*

This relates to a composite beam or column made up of two or more lengths of corrugated iron or steel, arranged to present a series of tubes or tubular formations communicating with each other, in conjunction with concrete filling.

19,317 of 1905.—J. NISBET: *Formation of Supports for Concrete Floors, Ceilings, and Walls.*

This relates to a fire-proof support for floors, ceilings, or walls, and consists in the provision, in conjunction with an iron or steel support of corrugated section, of the rods situated in the depression of said beam and adapted to be surrounded by concrete or cement run in in semi-liquid form.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing property sales including locations like Leytonstone, Park Grove, and Bow, with prices and details.

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; s.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; a.v. for avenue; g.m. for garden; yd. for yard; gr. for office; b. for beerhouse; p.h. for public-house; o. or offices; s. for shops; c. for court.

MEETINGS.

- FRIDAY, JANUARY 10. Architectural Association.—Mr. F. Lynn Jenkins on "The Consideration of Sculpture by Architects." 7.30 p.m. Royal Institution.—Professor J. J. Thomson on "Some Applications of the Theory of Electric Discharge to Spectroscopy." 8 p.m. Institution of Mechanical Engineers.—(1) Discussion to be resumed and concluded on paper on "The Behaviour of Materials of Construction Under Pure Shear," by Mr. E. G. Izod; (2) Mr. Robert A. Bruce on "Worm Contact." 8 p.m. SATURDAY, JANUARY 20. Builders' Foremen's Association.—Twelfth annual dinner, King's Hall, Holborn Restaurant. 6.30 p.m. MONDAY, JANUARY 22. Royal Institute of British Architects.—(1) To read the deed of award of prizes and student medals for 1905-6. (2) Papers on "Metalwork," by Messrs. J. M. Swan, R.A., Montague Fordham, and Walter Oilbert. 8 p.m.

Liverpool Architectural Society.—Mr. T. T. Rees on "The Laying-out of Streets, Buildings, Open Spaces, Parks, Planting of Trees, Advertising Hoarding, and Smoke Nuisances." 6 p.m.

TUESDAY, JANUARY 23. Royal Institute of British Architects.—Annual Exhibition of Designs and Drawings submitted for the Institute prizes and studentships, in the gallery of the Alpine Club, Conduit-street, 10 a.m. to 8 p.m. (Close on February 3.) T. Square Club.—The first meeting and invitation supper to be held at the "Monico" Restaurant, Rogen Street, Piccadilly-circus, W. 8.30 p.m. Institution of Civil Engineers.—Discussion of papers read at previous meeting. 8 p.m.

WEDNESDAY, JANUARY 24. Society of Arts.—Dr. J. Nisbet on "The Planting of Waste Lands for Profit." 8 p.m. Edinburgh Architectural Association.—Mr. J. M'Kessack on "Architectural Photography," illustrated by lantern slides. 8 p.m.

THURSDAY, JANUARY 25. Society of Arts (Howard Lecture).—Professor Silvanus Thompson on "High Speed Electric Machinery, with special reference to Steam Turbine Machines," II. 8 p.m. London Institution.—Mr. Maurice N. Druceur, M.A., on "Legal History of Trades Unionism." 6 p.m. Institution of Electrical Engineers.—Mr. F. W. Carter, M.A., on "Technical Considerations in Electric Railway Engineering." 8 p.m.

FRIDAY, JANUARY 26. Junior Institution of Engineers (Westminster Palace Hotel).—Honorary members' lecture, during which Professor "Notes on Boiler Trials," by Professor J. D. Cornack, F.R.C., 8 p.m. Institution of Civil Engineers.—(Students' meeting.) 8 p.m.

SATURDAY, JANUARY 27. Junior Institution of Engineers.—Visit the engineering laboratories of University College, during which Professor Cornack will demonstrate the methods of conducting a boiler trial. 3 p.m.

PRICES CURRENT OF MATERIALS.

Table listing prices for materials like Hard Stocks, Grizzlies, Facing Stocks, Shippers, etc.

Table listing prices for various types of bricks and blocks, including Glazed Bricks, Best White and Ivory Glazed, etc.

Table listing prices for various types of sand, including Thames and Pit Sand, Portland Cement, etc.

Table listing prices for various types of stone, including Bath Stone, Portland Stone, etc.

STONE (continued).

Table listing stone products like 'Scrapped random blocks', 'Hoop Stone', and 'Hopton Wood (Hard Bed) in blocks' with prices per cubic foot.

WOOD (continued).

Table listing wood products like 'Joistens' Poods', 'White Sea and Petersburg', 'Pitch-pine deals', and 'Compound Girders' with prices per standard unit.

ENGLISH SHEET GLASS IN CRATES (continued).

Table listing glass products like 'Fluted Sheet, 15 oz.', 'Hardley's Botted Plates', and 'Figural and Oxford Rolled' with prices per square foot.

OILS, &c.

Table listing oil products like 'Raw Linseed Oil in pipes', 'Turpentine in barrels', and 'Genuine Ground English White Lead' with prices per gallon or ton.

VARNISHES, &c.

Table listing varnish products like 'Fine Pale Oak Varnish', 'Superfine Pale Elastic Oak', and 'Eggsell Flattening Varnish' with prices per gallon.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications...

JOISTS, GIRDERS, &c.

Table listing joist and girder products like 'Rolled Steel Joists', 'Compound Girders', and 'Iron' with prices per ton.

METALS.

Table listing metal products like 'Common Bars', 'Staffordshire Crown Bars', and 'Sheet Iron' with prices per ton.

Table listing slate products like '20x12 best blue Bangor', '20x12 first quality', and '20x10 best blue Port' with prices per 1000 or 1200 at r.d.

SLATES.

Table listing tile products like 'Best plain red roofing tiles', 'Hip and Valley tiles', and 'Best Ornamental do.' with prices per 1000 or per doz.

WOOD.

Table listing wood products like 'Deals: best 3 in. by 11 in. and 4 in.', 'Battens: best 2 1/2 in. by 7 in.', and 'Foreign Sawed Boards' with prices per standard unit.

TENDERS.

Communications for insertion under this heading should be addressed to 'The Editor', and must reach us not later than 10 a.m. on Thursday. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner...]

LEAD, &c.

Table listing lead and other metal products like 'LEAD—Sheet, English, 3lb. and up.', 'Pipe in coils', and 'Zinc—Sheet' with prices per cwt.

ENGLISH SHEET GLASS IN CRATES.

Table listing glass products like '15 oz. thirds', '21 oz. thirds', and '26 oz. thirds' with prices per square foot.

Table listing tender notices for reconstruction work, including names like 'BOLSOVER', 'BRAINTREE', and 'Mason & Son' with details of the work and contact information.

List of Contracts, etc.

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*DESIGNS FOR FREE PUBLIC LIBRARY	Swadlinote U.D.C.	25l, 15s, 10s.	Mar. 24

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Reconstruction of Cotton Shed, Werneth, Oldham.	Lancashire and Yorkshire Ry.	Engineer's Office, Hunts Bank, Manchester	Jan. 23
780 yds. of Gas Main	Bolsover U.D.C.	W. G. H. Browne, Surveyor, Bolsover	do.
Nine Gas Lamps with Standards, etc.	do.	do.	do.
English Portland Cement	do.	do.	do.
Sewering, Paving, etc., New Street	Derwent Valley Water Board	E. Sandeman, Engineer, Bamford, near Sheffield	do.
*BOUNDARY WALL, NEASEDEN	Manchester Improvement Comm.	City Surveyor's Office, Belfast	do.
Detached Villa, Anley, Elland	Willersden District Council	R. Berry, Architect, Arcade Chambers, Elland	do.
Villa, Storth Fields, Lightcliffe	do.	City Surveyor's Office, Dyncrood, Kilburn, N.W.	do.
Strengthening Varley-street Bridge over Rochdale Canal	Mr. A. Sharrott	H. Thompson, Architect, Post Office-chambers, Halifax	Jan. 24
Additions, etc., to Goods Warehouse, Middlesbrough	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	do.
Road, East Hamstead-road, Wokingham	North-Eastern Railway Co.	W. Bell, Architect to Company, York	do.
170,000 Jarrah Wood Blocks	Wokingham Investment Co.	Sec. S. Shuttle-croft to Company, York	do.
Electric Lighting of Two Sheds, Canon's Marsh	Birkenhead Corporation	C. Broward, Borough Engineer, Town Hall, Birkenhead	do.
Schools, Gladstone-road, Barry	Bristol Dock Committee	O. A. Birkenhead, Architect, 21, Park-avenue, Barry	do.
Extension of Edenhall Girls' College, Bilefold	Barry Education Authority	J. Crocker, 98, Queen-street, Exeter	Jan. 25
Villa at Castlede, Durham	Mr. J. A. Ripley	F. J. Eltringham, Architect, Derwent-street, Blackhill	do.
Wiring, Fittings, etc., for Baths, Grove-lane, Handsworth	The U.D.C.	J. A. Nixon, Electrical Engineer, Soho-road, Handsworth	do.
Wiring, Fittings, etc., Birchfield Branch Library	Hull Corporation	A. E. White, City Engineer, Town Hall, Hull	do.
Paving, Flagging, etc., of Gibson-street, Hull	Tb Managers	C. Benyon, Architect, Frome	do.
Walls Asphalting, etc., Hemington Schools, Radstock	Windsor Guardians	B. J. Parry, 30, Park-street, Llynwypia	Jan. 27
Eight Dwellings, Aboulay, Radstock	Harrogate Corporation	Edgington & Sumnerbell, 7, Park-street, Harrogate	do.
Porter's Lodge at Warehouse, Old Windsor	Glasgow Corporation	W. W. Dixon, Engineer, 14, Albert-street, Harrogate	do.
Wrought-iron Steel Nails, Screws, etc., Musham Scheme	Hertfordshire County Council	Office of Public Works, Hatfield	do.
Alterations of Public Convenience, Bridgton Cross	Llandaf, etc., R.D.C.	N. A. Smith, County Engineer, 20, Park-place, Cardiff	do.
Granite and Slag	Balaix Highways Committee	A. F. Long, Architect, 53, Market-place, Warrminster	do.
Limestone and Tean	do.	J. Lord, Borough Engineer, Town Hall, Halifax	do.
Two Villas, Upper Marsh-road, Warmminster	Sale U.D.C.	do.	Jan. 29
Ex. Sewage Disp. Wks., Salford Hebble (Contract 1, Brick Conduit)	Warrington Paving Committ	W. Holt, Engineer, Council Offices, Sale	do.
Extension of Sewage Disposal Works (Contract 2, Pipes)	Stafford Corporation	W. Blackshaw, Borough Engineer, Borough Hall, Stafford	do.
Flags, Kerbs, Macadam, Salfors, etc.	Southwick U.D.C.	O. Warr, Surveyor, Council Offices, Southwick	do.
Stores	Walsend Corporation	H. T. Ridge, Council Offices, Market-place, Romford	do.
Constructing St. Leonard's-avenue	West Wylam, etc., Co-op. Soc.	Walsend Corporation	do.
Municipal Buildings, Lower Shorham-road	Bootle Corporation	Society's Offices, Prudhoe	do.
Making-up Cromer-road, Romford	Great Western Railway Co.	C. H. Marriott, Son, & Shaw, Church-street-chbrs, Dewsbury	do.
Mortuary and Urinal, Portugal-place	Epsom U.D.C.	B. J. Wolfenden, Borough Engineer, Town Hall, Bootle	do.
Branches, Greenfield	Glasgowkirk Trust	E. R. Capon, Eng. & Sur., Bromley Hurst, Church-st., Epsom	Jan. 30
Extension of Tennis Pavilion, Dewsbury, etc.	Edinburgh, etc., Wa. Trustees	Fairweather, Engineer, Oas Office, Kilmarnock	do.
Granite Paving Materials	Stockport Education Com.	Secretary to the Educn. Com., Education Offices, Stockport	do.
Reconstruction of Part of Concrete Tubes	Edin. Trinity Hospital Comm.	Warkington Engineer, Police-chambers Edinburgh	do.
500 yds. of Egg-shaped Gas and Electricity Works	Great Crosby U.D.C.	Burn Hall Surveyor, Council Offices, Great Crosby	Jan. 31
Railway into Riverbank Can and Electricity Works	do.	do.	do.
*COMPLETING CHESTERGATE COUNCIL SCHOOLS	Govan Parish Council	Thomson & Sandhams, Architects, 4, Jane-st., Blythswood-sq	do.
Pipe Sewer, Dean Park and Binktonny	Isle of Ely County Council	Mr. Gilbert, Engineer, The Square, Grantown, N.B.	do.
375,000 Plastic Engineering Invert Bricks	do.	R. S. W. Perkins, County Surveyor, Southern Division, Ely	Feb. 1
80,000 Square Engineering Bricks	Carmarthenshire Educ. Comm.	Mr. Anderson, 20, York-place, Edinburgh	do.
*COMPLETING CHESTERGATE COUNCIL SCHOOLS	do.	W. D. Jenkins, County Educ. Archt., Salford Hall, Carmarthen	Feb. 2
Pipe Sewer, Dean Park and Binktonny	do.	do.	do.
375,000 Plastic Engineering Invert Bricks	do.	do.	do.
80,000 Square Engineering Bricks	do.	do.	do.
410,000 Semi-Plaster Engineering Invert Bricks	do.	do.	do.
Additions to Hospital, Merryblatts	Reigate Union	Clerk to the Guardians, Reigate, Surrey	do.
Water Supply Works, Nethy Bridge	Wallasey Works Committee	W. H. Travers, District Engineer, Public Offices, Egremont	Feb. 3
Granite and Iron Slag	West Riding Education Com.	J. Vickers-Edwards, County Archt., County Hall, Wakefield	do.
Streets, McDonald-road, Edinburgh	School, Thrybergh	do.	do.
Penwanan Council School, Repairs	Alterations, Moss and Fenwick School	do.	do.
Capel Evan Council School, Repairs	School, Wath-upon-Dearne	do.	do.
Fennygaer Council School, Repairs	Alterations, Darton Borough School	do.	do.
Saron Council School, Repairs	Enlargement of Rawmarsh Ryecroft School	do.	do.
Cordmore Council School, Ventilation and Repairs	Alterations, Redness Provost School	do.	do.
Glanmama Council School, Heating Apparatus	School Alterations, Austerfield	do.	do.
*HEATING AND HOT-WATER WORKS, REIGATE WAREHOUSE	Conveniences, Darton, Mapplewell School	do.	do.
Stores	Asphalting, etc., Templenewham, Colton School	do.	do.
Two Schools at Brinsworth	175,000 Jarrah Wood Blocks	do.	do.
School at Carforth	Materials	do.	do.
School, Thrybergh	Superstructure, New North Block, Glasgow Infirmary	do.	do.
Alterations, Moss and Fenwick School	Private Street Works	do.	do.
School, Wath-upon-Dearne	Sewer Works	do.	do.
Alterations, Darton Borough School	Chalk, Granite, Quartzite, and Flints	do.	do.
Enlargement of Rawmarsh Ryecroft School	*SUPPLY OF ROAD MATERIALS FOR ROYAL PARKS	do.	do.
Alterations, Redness Provost School	Private Street Works, Broad-street, etc.	do.	do.
School Alterations, Austerfield	*ELECTRIC SUB-STATION, SALTLEY	do.	do.
Conveniences, Darton, Mapplewell School	*ELECTRIC SUB-STATION, BORDLESLEY	do.	do.
Asphalting, etc., Templenewham, Colton School	Surface-water Sewers, Hay Mills	do.	do.
175,000 Jarrah Wood Blocks	Foul-water Sewers, Hay Mills	do.	do.
Materials	*ELECTRIC SUB-STATION, BALSALL HEATH	do.	do.
Superstructure, New North Block, Glasgow Infirmary	Alterations, etc., to Haughley V. Schools, Stowmarket	do.	do.
Private Street Works	Sanitary Conveniences, Jubilee Park	do.	do.
Sewer Works	Sewage-lifting Station, Pigeon House-road	do.	do.
Chalk, Granite, Quartzite, and Flints	Impounding Reservoir	do.	do.
*SUPPLY OF ROAD MATERIALS FOR ROYAL PARKS	Brettenham Voluntary School	do.	do.
Private Street Works, Broad-street, etc.	ENLARGEMENT OF ORO. LOFT, ETC., AT GOLDBORNE PARISH CHURCH	do.	do.
*ELECTRIC SUB-STATION, SALTLEY	Warehouse, Harris-street, Bradford	do.	do.
*ELECTRIC SUB-STATION, BORDLESLEY	Alterations, etc., to Northwale Church School	do.	do.
Surface-water Sewers, Hay Mills	Heating Four New Billiard Halls	do.	do.
Foul-water Sewers, Hay Mills	Roadstone, Chippings, Slag	do.	do.
*ELECTRIC SUB-STATION, BALSALL HEATH	House, Barnfield Estate, Exeter	do.	do.
Alterations, etc., to Haughley V. Schools, Stowmarket	Sinking a Shaft at Chilton Colliery, etc.	do.	do.
Sanitary Conveniences, Jubilee Park	*ALTERATIONS TO FACTORY PREMISES IN BERMONDSEY	do.	do.
Sewage-lifting Station, Pigeon House-road	*COMPLETION OF SCHOOL, LOUGHTON	do.	do.
Impounding Reservoir	Essex Educational Committee	do.	do.
Brettenham Voluntary School	do.	do.	do.
ENLARGEMENT OF ORO. LOFT, ETC., AT GOLDBORNE PARISH CHURCH	do.	do.	do.
Warehouse, Harris-street, Bradford	do.	do.	do.
Alterations, etc., to Northwale Church School	do.	do.	do.
Heating Four New Billiard Halls	do.	do.	do.
Roadstone, Chippings, Slag	do.	do.	do.
House, Barnfield Estate, Exeter	do.	do.	do.
Sinking a Shaft at Chilton Colliery, etc.	do.	do.	do.
*ALTERATIONS TO FACTORY PREMISES IN BERMONDSEY	do.	do.	do.
*COMPLETION OF SCHOOL, LOUGHTON	do.	do.	do.

AUCTION SALES.

Table with columns: Nature and Place of Sale, By whom Offered, Date of Sale. Includes entries for Churchhill & Sim, Protheroe & Morris, Curtis & Henson, Jones, Lang, & Co., Fuller, Horsey, Sons, & Cassell, May & Rowden.

* Those with an asterisk are advertised in this number: Competitions, IV.; Contracts, IV. vi. viii. x.; Public Appointments, XVII.; Auction Sales, XIX. XXVIII.

TENDERS.—Continued from page 75.

Table of tenders for BRIDLINGTON, CAERPHILLY, CONSETT, COOKHAM, and COWPEN. Lists contractors and their respective bids.

Table of tenders for EAST PRESTON (Sussex). Lists contractors like G. Crane, J. Longley & Rowland, A. Burrell, etc., and their bids.

Table of tenders for HENDON. Lists contractors like G. Adams, G. C. Rayner, R. Ballard, etc., and their bids.

Table with columns: Gutter, North Hedge-lane, End-road, Total. Lists contractors like T. Adams, G. C. Rayner, R. Ballard, etc., and their bids.

Table of tenders for HOVE. Lists contractors like J. Parsons & Sons, and their bid.

Table of tenders for LEYTON. Lists contractors like G. Hay & Co., R. C. Breber & Co., etc., and their bids.

Table of tenders for LEYTON (continued). Lists contractors like G. Law, A. Kraus & Son, G. Wimpey & Co., etc., and their bids.

Table of tenders for LEYTON. Lists contractors like T. Adams, T. Free & Sons, etc., and their bids.

Table of tenders for LINCOLN. Lists contractors like Lincoln Co-op. Society, Haikes & Co., etc., and their bids.

Table of tenders for LANDILO. Lists contractors like D. Howells & Son, Thomas Bros., etc., and their bids.

Table of tenders for LEYTON. Lists contractors like H. Hest & Co., Kavanagh & Co., etc., and their bids.

Table of tenders for LONDON. Lists contractors like Hest & Co., Kavanagh & Co., etc., and their bids.

Table of tenders for LONDON. Lists contractors like H. E. Buckley, A. J. Cottle, etc., and their bids.

Table of tenders for MONMOUTH. Lists contractors like R. L. Friend, J. Edwards & Son, etc., and their bids.

WOODFORD.—For making-up private streets, for the Urban District Council. Mr. W. Farrington, Surveyor, Council Offices, Woodford Green:—

Large table with columns: Elm-wood, Crescent-road, Horn-lane, Esclaire-terrace, Landscape-road, Eastwood-road, Waverley-road, The Stubbles, Globe-road, Gordons-road. Lists contractors and their bids.

NEWTON ABBOT.—For providing and fixing pens and rails for cattle, and covered sheds, ticket-office, etc. for the Urban District Council. Mr. L. Stevens, Surveyor. Town Hall, Courtenay-street, Newton Abbot. —

Andrews	£3,437	P. A. Stacey	£2,425
Coles	3,265	H. Parker, Newton	
F. Zealandy	2,493	Abbot*	2,185
J. Stokes	2,417		

OSWALD TWISTLE.—For erecting hall and cottages, etc. Oswald Twistle, Mr. G. Riley, architect.—

Mason and Bricklayer, etc.

W. Parker	£1,082	0	0	W. H. Bury & Son, White
J. Riley	1,074	2	8	Sons, White
W. Broad	992	8	6	Oswald Twistle*
G. Culliffe & Son	919	5	0	£847 15 0

Joiner and Carpenter.

W. H. Dixon	£649	5	0	J. Diehauert	£490	0	0
G. Walsh & Sons	525	0	0	R. Duxbury	475	0	0
Pikington Bros.	520	0	0	J. W. Harrison	438	4	9
S. Booth & Sons, Sadler-street, Church*	498	0	0				

Plumber, Glazier, and Gasfitter.

N. Philippot	£499	5	11	J. Lonsdale	£173	4	0
M. Porter	195	0	0	R. T. Kenyon	172	0	0
J. R. Suddall, Union-road, Oswaldtwistle*	178	0	0				

Slater.

Evans & Co*	£70	10	0	T. Faruworth, Garden-street, Oswaldtwistle*	£70	5	0
W. Green	70	9	6				

Plasterer.

J. J. Wright	£145	0	0	G. Eastwood, Horne-street, Accrington*	£198	9	3
J. Barus	115	18	4				

Painting and Colouring.

S. Robinson	£55	0	0	N. Philippot	£44	6	11
Yates & Son	52	0	0	T. Foulds	39	16	7
J. Carter, Unlo-road, Oswaldtwistle*	48	10	0				

Structural Engineer, Ranges, Pipes, and General Door and Window Fitting and Ventilation.

J. W. Bridge, Accrington*	£369	7	4				
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REDDITCH.—For 4,417 yds. of stoneware pipe sewer, for the Urban District Council. Mr. B. Perrins, Surveyor, Council House, Redditch.—

Tilt Bros.	£7,264	3	0	A. E. Palmer	£3,945	0	0
J. White, Hill	6,581	7	6	J. Riley	3,733	4	9
Sutherland & Thorne	4,382	13	4	E. Bone	3,605	13	11
Curral Lewis & Martin	4,263	0	0	G. Rutter	3,527	10	1
Lid.	4,263	0	0	J. Holme & Sons	3,442	9	0
J. Owens	4,262	0	0	T. J. Mason	3,409	8	10
J. A. Meredith	4,213	0	0	W. Medley			
F. Osenton	4,185	0	0	X Booth			
Hewett & Sons, Ltd.	4,065	0	0	Leicester*	3,245	17	5

RUGBY.—For Rugby Station sorting-office enlargement.—

Walton & Son	£1,076	0	0	Credit	£20	0	0
A. J. Chown	990	0	0		25	0	0
R. Cleaver	980	0	0		25	0	0
J. Hollowell	974	0	0		—		
Mackley Bros.	902	4	0		11	12	6
R. P. Gathercole	823	10	0		14	3	6
Hopkins & Son*	822	6	0		15	16	0

SUTTON.—New Infants' Council school, for Surrey Education Committee. Messrs. A. Wickham Jarvis and Frank A. Richards, M.A., Architects to the Surrey Education Committee, 35, Victoria-street, London, S.W.—

Mitchell Bros.	£5,099	J. B. Potter	£4,458
J. J. Pank	4,987	J. & M. Patrick	4,458
Crosby & Co.	4,916	G. Kemp	4,432
R. J. Humphreys	4,852	F. J. Shoptand	4,223
R. Wood & Son	4,817	Hawkins & Co.	4,121
Martin Wells & Co.	4,565	R. Jones & Son	3,990
Drowley & Co.	4,511		

TEIGNMOUTH.—For making-up Upper Ferndale-road for the Urban District Council. Mr. C. F. Gettings, Surveyor and Water Engineer, Town Hall, Teignmouth.—

Hawking & Best	£673	E. Harris, Clyst Hydon, near Exeter*	£625
S. J. Hayman	650		

TWICKENHAM.—For erecting a free library, for the Urban District Council Free Library Committee. Mr. H. Goodall, architect and surveyor, Bank-chambers, Twickenham.—

T. Co. stige & Co.	£5,946	0	0	W. Lawrence & Son	£5,274	0	0
W. Bondon	5,843	0	0	Wisdom Bros.	5,250	0	0
W. Gibson	5,804	0	0	J. & C. Bow	5,237	0	0
J. W. Brook	5,800	0	0	W. J. & C. Fryer	5,197	0	0
T. Almond & Son, Ltd.	5,835	0	0	H. E. Lamp	5,150	0	0
J. Cassee	5,596	0	0	W. J. Dickes	5,149	0	0
J. Minter	5,471	0	0	W. & B. H.	5,127	10	10
M. W. He & Co., Ltd.	5,465	0	0	J. Barker & Co., Ltd.	5,126	0	0
S. E. Moss & Co.	5,400	0	0	H. Lovatt	5,100	0	0
W. J. Ren	5,395	0	0	F. & G. Foster	5,077	0	0
shaw	5,315	0	0	W. Taylor	5,074	0	0
Mvill & P	5,300	0	0	E. F. McCarthy	4,987	0	0
S. N. Soole & Son	5,300	0	0	J. Christie	4,977	0	0
S. Penner	5,300	0	0	F. & E. Davy	4,973	0	0
Sant	5,294	0	0	W. Drake	4,873	0	0
W. H. Hyde	5,280	0	0	B. E. Night	4,832	0	0
Speenley	5,250	0	0	Wes to n s u p e r	4,750	0	0
G. Smith	5,204	0	0	Mare	4,740	0	0
Eldridge & Son	5,278	0	0	ingale	4,632	0	0

WESTON-SUPER-MARE.—For alterations to premises in High-street, for Messrs. George Messrs. Hans Price & W. Jane, architects, Weston-super-Mare.—

G. & J. E. Stokes	£909	0	0	C. & E. Stradling	£440	12	
C. Althoff	550	10					
G. Sprake	450	0					
Eldridge & Son	450	0					

WHITLEY.—For private street improvement works for Whitley and Monk-seaton Urban District Council. Mr. J. P. Spencer, architect and surveyor, 30, Howard-street, North Shields.—

W. Gray, Whitley Bay,*	£1,923		
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WITLEY (SURVEY).—For the erection of a farmhouse on Witley Park Estate, for the Right Hon. Lord Derby. Mr. John H. Howard, architect, Haslemere.—

Chapman & Levy, Ltd.	£1,617	0		E. Entwistle	£1,495	10	
F. Milton	1,520	0		Sons, Milford	1,313	0	

YSTRADGYNLAIS.—For erecting a new chapel for the Trustees of Ynys Calvinistic Methodist Church. Messrs. W. Jones & W. D. Morgao, architects, Victoria-chambers, Portra, Rhondda.—

E. Thomas & Son, Seven Sisters, Neath	£1,923		
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The Builder.

VOL. XC.—No. 3286.

JANUARY 27, 1906

ILLUSTRATIONS.

Palazzo Pubblico, Siena.....	Drawn by Mr. Lionel U. Grace, A.R.I.B.A.
The Wertheim Warehouse, Berlin.....	Herr Alfred Messel, Architect.
House, No. 73, Harley-street)	Mr. W. Henry White, F.R.I.B.A., Architect.
House, No. 32, Cavendish-square)	
Design for Pair of Labourers' Cottages.....	By Mr. H. Reginald Coales.

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Students' Designs: Institute of Architects.



THE drawings sent in by the students for the various prizes given by the Institute of Architects are at present on view in the large room at the Alpine Club; and a very

fine collection they make. The two most interesting and significant sets are always those submitted for the Soane Medallion and the Tite Prize, as these alone represent the original treatment of an architectural problem, the other competitions representing diligence and accuracy in the study and representation of existing work, except the Grissell Medal, which is mainly given for drawings showing knowledge of construction, though the question of design unavoidably enters into it to some extent.

The subject for the Soane Medallion—the realisation of the ideal mansion described in Bacon's essay "Of Building," was first suggested in a paper read some years ago before the Architectural Association by the editor of this journal, whose recommendation of it was accepted by the Council last year, and who has every reason to be gratified with the result. The subject has evidently proved an attractive one, and has brought out a good deal of very clever and meritorious work, besides that shown in the two sets which have gained prizes. Mr. W. S. George, to whom the medallion has been awarded,

has been evidently and confessedly influenced by John Thorpe, whose name he has adopted as his motto, and whose rhyming propensities he has imitated in a distich in the corner of one of his drawings—

"These 7 drawings that you see,
Though not all I would have them be,
I hope will win the Soane for me."

There is a calculated archaism in the style of the drawings and the writing on them, which does not affect the design in any way, but which is a picturesque and perfectly harmless fancy in a competition of this kind. There can be no question that the award is the right one, as among the two or three which may be considered to be before the rest in architectural quality, this is the only one which properly realises the idea of a building which, however sumptuous in character, must still have something of the character of domestic architecture, and impress itself upon us as a dwelling, though a palatial one. In fact, in regard to general style and treatment, it comes remarkably near to representing what Bacon probably had in his mind; though there are two points of detail which do not quite accord with the language of the essay. Bacon undoubtedly speaks of "a great and stately tower in the midst of the front," an expression which has misled some of the competitors into producing designs which suggest a town-hall rather than a mansion; but on the other hand, Mr. George's rather small cupola or turret, though it is perhaps what would have been most likely to be built in the reign of Elizabeth, does not agree with

Bacon's actual expression. Then we do not see quite sufficiently emphasised the "two delicate and rich cabinets" which were to be placed at the further side of the building, "by way of returns," i.e. they were to be projections from the main line of building, in one or another direction, it is not easy to say which. There are rooms with projecting bays, near each corner of this portion of the plan, which may be held to answer for these; but they are not sufficiently emphasised; they were evidently intended to be marked features in the plan, and several of the other competitors have recognised this and treated them accordingly. But these two inaccuracies, or discrepancies with Bacon's description, are not sufficient to counteract the fact that this competitor has best realised the general spirit of Bacon's ideal, besides showing, in the perspective especially, an exceedingly fine architectural conception.

Mr. Atkinson's design, which receives an Honourable mention and ten guineas, is in some respects a very fine one, and he has followed Bacon correctly in the provision of the special "cabinets," which are placed as indicated in the essay; he also has "a great and stately tower in the midst" of the front; but it errs on the other side, in being massive and castellated—too like a "keep." The main front, with a range of lofty mullioned windows in four tiers, and large circular windows adorned with massive swags over them, has a very fine and broad effect, and the pencil drawing which shows it in

perspective is a capital piece of work; but the whole has too much the appearance of a public building. The greater part of the plan is designed in the modern fashion, with a corridor round the quadrangle on the sides next the courtyard, except in the cross block, where there are rooms on both sides of a central corridor, which latter must be very insufficiently lighted. This and some others of the plans show that the competitors have not quite appreciated Bacon's meaning when he says "Let all three sides be a double house without through lights on the sides, that you may have rooms from the sun, both for forenoon and afternoon." He did not think of a central corridor, with rooms on each side; that is a modern idea; he simply meant two sets of rooms, the uses of which were to be so disposed that one could with as little inconvenience as possible be made a passage to the next; as we see at Burleigh House and other such XVIth century mansions. The author has shown a fine lay-out of the ornamental gardens in his block plan. His forecourts, except the third one next the house, are very large, and in connexion with the second one, which is laid out with a circular walk and intersected by cross walks at right angles, he has provided for those "offices" which Bacon dismisses so summarily in the last sentence of the Essay, by a "stable block" on one side of the green and a "laundry block" on the other; both forming small courtyards.

The author of the design distinguished by a red fly in the corner shows a very good plan, and has understood Bacon's meaning as to the double sets of rooms. In the general character of the design, the faces towards the courts especially, he seems to have been influenced by Hampton Court—the Classic, not the Wolsey portion; the exterior design is correct and dignified but rather cold, and the perspective view does not make the best of it. The large tower is effective in itself, but again a little too municipal in appearance; the design as a whole, however, is more that of a mansion for habitation than that of Mr. Atkinson, but it is certainly not so architecturally interesting. "Regal," in general aspect, is simply a Town Hall. "Palazzo," though weak in plan, is a design with a good deal of architectural merit, as judged by the perspective view; it is somewhat bare and heavy in character, and wants what is called "pulling together," but it has a distinctly marked architectural character of its own, and the author has in this case contrived to provide a large and massive tower which is not municipal in character, but belongs to a mansion. "Peruzzi" is a very modern plan, and suggests a large hotel; it is a masonic classic design with a rusticated ground story and an order above; in connexion with which architectural ordinance one is rather surprised to see a square brick tower rising over the centre, crowned with a stone lantern and cupola; this brick tower is an excrescence in any sense, whether we regard the building as private or public—it has more the appearance of the latter. The tinted elevation is a credit to the author, as are the drawings generally. "Fraxinele"

only shows a plan of one floor, which is a good one and quite after Bacon's idea, and his design is domestic in character, but in this case the design errs in not being palatial enough for the idea of a princely residence; it rather suggests a very large rambling country house which has been added to at different times; still there is a great deal that is picturesque and interesting in the perspective view, and the plan shows a good arrangement of the offices in two quadrangles at some distance on each side of the house, "and with some low galleries to pass from them to the palace," exactly as described in the essay.

For the Tite prize also a most attractive subject has been set—"An Open Air Swimming Bath," to be designed according to the principles of Palladio, Vignola, Wren, or Chambers. Is "principles" the right word to have used? The principles of architecture on classic models are much the same in all its variations of detail; "according to the practice" would have been the better term. In designing a structure of the kind indicated an important point is that its external treatment should convey the impression of an open-air structure; that is to say, the architectural surroundings should give the impression of a screen rather than of a building. The general merit of the designs is very high, but some of the competitors have made the mistake of producing designs which, viewed from the outside and from the ground level, would convey more the impression of a roofed building; the bird's-eye perspectives show that they are not so, but that would be the impression produced on the spectator by the actual building, at first sight. Mr. A. G. Horsnell, to whom the prize has been awarded, has entirely avoided this; his design is, in fact, the most distinctly open-air one of any of them, and in its treatment evinces no little natural architectural genius. His bath is in the midst of a very large enclosure defined by a columnar semi-circular screen sweeping round one side of the area, with the pavilion entrances at the starting of the curve; at the other side is a large erection on a slightly curved line, containing a lofty bank of seats for the spectators, with the bath, a long parallelogram, below them, forming the chord of the arc. On the side of the large bath furthest from the spectators is a smaller circular bath with a fountain in the middle, the circle being concentric with that of the large colonnade which forms, as observed, the boundary on one side of the enclosure. The small bath has two large pedestals for sculpture, built on lines radiating from the centre. The effect of the collection of erections, with its play of curved lines, is exceedingly fine, and is shown in a large pencil perspective which, though not highly finished, shows a fine freedom in drawing. We do not perceive anywhere in the plan or section any distinct provision for dressing rooms, though it is easy to see where they might be got in, beneath erection for spectators. But the whole design is unquestionably the best thing sent in, and is a great credit to its author.

Mr. C. L. Wright, who receives an "Honourable Mention," adopts a nearly

square form for his main erection, the bath being a long rectangle and the spaces for seats filling up the square on each side of it. His design is also of the nature of a screen erected round the bath, with two orders on it, Ionic above, and a form of Roman Doric below, the capital of which we do not like though there is precedent for it. The design generally is marked by a classic correctness and finish, though hardly by genius or originality; it represents very well, however, what Tite intended by his bequest, which was to encourage the study of Italian architecture. Mr. C. E. Pearson, who receives a medal of merit, adopts an elliptical plan of bath, the ellipse being expressed both internally and externally; the exterior screen forms a loggia with coupled columns, following the line of the ellipse, and interrupted at four points by square projecting pavilions which form the entrances. The effect would have been better if these pavilions had been treated in a rather more broad and simple manner, and on the same architectural scale as the rest; as it is, they do not seem quite to belong to the composition; but the general conception is a good one.

"Fiat Lux" is an ambitious design with a very clever perspective, but it is overdone with architectural erections, with a large dome at each end with a colonnaded hall beneath it. These halls would have a good effect in themselves internally, but the whole design has more the effect of a building—a town hall or something of that kind, than an architectural screen to a bath. The side colonnades, it is true, are open, showing the bath through; but it is overbuilt, and the bath compartment becomes rather the secondary than the principal feature. "Aristobulus" is a design properly treated for the subject, and the internal pavilion at the end of the bath and projecting partly into it is well managed architecturally. "Pleiades" has some effective points in the internal treatment, but his arrangement of dressing boxes and entrances to the swimming bath for "ladies" and "gentlemen" at opposite sides seems to contemplate the use of the bath by both sexes simultaneously, which is hardly "within the range of practical politics." "Bo'sun" has the right idea for the architectural treatment, with the open colonnaded screen at the top of the range of seats, but the details are not very good, and his elliptical plan of the bath is too narrow and has too sharp a curve at the ends; in other words, the foci are too near the end of the axis. "Hodden-Gray" is not a very good design as a whole, in particular the square blocks of building containing retiring rooms cut very awkwardly into the curve of the bath at one end; but he deserves mention for an effective planning of the dressing rooms, which are arranged around four semicircular halls in the basement, opening off the margin of the bath and partly screened from it by columns, so that the dressing boxes themselves are kept quite out of sight (as in a monumental bath of this type they should be), and are yet conveniently placed for access. "1905" shows rather a fine design for a straight-sided bath with circular ends,

the straight portion flanked on one side by an entrance pavilion with a cupola, and a large flight of steps at the base. "Aqua" shows a very respectable two-story design of Palladian character, with an open arcade round the bath, and he introduces, not unsuitably, an impluvium over the entrance hall to the establishment. "A.D. 1906" is a meritorious design which would have been done more justice to by a better-drawn perspective view; the bath is in an enclosure which is a parallelogram with rounded ends, with projecting halls at the sides defined by screens of piers and columns, the piers bearing decorative tablet for inscribing the names of victors in the races. Internally, on the chord of the end semicircles and on the axis of the bath, is a large pedestal at each end over the reception of a group of sculpture. "Cui Bono?" is a very clever and original design, which is a credit to its author; but as its architecture is based on mixed elements of Greek Doric colonnades and adaptations of Egyptian pylons, it does not come properly within the programme of the competition. "E Pluribus unum" is a design on the proper kind of lines, with an open colonnade round the bath, and a kind of narthex across the end, terminating in a semi-circular colonnade at each end; but the position of the dressing-boxes at the farther side of this narthex is putting them a great deal too far from the bath. "Michelange" shows a plan in the shape of a rather wide parallelogram with rounded angles—not a beautiful shape, but the double colonnade along each flank of the bath has a good effect, and the whole thing looks well in the perspective view.

In the Grissell Medal competition architectural design is not the most important point, though at the same time we do not think that the medal should be given for a design which was thoroughly bad architecturally, on account of cleverness in construction; nor do we remember that this has ever been done. In the present case Mr. G. Nott's design, to which the Medal is awarded, is architecturally the only one that is really good; the bridge is very simply treated, but in perfectly good taste. "Nil" shows a nice-looking bridge in a good pencil drawing, and we do not know that there is any other design that is worth mention on purely architectural grounds. From the constructional standpoint the drawings submitted possess various degrees of merit. The design to which the gold medal has been awarded has been well worked out, the sheet containing the graphical determinations of the line of resultant pressures in the arch ring and abutments, and the development of the arch soffit, being particularly worthy of commendation. While quite agreeing with the justice of the award, we may point out that the abutment shown in the half longitudinal section of the bridge appears to contain an unnecessary amount of material at the outer top corner, which might have been sloped off or stepped back to a greater extent without impairing the stability of the structure. The abutments are not represented in a separate drawing, but from the general plan it is evident that they are based upon the principles

generally adopted in the design of skew arches, and about the accuracy of which there is now some doubt. Although the drawings under the motto "Catenary" do not include a sheet giving graphical determinations, they are noteworthy for the reason that the arch has been designed in accordance with the theory of Professor Kerol of Melbourne, which shows that the principles adopted by Rankine for the design of skew arches are not correct. There is much to be said in favour of the new theory, and if "Catenary" had submitted full particulars of the means by which his design was evolved his chances of securing the medal might have been considerably improved, for the construction itself is decidedly good. The other sets of drawings by "R." "Bydand," and a second "R" also deserve praise, for an evident knowledge of the essentials of arch construction and for the careful manner in which the calculations for stability have been made, but limits of space will not permit us to deal in detail with the distinctive features of each design.

The Arthur Cates prize is awarded to Mr. John H. Markham, among whose drawings figures a very agreeable and suitable design for a "Town Hall or Public Offices for a small Town," in which he has contrived to give the character of a municipal building while preserving an appropriate simplicity of style and treatment. He also shows two finely executed detail elevations of parts of Hampton Court Palace. The drawings for the Pugin Studentship cover the whole of one wall and half the end wall, and show a great amount of interesting illustrative work. The Studentship is awarded to Mr. G. Drysdale for a varied set, which show not more work, but more style in drawing (pencil drawing especially) than any other. Mr. J. S. Richardson sends some good work; Mr. Jordan Green receives an Honourable Mention for a set which includes much clear and careful pencil drawing, of the kind that are accurate rather than effective; Mr. Morison has careful drawings of the screen at Aberdeen University and the sedilia at Furness Abbey; and Mr. W. S. George, the winner of the Soane Medallion, shows a good set of Pugin drawings, including large tinted drawings of the central pillar in the porch at Amiens, with its well-known sculptured Christ; also drawings of the lavatory at Fountain Abbey.

The measured drawings for the Silver Medal are also numerous and of a high average of excellence. Mr. G. Coombs gains the medal mainly by a set of fine drawings of Christ Church Priory. Mr. A. E. Poley also receives a medal (*ex æquo* apparently) for a set of drawings of Hampton Court; and an Honourable Mention is given to Mr. Percy W. Lovell, whose principal subject is Sta. Maria dei Miracoli at Venice. Wren's Orangery at Kensington is the subject of three different sets, of which "Auspicante Deo" is the best. There is a fine and careful set of St. Stephen's, Walbrook, signed "Reflex"; drawings of St. Mark's Library by "Sansovino"; and drawings signed "Fiat Lux" of the Grand Trianon, not a very inspiring subject, though interesting as an unusual choice.

In regard to the drawings for the Owen Jones' Studentship the examiners seem to have had so much difficulty in deciding on relative merits that they have come pretty near to giving prizes all round. The actual Studentship is awarded to Mr. Charles Gascoyne, whose drawings, though less showy than one or two other sets, have a delicacy and refinement of the highest kind. He shows details from San Vitale and other buildings of renown in Italy, and various water-colour sketches of what may be termed architectural landscape and of separate buildings—Sta. Maria in Campitella, Rome; the façade of Villa Papa Giulia, etc. Prizes of five guineas are awarded to Mr. A. D. Nicholson, Mr. A. R. H. Jackson, and Mr. W. J. Davies, all of whom have many fine and elaborate coloured drawings to show. Those of Mr. Davies are perhaps the best; among them is an admirable drawing of the decoration of a doorway at Siena, the colouring of the marble very well rendered, and one of the sculptured holy water stoup in the same cathedral, backed by three or four courses of the black and grey bands of one of the piers, making a very effective combination.

Taking the collection of drawings as a whole, we do not remember that the Institute Students have ever shown a better record than this year.

AN EMINENT BERLIN ARCHITECT.

AS we mentioned under the heading of "Magazines and Reviews" a fortnight ago, the *Berliner Architektur-welt* has issued a special extra number on the work of the eminent Berlin architect, Herr Alfred Messel. As the publication was sent to us accompanied by a note inviting our special attention to it, we thought it would be of interest, instead of merely giving a written description, to reproduce a few of the numerous illustrations of Herr Messel's architectural work, and we have therefore deferred further mention of it till we could illustrate it in this manner.

Herr Messel is a native of Darmstadt, but his professional career has been chiefly connected with Berlin. He studied at the Bau-Akademie of Berlin, where he came under the influence of such teachers as Strack and Bötticher. Later he was elected Professor of Architecture at the Berlin Technical Schools, and was afterwards appointed a lecturer at the Kunstgewerbe Museum. As a young man Herr Messel was distinguished by the thoroughness of his work, and attained the general recognition which he now enjoys, as the result of patient and careful study of the problems of architectural design and construction.

It seems to be agreed that the most remarkable building he has carried out is the Wertheim warehouse, an establishment which is said to be to Berlin what Whiteley's is to London, but has been made much more important in an architectural sense. On one of our lithograph sheets we give a general view and two portions of the details of this building, reproduced from the illustrations of our Berlin contemporary. How far English architects will sympathise with



Details of Carving, Wertheim Warehouse, Berlin.

the style of this building may be doubtful; there is probably rather too much of "L'Art Nouveau" about it for some of us; but we think no one can deny that it possesses one of the most important qualities that a piece of modern architecture can have—viz.: that it is unquestionably interesting; far more interesting than many a piece of correctly designed architectural commonplace. As the building extends over a great deal of ground and faces at different points to various streets, it seems to have been the aim of the architect to render it as multifarious as possible, and to make it a kind of free fantasia in architecture, presenting different aspects at different points. The plan of the building will be found on the page devoted to "Illustrations," and we give also here some examples of the carved ornament with which it is decorated.

The classically treated doorway to a school building at Berlin shows, however, that Herr Messel is not committed to eccentricity in architecture, and can design on scholastic lines when it so pleases him. More interesting than this, however, to us, is the entrance to a stable building (page 84), with its rough rusticated work in the doorway, and the big scrolls above which serve to remind us that an architect has been at work here.

These, however, form a very small proportion of the work illustrated in the special number of the *Berliner Architektur-zeitung*, which English architects would do well to procure.* They will find in it numbers of illustrations of exteriors,

interiors, and decorative detail, all, whether or not one agrees with the taste of it, the work of a vigorous and original mind in architecture. Among the works of Herr Messel are the museum at his native town, Darmstadt; the Berlin Post Office buildings, the Chamber of Commerce, the Coln-Uppenheim Palace, etc. The Darmstadt Museum forms the frontispiece to the number; it is a quiet building in a very sober style of classic, but with a distinct originality; the only thing we do not like about it is the rather ungainly shape and outline of the roof over the central entrance. A good many small dwelling-houses are included in the illustrations, as well as street houses and mansions of a more important class. Among these a classically treated house in the Victoria-strasse is worth attention, not only for its general design but for the number of interesting decorative details which are illustrated; also the "Landesversicherungsanstalt" in Berlin (the Germans are terrible people for long compound words), with its interesting sculptured details, internal and external.

We are glad to take the opportunity of calling attention to the work of a very original German architect, and also to a notable example of the journalistic form of what is sometimes called in London "a One-Man Exhibition."

COLLEGE OF SCIENCE, SOUTH KENSINGTON.—The President of the Board of Education has appointed Professor W. W. Watts, M.A., F.R.S., of Birmingham University, to the Professorship of Geology at the Royal College of Science, South Kensington, vacant by the retirement of Professor Judd. Professor Watts was a Fellow of Sidney Sussex College, Cambridge, from 1888 to 1894, and a member of the Geological Survey from 1891 to 1897.

NOTES.

In our Note of October 14 last we referred to the fraudulent devices adopted by certain Belgian cement makers in marking their products so as to lead purchasers to believe that they are buying the British-made Portland cement, a reprehensible practice which is encouraged by the action of the Customs Authorities in permitting the importation of foreign cement without the warning obviously intended by the Merchandise Marks Act. A good deal of the foreign material so placed upon the British market is not Portland cement at all, but "natural cement," which is admittedly of very inferior quality, and, owing to its low price, has found extensive sale in the United Kingdom. Of course, in some cases it may happen that the rock employed in the production of natural cement may be more or less correct as to chemical composition, but there is no guarantee that this will be the case as the process of manufacture does not include methods of scientific control, or any attempt to regulate the proportions of the ingredients. It may be asked if the material in question is of such inferior quality why those concerned in its sale are able to publish satisfactory results as to its tensile strength. From a pamphlet issued by the Associated Portland Cement Manufacturers it appears that the answer is very simple, namely, that samples of cement are prepared for advertisement purposes from specially selected rock,

* It is published by MM. Ernst Wasmuth, of Berlin.

but that these do not truly represent the bulk of the cement afterwards delivered, nor do they afford any criterion of its quality. Considering the endeavours that are being made by British architects, engineers, and manufacturers to improve the quality of Portland cement, it is much to be regretted that the nefarious methods of business to which we refer should be countenanced at all in this country, and especially by those upon whom devolves the duty of seeing that the provisions of the Merchandise Marks Act are properly carried out.

In a paper read before the Electric Railway Institution of Electrical Engineers, Mr. F. W. Carter deals in a general way with the technical side of the electrification problem, leaving alone the larger questions of economic engineering and descriptions of apparatus and material. Even with this limitation the subject certainly provides ample material for a lengthy paper, and its importance is evident from the fact that the electrification of railways can only be undertaken after full technical investigation. The author takes chiefly into consideration continuous-current motors as applied to suburban services. It should be noted, however, that the single-phase and polyphase systems also receive attention. This is a point we are glad to observe, in view of the claims possessed by the single-phase system. Mr. Carter discusses the features of four classes of railway services all differing in their requirements with respect to rates of acceleration and speed, behaviour on grades, and maximum speeds attainable on the level. We quite agree with the conclusion that the chief immediate development of railway electrification is to be expected in urban and suburban districts. There is also a good opening on branch and inter-urban lines for electric train services conducted by means of single cars or short trains run at fairly high speeds and at frequent intervals. As for main line passenger and goods traffic, it is somewhat doubtful at present whether general electrification would justify the great outlay involved. This is a matter upon which some engineers who are directly interested in electric traction may have something to say.

Heat Losses from Buildings and Radiators. THERE is undoubtedly need at the present time for more precise data as to the amount of heat dissipated through the walls and by way of windows, doors, chimneys, and ventilators of buildings. The consideration of this point occupies part of a paper read by Mr. A. H. Barker before the Institution of Heating and Ventilating Engineers; and with the object of obtaining information for the guidance of those who have to design and instal heating systems the author proposes a series of tests, to be conducted as far as possible under actual working conditions. In view of the somewhat doubtful character of the purely theoretical data given in many text-books, the idea is certainly a good one, and we are sorry that their financial position will not permit the Institution to vote the necessary funds for the purpose of undertaking an investigation of the kind. Of course, even if equipped with the most

reliable practical data, architects and engineers would still have to contend with a good many variable factors. But these must be present in any event, and the fact that they exist is no reason why the basis of calculations should not be as accurate as possible. Another matter discussed by Mr. Barker is the desirability of determining, for the various types of radiators on the market, the correct rate of heat emission under given conditions. This again is a subject well worth inquiry.

VENDORS and purchasers of real property should note the decision of the Court of Appeal in the recent case *re Nisbet and Potts Contract*. The vendor of certain land had purchased it in 1901 under a contract which provided that the title should commence with a conveyance dated August, 1890, which only showed a title by thirteen years' possession. The purchaser, hearing from some outside source that the land was subject, by virtue of a deed dated 1872, to restrictive covenants which would render the land useless for his purpose, requisitioned

the vendor, and the vendor relying on his purchase in 1901, when the existence of such covenants had not been disclosed to him, asserted that the land was not subject to the covenants, especially having regard to the thirteen years' title by adverse possession. The Court of Appeal has held, however, that those restrictive covenants are in the nature of negative easements binding, except on a *bona-fide* purchaser for value without notice, but—and in this lies the importance of the decision—such a purchaser must have required a forty years' title; the reason for this being that constructive notice will be assumed if the purchaser neglects to take this precaution. People anxious to buy a particular site are far too apt to waive a forty years' title, but if they do so the present case shows that they run a serious risk of finding their building schemes frustrated by some undisclosed restrictive covenants.

THE Annual Report by Mr. O. Claude Robson, the Engineer and Surveyor to the Willesden District Council, is, as



Doorway to School Building, Berlin.



Entrance to Stable Buildings, Margareten-Strasse, Berlin. (See page 82.)

usual, a long and ahy drawn-up document, forming a hook of more than 200 pages, and presenting a complete synopsis of the work in his department during the year. Among the points mentioned it is recommended that motors should be used for cartage of road material and watering roads. The necessity for rolling the roads becomes more pronounced every year, owing to the demands of cyclists, but, as the Engineer observes, "it is difficult to ensure every patch being instantly rolled over an area of 7 square miles, and upon roads nearly 70 miles in length." In regard to the prevalence of paper and other *débris* on the roads on Sunday mornings, Mr. Robson doubts if scavenging work in respect of this would justify the employment of such a number of men as would be required to carry it out; but it must be observed that this prevalence of rags of paper on the roads is a disgrace to most English municipalities (in London especially), and ought to be abated: we are glad to see it even referred to as a matter to be considered. The number of upcast ventilating shafts to the sewers in the district has been increased, and it is stated that these have proved very efficient as extractors of foul air. The sewage disposal is an increasing difficulty in the district, the capacity of the

precipitation tanks being at present 600,000 gallons, while the dry weather flow is 1,800,000 gallons, and it is proposed to construct eight additional tanks. Without this work it is feared that the present impervious land beds will become more and more useless for filtration purposes. The filling in of the old arm of the Brent, as far as it extends through the property of the Council, is recommended to be carried out during the present year; "at present it is a stagnant elongated pool, of no great utility, and at times threatening to become a nuisance." The work, it is suggested, might be allocated to the unemployed. The following remarks are worth attention by borough authorities generally:—

"The sewer proper still remains approximately under the centre of the Tramway. In London, with large brick sewers and the frontages of streets fully developed, but little necessity to open ground over sewers need occur, but should it be necessary at any time to obtain access to pipe sewers, such as those that so largely exist in Willesden, at any other point than by the side entrances, great difficulties will be encountered, as the excavation of a shaft within the boundaries of the Tramway line will be almost impossible, and access to the sewer must consequently be obtained by tunnelling if possible, in order to avoid disturbance of the line. Thus one more obstacle is added to the many now existing in our main roads where the ground has to be opened for public purposes, the larger area being monopolised by Gas, Water, Cables, and Tramway undertakings. It is greatly to be regretted that powers are not given to compel the construction of proper

brick subways in all streets of any importance, the cost being defrayed by all those who would be benefited by the work both in the present and in the future."

Village Halls. We have more than once called attention to the necessity in large villages of a public village hall in which meetings of any kind can be held. The recent General Election has in numerous instances shown the need for these buildings. Political meetings are out of place in the elementary schools, and are troublesome in causing disarrangement of desks and furniture. In every village there is a constant need for a hall, but at such a time as a General Election this need is emphasised and made more apparent. We certainly hope that some legislation may be introduced to give parish councils power to buy land compulsorily for the purpose of village public halls, and to borrow money for the purpose. Such a hall would form a centre of local life, and give opportunities for its expression, and it is by such means that rural life can be made more interesting. Everything that tends to give interest to it tends also to keep the countryman on the land.

Stationers' Almanac, 1906; and a View in London. THE almanac for the current year issued by the Stationers' Company is illustrated with a reproduction of J. H. Nixon's drawing, engraved by Henry Wallis, of the prospect from the east end of the Poultry as it appeared seventy years ago. The view embraces Soane's Bank of England, with Wren's Church of St. Bartholomew-by-the-Exchange in the background, since replaced by Cockerell's Sun Fire office; the triangular block—(old) Bank-buildings—which remained until 1843, where is now Chantrey's equestrian statue of the Duke of Wellington, behind which appear portions of E. Jerman's Royal Exchange as completed by Cartwright and burned on January 10-11, 1838; and, in perspective, Cornhill, Lombard-street, and King William-street as laid out by William Mountague, the City Architect, in 1824-30 for an approach to London Bridge. The view should be compared with T. Malton's aquatint of 1781, which is reproduced in our number of December 23, 1899, and delineates the offices, with a Classical front, erected by Sir Robert Taylor at the angle of Bank-buildings for the lottery office of Richardson, Goodluck, & Co. A plan of the buildings, signed and dated by Sir John Soane in March, 1802, is preserved in a portfolio of his drawings, etc., in the Soane Museum. At the angle of Cornhill and Lombard-street appear the old offices of the London and Liverpool and Globe Insurance Company, recently rebuilt for them after Mr. J. MacVicar Anderson's designs. The former offices of the insurance company on that site were built after the demolition, by Mountague, of two or three houses on the south side of Cornhill, including No. 1, latterly known as "Lucky Corner," Pidding's lottery office, which had been occupied by Thomas Guy, publisher and bookseller, a benefactor of St. Thomas's Hospital and founder of Guy's Hospital, Southwark. In Nixon's drawing the then proposed statue of the Duke of Wellington is placed on the site of "Lucky Corner."

The present exhibition at Messrs. Tooth's Gallery is not quite a new one, for several of the more important pictures—Bouguereau's "Offrande à l'Amour," Fr. D. Farquharson's "Summer," Chreyer's "Chevaux de Poste en l'alachic," M. Dagnan-Bouveret's "Sihylle," and M. Israels' "The Day before the Departure"—were in the same places in the last exhibition, and were noticed by us at the time. Among the oil-paintings there is a beautiful little Corot "Twilight" (47), and a large picture by Clays, "The Zuyder Zee—Calm" (48), which represents this painter's one effect at its best. The collection of water-colours in the small room is, as far as we remember, new, and contains one thing which is alone worth going to see—Alfred Hunt's exquisite drawing entitled "When Summer Days are Fine" (33), which we remember years ago in one of the Society of Water-colours' Exhibitions, and have not seen since. This is a drawing so ethereal in its representation of foliage and hills in the brightest sunshine, that one loses the sense of it being painted on paper; the mechanism of execution disappears; it is almost as if Nature herself were, so to speak, melted down on to paper. It is curious that the owners of the Gallery do not seem to understand the value of this work, which is the gem of their water-colour collection, or they would not have put it close to the floor and hung far inferior works on the line. Among the other water-colours are a fine free sea-piece by Mesdag, "Dutch Pinks" (1); a landscape and horses, "Ploughing" (4), by A. J. Grønewegen (a name new to us), which is notable for its delicate colour effect; two large drawings by Mr. North "View on the Darenth" and "January in Algiers" (27, 28), hung in a very bad light, but fine works, apparently painted a good while ago, as they do not exhibit the artist's present very strongly-marked style; two or three good landscapes introducing buildings by C. De Windt (not to be confounded with De Wint); a very conscientiously finished coast scene in an old-fashioned style (42) by Mogford; two examples of Prout in his best manner (30, 40); David Cox's "A Welsh Valley" (32), fine and broad in its general treatment of the landscape, but curiously old-fashioned in its foreground; and two street pictures, "The Hague" (17) and "Amsterdam" (26) by K. Klinkenherg (another name new to us), which are admirable of their kind, and remind one of Van der Heyde.

At the Gallery of the Society of Fine Arts is a fresh collection of garden pictures by Mr. Elgood, who has made a reputation in this class of subject, which the present exhibition entirely maintains, though one feels that it is possible to get a little tired of garden pictures, or at least that a whole room full of them becomes a little monotonous, though all are good taken separately. Among the best in this collection are two of "Cawdor Castle" (6 and 18), in which the mass of the castle, rising above the trees, is hacked

by white cumulus clouds which greatly assist the composition. "Barncluth: Cat's Castle" (9) is a highly-finished drawing of one of those old gardens with clipped trees cut into huge rounded masses, which are more curious than beautiful; another of "Barncluth" (27) is good, and "The Fountain. Murthly" (12), and "Villa Borghese" (37), with its statues and foliage under a tenderly-painted sky. Among the largest and most effective drawings is that of "La Vasca dell' Isolotto, Boboli Gardens" (60). Some small drawings of general landscape, chiefly Italian, are added to the collection; among which two or three small and delicate views of the "Isola dei Pescatori" (61) are very charming, and there is an interesting little view of "Pisa" (23) seen from rising ground beyond the town, with the well-known forms of the baptistery and the leaning tower peering at a distance through the trees.

We are glad (and agreeably surprised) to learn from a letter in the *Times* that the efforts of the National Art-Collections Fund to secure this fine work for the nation have been successful. Three thousand pounds, it is true, is yet required to make up the price, but this sum Messrs. Agnew have given the Society time to collect, and we may assume that there is little doubt that it will now be collected. But that the purchase of such a work, which would otherwise probably have gone out of England for good, should have been left entirely to private enterprise without any assistance from public funds, is not creditable to the country.

ROYAL ACADEMY LECTURES.

MR. CLAUSSEN'S fourth and last lecture, delivered on Thursday last week, was on the much-vexed question (in the present day) of "The Relative Importance of Subject and Treatment." Pictures, he said, might be considered on various different grounds—as to the subject, the drawing, or the colour. Success in regard to any one of these elements would justify the existence of a picture, but the highest excellence could only be realised by success in all three. Some people, painters especially, when they looked at a picture were chiefly occupied in studying it as painting; others looked at it for its sentiment; and there was often a want of accord between the painting and the sentiment, between the treatment and the subject. What relation ought there to be between the two? Well, he would say that a picture ought to be the result of a single impulse controlling both the subject and the treatment. That a picture told a story was not a sufficient excuse for its existence; nor was it sufficient to say that it told its story clearly; it must also have technical excellence, and it would live by that more surely than by its story, for the story might be forgotten or have ceased to interest, as they saw in the case of some of the paintings by old masters, but the technical excellence remained. Take the case of the picture by Velasquez which professed to represent Christ in the House of Martha; the treatment there was out of relation to the professed subject, for the figures were of quite secondary interest; it was really a Still Life picture and it only retained its value as such, for the painting of the foreground detail; and the professed story was merely an excuse for the painting. In the same painter's "Dead Warrior," on the other hand, the subject and the treatment were in true relation with each other; the treatment grew out of and assisted in the expression of the subject; even the incident of the candle going out and its smoke drifting away was symbolically in harmony with the subject. A picture was not better for being

without a subject; a picture which told a story interested a larger number of people than one that did not; and after all, pictures were made to be looked at. With artists, however, there was a certain antagonism in regard to subject and treatment. The relative importance to be given to either was a good deal a matter of taste. Painting seemed to have had its origin in a desire to express something in a better way than could be done by mere narration. Thus, early painting was essentially the story of Christianity; it was an expression. The idea of looking to the beauty of things seen, just for the sake of their beauty, only developed later. But should not the setting forth of a story in painting really be good for us? And as to method, where the painter was much possessed by his story, the method was the servant of the mind; he would find his own method for the best expression. They saw that in Blake, who was deeply impressed with his subject, and employed a method of expression entirely his own and derived from no one else. They might see the same in Rossetti's picture of the "Annunciation," a simple expression of a story, to which the method was subordinate. The old painters were masters of their methods and made them subserve the purpose of expression; the mere pleasure in appearance for their own sake did not then exist; the whole object was to express something; their minds were left free to do this without being hampered by considerations of method, and this was to a great extent the source of their charm. We saw very much the same characteristics in the drawings of children at the present day. He showed a painting of an old woman and a boy, executed by a schoolboy. Here they would see that the boy considered that a face as a whole was of a certain colour, and he put that colour all over it; he knew that the cloak was of a certain colour, and he put that colour on it; he did not trouble about variations of shadow and texture; he was just giving the facts. A Japanese drawing of a lady, which was exhibited, they would see had the same characteristics; the face showed no modelling, only the decorative detail of the costume was elaborate and carefully drawn. If they compared a picture of Fra Angelico's they would recognise that, though somewhat more advanced in execution, it was essentially the same kind of thing—the endeavour to represent facts in the most simple and direct manner. These early works nevertheless were beautiful in their way, because they showed good taste though with primitive methods, and they were controlled by an impulse which led the painter to adopt a composition suitable to the sentiment of the story. Thus in Paolo Uello's "Battle of Egidio" in the National Gallery, the composition and the contrasts of line and colour were violent and abrupt, in keeping with the nature of the subject. In Bellini's "Death of Peter Martyr," on the contrary, there was a want of relation between treatment and subject; the little peaceful town and the quiet trees assorted ill with the subject; one felt that in looking on at a deed of violence one would not be disposed to note these tranquil accompaniments.

So much had come between us and the early painters that we could hardly work in their manner except in accordance with an adopted conviction; and this to be of any value at all must be a sincere conviction, as it was with the pre-Raphaelite artists. Rossetti's "Annunciation," before referred to, was planned out in the definite manner of the early painters—one could even trace the pencil outline in which it was laid down. But this manner was not really natural to Rossetti, as it was to the early painters, and he could not keep it up; but this shows true accord between subject and treatment. Rossetti had made the very pregnant remark that in painting "the essential thing was fundamental brainwork." In comparing Crivelli's "Annunciation" with Rossetti's they would see that there was not this harmony between subject and treatment; there was no repose in the scene and in the figure of the over-dressed angel, which was fantastic and affected; there was a quantity of irrelevant detail which interfered with and distracted one from the ostensible subject of the picture; it was a picture that missed its point in regard to subject and only survived in virtue of its workmanship.

There were but few works in existence

which touched the highest excellence of complete balance between subject and execution. The Sistine paintings and the Stanze of the Vatican were among them. There we saw great themes treated with the highest power of execution. Ordinary mortals were wont to lean somewhat either to the one side or the other; to lay either too much stress on subject or too much on treatment. The greatest artists used their technical skill only to serve their mental conceptions. In these modern days we had so many things before us that it was difficult to judge which of numerous possible paths it was best to follow. Good work, technically, always had its value, but execution was not an end in itself; art had to influence the mind. We could not hold to the principle to let nothing come between us and nature; we could not help ourselves; all that had been done before us came between us and nature, and we could not ignore its influence. Reynolds indeed said that the best pathway to originality lay in the study of what had been done by our predecessors; but not to lead to the mere imitation of them. The present frequent attempt to imitate Velasquez was a mistake; it was only an imitation of his weaker side. Velasquez himself revealed that the easy mastery of his later work had not been easily attained; in his early period he was a plodding painter, as his early works distinctly showed; and his later works, in spite of their apparent freedom of style, were very carefully executed. But he was not at home in work requiring imagination. His so-called "Venus" was an example of this. It was not Venus, it was merely a model, and had it not been so splendidly painted it would have been valueless. So with Rubens; his goddesses were not goddesses, but merely Flemish women; he had little imagination; yet it must be said for him that he was obviously interested in his subjects for their own sake and not as a mere exercise in painting; he interested us by the dramatic force with which he represented the legends which he depicted; the "Abduction of the Sabine Women" for instance, though full of clever and interesting technical execution, was more than that—it was a very vivid and dramatic representation of the event. In imaginative work there was more than mere painting; the artist must have an ideal in his mind; and it was of no use to take great imaginative legends and treat them in a trivial and realistic manner. In the works of the old masters representing imaginative subjects it must be remembered that the archaic character of their work (as it now appeared to us) was in itself a quality which tended to remove them (to us) from the plane of realism; Botticelli's "Birth of Venus" was an example of this; and in Botticelli's work generally there was accord between subject and treatment: there was an endeavour to render an imaginative subject in a realistic manner. His Madonna in the Louvre, of which an illustration was shown, was not only fine in the design and expression of the figure, but was surrounded by beautiful accessories which all helped the main spirit of the picture, and yet did not distract the attention from the figure, because that still remained the strongest thing in the picture. Giorgione's "Fête Champêtre" in the Louvre might be cited as a perfect work; colour, subject, treatment all made one harmony; there was not a discordant detail in it. Veronese, like Velasquez, had technical power rather than imagination. His "Marriage at Cana" was merely a representation of a festival; it might be anything else than the marriage at Cana; and his "St. Helena" in the National Gallery was only a beautiful woman asleep; she might be any one; the angels with the cross in the air added nothing to the expression of the picture. Rembrandt and Watteau were among the imaginative painters. Rembrandt's treatment was always in accord with his subject; he always gave a dramatic realisation of the incident; in his "Good Samaritan" in the Louvre they could recognise this, for even the light and shade were so managed not merely for effect as such, but because some figures were intended to be prominent and others to be less so. Watteau might perhaps be said to be a poetic rather than an imaginative painter; he gave an air of reality to an unreal world. He exercised the will of the artist in choosing what he

wanted; and he produced his effects by concentration of light, somewhat in the same way that Rembrandt did. Hogarth might be described as an imaginative realist. In his own inventions of subjects, representing contemporary life but not actual facts, he was led along by his own mental impulse to treat the class of subject which he best understood; and it was noticeable that when he endeavoured to treat a subject of pure imagination, as in his "Sigmunda," he was much weaker in style.

In creative work dealing with purely imaginary subjects there was often a want of accord between the subject and the treatment because the artist's interest in the subject was not sincere. Sincerity of feeling was absolutely necessary to art, and with sincerity of interest any subject was justified. Where a picture represented something seen the artist's task was easier, as it was reduced to a matter of technical skill, and this quality was necessarily wanted, and there was no mystery about it; you could look and see how it was done and feel perhaps—"Well, if I were to give the same pains to it I could do that as well myself." Of this kind of unimaginative work where the treatment was in accord with the subject Velasquez, Moroni, and Veronese were examples, and the whole of the painters classified generally as "The Dutch School." Teniers showed the extreme of realism yet with a certain breadth of handling; he painted his pictures with a thick and full underpainting which came near the colour he ultimately wanted, and then finished by glazing over that. De Hooghe's pictures were remarkable for their simplicity of style and execution; they seemed generally to have been composed and painted straight off (there was one work of his that showed traces of a figure painted out, but this was very unusual); he always had a strong dark in one portion of a composition, with nearly white in the extreme lights. Steen, Metsu, and Terburg were among the great names of the school, and of these he thought Steen the greatest. With all these men the only impulse was to record in painting some appearance which had struck them as beautiful or picturesque. Franz Hals was one of the greatest exponents of this school; he was so clear and vigorous in style that the very execution of his works, his method, served to put one into the mood to sympathise with his work.

There were so many different kinds of excellencies in painting that it could hardly be said that there was any one to be followed exclusively of the rest. The modern painter ought to learn about the work of his predecessors; but to aim at following their principles rather than imitating their methods. It was a good practice to ask themselves, when struck by any particular point in the execution of a picture—"Why did the artist do that?" and to try to trace the reason. It must be remembered that they could not reconstruct the art of the past; their art must be in touch with their own time. Whether a man should aim at realistic or at imaginative painting was a question of the tendency of his own mind. Only one thing must be remembered, that to be an imaginative painter one must have imagination. Watts was our great modern example of this. All his subjects sprang from his own mind; he owed nothing to others on the imaginative side; he worked out his own thoughts in his own way, and hence there was complete accord between his subject and his treatment. Learning to paint merely would not make them artists; the training of the mind was as necessary as the training of the hand. The trivial treatment of great subjects that we sometimes saw arose from the want of mental training, from a consequent incapacity to understand the subject. It was well also to study the people one met ordinarily, out of doors, their manners and actions, as well as studying models in the schools. Experience and knowledge of the world, such as was possessed for instance by Titian, Rubens, Watts, and Millais, was of advantage to the artist. Knowledge of the world ought not to make him think less of his art, but more.

* Surely something more than this occasionally. Take that well-known Terburg, for instance (we forget his title at the moment), where the young woman stands with her back to the spectator listening to a lecture from her father; there is a real story in that, of obvious pathetic interest; it is like a chapter out of a novel.—Ed.

In conclusion, Mr. Clausen said that he could not but feel that it had been presumption on his part to critically review the works of great artists of the past, but it was necessary to adduce examples to illustrate his meaning, and if he had implied that there were shortcomings in some of them, this was not without a full recognition of their great qualities and their claims to respect. Painting was such a great subject that those who had accomplished anything in it were worthy of honour. Chardin said that art was an island of which he had only been round the coasts; and they might recall Chardin's well-known plea to Diderot, when the latter was posing as art-critic of the Salon, that if he took the worst picture in the exhibition, he would do well to remember that some two thousand men had nearly broken their hearts in trying to paint as well as that. And if they thought of all that had been accomplished in painting, those of them who would be become painters also and succeeded in their aim, might justly think that they had become citizens of no mean city.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

An ordinary meeting of the Royal Institute of British Architects was held on Monday night, at No. 9, Conduit-street, W., Mr. John Belcher, A.R.A., in the chair.

Metal-work.

Three papers on "Metal-work" were read, by Messrs. J. M. Swan, R.A., Montague Fordham, M.A., and Walter Gilbert, of which the following are abstracts:—

Mr. John M. Swan, R.A., in commencing his paper, apologised for the frequent allusions he was going to make to ancient art. He was so far penetrated by a profound reverence for the past that he felt we were but pigmies peering through the legs of the Colossus of antiquity. The thought of the Colossus of Rhodes that strode across the harbour where ships sailed out and in, and of Bartholdi's magnificent statue of Liberty at the entrance to New York Harbour, made him wonder when a statue of Britannia would arise from the waves in bronze of colossal form in the same spirit of antiquity, and emblematical of ourselves and of the sea-girt Isle to which we owe our greatness and power. Since the XVIIIth century Japan had produced a series of colossal works in bronze, the most notable being the Daibutsu, a seated figure, 53 ft. high, breadth of face 9 ft., 4 in. The processes employed by the ancients are shrouded in mystery, and so difficult to verify, that we cannot at this distance speak with absolute certainty or form a clear judgment upon them. All the varying changes of colour mentioned by the ancients are occasioned by the nature of the alloys. Many metals combine together when melted, and only remain in union within certain ranges of temperature by reason of the wide differences of their melting and solidifying points. In ancient bronze the proportions of tin mixed with brass or copper and of copper with silver seem to have been—Copper, seventy-one to eighty-seven parts; tin, three to six parts; lead, four to twenty-one parts. There are also traces of iron. With ourselves, in ordinary bronze ninety-six copper and four of tin are generally used. The Japanese are the real authorities for treatment of colour in metals to-day. They combine such extraordinary manipulative skill with artistic taste in carrying out any imaginative work. The superiority of French workmanship is doubtless due to their fine artistic instinct allied to their excellent art training. The Persian and Arabian metal work, with large plain surfaces of copper and brass, might, treated in a bas-relief manner, be well adapted by ourselves for panel treatment for interior decoration. Describing the process of casting in cera perduta, which we get from Benvenuto Cellini, the author recalled that it is now about twenty years since the first cera perduta castings were made in this country. First, an ordinary piece mould or gelatine mould is made from the plaster model. Then a wax casting is run from the mould, to which are attached the runners and gates for the flow of metal, and vents for air or gases. Afterwards the wax is cored, and an external covering-in mould covers the whole. It is then placed in a muffle or

furnace, the wax melted out, and when the mould is dry the metal is passed in that replaces the wax model. The founders' wax is made of Gambia, Italian, or native bees-wax and resin coloured with vegetable matter or vermilion. The colouring of the wax is important, as if some metallic pigment or earth colour were employed it would cause a residue in melting out that would destroy the casting. Speaking of the bronze statues of London, Mr. Swan said everybody must be struck with their uniform dull, heavy, monotonous black. It was a most unsatisfactory state of things for both public and artist. Was it not possible in metallurgy to discover an unchangeable alloy? The black coats of Landseer's lions in Trafalgar Square do not recall the orange tawny glow of the king of beasts. The author expressed his preference in many cases for gilded statues, or monuments that would better resist the action of the atmosphere and have a more decorative effect. They might appear too garish at first, but London fog would soon tone the surface and take off the glare of new gilding. Fine colour is a source of joy to us all; certain it is that a gilded statue, assuming the artist's conception a beautiful creature would appear as a sunbeam in our streets in the dull, foggy weather, and in the summer, in sunshine with blue skies overhead, would be a joy for ever. The "noble rust," the antique patina, is not naturally formed in the atmosphere of London, or our statues of malachite and copper denes would be a delightful green. The author hoped no more of their ancient landmarks in London would be removed, lamenting especially the old-time Lion of Northumberland House, and the old familiar figure of the Duke of Wellington at Hyde Park Corner. He should like to see Bobbin's statue of the Duke higher up. Whenever he took his walks abroad he cast his eyes around for fountains playing in the sun-baked square, the whirl of pigeons, the flower patches, he was always looking for them, also for some decorative groups as a relief from the historical personage on a pedestal—something to relieve the dull ache of town and the monotony of heroes in trousers. Bronze bas-relief or gilt bronze in relief on marble should be fine as a decoration—even with us. He did not see why we should have less devotion for our heroes by giving them a more beautiful decorative aspect or less feeling for our architectural surroundings. Colour would be subservient to sculpture and a glorious handmaid to architecture; the charm of mosaic is capable of wedding a beautiful monumental design; to present our monuments are barren of colour, especially deficient in treatment of the pedestals and bases. What can be more unsympathetic than the basins of the fountains of Trafalgar Square? Here is room for the sculptor as designer, and play of coloured metals and water. Gilded bronze can work in unison with black bronze, and aluminium may be looked after, so that it does not become the uniform London black.

Mr. Montague Fordham said he was anxious to draw architects down into the workshops, which would have the double advantage of giving them more knowledge of the actual treatment of metal and of creating a closer bond between architect and craftsman. With this object he gave particulars of the tools used in the ordinary working of copper, bronze, and iron, and followed with some notes on the nature of the metals and their proper treatment. Having discussed the technical side of his subject, and shown examples of the admirable work produced by craftsmen of the day, he referred to the want of encouragement the craftsman received from architects, who rarely entrust their metal-work to craftsmen, but deal with trade firms. Doubtless this was much less trouble. A trade firm employs a traveller, who is at the architect's beck and call, who will supply a design in any manner, adapt it for any metal, and cut his work down to any price. How was the designer craftsman, the master craftsman, who could turn out magnificent work under different conditions, to compete with such a system? He doubted whether any self-respecting craftsman would employ a traveller, neither should the architect expect it. If the architect would give the craftsman the slightest encouragement, he would gladly place at the architect's disposal the result of his practical study and knowledge. The

craftsman worked with the definite ideal of a revival of the crafts, and aimed at producing a really beautiful piece of work. There was no reason why the metal craftsman should not be as reliable in his arrangements as the ordinary man of business. They had got over the disease of their youth, the so-called artistic temperament, and had business organisation to support them. Again, the normal prices of the metal craftsman need be no higher than the ordinary trade price. If architects invited the craftsmen to help them in the detail of their metal-work, they would, whilst taking their share in the work of the revival of the crafts, obtain at the same time an undoubted distinction of detail in their work. This type of distinction he feared trade firms could not give, for the very essence of the difference between good work and poor work lay only partially in the design, and largely in the conditions under which it is carried out, and the spirit in which it is made. It was a question of methods of organisation and of workshop inspiration: for example, in relation to such work as altar-crozes, chalices, etc., used for a definite religious purpose, it was of the utmost importance to realise that unless the workshop and men were imbued with some element of inspired enthusiasm the work would always be an artistic failure. The matter of the revival of metal-work rested largely with the architects. It was for them to say whether the small industries now growing slowly were to be allowed to flourish; if so, he felt great hope that the present century would become famous in all time for the distinction of its metal-work.

Mr. Walter Gilbert, whose paper was entitled "Romance in Metal-work," confessed his inability to show any fresh views of the art of metal-work, but he would endeavour to explain a little of that impulse which urged the artist to find expression in those methods and materials with which he felt in most sympathy, and which had the most influence in the development of the art. Primarily it is imagination, or rather the consciousness of imagination—the ruling faculty in all art—which creates art. But real art is something more than this: it is imagination allied with skill and dexterity in the creation of beauty. Beauty is the criterion of all art, the object of all human longing, and a source of human enjoyment. It is but to the most sordid and debased the great desire and the unflinching source of pleasure, and in such measure as the intellect is trained will that enjoyment be. The perfect work of art is always the result of some emotional mood and that work is the most perfect which conveys the dream of the artist most successfully and most fully. Treating of the influence at work amongst the metal-workers of the Greeks and Romans, of the Gothic period, and the masters of the Renaissance, the author showed that the Greek metal-worker or sculptor never sought nor received inspiration from plant forms—nothing of this is found in his art, save perhaps an occasional subordinate sprig of foliage, for the perfect art must always possess the sensual element of beauty to attract and retain attention. If the Roman loved the bay and the vine it was not because of their plant form, but because the bay spoke to him of conquest, and the vine was synonymous with the worship of Bacchus, and all that revelry and riot of the Empire which succeeded the severity and serenity of the Consulate years. Studying some of the beautiful little bronzes in the Pierpont Morgan and other collections in the South Kensington Museum, the author had been amazed at the extent to which the imagination of the great Italian and other masters of the Renaissance had been stirred by the purpose of the objects they had so lovingly and carefully designed. Yet there was no original treatment. Just as Petrarch and Ariosto were inspired by the masters of Greek and Roman literature, so the sculptors of the Renaissance were indebted to the Greeks and Romans for their ideals, and the source of origin of many of their creations is not far to seek. The great art of the Renaissance, however, was not the copy of the art of the ancients, but the result of its inspiration. Just as the Renaissance *littérateur* satisfied himself with rhetoric and well-rounded and polished sentences instead of the clear and limpid words of the classic, so the metal-worker viewed his imagination through

decorative spectacles and mysteries, and from that time onward the greatest artists have been those who have felt most strongly this fascination, and have become the poets of death rather than of majesty in human shape. In the north, however, the dramatic passion, the sublimity of the imagination, the energy and earnestness of purpose, and truer sincerity of religion, together raised the ideal from what had been the result of well-polished scholarship—this in itself was the subtle influence of the vigour and robustness of the long Gothic period. Traising the influence which has inspired later times, the author came to that period in France when the kings dreamt of glory and expansion, and the love of France became manifest in the worship of its kings. Examples of this courtly impulse were afforded by the screens round the forecourt of the palace of Stanislaus at Nancy, and Adam and Girardon's Fountain of Neptune at Versailles. From the worship and adoration of patriotism in the person of their kings it was a small stride in the days of freedom and democracy to deify the republic, its progress and triumph, both in the abstract, as in the masterpieces of Dalou, and in the personages of her most distinguished sons. As illustrations the author cited the gates to the Apollo Gallery in the Louvre, the statues to Delacroix, Danton, and La Fontaine. Under all great art of the metal-worker, whether the thing to be done is great or small, there must always be the same working of the intellect, the same poetic feeling for the ideal in story, the same tenderness for material. As for the future, let us not hastily condemn any struggle for new treatment. The achievements of the past are to be learnt from, not slavishly copied. To revive art, scholarship and intellectual training are necessary. It is not debating art to sell it. What the artist requires is not too arbitrary an assertion on the part of the architect of what is good or bad, for which often an architect, owing to present-day methods of training, is not too well qualified to judge, but a stimulus to thought and energy for the artist—that the architect may gather round him a band of men working eagerly in close co-operation with him for the glorification of his building and an advancement of his fame.

Mr. Hubbard, in proposing a vote of thanks to the readers of the papers, said they had approached the subject of metal-work from three very different points of view. Mr. Swan's paper was one of the most interesting as to early history of metal-work he had ever listened to, but one point he did not understand. He would like to know if he correctly understood Mr. Swan to say that the art of casting in bronze was not known at the time of Homer. Mr. Swan said he believed there was no historical reference to any cast-work. Mr. Hubbard said there was the Early Bronze Age after the Stone Age in which they certainly cast bronze centuries before the time of Homer. What struck him most agreeably was to hear Mr. Swan's statement that the Japanese were the Greeks of the present day in the excellence of their art in metal-work. Certainly from the exhibits before them they had some extremely fine specimens, not only of Japanese art, for the casting in bronze of the cat's head was a magnificent piece of early Egyptian work. As Mr. Swan had pointed out, the Japanese, not only in the excellence of their metal-work, but in their colour-work were unapproached by any other nation, while the ivory work by Okawa could not be approached by any other nation. It was also extremely interesting to hear the description of the cera-perduta casting, which was so well described by Benvenuto Cellini, for he had never before seen specimens which made it so clear as to how the wax was got rid of and the gases allowed to escape. It was by such lectures as these that architects really got an insight into the inner working of the arts which they were supposed to practise. Mr. Fordham treated the subject from the practical point of view, and in his innocence he (the speaker) always thought that it was the smith "who's brow was wet with honest sweat," but now he found it was not the smith at all, but the striker. The tools which were used were wonderful, but one could not help regretting that the work produced to-day was far inferior to the work of France or Germany, and that the work of no country equalled

that of the mediæval art metal-workers. The beautiful set of slides shown by Mr. Gilbert were very interesting, and showed how sentiment was a necessary encouragement to any art, and especially with metal-work.

Mr. Harrison Townsend seconded the motion, and said he had been asked by Mr. Fordham to apologise for his inability to stop for the discussion. Mr. Fordham had opened to them the door of the craftsman's workshop, and showed what the craftsman did and the implements he used in his work. Mr. Swan, on the other hand, was retrospective for part of his time and hopeful for another part when he led them to dream dreams of a London where their statues might not only be washed but even occasionally gilded. He did not know whether the experiences which had been gained as to this latter treatment would lead them to repeat it when they remembered the statue at the top of Sloane-street, from which the London County Council had now removed the last sign of gilding. Mr. Gilbert finally imparted what he thought was necessary in every consideration of art, i.e., sentiment, and had pointed out what were the inspiring cause and the ideal of the beautiful works of art which had been exhibited on the screen. Mr. Gilbert had shown them, as Emerson had said, that the artist could—

"Give to barrows (trays and pans,
Grace and slimmer of routine."

The Chairman said Mr. Swan had given them a paper full of enthusiasm, and, if he might say so, full of profound knowledge modestly veiled, and they were also indebted to him for showing beautiful examples of work they had before them. He felt with Mr. Swan how terrible was the dead blackness of the statues in London, and hoped that some way would be found of keeping them clean and of a bright colour. The London County Council was, he believed, the authority which had endeavoured to keep them clean, and had covered them with something which looked to him like chocolate—there was still a shine but the colour had all gone. Various attempts had been made at gilding, and reference had been made to the Sloane-street statue. There some parts were gilded, but it did not last very long, and evidently the London County Council considered it hopeless, for there was nothing new in the way of gilt. The only thing left when he last saw the statue was a bird's nest, which did not improve the effect very much. They had also the Gilbert fountain with the top figure in aluminium. He remembered Mr. Gilbert saying he hoped it would keep its colour, but it had got as black as the rest of the statues. It had lately been cleaned, and looked as if it had been done in cement. Mr. Swan had referred to the Duke of Wellington's statue, and when he saw that last at Aldershot it had a most delightful colour, being brilliantly green in some parts. He was also glad that Mr. Swan had referred to the columns of St. Martin's Church, for the silvery grey of the washed side of the columns had a most beautiful effect. It was one of the beauties of Portland stone in London. He knew the public thought it a great mistake, and one of the faults of Portland stone that it should be grey on one side and black on the other, and the effort had been made to wash St. Paul's Cathedral and get rid of the black. He thought, however, that it was one of the beauties of Portland stone where the contrasts of silvery grey and black were to be found, for the black intensified the appearance of the grey. Mr. Fordham had given them a great deal of information which was of value to them, and there was no doubt the more they knew of the details of the craftsman's work and the limitations of his craft the better it was for them. That applied to all the arts. The more they could familiarise themselves with the methods and processes adopted by various craftsmen the better they would agree together in working. He could not quite follow Mr. Fordham in his lecture to architects. He ventured to say that if they, as architects, had a good artist they stuck to him, but if they were supplied with bad work then they ceased to employ the artist. That was really the secret of the business. It was not a question whether a man worked in the society or company or guild—so long as his work was good they respected him and stuck to him. He felt that the paper by Mr. Gilbert was most delightful, intellectual, and poetical, and his

allusion to purpose in art applied quite as much to architects as to metal-workers. They had, however, been shown in a delightful way how purpose in art assisted the artist in giving expression and character to his work.

The vote of thanks was heartily carried. Mr. Swan, in reply, said that there was evidence that stone-moulds were used in the Bronze Age and the Egyptians produced solid bronze statues long before the Homeric Age.

Mr. Gilbert said that if architects would only back up artists there would be a great deal more gilding done, but in their modesty, as Englishmen, they were afraid of making too much show.

The Prizes and Studentships, 1906.

The Secretary then read the Council's Deed of Award in reference to the prizes and studentships for 1906. The designs and drawings submitted for the prizes and studentships are now on exhibition in the Gallery of the Alpine Club (entrance in Mill-street, Conduit-street, W.). The Deed of Award gives particulars of the competitions and the results thereof as follows:—

The Royal Institute Silver Medals.

(i.) *The Essay Medal and Twenty-five Guineas*.—Six Biographies of British Architects (deceased) practising in the XIXth century were received for the Silver Medal under the following mottoes:—

1. "Our Alchemists," 4.
2. "Terra Incognita," brevis, "Ars longa vita brevis," 4.
3. "Devotio of a Voluité," 5.
5. "Gargole," 6.
6. "Shingalee," 6.

The Council have awarded the Medal and twenty-five guineas to the author of the Biography of "George Devey, F.R.I.B.A. (1820-1886)," submitted under motto "Terra Incognita" [W. H. Godfrey, Queen Anne's-gate, S.W.], and Certificates of Hon. Mention to the authors of the Biographies bearing the mottoes respectively of "Gargole" [M. S. Briggs, Oldley] and "Shingalee" [A. E. Bullock, Chiswick].

(ii.) *The Measured Drawings Medal and 10l. 10s.*—Fifteen sets of drawings were sent in of the various buildings indicated, and under mottoes as follows:—

1. "A.D. 1690"; 6 strainers (Hampton Court Palace).
2. "Aix"; 4 strainers (Château de Montirail, Saitte, France).
3. "Aus Picante Deo"; 4 strainers (Queen Anne's Orangery, Kensington).
4. "Fiat Lux"; 6 strainers (Le Grand Trianon, Versailles).
5. "C"; 6 strainers (Banqueting Hall, Kensington Palace).
6. "Mecca"; 5 strainers (St. Allege, Greenwich).
7. "Omega"; 6 strainers (St. Anne's Orangery, Kensington Palace).
8. "Qui s'excuse s'accuse"; 6 strainers (Le Petit Trianon, Versailles).
9. "Reflex"; 5 strainers (St. Stephen's, Walbrook).
10. "San Marco"; 6 strainers (Santa Maria dei Miracoli, Venice).
11. "Sansvino"; 6 strainers (Old Library of St. Mark's, Venice).
12. "Sigillu Ecclesie Trinitatis d. Toimham"; 5 strainers (Christchurch Priory, Hants).
13. "Try"; 6 strainers (St. Peter Mancroft, Norwich).
14. "VII God I Zal"; 6 strainers (Castle Menzies, Aberfeldy).
15. "Wren"; 4 strainers (Banqueting Hall, Kensington Palace).

The Council have awarded a Silver Medal and ten guineas to the delineators of Hampton Court Palace and Christchurch Priory, submitted under the mottoes, respectively, of "A.D. 1690" [A. E. Poley, Hampton Hill], and "Sigillu Ecclesie Trinitatis d. Toimham" [G. J. Coombs, Boscombe], and a Certificate of Hon. Mention to the delineator of Santa Maria dei Miracoli, submitted under the motto "San Marco" [P. Wells Lovell, Highgate].

The Travelling Studentships.

(i.) *The Soane Medallion and 100l.*—Ten designs for a realisation of the ideal mansion described in Bacon's Essay "of Building" were submitted under the following mottoes:—

1. "Comme Cl"; 4 strainers.
2. "Fraxinella"; 4 strainers.
3. "John Thorpe"; 4 strainers.
4. "Palazzo"; 5 strainers.
5. "Peruzzi"; 5 strainers.
6. "Recess"; 5 strainers.
7. "Viscount"; 6 strainers.
8. "White Lion"; 6 strainers.
9. "Zed"; 5 strainers.
10. "Devise of a Bee on the Wing"; 5 strainers.

The Council have awarded the Medallion and (subject to the specified conditions) the sum of 100l. to the author of the design bearing

the motto "John Thorpe" (W. S. George, Ashton-under-Lyne), and a Certificate of Hon. Mention and ten guineas to the author of the design with the motto "White Lion" [R. Atkinson, Lenton, Nottingham].

(ii.) *The Owen Jones Studentship and 100l.*—Five applications were received for the Owen Jones Studentship from the following:—

1. W. J. Davies; 6 strainers.
2. Matthew Dawson; 6 strainers.
3. Charles Gascoyne; 6 strainers.
4. A. R. H. Jackson; 6 strainers.
5. Arthur D. Nicholson; 6 strainers.

The Council have awarded the Certificate and (subject to the specified conditions) the sum of 100l. to Mr. C. Gascoyne, Gray's Inn-square, W.C., and five guineas each to Messrs. W. J. Davies, Thornton Dene, Sidcup Park; A. D. Nicholson, Glasgow West; and A. R. H. Jackson, Royal College of Art, South Kensington.

(iii.) *The Pugin Studentship and 40l.*—Twelve applications were received for the Pugin Studentship from the following:—

1. J. W. Carter; 5 strainers.
2. G. H. Hill; 6 strainers.
3. Walter S. George; 6 strainers.
4. Jordan Green; 6 strainers.
5. T. Gordon Jackson; 6 strainers.
6. W. H. MacLuscas; 6 strainers.
7. Oswald P. Milne; 6 strainers.
8. J. R. M. Morison; 6 strainers.
9. J. S. H. Pearson; 6 strainers.
10. G. S. Salomons; 6 strainers.
11. H. W. Simister; 6 strainers.
12. B. Cecil Westwick; 3 strainers.

The Council have awarded the Medal and (subject to the specified conditions) the sum of 40l. to Mr. G. Droydale, and a Certificate of Hon. Mention to Mr. Jordan Green, Handsworth, Birmingham.

(iv.) *The Godwin Medal and 65l.*—Five applications were received for the Godwin Bursary from the following:—

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| 1. Alfred E. Corbett; | 4. Inbro Triggs. |
| 2. C. E. Power; | 5. A. H. Verstaag. |
| 3. F. Tomlin. | |

The Council have awarded the Medal and (subject to the specified conditions) the sum of 65l. to Mr. H. Inigo Triggs, Bedford Park, Chiswick.

(v.) *The Titie Certificate and 30l.*—Twenty-one designs for an open-air swimming-bath with an arcade or colonnaded inclosure were submitted under the following mottoes:—

1. "A.D. 1906"; 5 strainers.
2. "Ajax"; 4 strainers.
3. "Aqua"; 4 strainers.
4. "Aquatius"; 6 strainers.
5. "Aristobulus"; 4 strainers.
6. "Bo'sun"; 4 strainers.
7. "Cui Bono?"; 5 strainers.
8. "Dolphin" (white strainers); 4 strainers.
9. "Dolphin" (brown strainers); 4 strainers.
10. "Dorian"; 5 strainers.
11. "Pleuribus unum"; 4 strainers.
12. "Eclipse"; 4 strainers.
13. "Fiat Lux"; 5 strainers.
14. "Hoslen Gray"; 6 strainers.
15. "R.L."; 5 strainers.
16. "Michaelange"; 4 strainers.
17. "Pleades"; 2 strainers.
18. "Seed"; 5 strainers.
19. "Schiz"; 6 strainers.
20. "Ultra"; 5 strainers.
21. "1905"; 5 strainers.

The Council have awarded the Certificate and (subject to the specified conditions) a sum of 30l. to the author of the design bearing the motto "Dolphin" (white strainers) [A. G. Horsnell, Cheshamford], a Medal of Merit to the author of the design under motto "Eclipse" [C. B. Pearson, Lancaster], and a Certificate of Hon. Mention to the author of the design under motto "Dorian" [C. L. Wright, West Kensington, W.].

The Arthur Cates Prize: 40l.—One application for the Arthur Cates Prize was received from Mr. J. H. Markham, West Hampstead, N.W., and the Council have awarded him the prize.

Prize for Design and Construction.

The Grissell Gold Medal and 10l. 10s.—Six designs for a stone skew bridge were submitted under the following mottoes:—

1. "Bydand"; 3 strainers.
2. "Fatenary"; 3 strainers.
3. "P"; 6 strainers.
4. "Nil"; 4 strainers.
5. "R"; 6 strainers.
6. "Little Dalc"; 3 strainers.

The Council have awarded the Medal and 10l. 10s. to the author of the design bearing the motto "Little Dalc" [G. Nott, Leicester].

The Asphitel Prize, 1905.—The Council have, on the recommendation of the Board of Examiners (Architecture), awarded the Asphitel Prize to Mr. J. H. Markham, West Hampstead, N.W. The Council have further

awarded a Prize of Books, value 10l., to Mr. A. R. Myers, Edinburgh, in recognition of his meritorious work at the Special Examination, November, 1905.

The Travelling Students' Work.

Soane Medallist, 1904.—The Council have approved the drawings executed by Mr. Frederic J. Horth, who was awarded the Medallion in 1904, and who studied in Italy.

Owen Jones Studentship, 1904.—The Council have approved the work of Mr. Wm. Davidson, who was awarded the Studentship in 1904, and who studied in Italy.

Godwin Bursary, 1904.—The Council have approved the report of Mr. H. Phillips Fletcher, who was awarded the Godwin Bursary, 1904, and who visited the St. Louis Exhibition.

Godwin Bursary, 1905.—The Council have approved the report of Mr. F. R. Horns, who was awarded the Godwin Bursary in 1905, and who has reported on Municipal Administration in France.

Pugin Studentship, 1905.—The Council have approved the work of Mr. Edward Garratt, who was elected Pugin Student for 1905, and who travelled in Oxfordshire, Somerset, Dorset, Gloucestershire, Wiltshire, and Hampshire.

Tite Prizeman, 1905.—The Council have approved the work of Mr. R. Atkinson, who was awarded the Tite Prize in 1905, and who studied in Italy.

The Chairman announced that the next meeting would be held on February 5, when an address would be delivered to students, and there would be a criticism of the works submitted for the year's prizes by Mr. J. W. Simpson.

THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of the Architectural Association was held on Friday last week at No. 18, Tufton-street, Westminster, S.W., Mr. Louis Ambler, Vice-President, in the chair.

The minutes were read and confirmed, and some nominations were made, after which the following gentlemen were elected members, i.e. —

G. W. Home, West Kensington	E. P. Cooper, Acton
R. Griffin, Southend	C. H. Rose, Balham
R. Mountford, Piggott, Wandsworth Common	E. J. Cartear, New Green.

The reinstatement of Mr. A. Dicken was also announced.

The Chairman announced further donations to the Building Fund, i.e. —

J. S. Gibson, £1 1 0	D. W. Stewart, 0 10 6
T. H. Russell, 1 1 0	ditto, 0 10 6
G. H. F. Conyn, 1 0 0	A. Stratton, do. 0 10 6
L. Ambler, double subscription, 0 10 6	H. A. Satchell, 0 10 6
W. G. R. Bousfield, ditto, 0 10 6	W. F. Ensworth, 0 10 6
W. A. Forsyth, ditto, 0 10 6	W. Henry White, 0 10 6
A. Mantley, do. 0 10 6	P. G. Yates, 0 10 6
F. E. Newton, do. 0 10 6	ditto, 0 10 6

He also stated that there was a vacancy in Bombay for a practical draughtsman, age between twenty-two and twenty-eight; three years' agreement. Particulars could be had upon application to the Secretary.

Mr. A. Maryon Watson, Hon. Secretary, announced the first spring visit, to the Central Criminal Court, Old Bailey, by permission of the architect, Mr. E. W. Mountford, on Saturday, January 27. Members to meet at the building at 2 p.m.

Mr. Tanner, jun., Hon. Secretary, proposed a vote of thanks to Mr. W. G. B. Lewis for donation of a copy of the Post-Office Directory, 1906. This having been agreed to, Mr. Tanner also announced that the Discussion Section would meet on January 31, when a paper will be read by Mr. A. C. Dickie on "Internal Steps and Stairs and their Treatment." He also stated that a students' smoking concert will be held on Friday, February 2, at the Gaiety Restaurant, Georgian Hall, at 8 p.m.

The Consideration of Sculpture by Architects.

Mr. F. Lynn Jenkins then read the following paper on "The Consideration of Sculpture by Architects" —

"When some months since I received from the Architectural Association Council an invitation to read a paper to the Association, I at first experienced some difficulty in finding a new and interesting subject. It happened, however, that early last year, as no doubt, some of you will remember, a very interesting and lively discussion took place

at one of the meetings of the Art Workers' Guild on the subject I have chosen, and I thought I could not do better than select this, and by enlarging on the paper I read then, endeavour to use it to the best of my ability. I am not sure that the title is altogether clear in its meaning. Perhaps "How Architects Consider or Deal with Sculpture" would better express the intention I have in my mind.

From the earliest times the master builder, he who conceived the design of a structure to be built, consciously or unconsciously felt that the bare constructive details which utility demanded in the edifice did not wholly satisfy him. The desire innate in man far more peculiar or personal significance in his house led him to carve on the door-post, or some similar coin of vantage, a sign, symbolic of his name, his craft, his character, or his position. Later these hieroglyphics became more pretensions, and as civilisation advanced and the cult of hero-worship grew in force, man began to memorialise his dead and to build sarcophagi, on which he sculptured a history of the deeds and virtues of the departed. Religion also brought its necessities of altars and temples, and its presentments of the deity worshipped. In studying the history of the earliest ages of civilised mankind we seldom, if ever, find the art of sculpture employed without a direct and useful purpose, the isolated statue, unless it portrayed a hero or an idol to be worshipped, being practically unknown, so that we may infer that sculptured figure or symbolical ornament, whether carved in wood or stone, marble or granite, or cast in metal, was designed and executed solely to convey an intention which could not be well expressed by any other means.

It was not until a later age, when cultured simplicity gave place to the luxury and extravagance of super-civilisation, when pompous vulgarity superseded refined taste, that man commenced to lavish ornament devoid of any real significance on his buildings. I do not propose to illustrate this fact by reference to individual works throughout the ages; I think it will be sufficiently obvious that the argument is proven by history, that whereas in the beginning sculpture was used solely for an end which rendered it a necessity, in later times it degenerated into being, broadly speaking, a means of ostentatious display of wealth and exuberant luxury, and ceased to be an integral part of the *raison d'être* of the building it adorned. In stating this I do not overlook the gradual development of the natural instinct to make the "house beautiful," nor do I aver that ornamentation may not be equally necessary in designing from the æsthetic point of view; the fact remains that a time came when the demands of beauty claimed equal, and afterwards greater, rank than those of pure utility, and that whereas in the latter case the artist was limited within set bounds, in the former the restrictions were less apparent, depending as they did on the individual taste of the designer.

Hence we may take the architecture of the Egyptian as one example of a period when sculpture was used solely because it was the only means the builder had of expressing his full intention, and, on the other hand, that of the Greeks as illustrative of the perfect, restrained, and refined consummation of the aims of the utilitarian as well as the lover of beauty and style.

There was another difference noticeable from the moment when the cult of beauty entered largely into the consideration of the architect, for, whereas in the structures of the earlier designers that elusive quality we call "style" was shown in a very marked degree, it was the unconscious emanation of the character of each particular age and people, while the Greeks, with their newer ideals, aimed at and actually achieved the creation of not one but several complete conventional orders of architecture, each replete with style, each with its corresponding detail of ornamentation, each in harmony with the requirements of its time, both æsthetic and practical, finer than which nothing has since been attained to. The architecture of that age without doubt most nearly approached human perfection in its rich simplicity, won by the wedding together of the highest ideals of beauty and practical utility.

From that culminating point onwards in

the history of architecture and sculpture the downward grade began, in some measure because of the very perfection of these ideals materialised for man's emulation.

After every exposition of genius there is always some reaction, always a host of imitators who strive to reach the same or even a higher goal of perfection without ever probing for the great secret which underlies the perfect success, and which is the mainspring of the achievement. Seizing on whatever superficial characteristic marks the work of genius from others, they endow this apparent difference with miraculous virtue, and, imagining that therein lies the straight road to the desired end, seize on this peculiarity, enlarging on it and carrying it beyond all bounds of restraint in their illogical efforts. It has ever been thus in the history of art, whether sculpture, painting, architecture, literature, or music. So, because the Greeks introduced a new note into their wonderful architecture by the use of sculptured decorative ornament conceived in the finest spirit of logical practicability, introduced not merely for the sake of utility, but because they achieved the grand secret of making utility and beauty coincide, in the ages that followed men strove to emulate their genius by attaching undue importance to this one note in the perfect chord of Greek art, and played that note loudly, with many octaves, remorselessly endeavouring to make it the dominant of other chords in lower keys. Sculpture and ornament were applied lavishly with no logical reason as regards utility of purpose, with no cultured simplicity of style, and with little or no individuality or fitness. It is true that the Renaissance for a time stimulated a noble order of things, that while it lasted a glimpse of the vital secret of the Greeks enabled the artists of that period to attain to a high standard of beauty, in which we find purity of motive, marked individuality, and yet another fresh characteristic. For while the Greeks achieved an almost godlike perfection, it was a pagan, superhumanly cold perfection, while the artists of the Renaissance, though attaining to a lower standard of success, infused a larger proportion of human nature into their productions, a sympathy with mankind born of the warmer culture of a romantic and passionate people. For this reason when the inevitable reaction again occurred the art did not sink so low, because men were striving with ideals they better understood, in which the human element responded and beckoned them on.

Another factor had also risen in Western Europe, which reached its richest, if not its purest, expression coincidentally with the Renaissance. I refer to the Gothic movement, that great style in which Christian men found outward expression for the religious fervour which possessed their souls, and which at its best conformed to the same ideals as the architecture of the Greeks. For my argument, however, I introduce it merely because of the influence it had on the work of the Renaissance, for there can be little doubt that a greater proportion of the human element instilled into the Renaissance architecture owed its origin to Gothic influence.

Since the date of the Renaissance there have been many notable architectural achievements, particularly in France and this country, periods when sculpture has played a logical and consistent *role* in conformity with the architecture it embellishes. Still, there has been no great movement to mark an epoch, and until the last few years no effort has apparently been made to evolve a style bearing the vital expression of its own time.

I have the profoundest admiration for the sublime performances of the great masters of Greek and Roman architecture for their genius and culture. I do not argue that another Doric, Ionic, or similar order may be lightly evolved, but, nevertheless, I strongly feel that, inasmuch as they were the creations of minds trained to perfection in practicability, beauty of line, proportion, mass, and silhouette, and, above all, in exquisite detail, there is no reason why the architect of to-day should not from his own inner-consciousness, his culture, and set aim produce buildings inspired by the requirements of his own day which would at least be thorough throughout, with individuality and characteristic style in the smallest detail.

When we remember that it is a simple matter for any architectural student to determine the style and date of a mediæval Gothic building merely from a glance at the ornament on it, it seems an anomaly that to-day, when a new style consistent with the spirit of our time is being surely, if slowly, evolved by some of our ablest architects, a style marked by strong individual characteristics in general, there has been little or no attempt at the evolution of a fresh and fitting style of ornament to embellish such buildings, and we find XXth century architecture ornamented with a parboiled *réchauffé* of classical Renaissance or Jacobean detail. I have often thought that one of the chief reasons why the sculpture and ornament of the Greeks and Romans, of the Renaissance, and of the Gothic buildings were so perfectly in accord with the architecture was because the architects were the sculptors and the sculptors the architects. Nowadays, unfortunately, we are specialists, and, as a rule, the architect knows little of the practical side of sculpture and the sculptor even less still of that of architecture.

This is, however, an age when there are many thoughtful, enthusiastic, and inventive sculptors who would gladly assist in the development of a characteristic and personal style of ornament, if architects could but express what they themselves really wanted. So long as ornament is handed over to business firms of architectural carvers, with their private museums of stock casts as their sole inspiration, not to get new ideas from, but from which to select and arrange, long will the neglect of this important part of the detail of many an otherwise good building appear to the historian of our time to have been unwarrantable and inexplicable in architects showing otherwise so much individuality, forethought, and enthusiasm. The over-familiar "egg-and-tongue," "bead-and-reel," and similar detail are perfect when properly applied; still, it must surely be possible to devise new ornamental members having all the degrees of light and shade which they possess, and yet with a more personal motif suitable to the modern building.

Some sculptors have felt the want of individuality in carved detail so much that they have for their special requirements evolved their own ornament. Amongst these Alfred Gilbert, R.A., and George Frampton, R.A., are notable instances. But while such ornament as modern sculptors have produced may be excellent in its conjunction with the rest of the sculptor's design, it was frankly for the personal requirements of the artists, and I mention it but to show that architects have not sufficiently exploited the latent ability of their brother artists the sculptors to strike with them that complete chord of harmony and refinement which is comparatively rare in the architecture of the present day.

One of the most notable features of the wonderful perfection of the Greek masterpieces, a fact that must have forced itself upon all who have closely studied them, is that it would not be possible to omit any minute part of the sculptured or ornamental detail without marring the perfection of the whole, and, *vice versa*, nothing could be added without procuring a similar result.

There can be no doubt that the Greeks considered the close study of the human figure above all else, making not merely drawings or models from life, but analysing the reasons which make it the most perfect design on earth, embodying themselves with the essential theory of its wonderfully constructed form rather than examining the anatomical structure. Hence they attained a thorough knowledge of the laws which govern the making of a practical and exquisitely beautiful creation by means of critical and analytical observation of nature in its most ideal forms.

Goethe wrote: "So much is certain; the old artists had as complete a knowledge of nature, and as definite an idea of what can be represented and how it must be represented as Homer had. These great works of art were at the same time supreme works of nature, produced by men according to just and natural laws. All that is arbitrary or fantastic falls away; here is necessity; here is God." And, again: "If the artist, by imitating nature, by striving to find a universal expression for it, by exact and

profound study of the objects themselves, finally attains to an exact and ever exacter knowledge of the qualities of things and the mode of their existence, so that he surveys the whole series of forms and can range together and imitate the various characteristic shapes, then what he achieves, if he achieves his utmost, and what, if achieved, sets his work on a level with the highest efforts of man, is Style."

It was this gigantic understanding of nature which endowed their great sculpture with a God-like impersonal idealism, and which when brought to bear on their architectural undertakings rendered them equally perfect in their sublime beauty and practicality.

I believe they regarded the human figure in its most ideal form as the type governing all rules of design. They realised to the fullest extent that it could in no possible way be improved by alteration, either by addition or subtraction; they knew by heart its subtle constructive values; they studied the disposition of its details, as opposed to its broad, simple masses; they understood the exquisite beauty of its proportions and its unapproachable harmony of line and silhouette viewed from any aspect; they felt the value of its wonderful variety of planes, its "local colour," and, above all, its marvellous unity and simplicity; and, with this set ideal well rooted in their minds, they strove and succeeded with consummate skill in blending these conditions into their masterpieces of architecture. I fully appreciate that modern conditions are altogether different, that the curriculum of study of an architectural student of to-day must of necessity cover a wider ground than of old, leaving little time for the practical study of the sister arts; but I feel sure that if students were given opportunities to draw and model from life to a much greater extent than they do, and were logically trained to regard this particular study as a means to a definite end in somewhat the same manner as the Greeks must have, then we should soon find an appreciable advance made towards the higher ideals of artistic architecture.

Students in architecture spend considerable time wading through a long course of study of the "orders," a course corresponding to the drawing and modelling by painting and sculpture students from the antique. I am convinced that not one in a thousand painting or sculpture student has any real comprehensive appreciation of the nobility, style, and ideal beauty of the wonderful masterpieces of Greek sculpture which they copy so laboriously, so blindly, and so mechanically. Such appreciation and understanding only begins to come long after they have passed through their apprenticeship to the art they practise. I fancy that the same remarks apply to the study of the "orders" by architectural students. In the case of the architects, they have not even the same chance of understanding the masterpieces they are copying as the sculptor or painter, who model or draw from a complete or sufficiently complete work, while the architectural students spend many a weary, some hour endeavouring to learn by heart the proportions and details of one column, a piece of architrave, and a portion of cornice, considered without relation to the whole design of which they form but a part. I doubt if 1 per cent. of the students who yearly make such exhaustive study of the "orders" ever take the trouble to make a complete scale drawing of the entire elevation of which the column, architrave, and cornice are but details. How, then, can they possibly train themselves by such means to analyse and appreciate the great principles which guided the Greeks in designing these masterpieces?

And now in what follows, if it should appear that I am unduly critical in my remarks, I would beg you to allow me the privilege of speaking less as an individual than as a logician who would carry his point with all the wordy insistence at his command.

It would generally be supposed that of all men the architect should be best equipped to understand and appreciate the art of sculpture; for he is trained to consider masses, to judge form from its plans, elevations, and sections, to realise the value of line and silhouette, and proportion, and the contiguity of happily-disposed planes of light and shade. Yet, in spite of this, we

continually hear of architects surprised at the effect of light and shadow caused by sculpture applied to their façades, even though designed to their own instructions and after their approval of the sculptor's scale models. Again, architects are apt to consider sculpture as an afterthought, to be added to the design if funds permit, or omitted if not. The average architect does not regard sculpture as an integral part of his conception from the very outset, the omission of which would inevitably mar the entire design, which would be equally impaired by any afterthought or addition. I have not studied architecture to any practical extent, but it seems to me that in conceiving his design for a building the architect to be successful must, from the start, have two definite ends in view—the planning of a practical scheme and the making, as far as lies in his power, of a beautiful shell to contain this scheme. If this is the case, then I cannot understand the attitude of so many architects of to-day in regard to the introduction of sculpture. Either it must be deliberately accounted for as a concrete part of the design, or it must be dismissed for ever, and no matter what funds should later accrue to provide for sculpture, its inclusion is rendered impossible by reason of the already complete nature of the design. I have perhaps unduly insisted on this point, because I firmly believe that its mature consideration will do much to improve the existing condition of architectural sculpture.

There is also a tendency to be too closely bound by tradition in the application of sculpture or ornament to just those parts of a façade which have usually been so filled. Possibly custom has labelled as a general rule the most fitting parts to be decorated, but it does not necessarily follow that under new individual conditions they should still be the most appropriate. Another fault is common—namely, the over-lavish distribution of small frittering ornamental detail, which sometimes completely destroys the simple dignity of an otherwise good architectural design. It would have been far better in some cases if ornament had been altogether omitted, or at most massed at one or two essential points. Such buildings remind one of men whose bodies are tattooed all over with designs having no relation whatever to the form thus masked. One may admire the fine detail and workmanship of the tattooed design and yet heartily wish it were not there.

The proper use of sculptured relief has always been one of the most difficult problems both to architects and sculptors, and I fear that too little attention is often paid to the matter of projection in relief when applied to architecture. One sees buildings where, although satisfactory as regards scale, pattern, and style, the reliefs do not seem to wholly enter into the spirit of the scheme, and it is not until one has carefully sought the reason of this that one arrives at the definite conclusion that the projection is the cause of the trouble. Either it is too high and the local colour is too marked or the case is reversed, with corresponding damage to the unity of the architect's conception. It must be borne in mind that there are two methods of obtaining strong values in relief. One is by having a high projection and making the sections rather round; the same effect can also be procured with much less actual projection by treating the planes very simply and making the edges sharp and square. It is therefore of importance for the architect to decide and instruct the sculptor as to which method he considers most applicable to his design if he wishes to ensure complete unity of feeling throughout.

I am not one of those who, dissatisfied with the conglomerate mixture of styles prevalent to-day, advocate entire rejection of all existing schools of architectural expression and a return to the primitive modes of thought, and a bland, childlike innocence of aught but natural law. I do not believe that this deliberate intention to gain originality can result in anything but eccentricity, because it is not, as is pretended, the outcome of a natural train of thought, but in reality that of affectation. I see no reason to reject any of the useful store of knowledge to be gained by study of the finest examples of all ages. At the same time, I

do firmly believe that one of the surest methods of creating a purer and more forcible expression of the individuality of our time will be found by the acquisition of such culture concurrently with a more complete familiarity with nature's own laws of beauty. This latter I contend to be the core of the whole matter.

A great deal has been written and there has been endless discussion on the subject of collaboration between architects and sculptors. For my own part, I fail to see how it is possible, under existing circumstances, for true collaboration to occur, and, although in a few isolated instances a great measure of success has been attained, it has, I believe, been more the result of accident than otherwise. Before collaboration can be thorough there must be a common ground of mutual understanding between the sculptor and architect, which certainly does not exist at present. As I have said before, there are very few architects practised in the craft of the sculptor, and fewer sculptors are there who can by looking at plans, elevations, and sections realise to any extent the entire conception in the architect's mind. How, then, under such haphazard conditions can the two minds hope to work to one accord? Is it any wonder that, for want of practical knowledge, the architect does not fully realise the intention of the sculptor's sketch models, or, on the other hand, that the sculptor is hampered by uncertainty as to whether he is really in sympathy with the architect's conception, and thereby prevented from working with the sincerity and directness of purpose which must inspire all true artistic endeavour? If, by practical means some common ground of mutual understanding can be found and adopted, then I am convinced that true collaboration, necessary in an age when artists are specialists, will become an accomplished fact, and with its practical and successful working will cease the fruitless discussion which usually ensues when the word "collaboration" is mentioned.

I venture to lay before you what I consider may be the means of providing this "common ground of mutual understanding" whereon the architect and the sculptor may start to build their ideals in unison, each with perfect freedom of sympathetic action. I refer to the use of scale models of the architect's buildings. I am convinced that in all serious undertakings where sculpture is to be employed as a part of the architectural scheme success will in the end be more surely attained by the architect's careful consideration, at an early stage of the designing, of a scale model of his conception. In this model he should express his intention as to the general planes and masses, the proportionate depths and projections of mouldings and reveals, and be himself must decide by means of suggestive bits of clay exactly the disposition, pattern, and projection, silhouette, and mass of the parts he wishes the sculptor to enrich. Then, when he has finally brought the model to the point when it realises to the best of his power the full expression of his conception, he can safely call in the sculptor whom he feels most in sympathy with the particular style of the project in hand. I venture to say that the sculptor selected, if he has any artistic imagination, will from the onset enter into the spirit of that undertaking with a mind attuned to the key of the architect's inspiration in such a manner as he never does at present. He will see shapes which he can understand, and which at once will inspire him with suggestions of beautiful detail which may be evolved therefrom. He will be in his natural element, an element in which plans, sections, and elevations play but an imperfect part, and, best of all, he will be able to realise from the commencement the most fitting treatment of each particular detail in its relation to the whole structure.

Herein, I contend, lies the chance of great success for both architect and sculptor—success for the sculptor because he will have a chance to do really decorative and monumental sculpture, and success for the architect for two reasons: firstly, because he will no longer be worried by uncertainty as to what his brother artist is going to give him or how the work will look when completed; and, secondly, because when he sees before him the model of his proposed building he will be less likely to be conventional, he will

infuse more of his own individuality into the minutest detail, and there will be less likelihood that in an absent-minded way he will label every other member "egg-and-tongue," "bead-and-reel," and so forth. I also believe that the adoption of scale models such as I have described would exercise a great educational influence on both artists. The sculptor would gain by the practical consideration of architecture in a medium that he can understand and by a fuller realisation of the needs inspired by the conception of the architect, while, on the other hand, there would be a tendency for architecture to become simpler and more monumental, and the architect, by means of his practical study of form giving broken light and shade, would widen the already large field of his knowledge and gain fresh power.

I have often thought it would be an excellent idea if students in sculpture and in architecture were taught, side by side, in classes where the decoration of architecture with sculpture should be the subject for special consideration. Architectural models should be made by the joint efforts of one sculptor and one architect, in the designing, modelling, and decorating of which both students would become intimate with the principal laws governing each branch of the art.

Such training would, I believe, bear so rich a harvest of practical result that it would soon become a definite part of the curriculum in the education of architects and sculptors. I would like to see the experiment made by enthusiastic students under sympathetic and appreciative guidance.

There are several small sketch-clubs where young practising artists, sculptors, painters, and architects periodically meet together at each other's studios to practise drawing from the living model. The idea is an excellent one, serving as it does the two-fold purpose of useful study and the creating of a bond of fellowship between the votaries of each different craft. I am sure there are many young sculptors and architects of equal professional rank who would gladly welcome the formation of similar clubs, where the particular study of decorative sculpture applied to architecture might be practically considered by means of sketch scale models. Such clubs or classes should for useful purposes be limited in membership; possibly two of each craft would be found to be sufficient. The procedure might be as follows:—Having at the outset mutually agreed upon a particular type of building giving fair scope for the joint study, the architects would evolve the plans and elevations sufficiently for the object in hand, explaining the scheme and their method of dealing with it for the benefit of the sculptors. Then, selecting such portions as would best serve the purpose, they would all proceed to the making of a clay or plaster model or models, and in this process the practical experience of the sculptors in handling plastic material should prove of value to the architects. I would, however, suggest, in order that the fullest benefit should accrue from the study, that the architects should be considered the controlling spirit of the design as regards the disposition, line, mass, and projection of the sculpture or ornament on the façades under construction. The next step would be for the sculptors to evolve from the lumps of clay suggesting merely the desired values of broken light and shade, sculpture or ornamental detail which should accentuate the intention of the architects, at the same time by choice of subject giving full expression to the *raison d'être* of the building. The study might with advantage to all be carried further by the enlargement of these details to a working scale, with practical reference to nature by the use of the living model, and, as every process would take place in the presence of all, it could but result in a better understanding of the bed-rock principles governing each other's art, elucidated by practical means in a sympathetic way, throughout the joint undertaking. I believe that this form of study would do more for the advancement of art than any number of lectures to sculptors on architecture, or to architects on sculpture.

Let there be a practical and sympathetic understanding of sculpture by architects, a closer and more analytical study of the laws of Beauty and Nature; let the individuality

of our many clever architects have full play in the thorough consideration of the smallest detail; let sculpture be introduced on buildings only to serve a definite purpose, both æsthetic and practical fitness, and at once we shall see the logical result in the more rapid growth of a school of architecture imbued with style inspired by the spirit of our own age."

Mr. T. Stirling Lee, in proposing a vote of thanks, said they had listened to a practical paper, which was full of suggestions and which started very thoroughly with the beginning of things architectural and sculptural. The author started with the idea of what the sculptor did or what he wanted to do when he commenced to ornament a building, and he carried that idea right through, *i.e.*, what the sculpture was to do, how it was to be treated, what parts of the building were to be treated and connected together, and proportion of light and shade. In looking at a building, with sculpture new upon it, one asked how far it connected the different parts of the building, how far the sculptor had grasped the fact of what the architect wanted to do, how far the architectural lines were emphasised, and how the different heights of relief were treated (they were very often not accurate in the matter of the shadows they carry). The first thing that one wanted to grasp clearly in designing sculpture in relation to architecture was the part of the scheme it was to apply to. The old men did not use sculpture without an object; they did not wish for a little enrichment here and a little enrichment there; it was all part of a definite scheme. When one saw sculpture decoration of building one ought to think how far it carried out the decorative idea. He thought every architect would agree with that, but, unfortunately, building or other committees paid no attention to this, and schemes were altered, so that frequently a building would be far finer without the ornament. Many buildings—certainly in London where there was much smoke and soot shadows to contend with—would be much more dignified if it were not for the carving put upon them. What one felt with the ornament was that unless it was of some absolute use to carry the light and shade it should not be used, certainly in London. If they did use it, it should be of the best. They should not use meretricious ornament. Buildings were often injured from the point of view of the sculpture by the use of meretricious ornament, and sculptors would rather see a fine piece of masonry than any attempt at cheap ornament. The one thing to grasp most clearly was that sculpture in connexion with architecture was only a form of carved masonry, and sculptors came to that conclusion when they found that they must try a sort of masonry treatment—that they must treat the sculpture as the mason would treat his work: if they should treat it architecturally. Another matter dealt with was how ornament grew, and that was important. In every development of style there had been this growth, and they could not take certain kinds of sculpture quite apart from the architecture and apply them to the architecture. The severance of the two arts to-day was the actual cause of the want of harmony in their work, and the more they got the academical away from the practical the more they severed the two arts. While the sculptor was trained academically as apart from the practical they would never get the two arts to come together. It was all a matter of growth; the architecture and the ornament must grow in sympathy the one with the other. To do otherwise was like mixing French and German and Italian and other languages together and expecting the result to be harmonious: the style and the vision were different. The sculptor must have the same vision as the architect, and that could not be put too strongly. In the case of a clay model—of a figure, say, for a building—if they looked at it only as a clay model, and applied the treatment to a stone building, the work could never harmonise. Many sculptured figures of to-day were developed from the actual clay construction; they were stone copies of clay models; they were not stone figures, and that showed how essential it was that sculptors who did work for buildings should see with the eyes of the architect—should see what the architect

(Continued on page 93.)

Fifty Years Ago.

FROM THE *Builder* OF JANUARY 26, 1856.

THE ISTHMUS OF SUEZ MARITIME CANAL.

The object of this extraordinary engineering work, now again occupying public attention, is to effect a direct communication between the Red Sea and the Mediterranean, by the shortest route across the narrow Isthmus of Suez. It is intended to be a ship canal of the largest size, to allow vessels of 1,500 tons burthen to pass direct from one sea to the other, without the necessity of discharging cargo. For the mere conveyance of passengers, the railway, now in course of construction, from Alexandria by Cairo to Suez, would be ample accommodation; but for the transport of merchandise, the unshipping at Suez, transport across the desert, and reshipping at Alexandria, is rather too slow work for the rapid exigencies of the present time. It must also be borne in mind that the traffic to the East is continuously increasing, and in process of time will demand greater facility of transit than the Desert Railway will be able to afford: for light goods and passenger traffic, the railway will be of infinite use; but how much more so a ship canal to admit at once the passage of a vessel with all its goods and passengers on board.

It will shorten the distance of the northern parts of Europe by 3,000 leagues; and for the Mediterranean ports by at least 3,400 leagues. It will be far the most direct route to British India—not only the shortest, but the safest, notwithstanding doubts expressed to the contrary by interested parties.

Illustrations.

SKETCH OF PALAZZO PUBBLICO, SIENA.

THIS sketch of the Palazzo Pubblico, taken from the back in the Market-Place, gives a more suggestive idea of the immense height of the tower than does a front view, in which the tower is seen from the ground upwards.

The Palazzo, built of brick and travertine, dates from 1289-1305, and has, at various times, undergone considerable structural alterations; the crenellated portion having been added by Antonio Frederighi in 1450.

The building contains a fine collection of Sienese art.

The basement story was originally an open space, the portions filled in being easily discernible in the sketch, the tops of these arches being about on a level with the ground in front of the building.

The loggia, as seen upon the top story, has a fine open-timber roof, repaired about 1876, and the view of Monte Amiata, as seen from here, is one of the finest in Italy.

The tower, built 1325-1345 ("Torre del Mangia," so named after the stone figure, now removed, which used to strike the hours), is 335 ft. high, as measured from ground in front, and the she-wolves carved upon the angles of the upper portion as gargoyles represent the arms of Siena. This tower, typical of the period, is perhaps quite the finest example. The palaces upon either side are also typical examples of this period, 1300.

L. U. G.

THE WERTHEIM WAREHOUSE, BERLIN.

The illustrations of this building, of which Herr Alfred Messel is the architect, are reproduced from the special issue of the *Berliner-Architekturwelt*, to illustrate a short article on Herr Messel's work, which will be found on another page. A plan of the building is appended.

HOUSE, No. 73, HARLEY-STREET, W.

HARLEY-STREET is fast losing its former monotonous appearance owing to the number of remodellings and rebuildings which have been carried out during the past few years.

In this instance the old house (to which some interest attached, being at one time the residence of Mr. Gladstone) and stabling were pulled down to make room for a house more suitable to the present owner's requirements, and the stables have been replaced by a motor garage.

The new house contains six large reception-rooms, central hall and staircase, eleven bed and dressings rooms, three bath-rooms, and all the usual offices, and an electric passenger "push-button" lift. The old house contained a fine "Adam" ceiling, which has been remodelled and adapted in the new house.

The elevation is built of Portland stone and Lawrance's red facing-bricks. The whole of the work has been carried out from the designs, and under the superintendence, of Mr. W. Henry White by the contractors, Messrs. Prestige & Co.

Our illustration is taken from the architect's Academy drawing (1905).

HOUSE, No. 32, CAVENDISH-SQUARE.

The house which formerly stood on this site was that of Romney, who painted many of his pictures there. It was only removed to make room for the new building shown in the illustration. A finely carved chimney-piece which existed in the studio was practically all that was interesting architecturally in the old house, and this has been carefully preserved and re-used in the dining-room of the new house.

The old house was badly planned, badly built, and ill lighted, and has now made room for one more suitable to modern ideas of planning, light, and comfort. It contains good hall and staircase, large dining-room, morning-room, library, double drawing-rooms and billiard-room, nine bed and dressing rooms, three bath-rooms, and a well-lighted basement containing all the usual accommodation. There is also an electric "push-button" passenger-lift.

The architect is Mr. W. Henry White, and the contract for the work was given to Messrs. James Smith & Sons, of South Norwood.

The illustration is taken from the archi-

tect's drawing, which was hung in last year's Academy.

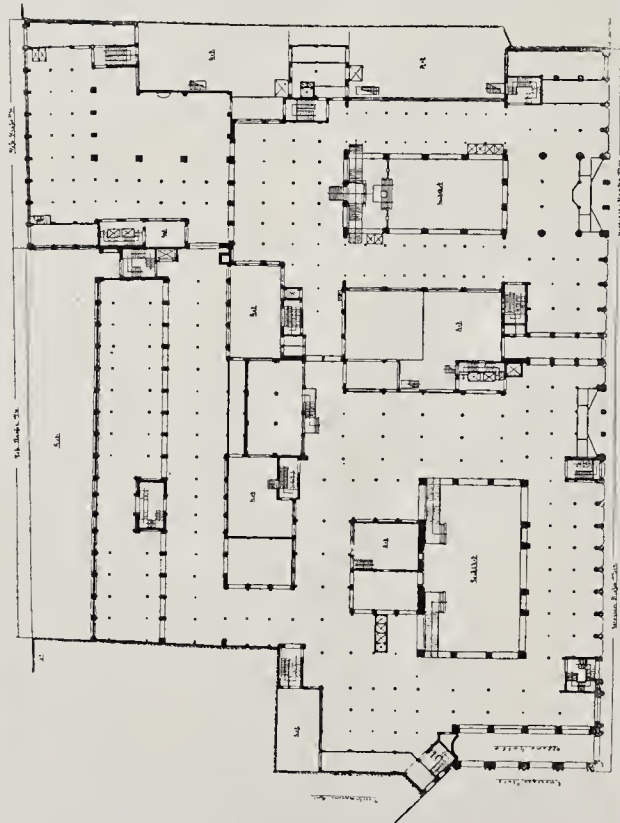
DESIGN FOR TWO LABOURERS' COTTAGES.

In designing these cottages the cost of building was the chief consideration, and in detail everything is of a simple character throughout. Perhaps the cubical contents might be interesting, which at 4d. (outbuilding inclusive) come to 330l. for the pair.

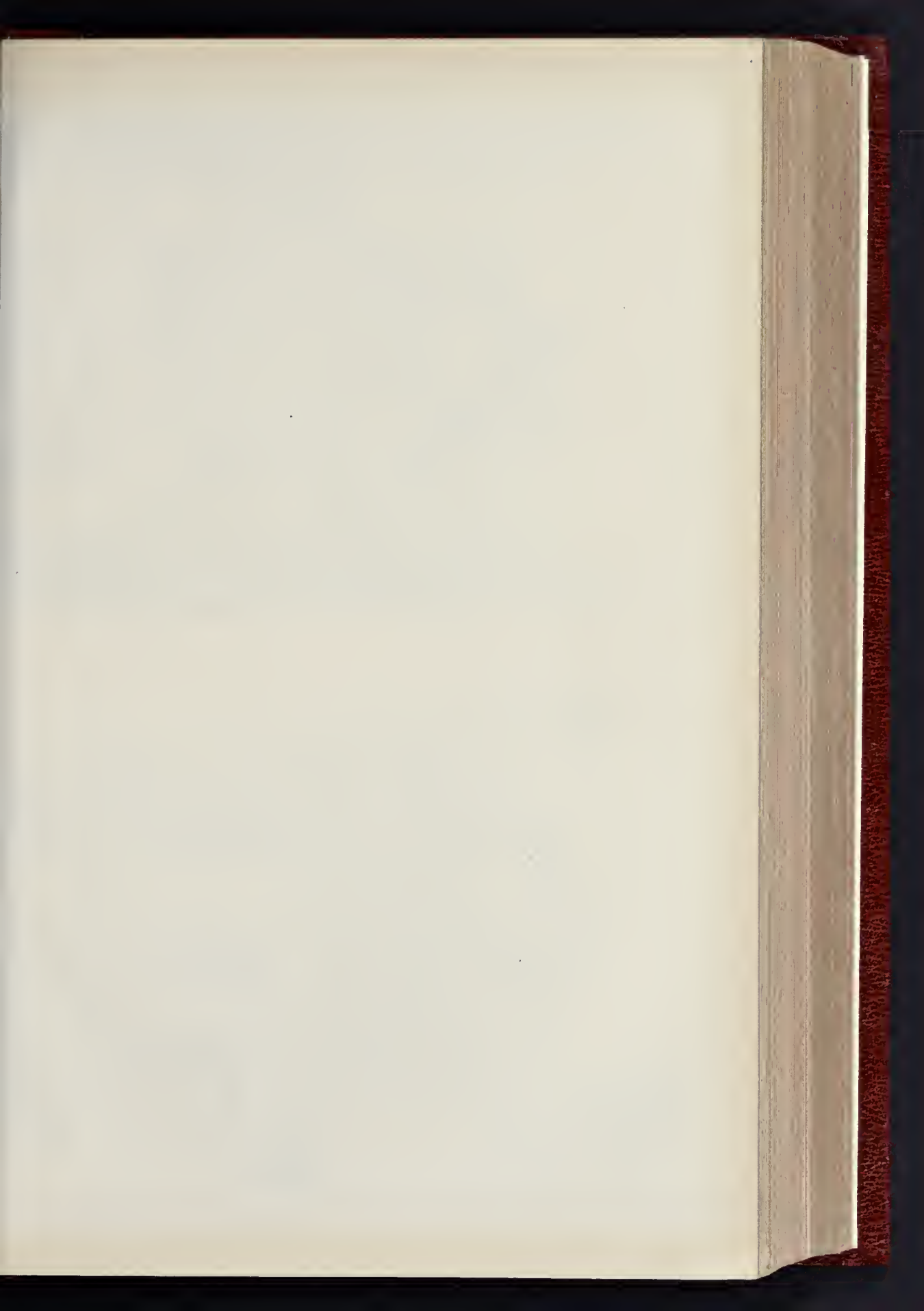
Externally the materials are local bricks and tiles, with rough-cast. The arrangement of the plan shows two bedrooms on the first floor, and a third on the ground floor which it is thought might be used as a small sitting-room in summer if not required as a bedroom, as the case might be.

H. REGINALD COALES.

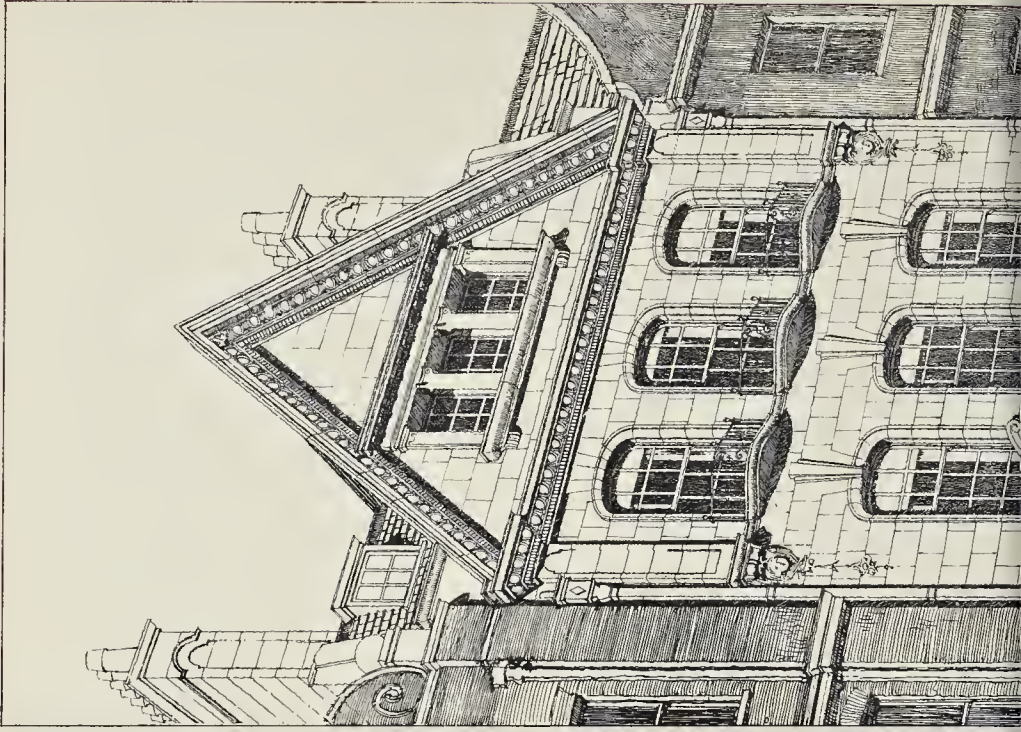
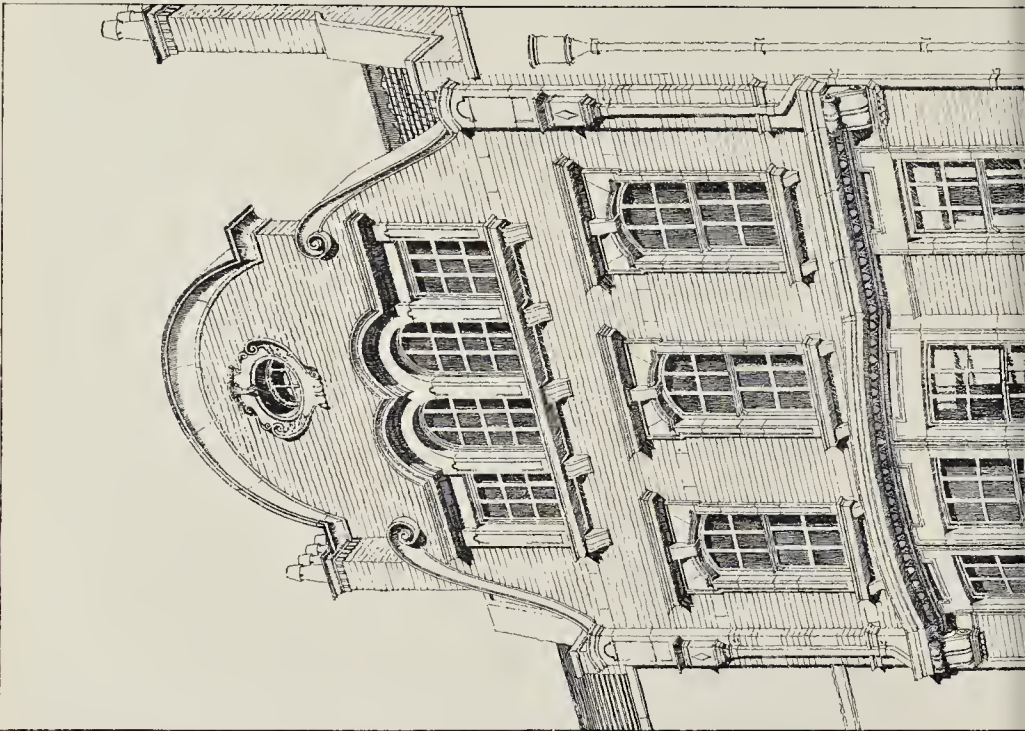
THAMES CONSERVANCY BOARD.—At their last meeting before the Christmas recess a report of the Lower River Committee was adopted in the matter of the scheme for dredging referred to in the Thames Conservancy Act of last year. The Board resolved to accept under certain conditions the lowest tender, being that of Sir John Jackson to remove 500,000 cubic yds. of hard material from the Lower Hope, between Gravesend and the Mucking Light, at the rate of 1s. 4½d. per cubic yd., and to invite tenders for the construction of a centre ladder bucket dredger capable of dredging 600 cubic yds. of ballast per hour and of four steam hoppers having a capacity of 800 cubic yds. apiece. The Committee stated in their report that they did not recommend the acceptance of any of the tenders received for dredging sand and silt in the Yantlet Channel in Sea Reach, between Chapman Light and the Nore, as they deemed that the work could be best carried out by the Conservators with new suction dredging plant. The Board decided to invite tenders for combined suction dredger and hopper plant for the latter work as soon as they are in a position to do so.

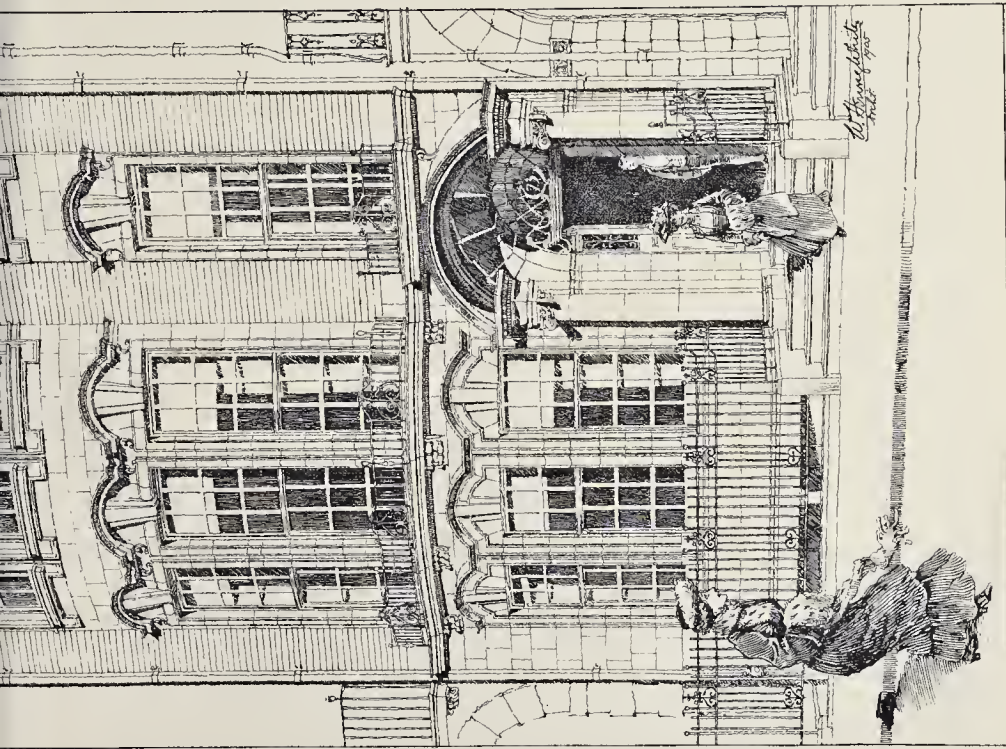


Plan of Wertheim Warehouse, Berlin.



THE BUILDER, JANUARY 27, 1906.





No. 73 HARLEY STREET, W.—MR. W. HENRY WHITE, F.R.I.B.A., ARCHITECT.

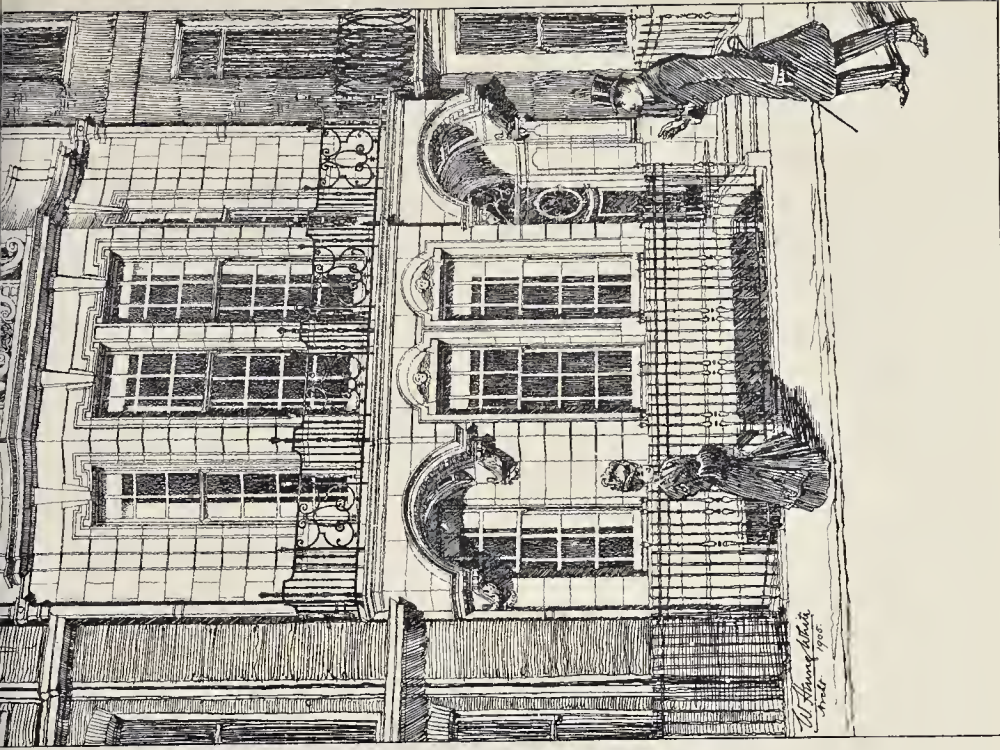
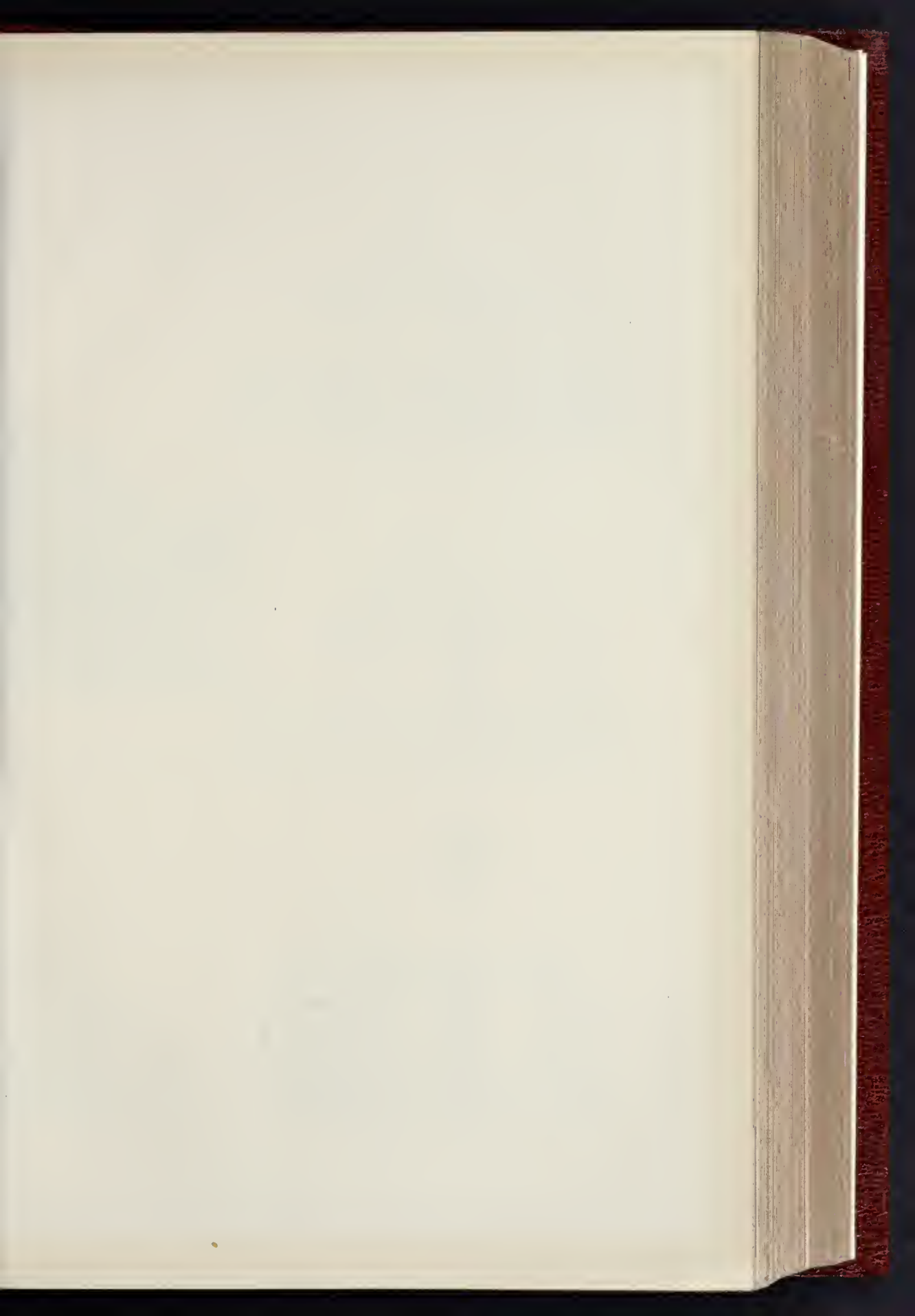


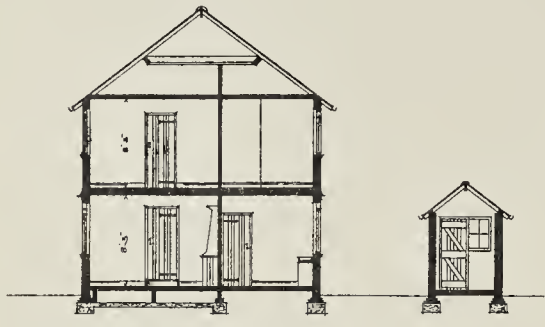
PHOTO LITHO SIMMONS & CO. LTD. 4 & 5 EAST HINDING STREET LONDON, E.C.

No. 32 CAVENDISH SQUARE, W.—MR. W. HENRY WHITE, F.R.I.B.A., ARCHITECT.

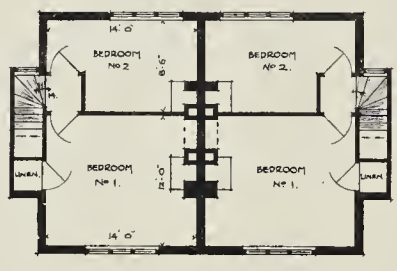


PROPOSED PAIR OF LABOVRE

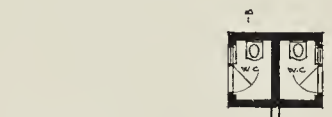
SCALE OF 1" = 10'



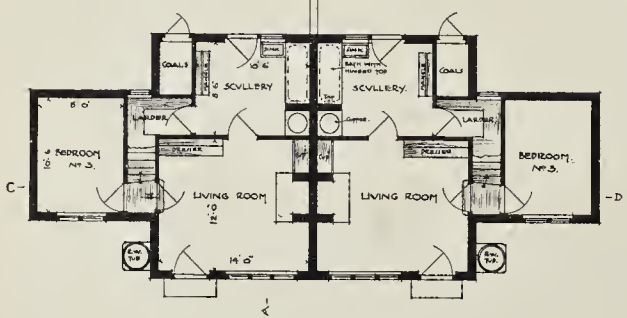
SECTION A.D.



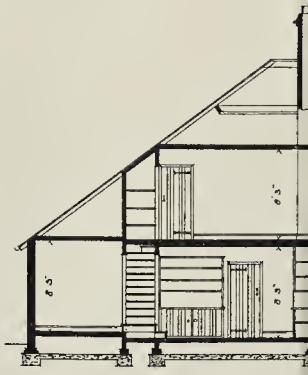
FIRST FLOOR PLAN



GROUND PLAN



PERSPECTIVE VIEW



STAGES.

FEET.

DESIGNED BY ARCHITECT:
D. H. HARRIS, NEW YORK, 1905.
TRADES:



FRONT ELEVATION



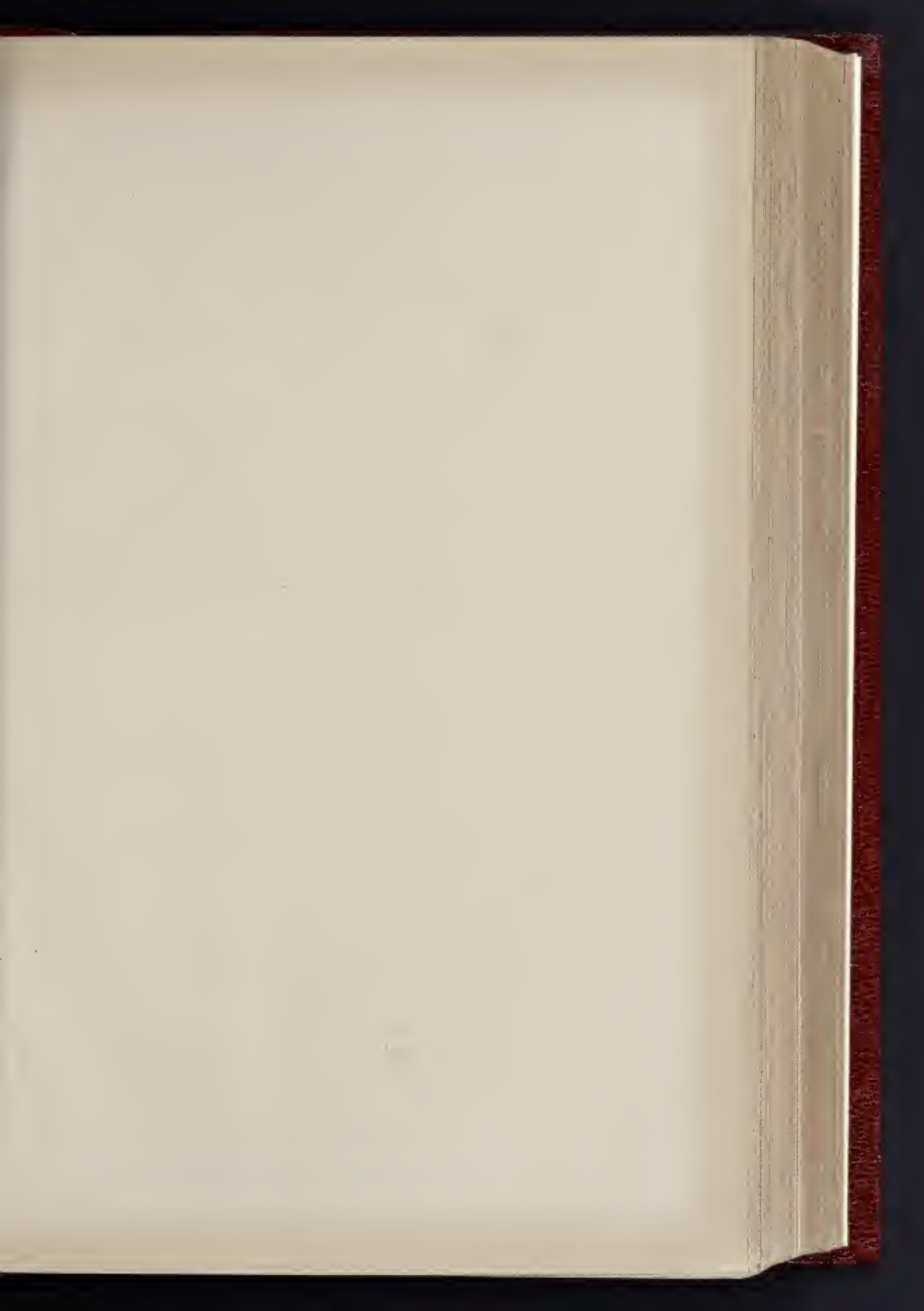
BACK ELEVATION

SECTION C.D.

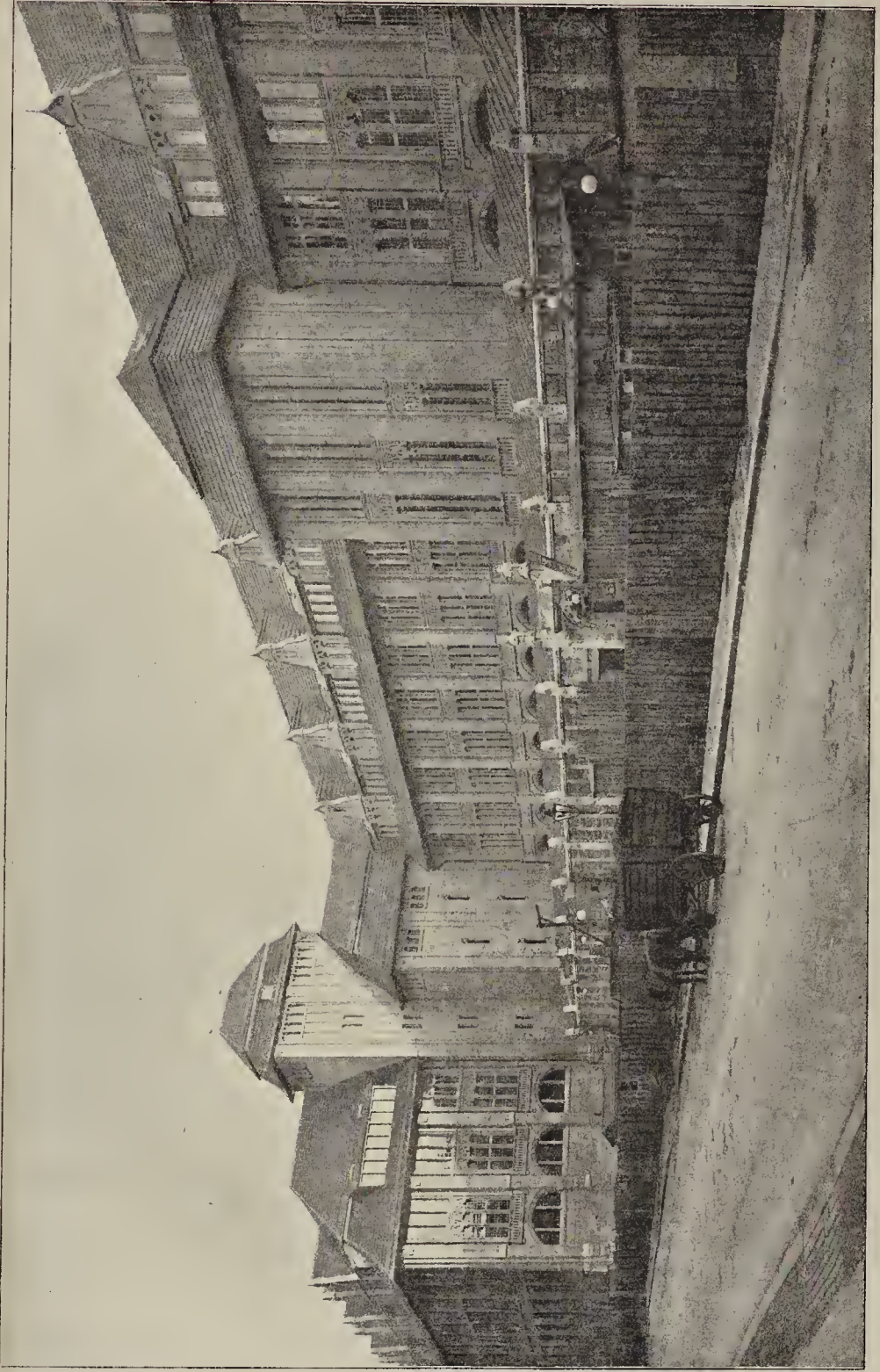


SIDE ELEVATION

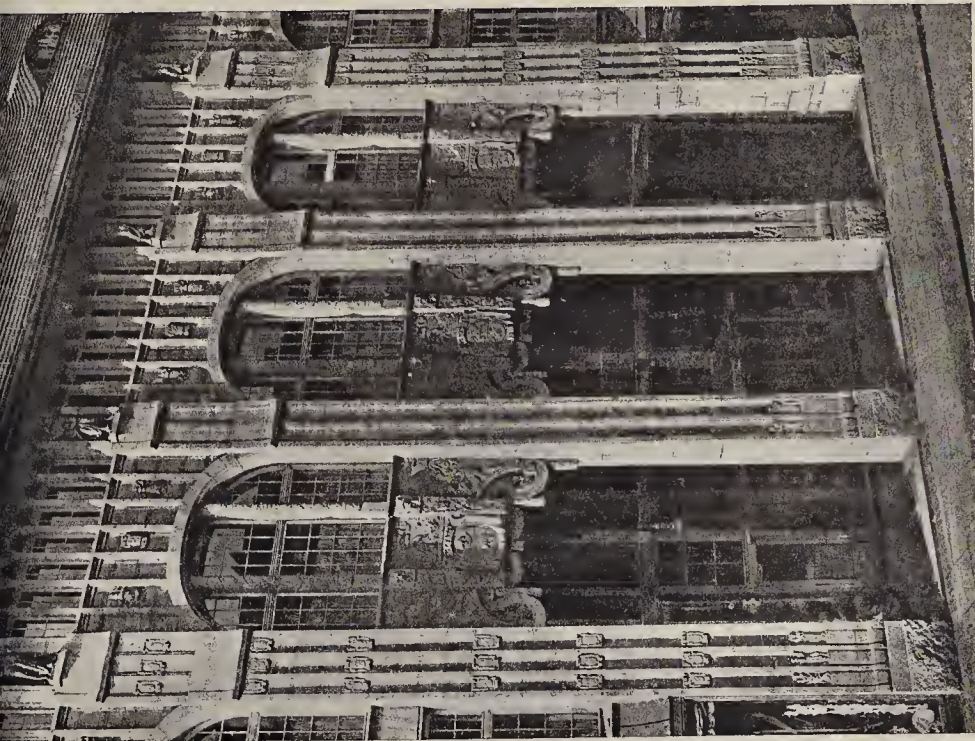




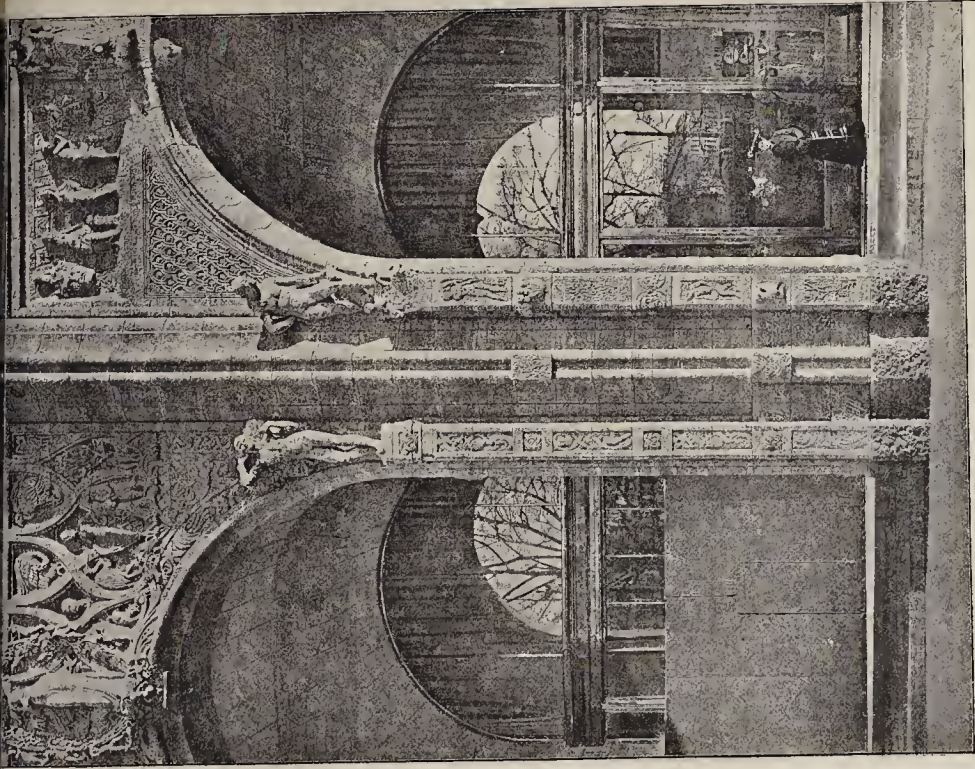
THE BUILDER, JANUARY 27, 1906.



GENERAL VIEW.



PRINCIPAL ENTRANCE.

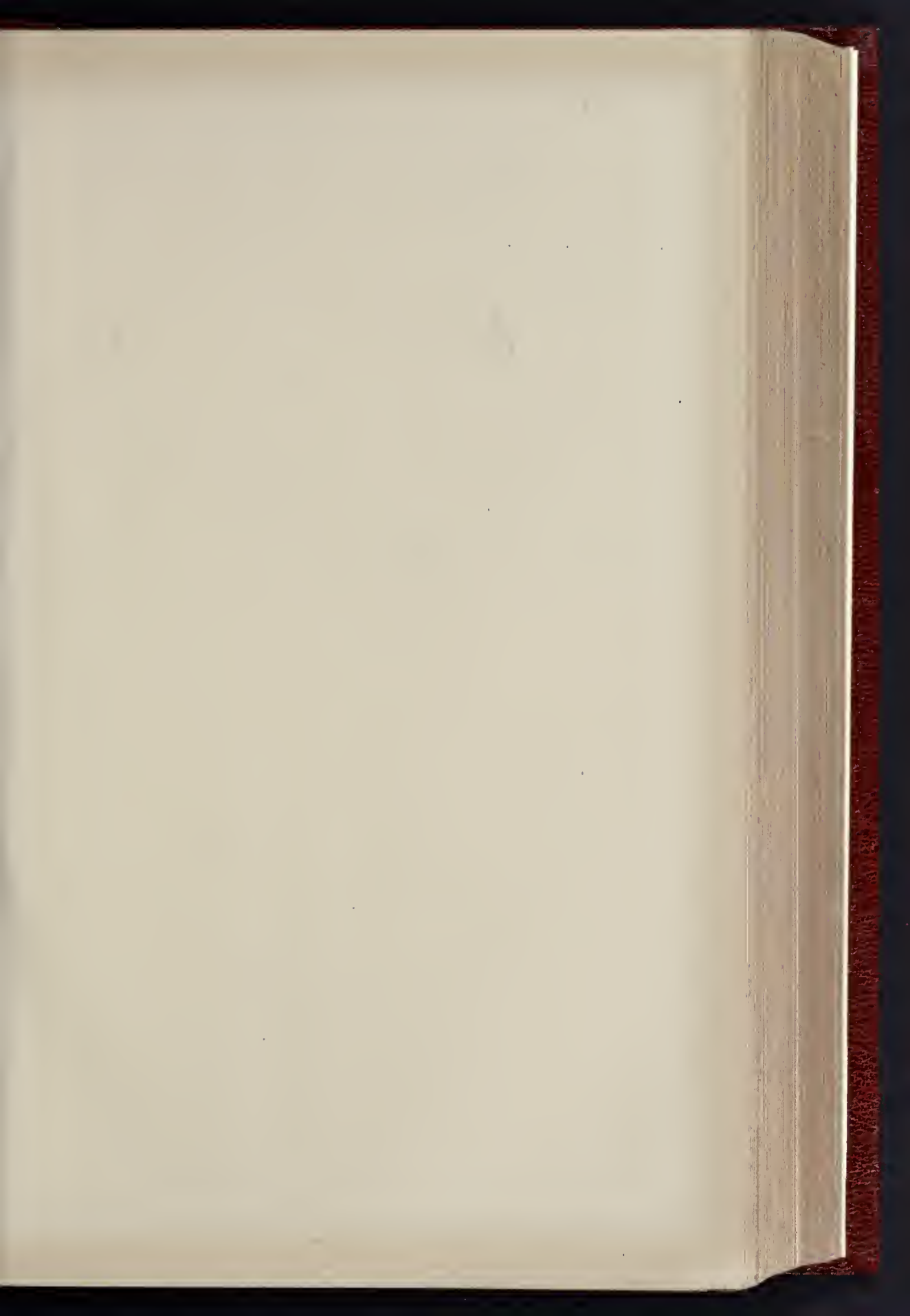


PART OF FAÇADE IN THE LEIPZIGER-STRASSE.

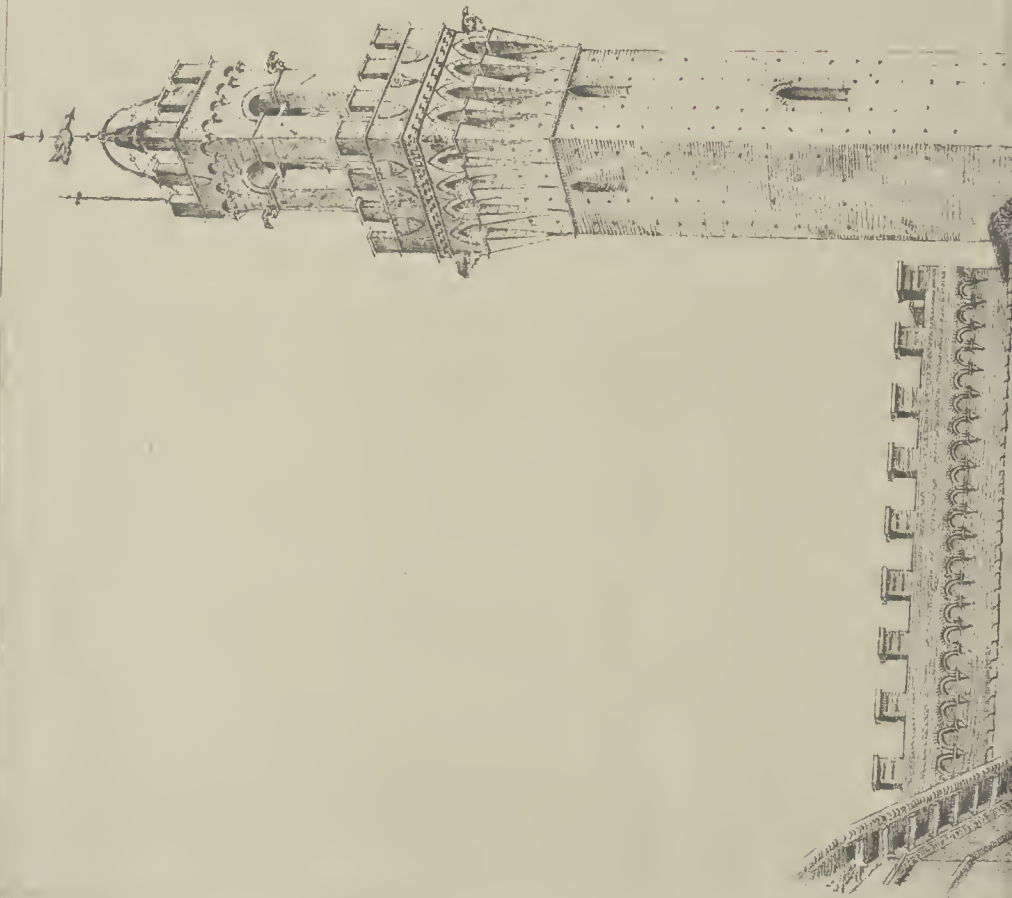
INK PHOTO SPRAGUE & CO. 4 & 5 EAST WASHINGTON STREET FETTER, LANE & CO.

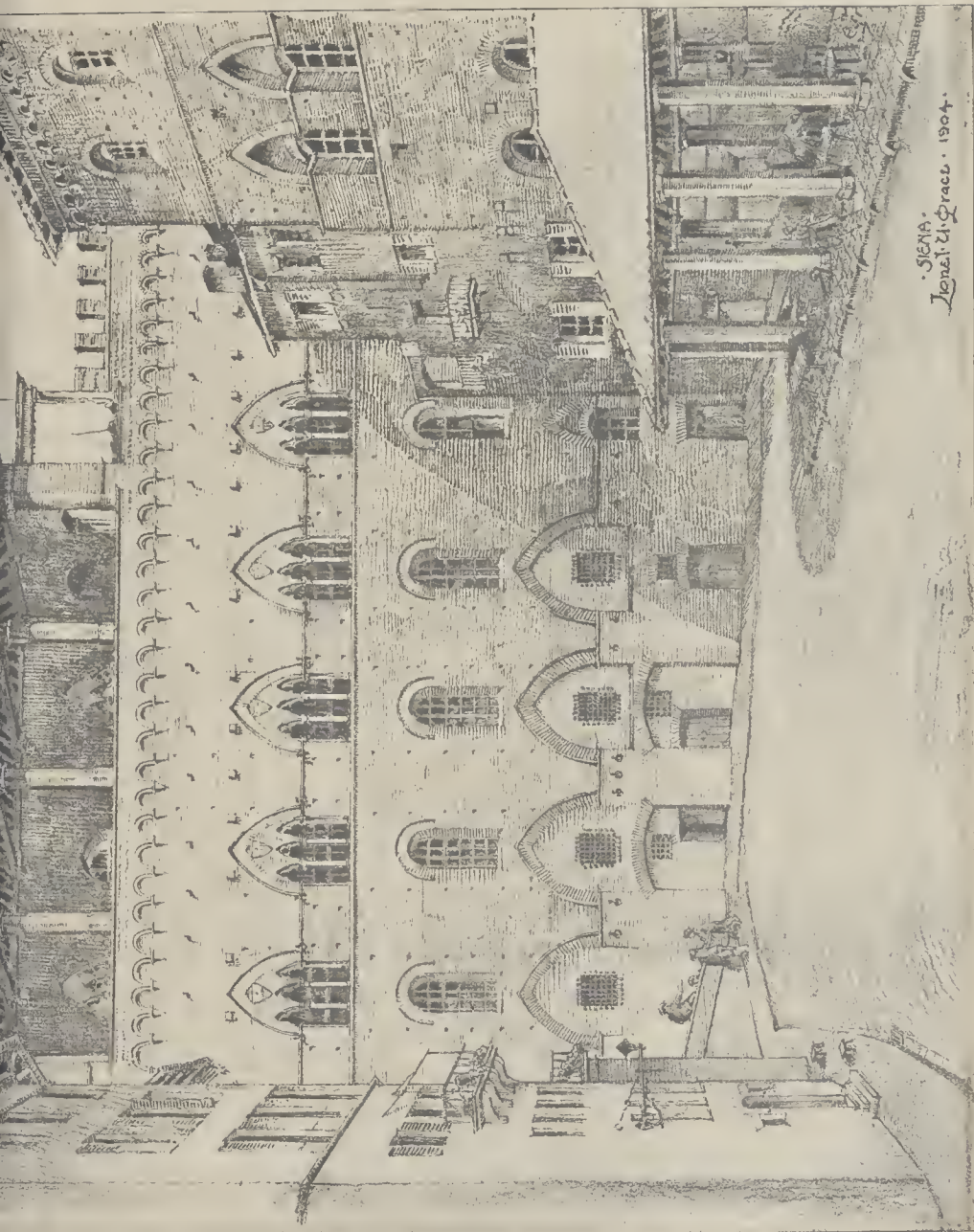
THE WERTHEIM WAREHOUSE, BERLIN.—HERR ALFRED MESSEL, ARCHITECT
(Reproduced from the "*Berliner Architekturwelt*,".)

PLATE 100



THE BUILDER, JANUARY 27, 1906





SIENA.
Piazza del Campo. 1904.

NEW PHOTO-SPRAGUE A.C. 47 4 & 5 EAST WINDING STREET FETTER LANE, E.C.

THE ARCHITECTURAL ASSOCIATION.

(Continued from page 91.)

wanted in the way of ornament on his buildings. Mr. Jenkins had made some suggestions as to how that should be done. Take the case of someone going to a studio and saying that he wanted a frieze and giving a sort of suggestion of it. The frieze was generally done in architectural shops without any consideration of the mouldings above or below it; the mouldings were not considered, and yet it was expected that the work would be a success on the building! What was found was that it was always necessary, if they were going to do the ornament for a building properly, to have the mouldings run so that the work itself was modelled to carry the scale through the mouldings and the harmony of light and shade. From the sculptor's point of view it was desirable wherever possible to meet the architect on the building, and make the designs, not in the studio, but *in situ*. Get the whole scheme, if possible, thoroughly set out—its proportions, planes, and lines, etc.—settled on the spot. The more he worked the more he felt that the old Greeks worked a great deal from drawings; they got the effect in their drawings, and in the case of the ornament they got the same effect in stone. The most important point was to get the scale of the work *in situ*; even then there was a great deal to do if they had to prepare models and drawings. He agreed with Mr. Jenkins that the ideal for sculptors and architects was to see the thing from the same point of view, and if they worked together in such a class as the Association class, in which Mr. Pomeroy used to teach, they would derive great benefit from doing so. Those architects who had been in the atmosphere of painting and sculpture, who worked together in the studios, were the men who had most sympathy with sculptors. They wanted to get back to first practices, and when they did that they would understand first principles and the common laws governing architecture and sculpture.

Mr. H. H. Statham, in seconding the vote of thanks, said that, in reference first of all to Mr. Lee's remarks, he thought that a remarkable point had been made as to sculpture on buildings not being masonry sculpture but a reproduction of clay modelling. But there was a difficulty, *i.e.*, that the sculptor modelled in clay first, and how was it to be got over? Would Mr. Lee like, supposing he had to carve a frieze on a building, to try the experiment of doing what Michelangelo did, *i.e.*, of going straight to the stone and cutting the sculpture out without any previous modelling? It would require a man to be absolutely certain of what he was going to do, but it might have the result of producing the masonry style of sculpture which Mr. Lee rightly wanted to secure. In considering sculpture in relation to buildings it had to be remembered that there were two possible points of view, *i.e.*, whether the sculpture was to appear as put in a frame or whether it was part of the building. They might have both. He should say that the sculptures in the Parthenon pediment were sculptures framed within the pediment free from the building; but the frieze was sculpture forming part of the masonry. The two kinds of sculpture required to be treated differently. He was amused to hear Mr. Jenkins say that the first works of sculpture were simply to express facts, because the previous day he heard the same statement from Mr. Clausen in regard to painting, in his Royal Academy lectures. Mr. Clausen said it was only later that painting was used for the expression of the beautiful. He (the speaker) should not quite agree in saying that the Greeks in their great period had combined utility with beauty, because he did not himself see the element of utility in the Parthenon sculptures. He thought that the Greeks wanted to have sculpture to contrast with their masses of stonework, and he did not know—except in the pediment which represented the combat of Neptune and Minerva for the city—that there was any particular reason in the sculpture. The *metope* sculptures represented the battle of the Centaurs and Lapithæ, but he did not think that was one of the most important Greek myths; they wanted some sculpture there, and the battle of the Centaurs served the purpose. He could not be so optimistic as Mr. Jenkins about the new style getting gradually formed at present.

He did not see it himself, and he did not think we could ever expect to see a national style of architecture grow up as it used to grow up, for the simple reason that we have so much before us; the knowledge of what had gone before, brought before us by travel and photography, etc. These facts could not be forgotten and let alone, and for that reason they could not evolve a new style. He felt much sympathy with the quotation from Goethe, and it reminded him of Johnson's literary criticism in reference to Sterne, *i.e.*, that "nothing odd will do for long." It was a remarkable fact about the Greek sculpture that there was nothing odd in it. There was that quality of completeness of style, with nothing over-emphasised anywhere. In regard to students not appreciating sculpture, what students went to schools of art for and drew from sculpture was to learn to draw more than anything else, and he heard the other day of a rather significant utterance at the Slade School, when the master said: "What are you copying that for? You are not to copy it, but to draw it." There was a great difference between the two. Mr. Jenkins said that one of the surest methods of evolving a purer and more forcible expression of the individuality of our time would be found by the acquisition of culture concurrently with a more complete familiarity with Nature's own laws of beauty, and from that it was to be supposed that Mr. Jenkins knew what Nature's laws of beauty were; he did not, and he never met anyone who did. Sculpture, perhaps, and architecture certainly, had not much to do with Nature, which was at the most only the foundation of them to a certain extent; the results were art. Just before Mr. Jenkins came to his recommendation of models, he (the speaker) had made a similar note. When an architect wished to have sculpture on a building the first thing was for him to have some idea of what he wanted the sculpture to do, for it was a poor method to leave certain places for sculpture and then to go to a sculptor and say: "I want some of your work here." An architect should have some scheme in his mind as to what the sculpture should express, and in what part of the building it should be placed. The question of where to place sculpture upon a building was important, especially on this ground, that sculpture and architecture seemed to have opposite demands. Architecturally, it was most effective to put the sculpture at the top of a building, as the Greeks did with the Parthenon frieze, which he thought the Greeks regarded as an architectural band of ornament, for they put it where it could hardly be seen, and only by reflected light from below. But if the sculpture was to be seen and understood intelligently it must be near the base of the building. These points had to be considered. Did they want an architectural ornament, with some meaning in it when they looked closer at it, or something to be studied close at hand? Mr. Jenkins referred to the two styles in sculptured relief—one to have it in low relief with square and sharp edges. He (the speaker) thought of Donatello while Mr. Jenkins was speaking. The low relief with sharp edges was distinctly the more architectural of the two methods, though there were cases in which the other might look better. He hoped it was not too personal to refer to a monument recently erected in London, *i.e.*, the Strand monument to Gladstone. The principal figure was a fine one; but there was a want of harmony between the sculpture and the architectural portion of the work, and the moment he saw the monument he concluded that the sculpture had been designed irrespectively of the architectural part. The sculpture groups were removed from the architecture, leaving great gaps between, which ought to have been filled up and connected with the architectural centre. He did not know whether an architect had been associated with the sculptor, but he thought that the part of the design he had referred to was bad in composition. He agreed with Mr. Jenkins in what he said as to the peculiar advantage of having models of buildings; it could not be done in the case of small buildings, but where they had to do with important buildings, and, more particularly, where sculpture was to be combined with architecture, it was most desirable to produce a model in order to secure the best

result ultimately. In conclusion, he desired to say how much he had enjoyed listening to the paper, which was of a very high literary character.

Mr. Hugh Stannus said the question of the connexion between sculpture and architecture was a very large one, and would take a long time to discuss adequately. In spite of what Mr. Jenkins said, he could not help thinking that lectures on such subjects were of some value. Mr. Jenkins's suggestion that young architects should study with models was most admirable, but should not young sculptors study with models of architecture? He felt that there was far more opportunity for improvement in the sculpture as was connected with the sculptural monuments up and down London and Great Britain than in connexion with the application of sculpture to architecture. He quite agreed that there was great necessity for sympathy between architect and sculptor. Let them think of all the monuments executed in London, in how many of them had the sculptor ever thought to invite the help of the architect? They did these things better in France, where, whenever a great monument was to be erected, collaboration was the rule: they had the architect to make the architecture, and the sculptor to make the sculpture. And architects who were willing to help the sculptors in London found that when sculptors got a monument to design they did not go to the architect. He could not compliment the sculptors on the architecture they produced; and so, when they advised that sculptors should be called in to help the architect and give them opportunities of introducing sculpture into architectural work, architects would like to feel that they had got hold of the sculptor who would know how to design sculpture which would be perfectly fit and proper in connexion with the architecture. He knew one man who did that admirably, and he knew others who had attempted to make monuments. Public monuments in London were not a credit as were the public monuments of Paris, and one had but to look at the monuments in Paris to see the excellent result of this collaboration. The monuments there were very good individually, but here there were very few which one could be pleased with. He could not help thinking that Mr. Jenkins had given his opinion on the architecture of perhaps twenty years ago, and he was a little pessimistic. In his (the speaker's) opinion the architecture of to-day would compare far more favourably and would take a much higher stand than the architecture Mr. Jenkins referred to. Mr. Jenkins seemed to desire that there should be more novelty; but what was wanted was not novelty so much as more harking back to the principles of the great men of the great times. All young architects as well as young sculptors would find it better if they were to hark back to these principles; the novelties would come later on; but what was desired was that there should be a good academic training which, in France, did not spoil novelty, and he felt quite sure it would not spoil it here. Mr. Jenkins said that collaboration was not possible, and that there was no common ground between the architect and the sculptor; whose fault was that? He did not think it was the fault of the architect, but of the sculptor. He knew that there were some buildings by some of our leading and successful architects that bore comparison with anything that was done twenty or thirty years ago. He thought a paper like Mr. Jenkins's should be nailed at the door of the sculptor rather than the architect. But he was sincerely thankful to Mr. Jenkins for the paper and for the opportunity it had presented of having a discussion on the subject.

Mr. H. T. Hare said that it seemed to him, as to the collaboration of architects and sculptors, that a great deal more of the blame rested with the sculptor than with the architect. He supposed that the cause of the lack of appreciation of the ordinary sculptor for architecture was due to the fact that in England the two professions or arts were divorced one from the other, and sculpture had become more or less a matter of studio work. Nearly all the sculpture works done in this country were isolated pieces intended for galleries and not for application to buildings. That, he thought, was the reason why the principal sculptors were not educated in pure architecture in the way that he thought

they really ought to be. One had only to look round London at the statues which were put up to realise how much they failed in their architectural accessories, and how much the effect of them was to a great extent spoiled through that fault. He was quite sure that some sort of school or class of the kind that Mr. Jenkins had suggested would be very much appreciated by architects, and he had no doubt, by sculptors as well, and he thought that a great deal of good might be obtained in that way. He noticed in one part of the paper the craving after a new style, which seemed to crop up so much amongst some people. He really thought that that was quite a hopeless thing to look for, and he did not think we wanted a new style at all. What was wanted was a development of the old style. It ought not to be a question of style at all. Art was art, and we did not want anything particularly new, but, instead, the old tradition carried on and impressed with the spirit of the age so far as possible. Anything which was as a rule bad, and all the visions which had arisen were, so far as one knew the history of the time or period, and they died out and were thought nothing of in after years. If one looked around London at the buildings erected years ago one would see that those which we thought highly of were those which were built on traditional lines.

Mr. Matt. Garbutt said that they had met to talk about the architects' consideration of sculpture, but that was a thing which often did not exist. And they did not get very far in such a discussion before they heard something about individuality—which was an expression he particularly hated—and something about a new style being desired. It had occurred to him that the Doric style took about 400 years to get evolved. We English had during the last 400 years run through a good many styles, had built a good deal which we did not invent, and a great many things for which we should be sorry for some time. At the time of the Glasgow Exhibition he saw in one of the Glasgow streets an erection in Dumfriesshire stone which very well illustrated one phase of present day consideration of sculpture by the architect. There were lumps of something on the building which perhaps were intended for translations of Nature, but, if so, the sculptor must have had some special kind of Nature to study from. It was some of the "new" art, and was full of "originality." Mr. Stannus said that some of these things were done better in France. He agreed by admitting that anyone who walked along the new streets in Paris would see that not only were the buildings appropriately decorated, but that the sculptors knew how to do work which looked as though designed for its purpose and as though it could not be altered without spoiling the effect, but when one came to some of the monuments one saw what the collaboration of architect and sculptor had resulted in. On the whole, collaboration was a good thing, but there was a certain stamp of work to be seen in France which was not particularly comforting—one type of it was the monument adorned with stone angels of imperfect anatomy anxiously trying to sustain themselves by obviously insufficient wings. The principles which the author insisted upon were to be seen abundantly illustrated in some of the old buildings. Take such Gothic buildings as Wells Cathedral, and there would be seen the harmony between the sculpture and the architecture, and it might be said that Gothic figures agree with Gothic architecture, but that they would clash with Classic, whereas the Classic figures were appropriate to their own buildings and not to Gothic ones.

The Chairman, in putting the vote of thanks, said that they were all indebted to Mr. Jenkins for his excellent paper, and the interesting way in which he had written it. Few of them had the opportunity of using sculpture in their buildings, but they should all make a point of studying it. They ought to be provided with the knowledge necessary to make proper use of sculpture, and he rather ventured to think that Mr. Jenkins was somewhat mistaken in imagining that architects did not study sculpture. If Mr. Jenkins were to see the sketch-books and portfolios of a great many architects he would be surprised to see how very often they sketched sculpture work. They did not as a rule act in the spirit of the man whom he heard about recently who said:

"What is the use of sketching cathedrals? I shall never get a cathedral to build." Architects studied sculpture, even though they might not have an opportunity of using it. He rather agreed with Mr. Stannus in his defence of architects against what was rather a severe attack. Mr. Jenkins seemed to be a little behind the times, or he would know that the best architects did use sculpture and did collaborate sculptors much more than he assumed. They were told by Mr. Jenkins that in the old Greek days architects were sculptors and sculptors architects, but were Phidias and Praxiteles architects as well as sculptors? Mr. Jenkins referred to the study of sculpture and the human figure and the use of the human figure in sculpture work, but he might have said a little more about the use of everything in Nature in the animal and vegetable kingdoms. Mr. Jenkins was perfectly correct in saying that architectural students made drawings of the Orders without understanding them, and it had always appeared to him (Mr. Ambler) that they ought to be taught at the same time how to apply them, that they ought to be made to sketch buildings or parts in the style or order which they were drawing out so elaborately, and that they should be made to sketch some parts by heart, including the whole Order—the column, entablature, and so on—and that they ought to be able to draw it from memory. He quite agreed that the architect was best equipped to understand and appreciate the art of sculpture, as he was so accustomed to mass and form, and he believed that architects did think a great deal more in the round or the solid than Mr. Jenkins seemed to imagine. And certainly they ought to. Some of Mr. Jenkins' remarks were very aptly put, and his point as to models would commend itself to most people; but it was difficult to apply what he said in that connexion, partly on account of cost and also because one could not reduce one's vision to the scale of a model. If one could shrink like Alice in Wonderland to the same scale as the model, and walk round it and have step-ladders at different points, one could get the right effect. One got a false effect in looking at a small scale model of a building. How would some of the fine pieces of sculpture one admires—say, Watts' "Physical Energy"—look in a small model viewed from above? It seemed to him that the proper effect was not got in models. He was glad that Mr. Lee pointed out the difficulty of working from models, and that the clay model was apt to be copied too much in the stone, instead of the stone being treated as stone.

The vote of thanks having been heartily agreed to, Mr. Jenkins, in reply, said that there seemed to be a complete misunderstanding on one or two points he had dealt with. As to his presumed desire for a new style, that was farthest from his thoughts. He did not know enough about architecture to know whether it was possible to produce a new style, but he did mean that, whereas we find architects full of individuality, whose works stood out so that we could say, "That is So-and-so's building," yet there were others whose work was quite different. Some buildings by their character seemed to be suitable for London to-day, while others did not. The Parthenon erected in London would not look suitable for London to-day, and it seemed astonishing that some architects should design the buildings they did. He agreed with Mr. Statham that sculpture on buildings should be secondary to the architecture. Whether it was framed or not it must be secondary in value; whether framed or not it must be an integral part of the design. As to the values in relief, there were two styles of buildings he had in his mind; there was the style with large square expanses, with beautifully broad wall-spaces, and on the top one often saw a relief with a poor round-edged treatment, and he thought that that style of relief was wrongly applied. A, but where the character of the architectural design was curved and circular a rounder style of relief could be used. As to Nature's own laws of beauty, he meant that the Greek studied the figure, he should have said "All Nature"; and with a view to expressing the construction of that figure and gathering together some "principle," he should have said "Principles of Nature's

laws and beauty." He did not think it necessary to copy Nature altogether. One could gain a great deal from the study of Nature, and could apply it to literature or anything else. He must stand on his own ground in reference to Mr. Stannus' remarks about collaboration between architects and sculptors. He contended, as a working sculptor who had had a small but a very thorough knowledge of working with architects who had been most sympathetic over the joint work, that it was ever a matter of difficulty to thoroughly appreciate the aims of a brother artist of whatever craft. One might be able to talk conversationally in a foreign language and yet remain incompetent to judge the values of a great literary work written in that language. He contended that no sculptor could thoroughly visualise an architectural scheme from plans, elevations, and sections. As to the difficulty of judging a small scale model, he thought that might be overcome by photographing the scale model. It had been done with wonderful effect by making the scale model and photographing it. Another method was to make a pin hole in a card and look at it some distance away at the scale level of the eye. He quite understood that architect students did study sculpture largely, but he had spoken about studying principles regarding these things rather than the actual modelling. He could not say whether Phidias was an architect as well as a sculptor, but he contended he must have been. If they looked at the finest Greek buildings they would see that they were all complete masterpieces of sculpture in themselves.

The Chairman announced that the next meeting will be held on February 9, when the Rev. G. H. West will read a paper entitled "The Differences Between English and French Gothic Art," illustrated by lantern views.

The meeting then terminated.

THE ROYAL SANITARY INSTITUTE.

The following is the list of Members and Associates elected this month—

Members:

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| J. A. Amyot (Director of Laboratory of Provincial Board of Health of Ontario) | P. E. H. Nobbs (Professor of Architecture, McGill University, Montreal, Canada) |
| Prof. W. F. Connell, M.D. (Kingston, Ontario) | Heaton Comyn (London) |
| W. M. Davis (Civil Engineer, Berlin) | A. H. Dungray (Camberley) |
| J. Gait (Toronto) | A. E. Swift (Belham) |
| H. B. Mathew (Dover) | J. P. Larke (Levisham) |
| J. G. McNaught (Edinburgh) | E. Middleton (Public Health Dept., Wellington, New Zealand) |
| F. Woodzambert (Director-General of Public Health, Ottawa) | E. Nugent (Balham) |
| W. Oldright (Toronto) | J. Tison (Harrow-on-Tyne) |
| C. A. Austin (Paddington) | F. G. Tuck (Sydney, New South Wales) |
| W. B. Clegg (Bradford) | J. Turner (Matlock, Derby) |

Associates:

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| T. H. Akers (North Kensington) | R. Harris (Great Marlow) |
| F. H. Allen (Kettering) | F. J. Hooke (Hainstead, N.W.) |
| F. Allwright (Faling) | Sergt.-Major A. Hooper (Bristol) |
| E. Amkins (Harrogate) | F. A. Jupe (High Wycombe) |
| R. W. Ashman (Bristol) | C. A. Laing (Edinburgh) |
| W. Baxter (Normanton) | A. E. Lloyd (Higham Ferrers) |
| G. W. Bird (Ripley, Derby) | F. C. Lock (Camberwell, S.E.) |
| A. H. Brain (Staple Hill, near Bristol) | J. Marland (Liverpool) |
| W. H. Butler (Eltham) | O. P. Mitchell (Hartlepool) |
| J. G. Carr (Eltham) | J. E. Nash (Rochester) |
| W. L. Carr (Northwood) | Miss L. Old (Weston-super-Mare) |
| H. H. Clarke (Bedford) | H. Pickering (Newcastle-on-Tyne) |
| Miss A. E. Coates (Weston-super-Mare) | H. Pileas (Goole) |
| C. B. Cranfield (Southampton) | E. E. A. Pratt (Bexley, Kent) |
| J. E. Crawshaw (Accrington) | G. W. Ragg (London) |
| J. Cummins (Willesden Green, N.W.) | G. J. P. Read (Manchester) |
| A. J. D. Davies (Haverfordwest) | Miss A. Robinson (Northampton) |
| W. J. Deau (Shanghai, China) | A. H. Strond (Upper Edmonton, N.) |
| R. Driscoll (Leeds) | A. H. Taylor (North Kensington) |
| S. D. Dunsford (Huddersfield) | E. Taylor (Upper Norwood) |
| S. H. Gaiger (Thornton Heath) | W. Thorpe (Deuton, W. Lancs.) |
| W. C. Gibbs (Holloway) | F. Turnbull (Dundee) |
| T. Griffiths (Prestwich, near Manchester) | J. A. Willis (Morcambe-super-Mare) |
| E. H. Hamerton (Darfield, near Birmesley) | G. F. Wilson (Darham) |
| H. W. Harris (Weston-super-Mare) | Miss T. H. Woodridge (Stock-on-Trent) |
| J. H. Heath (Newport, Shropshire) | W. H. B. Wright (Totton, near Southampton) |
| Miss L. Hitchings (Clayton, Manchester) | |

THE BUILDERS' FOREMEN'S ASSOCIATION: ANNUAL DINNER.

The twelfth annual dinner of the Builders' Foremen's Association was held on Saturday last week in the King's Hall, Holborn restaurant, W.C. Mr. A. Bull (Messrs. Ill & Esdaile) presided, supported by captain F. G. W. Buss, Messrs. H. M. Sdaile, T. Ballantine, H. A. Bull, R. Coles, J. W. Davis, W. M. Higgs, F. Faldo, J. E. Smith, A. Stansfeld, R. Walker, J. Young, and others, the company numbering about 30 members and friends.

The loyal toasts having been honoured, The Chairman, in giving the toast of the evening, "The Builders' Foremen's Association," said that the builder's foreman was, generally speaking, a picked man in his trade—a man who after several years of apprenticeship and more years of artisanship had perfected himself in his own special branch and had also obtained a good knowledge of the many other branches of the trade. The foreman was the man who by virtue of his ability, steadiness, and integrity had won his way to the position he held of trust and responsibility; and he was looked to by his employer to help to bring a job through to the right side, which sometimes, under the cutting prices at which work had to be taken, was not always an easy matter. The foreman had also to see that in exchange for the minimum wage which the British workman received a fair day's work should be given. An Association like the Builders' Foremen's Association, which promoted social and friendly intercourse between its members by meeting together once a month, by an annual dinner and a summer excursion, deserved to succeed; and an Association which aimed at promoting the intellectual and general capabilities of its members by lectures, discussions, and visits to works must commend itself to employers; and an Association which assisted its members when they were in need of employment must commend itself to all foremen, for however good a man might be at his work there were times when employment was hard to obtain. The Association had a membership of 120, and there were only eight or nine of them out of a position, which said much for the good which the Association did for the members. They had a Benevolent Fund, and 10l. was paid on the death of a member, which was a welcome sum in some cases at such a time, and he hoped the Association would become strong enough to grant a second or third 10l. whenever necessary. A Pension Fund for aged members had recently been established, and that was a work which commended the Association not only to foremen but to the community. He desired specially to appeal to them to do all they could to support the fund, which had increased from 70l. to 170l. during the last twelve months, and that said much for the zeal with which the members carried out what they set out to do. An Association founded on such sound principles must succeed, and, being a good thing, he hoped they would push it along. He hoped that all good foremen who were not members would join the Association which, as long as it adhered to its principles, would be a benefit to its members, the employers, and the community.

Mr. W. A. Harford, the President, in response, said that a good deal of their success was due to the Past-President, Mr. Taylor, and others who had worked energetically for the Association. During the past year they had added twenty members and 120l. to the capital, which now amounted to over 500l. The Pension Fund was two years old, and they had a balance in that connexion of, including 10l. from the Chairman and recent donations, over 200l. He hoped the members would support the fund, for he did not think it was possible for any institution to succeed unless those who were likely to derive benefit from it took an active part in supplying the funds, and the appeal issued by the late President should receive unanimous support.

Mr. W. Cook, Vice-President, then proposed "The Building Trades," and remarked that the term was intended to include the kindred trades, the united efforts of which were necessary to the complete evolution of a perfect building.

Mr. A. Stansfeld (Messrs. Dove Bros.), in response, said that builders were degenerating

into merchants, he thought, and the time would shortly come when a builder need not have a yard at all, when he might order from this merchant or that merchant, this sub-contractor or that sub-contractor, and get his work done for him. Foremen had asked him sometimes: "What am I here for? Am I an ornament, or am I to look after sub-contractors?" But this all showed that the foreman should be, and was, a better man to-day than he was thirty years ago.

Other toasts were: "The Visitors," proposed by Mr. B. T. Price and responded to by Mr. J. Young; and "The Chairman," proposed by Mr. G. Thomson, the Secretary of the Association.

During the evening several donations were presented, including 12l. 12s. from Messrs. Lee & Eastwood, per Mr. Townsend, and 2l. 2s. from Messrs. Wakeley Bros., per Mr. Sullivan.

THE LONDON COUNTY COUNCIL.

The first meeting of the London County Council after the Christmas recess was held on Tuesday in the County Hall, Spring-gardens, S.W., Sir E. Cornwall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 5,000l. for clinker slab paving, and 2,000l. for street widening; Lambeth Borough Council 1,854l. for construction of a public convenience; Finsbury Borough Council 1,000l. for street improvement; Hackney Borough Council 1,200l. for the construction of a public convenience; Hammersmith Borough Council 4,864l. for the construction of a public convenience; Hampstead Borough Council 5,075l. for paving works, and 7,722l. for housing purposes; St. Pancras Borough Council 2,123l. for street improvement; and Southwark Borough Council 2,500l. for contribution towards the cost of acquisition of a public park. Sanction was also given to Woolwich Borough Council to borrow 1,150l. for advances under the Small Dwellings Acquisition Act, 1899.

Apprenticeship.—The Education Committee brought up the following report on apprenticeship:—

"The Council on February 7, 1905, instructed us to report upon the best method of providing apprenticeships for children attending elementary and secondary schools in the county of London. We have accordingly given this matter our careful consideration. In connexion therewith we have found it necessary to consider also the wider question of the opportunities afforded in the administrative county of London to children to obtain technical or industrial training. With a view to facilitating our inquiries into this question, we appointed a special section, of which Mr. R. A. Bray was chairman. They have submitted an interesting and comprehensive memorandum on the subject, copies of which have been circulated to the members of the Council. From inquiries which this section have instituted it appears that in London the old system of indentured apprenticeship has for many years been falling into disrepute, and that in the majority of instances it has almost entirely disappeared; while in only a few trades can it be said to be the commonly recognised way of entering such trades. It would, no doubt, be possible to arrange with a certain number of employers to take boys as apprentices provided a substantial premium were paid, but by paying such premiums the Council would not be doing anything either to increase the aggregate number of apprentices engaged, or to secure for them a better training. All that would happen would be that the employer who desired to engage a boy would naturally give the preference to one for whom a premium would be paid. We have not been able to ascertain that the payment of premiums increases the total number of apprentices. From the point of view of a board of guardians anxious to find an opening for some particular boy, it is a perfectly justifiable proceeding to offer an employer a bonus in order to obtain the privilege of placing the boy in his shop. But from the point of view of the Council, whose interest in children is of a general educational character, extending to all the children in London, who manifested in favour of some particular child, it is doubtful whether a similar preferential treatment of individuals out of public funds could be defended. From inquiries made it appears that, as a general rule, the boys apprenticed by boards of guardians are the only lads in the workshops for whom premiums are paid. The other lads, consequently, and mainly of the same advantages. Thus the result of the guardians' action serves apparently to diminish the number of such free places and in no way to increase the aggregate number of boys who are employed or who have an opportunity of picking up a trade. It would, therefore, we think, be a dangerous experiment for the Council to follow the practice of boards of guardians in offering to pay apprenticeship premiums, even if such a payment be legal.

With regard to the legal question as to the power of the Council to pay apprenticeship premiums, we are advised that, in the opinion of counsel, "the payment of an apprenticeship fee is not legal unless the employer, in consideration of the

payment, actually and effectively teaches the apprentice, and does something more than give him an opportunity to learn." If, therefore, the Council decided to pay the premiums of apprentices, it would be necessary to employ a large staff of inspectors to visit the workshops and see that the apprentices were properly taught. This would, undoubtedly, be extremely costly. In view of the difficulties and expense attending the pursuit of such a policy, and bearing in mind that large funds devoted to apprenticeship already exist, we are of opinion that the Council should not sanction the payment of apprenticeship premiums.

The adoption by the Council of this recommendation would not, however, prevent the Council from co-operating with existing apprenticeship institutions with a view to enabling the trustees of funds, applicable to this purpose, to make the most advantageous use of their income. We have therefore decided to communicate with such institutions with this object in view. We also think that it would be desirable that the elementary schools should be brought into closer touch with the various apprenticeship agencies. In many of the poorer schools of London there are children, known to the head teachers, who require assistance in finding a suitable opening. Much good could therefore be done by acquainting the head teachers of the apprenticeships which are available.

We have therefore arranged (i) that a list of the apprenticeship charities, specifying those applicable to particular areas, should be drawn up, annually revised, and sent in May of each year to the head teachers of the senior departments of every public elementary school; and that the head teachers should be instructed to report in October of each year what steps they have taken to make known to boys and girls the opportunities thus offered, and the result; (ii) that the voluntary agencies engaged in apprenticing children and willing to co-operate with the Council should be included in the list. We are also of opinion that the information regarding apprenticeships should be supplied to the managers of the public elementary schools; and that among the duties of the managers of the London County Council schools a prominent place should be given to the duty of inducing the children to enter skilled trades as they leave school.

If the old system of apprenticeship is destined to disappear in London, it is necessary to inquire what substitute for this training is to take its place. Nothing could be more unsatisfactory in our opinion than the existing arrangements. While it is impossible to obtain figures, there is every reason to believe that the number of boys who enter a skilled trade on leaving school is steadily decreasing. So far as scholarships are concerned the Council offers twenty-five scholarships to boys tenable at the day school of the London County Council Shorehith Technical Institute. The scholarships provide free instruction, and for scholars under fourteen a maintenance grant of 10l. for scholars between fourteen and fifteen of 15l., and for scholars between fifteen and sixteen of 20l. The scholarships are tenable for two years, but the Council reserves the power to extend them for a third year. The competition for these scholarships is keen, this year there were 270 candidates for the twenty-five scholarships offered. In view of the success of these experiments, we are of opinion that scholarships similar to those at Shorehith should be awarded and made tenable at trade schools in other parts of London. On this question, however, we propose to report fully at a later date.

With a view to ascertaining the need for technical or industrial training of boys and girls, we are of opinion that an inquiry should be instituted amongst employers in London. We think that the best course would be for the Council to draw up a memorandum containing a list of questions which, if answered by the employers, would supply the desired information. This memorandum could then be sent to the principals of technical institutes, who would advise the Council whether they would advise the Council concerning the best firms in the neighbourhood to whom the memorandum should be sent. If the principals could arrange that certain of the larger employers should be seen, no doubt the general value of the inquiry would be much enhanced. We think that the result of the inquiry will show that it would be advisable for the Council to extend the present system of scholarships tenable at evening classes. We also suggest that the question of part-time instruction, about which further information is desired, should be included in the memorandum referred to. We desire to ascertain also to what extent this system can be applied in the case of girls, and the amount of the hours and the period for which it should be held.

As regards the curriculum of the higher grade and higher elementary schools, we think that a definite course of elementary and unspecialised instruction, calculated to prepare boys to enter the workshop of any skilled mechanical trade, should be introduced into the curriculum of some of them, and we have this matter under our consideration. We recommend:—

- (a) That no expenditure be incurred by the Council in respect of apprenticeship premiums.
- (b) That, with a view to establishing a system of industrial scholarships and of trade schools, an inquiry be made among the employers in the skilled mechanical trades in order to discover:—(i) whether the employers would co-operate with the Council in encouraging and affording facilities for apprentices or learners to attend evening classes on technical subjects; (ii) whether they would be prepared to accept apprentices or learners to be present for part of the week at trade classes held during the day; (iii) whether they would be willing to take on apprentices or learners children, as they leave school, to attend, for part of the week, trade classes held during the day; (iv) the extent of the demand for trade schools and the most suitable industries to be taught therein in the various districts of London; (v) how far the employers would be prepared to assist the Council by their advice in the establishment of such schools, and by awarding the pupils attending them special privileges.

After discussion, all the recommendations were agreed to, but the first line of (b)

was altered by omitting the following words:—i.e., "with a view to establishing a system of industrial scholarships and of trade schools."

Schools.—The Education Committee recommended, and it was agreed, that expenditure not exceeding 5,077*l.* in respect of the enlargement, adaptation, furnishing, and equipment of the London County Council Kingsland secondary school be sanctioned.

Enlargement of Secondary Schools.—The following recommendations of the Education Committee were agreed to:—

"That the estimate of expenditure on capital account of 1,548*l.*, submitted by the Finance Committee in respect of the enlargement and equipment of the London County Council Peckham Secondary school, be approved.

"That the special maintenance estimate of 1,591*l.*, submitted by the Finance Committee in respect of the enlargement and equipment of the London County Council Peckham Secondary school, be approved.

"That the estimate of expenditure on capital account of 3,153*l.* submitted by the Finance Committee in respect of the enlargement and equipment of the London County Council Southwark Secondary school, be approved.

"That the special maintenance estimate of 2,434*l.*, submitted by the Finance Committee in respect of the enlargement and equipment of the London County Council Southwark Secondary school, be approved.

"That the estimate of expenditure on capital account of 2,077*l.*, submitted by the Finance Committee in respect of the enlargement and equipment of the London County Council Stockwell Secondary school, be approved.

"That the special maintenance estimate of 1,964*l.*, submitted by the Finance Committee in respect of the enlargement and equipment of the London County Council Stockwell Secondary school, be approved.

"That it be referred to the Education Committee to take the necessary steps for the equipment of the London County Council Peckham, Southwark, and Stockwell Secondary schools.

"That, in the event of the Works Committee agreeing to undertake the work connected with the enlargement and adaptation of the London County Council Peckham, Southwark, and Stockwell Secondary schools upon the basis of actual cost with the usual establishment charges added thereto; the work be executed without the intervention of a contractor; and that the plans and specifications be referred to the Works Committee for that purpose."

Avery Hill College.—The same committee recommended, and it was agreed:—

"That the plans submitted to the Education Committee on January 17, 1905, of the proposed adaptation and adaptation of the mansion, and land at Avery Hill, Eltham (Woodwich), for the purposes of a day and residential training college for teachers, be approved.

"That, in the event of the Works Committee agreeing to undertake the work connected with the adaptation of the mansion, out-buildings, and land at Avery Hill, Eltham (Woodwich), for the purposes of a day and residential training college for teachers, upon the basis of actual cost with the usual establishment charges added thereto, the work be executed without the intervention of a contractor, and that the plans and specifications be referred to the Works Committee for that purpose."

No. 17, Fleet-street—Works of Restoration.—The Local Government Records and Museums Committee reported with reference to the restoration of No. 17, Fleet-street. The Council accepted the tender of Mr. W. Downs for the works, which have been completed.

"The building consists of two blocks, one fronting Fleet-street and the other in the rear of it. The two blocks being connected by a neck containing the staircase. At the time the premises were purchased by the Council the fine time premises were building, had been demolished, and the tenant, to whom the premises were let, was in occupation of the front block, which was the portion containing the features of architectural and historical interest. Upon the rebuilding of the back block, which was completed by the Works Committee on November 18, 1902, at a cost of 5,570*l.* 12*s.* 11*d.* (exclusive of electric lighting), the tenant was transferred to it, with a view to the remaining works of restoration being proceeded with.

The work to be done to the front block was affected by the undermentioned considerations:—

- (1) A scheme approved by the Council on July 26, 1896, provided for widening Fleet-street, as opportunity offered, at the joint expense of the Council and the Corporation of the City of London, and for the setting back of the front wall of the ground floor of No. 17, Fleet-street, which necessitated the reconstruction of the first floor so as to provide support for the overhanging upper portion of the building.
- (2) The recommendations of Sir Caspar Pardon Clarke, director of the Science and Art department, South Kensington, for the preservation of the ceiling of the large room on the first floor, known as the "council chamber," entailed the removal of the timbers of the second floor, upon which the main timbers of the upper portion of the building, including the old front, rested.
- (3) It had been ascertained that the principal floor timbers were decayed in parts and that their ends adjoining the rear wall were insufficiently supported, and that the back wall was unstable.

It had been ascertained that the facade visible from Fleet-street was a false or screen front of comparatively modern date. About twenty inches behind this stood the original half-timbered front, some of its bay windows and mutilated, but with

portions of the essential features intact. These included six fine carved solid oak story posts and jamb mouldings of the bay windows, the story beams a carved bracket, and portions of cornice mouldings. Eight carved oak panels had been removed and fixed to the false front. The whole of this old work was thickly encrusted with paint, and in places the carving could hardly be seen. The story posts and jambs had also been cut at the time when the false front was erected. On the removal of the paint the greater part of the carved work was found to be in an excellent state of preservation, and it was necessary to do little more than to piece in the portions which had been cut away. The missing portions were reinstated from the sound portions of such of the internal oak timbers as could not be replaced in their original positions.

The ceiling of the "council chamber" is an excellent example of Jacobean enriched plaster work. It was found that the moulding was obscured by accumulated layers of paint and whitewash, and that the ceiling had suffered from the sagging of the timbers to which it was attached, and had become insecure. The ceiling was taken down in sections with the timbers adhering to it, and conveyed to the Science and Art department, South Kensington, where it was removed from the timbers, cleaned, straightened, and strengthened under the supervision of Sir Caspar Pardon Clarke, at a cost of 110*l.*

The oak paneling with its original cornice on the west wall of the "council chamber" belonged to the original building. The paint with which they were thickly encrusted has been removed, and the work can now be seen in its original condition. The fir paneling on the east and south walls is 18th century work, and includes a mantelpiece with some good carving. The staircase from the first to the third floor is also a good specimen of work of the same period, and has been repaired. The stone archway leading to Inner Temple-lane has been taken down, cleaned, and repaired, and rebuilt on the new frontage line. In connexion with these alterations, it may be mentioned that the Society of the Inner Temple have recently rebuilt the southern arch in stone to accord with that in the front.

We are considering the question of the utilisation of the "council chamber," which has been reserved for public use, and we hope to be in a position to report with reference thereto at an early date."

Houses of Historical Interest.—It was agreed to erect memorial tablets as follows:—

"To No. 33, Ampton street, W.C., to commemorate the residence thereof of Thomas Carlyle; to No. 111, Broadwood street, W.C., to commemorate the residence of William Wilberforce; to Broadwood House; to No. 4, Carlton gardens, S.W., to commemorate the residence thereof of Lord Palmerston."

Ornamental Key, etc., for Public Function.—On the motion of Captain Swinton, the following motion was agreed to:—

"That it be an instruction to the different committees of the Council that in all cases of public functions and ceremonies, where it is considered necessary that an ornamental key, model, illuminated address, or specially bound book be presented to the principal personages, where it is considered an endeavour be made to have such memorial addresses and executed by students of the Council's schools of arts and crafts; and that every such memorial do bear the name or identifying mark of its designer and executor."

Street Traffic.—Mr. Cleland moved, and Mr. E. Smith seconded:—

"That it be referred to the General Purposes Committee to consider and report whether, having regard to the fact that the work included in the references to the Highways, Cleansing, Rivers, Bridges, and Building Act Committees is intimately connected with the provision of adequate facilities to cope with the traffic problem of London, the time has not arrived when, with a view to co-ordinate the various methods of dealing with this problem, it is desirable to establish a Traffic Committee."

This was agreed to after discussion.

Paving Outside Schools.—The following motion was also agreed to, moved by Mr. Johnson, seconded by Mr. Hubbard:—

"That it be referred to the Highways Committee to consider and report whether, in carrying out works of tranway construction or reconstruction, those portions of roads on to which about schools maintained by the Council should be paved with silent materials in so far as possible."

The Council adjourned at seven o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Lines of Frontage and Projections.

Bermondsey.—A building on a site abutting upon the north side of New Kent-road and the west side of Old Kent-road, Bermondsey (Mr. A. Harrison for the Council of the Metropolitan Borough of Southwark).—Consent.

Clapham.—For the erection of a projecting one-story shop in front of No. 88, Clapham Park-road, Clapham (Mr. H. Smith for Messrs. H. & C. Davis & Co., Ltd.).—Consent.

Dulwich.—For the retention of porches to Nos. 7, 8, 9, 10, 11, and 12, Ruskin-walk, Herne Hill (Mr. R. E. Mayo).—Consent.

Hampstead.—For the erection of additions to a house known as "Harlestone," on the south side

of Mortimer-road, Kilburn Priory (Mr. W. Reynolds-Stephens).—Consent.

Marylebone, East.—For a building on a site between Nos. 11 and 13, Portland-place, St. Marylebone (Messrs. V. Buckland & Garrard for the Right Hon. Earl Temple).—Consent.

Norwood.—For the erection of temporary buildings at the school, Gipsy-road, Norwood (Mr. T. J. Bailey for the Education Committee of the Council).—Consent.

Strand.—For the retention of a lavatory addition to the United Services Club, Pall Mall abutting upon Waterloo-place (Mr. H. L. Florence for the trustees of the United Services Club).—Consent.

St. Pancras, North.—Projecting one-story shops in front of Nos. 123 and 125, Fettes-road, St. Pancras (Mr. T. Fraser for Mr. T. H. Hawkins).—Refused.

St. Pancras, North.—Projecting one-story shop in front of Nos. 103 to 121 (odd numbers only) inclusive, Fettes-road, St. Pancras (Mr. T. Fraser).—Refused.

Chelsea.—For the erection of buildings on the site of Nos. 247 to 267, Fulham-road, Chelsea (Messrs. Elms & Jupp for Mr. R. C. H. Sloan Stanley).—Refused.

Marylebone, West.—Raising of projecting one-story shops in front of Nos. 168 and 170, Edgware-road, Marylebone (Mr. J. W. Stevens for Mr. E. S. Burns).—Refused.

Walworth.—An iron and glass shelter in front of the South London Central Mission, New Kent-road, Walworth (Mr. A. Conder for the Rev. A. Meams).—Refused.

Width of Way.

Southwark, West.—Houses on the site of Nos. 1 to 12, King's-court, Southwark, with external walls at less than the prescribed distance from the centre of the roadways of King's-court and Prince's-place (Mr. A. Burr for trustees of the Jolly Trust).—Consent.

Limhouse.—An addition to the St. John's schools, Halley-street, Stepney, with external walls at less than the prescribed distance from the centre of the roadway of John-street (Mr. T. J. Bailey for the Education Committee of the Council).—Consent.

Islington, South.—The retention of a building at the rear of No. 35, Thornhill-road, Islington, with a forecourt boundary at less than the prescribed distance from the centre of the roadway of the southern arm of Barnsbury-square (Messrs. F. J. Eedle & Meyers for Mr. T. Heath).—Refused.

Width of Way and Line of Frontage.

Chelsea.—Artisans' dwellings on the north-eastern side of Pond-place, Chelsea (Messrs. Joseph & Smithe for the Council of the Metropolitan Borough of Chelsea).—Consent.

Width of Way, Line of Frontage, and Space at Rear.

Strand.—A block of artisans' dwellings on the north-eastern side of Marshall-street, Westminster (Messrs. Joseph & Smithe for the Council of the City of Westminster).—Consent.

Line of Frontage and Space at Rear.

Wandsworth.—A deviation from the plan approved in respect of the erection of buildings on the west side of Streatham-hill, at the corner of Drewstead-road, Wandsworth, so far as relates to the erection of an office building on the south side of Drewstead-road, and to an alteration in the space at the rear of the buildings on the west side of Streatham-hill (Messrs. Taylor & Sons).—Consent.

Uniting Buildings.

City of London.—The uniting of No. 5, Threadneedle-street, with No. 8, Finch-lane, City (Mr. T. B. Whinney for the London, City, and Midland Bank).—Consent.

Deviation from Certified Plans.

Strand.—Certain deviations from the plans certified by the district surveyor so far as relates to the proposed re-erection of No. 13, Golden-square, Strand (Mr. W. Woodward).—Refused.

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

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

A MEETING of the Discussion Section of the Architectural Association was held at 18, Tuflet-street, W., on the 17th inst. Mr. E. W. Wonnacott in the chair, when a paper was read by Mr. Edwin Gunn on "The Ideal Architect from the Client's Point of View," of which the following is a summary:—

Clients, like architects, are various. Accordingly the client's point of view is not a fixed one. Generally speaking, however, its outlook is directed rather towards material than esthetic needs, and this is not solely in the business man. Bacon, in his Essays, shrewdly says:—"Houses are built to Live in and not to Look on; Therefore let Use be preferred before Uniformity: Except where

th may be had. Leave the goodly Fabriques Houses, for Beautie only, to the enchanted Pallaces of the Poets: Who build em with small Cost."

This materialistic view of things I cannot think a disadvantage. Indeed, if it were not wholly true, and the client more often willing to leave all questions relating to architectural form and expression entirely in the hands of the man who is (presumably) aimed to impart it, only good could result. Upon question of plan arrangement and details of convenience, the layman's opinion is generally interesting, if not always convincing; but his remarks, as soon as he leaves his practical ground for a higher sphere, are, as a rule, not of an edifying nature. "Styles" may bring himself to partly understand, and even to label and classify with the pride of imperfect knowledge, but the general quality described as "style" (for lack of a better word) is uncomprehended by him. Having now conveniently assumed the client's right point of view to be material (not necessarily practical), I will proceed a step further. In 90 per cent. of cases, a client's secret ideal would shape somewhat as follows:—"My ideal is the man who can embody all my ideas and requirements, and translate them to the builder, that I obtain in the result a building 'made to order,' coupled with every due economy of cost." In fact, the architect is looked on as a species of middleman between client and builder. This is not the light in which he should be regarded if good work is to result, and the client's interests are surely best served by an architect who attempts the ungrateful task of convincing him of the folly or impracticability of some of his pet schemes. I have known architects (and financially successful ones) whose extreme deference to their clients' views carried them to the extent of accepting their slightest wishes without advancing the objections which might be perfectly apparent to their professional knowledge. The man who has need for the services of a professional man should content himself with a statement of the situation in which he requires advice or help, and his adviser should be capable of taking the steps necessary to provide it. If architecture be an art, would any other artist, a painter, say, welcome suggestions as to the colours with which his palette should be charged, even though their giver had commissioned the work in hand? Assuredly not, yet a similar state of things is of daily occurrence in architecture, and the complaisant architect is undoubtedly popular with that conceited and self-opinionated type of client who knows what he likes." Another type of client is he who wishes to build he hardly knows what, and employs the architect to relieve him of the trouble. Viewed in the light of "Art for Art's sake," it is doubtless charming to work under such conditions, but practically it is awkward—it is akin to the difficulty of solving a problem without reliable data. Assume, however, that we have found our ideal client—one who is able to give clear instructions as to his needs, but remains open to reason, ready to accept modifications upon his architect's advice and does not trespass in matters of detail beyond his ken. It remains for the architect to take care that his advice so given is logical and well supported by cogent reason. As examples of the influence which an architect may legitimately bring to bear, I may instance stress laid on thoughtful planning, especially in relation to the arrangement of water services and drainage, and the avoiding of the provision of such necessities on the exposed fronts of the house. Generally speaking, I think it is well to take the client into our confidence and present to him our reasons more often than we do. How is he to know that these reasons exist, or that much thought and scheming have been devoted to such matters of detail, unless we so explain to him? In return for the disposition of sweet reasonableness, let the architect not design chimneys which smoke at the wrong end, transames at the eye line, and bedrooms minus good position for bed or wardrobe. In short, the architect must be assured that he does not forget utility or sacrifice it to any consideration. Our ideal architect will ever have both art and utility in his mind, and succeed in reconciling them. This brings me to what must be regarded as the point which I wish to make, viz., that the ideal architect, from the client's as well as every other point

of view, is he in whom the sense of proportion is best developed. By proportion, in this sense, I mean a due regard for the relative importance of all the multifarious details of modern practice. Our President, in his annual address at the commencement of this session, has put things into such true perspective that I make no apology for introducing his remarks as a fitting termination. Mr. Dawber says:—

"An architect, to a great extent, must combine two qualities, qualities that are generally considered impossible to find together in one individual; the artistic and sensitive temperament of the artist with the orderly and commonsense methods of the man of business. The latter must be ever present to restrain those fancies into the realm of reality in which the former may be tempted to indulge. Such success in most occupations depends largely upon efficient organisation and management; that is to say, on a due relation of each part to the rest. In architecture that is specially true. It is the art which is dependent for its expression on the ability of the artist to work and obtain his results through cooperation with his employer. Indeed, architecture is, to a certain extent, more capable of being judged by commonsense methods than any other art. This is doubtless the reason why commonsense people of other professions often think they would make better architects than those they employ. The general public are more apt to look upon architecture as a business than as an art; partly because it is ruled more or less by commonsense principles, and partly because the accepted method of payment is more businesslike than artistic. We associate directness and the power of quickly grasping a difficult situation and dealing with it with the qualities that go to make a good man of business, and nowhere are these qualities so necessary as in the work of an architect, which, above all things, must be practical. In the management of accounts, in keeping a constant check and supervision of expenses, it is obvious that, in his client's interests, an architect must be a careful man of business. Not only so, but in the artistic side of his work, in the management and disposal of the plans, and elevations of his buildings, the business quality will again make itself felt."

And, finally, let me add another quality necessary to peace of mind, viz., the long-suffering and patience of Job.

Mr. F. C. Mears, who proposed the vote of thanks, said the ideal architect should reduce his client to a state of docile admiration, and avoid rows. Mr. A. C. Dickie summarised the great need as "tact," added to sympathy, and Mr. A. H. Belcher defined the architect as a "diplomat." Generally, the discussion dealt more with the unideal client than the ideal architect. Mr. R. Watson, in summing up, said an architect should be frank and clear, and have his designs well thrashed out; he should be keen to consider his client's requirements and pocket. His contract plans should be full, accurate, and clear. Much of the knowledge required for sanitation, water supply, sewage disposal, and such matters can, and should, be learnt from the text-books, and then applied. A scheme should not be started with preconceived ideas, and, if the client's needs are well worked out, a successful result often ensues.

The Chairman, in concluding the meeting, announced that the paper to be read on January 31 would be by Mr. A. C. Dickie, on "Internal Steps and Stairs."

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At the Edinburgh Architectural Association meeting on the 17th inst., Mr. H. O. Tarbolton, President, in the chair, Mr. W. T. Oldrieve, Principal Architect for Scotland of H.M. Office of Works, read a paper entitled "What H.M. Office of Works is Doing for Historical Buildings in Scotland." Mr. Oldrieve said that all architects and antiquarians must be pleased to see a growing interest on the part of the general public in this question, for only the enlightenment and improved artistic sense of the public could enable any Government to take efficient control and enforce the necessary provisions for the conservation of such buildings. Much had been done by legislative action in other European countries for the care of ancient monuments. Almost every European country except their own was taking action in the preparation of official catalogues of national monuments, and surely every possible means should be used to take similar action in this country. Scotland was rich in historic remains of architectural monuments of the past, but the greater number of these were under no official cognisance and subject to no official control. It appeared to him that the work of the National Art Survey of Scotland deserved special notice and recognition in this connexion, and he could not imagine a more praiseworthy scheme than

that of encouraging architectural students, under proper guidance, systematically to measure and sketch the more important architectural remains. The historic buildings and remains over which their Department had direct control might be classified under two heads: (1) Buildings vested in the Department, and (2) architectural and antiquarian remains of which the Commissioners of Works were custodians under the Ancient Monuments Acts. It was now, however, recognised that other Government Departments which carried out building works referred to the Commissioners of His Majesty's Works cases which affected ancient buildings of an architectural character, as, for instance, the War Department with reference to Edinburgh Castle, Stirling Castle, etc., and the Admiralty Department as in the case of Rosyth Castle, a proposed restoration of which was contemplated. The archeological remains of a minor character, so-called ancient monuments in Scotland, of which they were custodians, comprised:—The circular walled structures called Edin's Hall on Cockburn Law, Berwickshire; the British Forts on the hills called the Black and White Catherluns, Forfarshire; the Pictish Towers at Glenelg, Invernessshire; the Stones of Callernish, Lewis; the Brough of Clickimin, Shetland; the Pictish Tower at Mousa, in Shetland; the inscribed slab standing on the road leading from Wigton to Whithorn; two stones with incised crosses on a mound in a field at Lagganair; and the pillars at Kirkmaidrie, Wigtownshire. Secondly, there were ancient monuments, to which the Ancient Monuments Protection Act, 1882, applied, but which had not yet been taken in charge by His Majesty's Office of Works. These included the Bass of Inverury; the vitrified fort on the Hill of Noath, and the pillar and stone at Newton-in-the-Garoch, Aberdeenshire; the British Walled Settlement, enclosing huts at Harefalds, in Lauderdale; the Dun of Dornadilla; the Sculptured Stone called Suenos Stone, near Forres; the Cross Slab with inscription in the Churchyard of St. Vigeans; a group of remains and pillars on a haugh at Clava, on the banks of the Nairn, Invernesshire; the Cairns, with chambers and galleries partially dilapidated, Minnigaff, Kirkeudbrightshire; the Catstane, an inscribed pillar, Kirkliston; the Ring of Brogar and other stone pillars at Stennis, Orkney; the Chambered Mound at Maeshowe, Orkney. Thirdly, there were ancient monuments not included in the schedule of the Act of 1882, but which had since been taken in charge by H.M. Office of Works under that Act by order in Council—viz., ancient Runic Crosses at Ruiswell, Dumfriesshire; St. Ninian's Cave, Wigtownshire; the Pictish Tower of Carloway, Lewis; cup-marked rock of three standing stones, Drumtroddan; the Meai Hill of Druchtug, semi-circular earthwork, Barsalloch; and the ancient chapel of Wigtownshire; sculptured stones at Essie, Forfarshire; Roman Camp at Rispan; and standing stone at Blairbowie, known as the Wren's Egg; and sculptured stones at Whithorn Priory, Wigtownshire; sculptured stones in Dyce Churchyard, Aberdeenshire. Mr. Oldrieve explained next the working of the Ancient Monuments Acts, and pointed out that while the object of the earlier Act was the preservation of ancient monuments consisting for the most part of prehistoric remains, dolmens, ancient forts, etc., the Act of 1890 had a much wider scope, as therein "monument" meant any structure, erection, or monument of historic or architectural interest, or any remains thereof. Mr. Oldrieve proceeded to show by means of limelight other important historical buildings under the charge of the Board of Works on which certain restorations had recently been made. First among them was Edinburgh Castle, the care of which, he said, had now been transferred from the Royal Engineers Department of the War Office to H.M. Board of Works. One of the first things that was done was to re-arrange, at a cost of about 1000l., the fire appliances at the Castle, and it was now on that account much safer from fire than it had formerly been. They were now considering how best to re-model the block known as the "new barracks." He was quite alive to the necessity of moving very carefully in the matter, and before anything was actually attempted upon the building itself, he should endeavour to have not only photographs and prospective sketches

from various standpoints, but a model prepared for full consideration. As to Holyrood Palace, he mentioned that, among other things, an old sculptured panel which had been removed at the time of the Commonwealth would be and-by be replaced in a recess in one of the turrets. It bore the Royal Arms of Scotland with Unicorn and St. Andrew's Cross. Another little bit of restoration work had just been done in Queen Mary's Audience Chamber by the removal of a comparatively modern partition which divided the room into two parts. Visitors would now be able to see the chamber practically as it was at the famous interview of John Knox with Queen Mary, and it would be worth while to look at the old ceiling, now that it could be properly seen, especially as it was the only ceiling at Holyrood which was part of the original building as occupied at the Queen Mary period. He also mentioned that an interesting little stair which had until recently been kept closed, between the audience chamber and the prison cells above, had now been opened to view. Mention was also made of what was being done for the restoration of the tapestries in the Palace of Holyrood and for the preservation of the grave slabs in the Chapel Royal. His next directed attention to the restoration and redecoration of Parliament Hall, which has been already described, and reference was also made to preservative work which had been executed at Linnithgow Palace, at Dunfermline Abbey, at St. Andrews Cathedral, where, in September last, stone coffins of the priors had been discovered; at Arbroath Abbey, Dundrennan Abbey, Forthrose Cathedral, and Haddington Abbey. Concerning Rosyth Castle, he said it was generally known that that old keep formed the central feature of the proposed naval base on the Forth. This was one of the cases in which the Board of Works were acting as architectural advisers to the Admiralty. It was thought that the old keep might be restored for the purpose of utilising the accommodation available in some way connected with the naval scheme. Accordingly, designs had been prepared for a restoration, one principal apartment being utilised as a reading-room for naval officers, and another for the purpose of a naval museum. The plans were now under consideration of the Lords of the Admiralty, and it was hoped the scheme might receive sanction. It would certainly be a pity to let the building fall into decay, since it was of some historical interest. Two dates were found upon the building, one 1561 and the other 1635 or 1655, along with these being some initials. On the motion of Professor Baldwin Brown, seconded by Mr. Hunter Crawford, Mr. Oldrieve received a cordial vote of thanks.

WOLVERHAMPTON ARCHITECTURAL ASSOCIATION.—The annual general meeting of the members of the Wolverhampton and District Architectural Association was held on the 18th inst. at the Law Library, Lynch Gates, when the officers and Council for the ensuing year were elected as follows:—President—Mr. Fred T. Beck; Vice-President—Mr. W. Edwards; members of Council—Mr. T. H. Fleeming, Mr. J. Lavender, F.R.I.B.A., Mr. Ashton Veall; Hon. Treasurer—Mr. Harrison Weller; Hon. Auditor—Mr. A. Eaton Painter; and Hon. Secretary—Mr. W. J. Oliver. 1, Darlington-street, Wolverhampton. The Vice-President (Mr. W. Edwards) presided at this meeting, in the absence, through illness, of the President (Mr. Beck), who was therefore unable to deliver his annual address. The meeting was of a business nature.

ARCHAEOLOGICAL SOCIETIES.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—At the evening meeting on January 17, Mr. R. H. Forster, Hon. Treasurer, in the chair, Dr. Winstone exhibited two rush-light stands brought from Llanidloes in Wales, inserted in massive blocks of oak and in perfect condition. Mr. Gould, in explaining how the rushes were applied and burned in order to produce the most light and to collect the falling tallow for re-use, said these rush-light stands were of a similar type to those occasionally found in Essex. The Chairman exhibited a coin of Carausius dredged up from the river in Putney reach with many other coins, which, unfortunately, were lost, together with the dredger almost

immediately afterwards, and could not be recovered. This coin is of somewhat rare type among the vast number of Carausius found in England. It is nearly identical with Cohen's, No. 217, "Carausius." Its description is as follows: Face of coin, bust to right, "I.M.P. CARAVSIVS P.F. AVG." Reverse, "PAX." "PAX" (the word "Pax" has disappeared from this coin) and figure of Peace, facing to left, holding an olive branch and leaning on a staff. Letters B E on either side of the figure, the meaning unknown, probably a moneyer's mark (?) at foot, "M L XXI," meaning London Mint and value (twenty-first part of a silver denarius). Mrs. Collier read a paper on "St. Clether's Chapel and Holy Wells."

The submerged ruins of a well and other buildings had long been known to exist upon the steep slope of a hill in the neighbourhood of St. Clether's Church, in the Tamey Valley, Cornwall, but it was not until 1897 that practical steps were set on foot to unearth them, with the consent of the owner of the land, by the Rev. S. Baring Gould, who was aided in the work by local subscriptions and donations. The work was not easy nor progress expeditious, as they lay in a swamp, and the water had to be drained off and diverted before excavations could be undertaken. The first discovery made was that of the upper Holy Well, which received, and still receives, its water from a spring higher up the hill, which may have been a Pagan well consecrated to Christian uses by St. Clether. Here were found stone jambs in position, an arch, but broken, and sufficient of the walls remaining to enable the size and outline to be obtained, and the trough beneath cut out from granite was found in perfect condition. A few feet lower down the slope other portions of walls were visible, which, on being cleared of the earth, under the supervision of the Rev. A. H. Malan, proved to be the remains of the chapel, or oratory, of St. Clether. Four feet of the height of the east wall was found with the altar slab in position still resting on four upright stones and fixed without mortar. Close to the south-east corner of the east wall a small recess was disclosed, and another, but larger one, at the south end of the altar in the same wall. A south-east corner a slab of granite resting on a set-off remained in position. The most interesting feature of the exploration is the fact that the water from the upper well was conducted in a channel through the north wall, flowing under the base of the altar, and emptying itself through the south wall into a lower well hollowed out on the outer side of the building. This was proved to be the case by clearing the passage with rods, when the water came running swiftly through the conduit, and does so still, as it did centuries ago. The building internally measures 19 ft. 1 in. by 11 ft. 4 in., with a door on the north and another on the west. The upper well is not square with the chapel, but is situated 7 ft. from the north-east angle. Of the date of the upper and original well discovered by St. Clether there can be only conjecture, but sufficient architectural remains of the chapel were met with to show it to be a building of the XVth century. It has been very carefully restored through the liberal donations of Mr. Spry, of Witherdon, the owner of the land, Mr. Baring Gould, and others interested in its preservation. The paper was illustrated by sketches and photographs. A second paper was to have been read by Mr. Patrick, Hon. Secretary, but, owing to his indisposition, it was read by the Chairman, contributed by Dr. Russell Forbes of Rome, on "The Curtian Lake." The natural condition of the forum, situated in the valley between the Palatine and Capitoline Hills, was a boggy hollow. It was called the Curtian Lake from a leader of the Sabines getting mired in it in the war with Romulus, and, although it was afterwards drained, it retained the name. A small part was consecrated to the memory of Mettius Curtius near the centre of the forum, represented in the present day by a shallow brick basin 15 ft. from east to west by 15½ ft. from north to south and 2½ ft. below the present level. It is over the north end of the fourth or eastern underground corridor of Caesar, and one-third down the south side of the Basilica Æmilia. A vase, some fragments of pottery, and sacrificial bones were found within it and remain on the spot. The incident of Curtius

flourishing in the marsh is commemorated in a relief of peperino stone now on the staircase of the Palazzo dei Conservatori, found in 1553 near the column of Phocas. This spot, the Curtian Lake, was believed to have been struck by lightning, and was enclosed by Cains Curtius, Consul, with the sanction of the Senate, a.c. 443, who built an altar there, the remains of which were discovered in the forum between the column of Phocas and Decian's pedestal on April 15, 1904. It is related by Proculus that, a.c. 360, the earth opened in that place, and the auspices being consulted by the direction of the Senate the response of the god demanded a sacrifice to the Manes. Then a certain Curtius (Marcus Quintus Curtius), a valiant man, armed and mounted on horseback, threw himself into the chasm, when the earth closed up, burying his body divinely. Dr. Russell Forbes asks: "Is the story of Marcus Curtius a poetical legend of self-sacrifice founded on the story of Mettius Curtius, or did Marcus open it as an earthquake, and did Marcus Curtius immolate himself?" "If he plunged into the chasm the remains of Curtius and his horse are existing, and will certainly see the light of another day in the course of further explorations. If they are not found, then the story is but a poetical legend." The Chairman, Mr. Gould, Mr. Kershaw, and others joined in the discussion which followed.

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday last week, the Mayor presiding.

Shadwell Market.—In reply to Mr. Barber, who asked what was being done with the Shadwell Market, Mr. Green said that efforts had been made in the past year to establish a market there. A deputation had also been received in connexion with the project for turning the market into an open space, and if a sufficiently liberal offer were made that proposal might be carried out. The question as to whether it would be possible to have a market there of a different character was under discussion.

Strand Improvement.—A letter from the Secretary of the Further Strand Improvement Scheme Committee, forwarding a copy of a memorial to the London County Council in support of the plan advocated by the Committee, and asking the Corporation to do the same, was referred to the Finance and Improvements Committee.

Trade Union Wages.—A letter was received from the town clerk of the Borough of Lambeth inviting the Corporation to send delegates to a conference to be held at an early date at the Lambeth Town Hall, with a view to framing and bringing into existence a uniform scale of trade union rate of wages and conditions for the employees in each department of the different borough councils. The letter was referred to the Streets Committee.

YORKSHIRE FEDERATION OF BUILDING TRADE EMPLOYERS.

THE annual dinner of the Yorkshire Federation of Building Trade Employers took place on the 19th inst. at the Hotel Metropole, Leeds. Mr. Paul Rhodes (President) was in the chair.

In proposing success to "The National Federation of Building Trade Employers," Mr. S. Smeethurst (Oldham) said the organisation was growing in importance every year. Defensive in its aims, it was founded on a broad basis of representation, and was financially sound. Great hopes were entertained, he said, that the result of the new conciliation scheme that was about to be inaugurated would be that there would be absolutely no more strikes or lock-outs. The scheme had been favourably received in Lancashire, and there was reason for believing that it would be received with equal favour in other parts of the country. Under the new scheme every effort would be made to settle amicably every point that might be raised between employers and workmen, and without cessation of work. In view of the growing strength of labour it behooved masters to be well organised and to be suitably financed.

Mr. W. Shepherd (London), President of the National Federation, responded. It was true that the Master's Federation was mainly meant for defensive purposes. If it had not been for the strength of the masters' organisation, such a scheme of conciliation as had been indicated would not have been possible. It was only when two parties became organised and strong that they began to respect one another—that conciliation became possible. They stood for freedom of contract, and for equitable and just treatment. When it was realised that, taking the country as a whole, building was the largest industry in England, after agriculture, one felt

but there was very little litigation amongst employers, and very little friction amongst them. With regard to the progress of labour, it behoved that Federation to watch what was going on around them. He was ready to acknowledge that the Labour representatives who had come to the front had a high conception of their duties, and a keen sense of their responsibilities. It was for employers to watch the trend of events.

Mr. W. Nicholson, Vice-President of the National Federation, also acknowledged the toast. What the Federation now stood most in need of was a reserve fund. That reserve fund might be termed the masters' premium against labour. With regard to the conciliation scheme it was important that the conciliation board should be a strong one. One thing the trade had to be particularly thankful for was the concession that there should be no cessation of work pending negotiations.

Mr. J. Dawson (Huddersfield) proposed the toast of "Architects and Surveyors," and it was responded to by Mr. G. B. Bulmer, President of the Leeds and Yorkshire Architectural Society.—(Alderman Judge (Wakefield) gave "The City and Trade of Leeds," and this was responded to by Mr. Charles Myers.

Mr. J. H. Armitage, Chairman of the Leeds Waterworks Committee, proposed "The Yorkshire Federation of Building Trade Employers," and the toast was responded to by the President (Mr. Paul Rhodes) and the Vice-President (Mr. A. W. Sinclair).

METROPOLITAN ASYLUMS BOARD.

The ordinary fortnightly meeting of the managers of the Metropolitan Asylums District was held on Saturday last week at the offices, Victoria Street, W.C.

East Cliffe House, Margate.—On the recommendation of the Children's Committee the Works Committee were instructed to submit a plan and estimate of cost of proposed additional staff accommodation at this seaside home.

North Eastern Hospital.—The amended plan of the new boiler house, etc., at this hospital was approved and the matter was referred to the Works Committee to be dealt with.

Joyce Green Hospital.—A sketch plan, prepared by the Engineer in Chief, of a proposed goods reception station at Joyce Green Hospital was approved, and referred to the Works Committee.

A scheme for the erection of staff cottages at the hospital was referred to the same Committee.

South Eastern Hospital.—Plans prepared by Messrs. T. W. Aldwinckle & Son for structural alterations in the boiler house at this institution were approved, and ordered to be forwarded to the Local Government Board for sanction. It was agreed also, subject to the sanction of the Local Government Board, to enter into a contract with Messrs. Babcock & Wilcox for providing and fixing three multi-tubular boilers, with settings and mechanical stokers, for the sum of 2,250*l.*, and it was further agreed to apply to the Local Government Board for sanction to inviting tenders from six selected firms for the execution of engineering, pipe work, fitting, etc., in connexion with the installation of the new boilers.

COMPETITION.

SHIRE HALL, NORWICH.—In reference to the paragraph in our last issue relating to the proposed enlargement of the Shire Hall, Norwich, a mistake was made in the names of the authors of the first and second premiated designs. Mr. Tench is the author of the design placed first, and Mr. Wm. Whiddington, 71, Queen-street, Cheapside, the author of the design placed second. The mistakes were not ours.

BOOKS RECEIVED.

THE VENTILATION, LIGHTING, AND HEATING OF DWELLINGS. By J. W. Thomas, F.I.C., F.C.S. (Longmans, Green, & Co. 6s.)

DEPARTMENTAL DECISIONS. By the Local Government Board, Board of Education, Home Office, and Treasury. Quarterly Issue No. 1. (S. Edgecombe Rogers, 2s.)

THE WATER SUPPLY OF VILLAGES AND SMALL TOWNS. By H. C. H. Shenton, M.S.E. (Local Government Journal Office, 6d.)

LOCAL GOVERNMENT ANNUAL AND OFFICIAL DIRECTORY. Edited by S. Edgecombe Rogers. (Local Government Journal Office, 1s. 6d.)

THE LAW OF COMPENSATION. By Alfred A. Hudson, Barrister-at-Law. (Sweet & Maxwell.)

THE ARTS AND CRAFTS MOVEMENT. By T. J. Cobden-Sanderson. (Hammersmith Publishing Society.)

Correspondence.

ARCHITECTURAL "REFINEMENTS."

SIR.—The article in your journal dealing with Professor Goodyear's conclusions, and the further reference to the matter in the issue of the *Builder* for December 9, entertained me immensely. I had previously wondered what was the perusal of the reports of the Edinburgh lectures as published and commented upon in other journals, whether the time was not ripe for someone with a gift for writing to come forward and finally demolish these pseudo-scientific theories. One can but suppose that their ready adoption by an unthinking public is due to the modern tendency to invest everything ancient with a undue mysticism. In another direction the same thing is to be observed in the highly-developed faculty some people have for detecting symbolism in everything relating to the structure of a church. You will pardon what may be properly described as a pointless letter, but in a country like this, where the mental horizon of the inhabitants is bounded by the share market, it is a relief to feel oneself in touch with London. In this respect the *Builder* is a most valuable link.

FREDK. CHATTERTON, A.R.I.B.A.
Pretoria Club, Pretoria, December 30.

APPOINTMENT OF DISTRICT SURVEYORS.

SIR.—If the system advocated by "An Architect" becomes law, poor unfortunate builders would have to wait months before starting their jobs, whereas at present they can give notice to the District Surveyor and start the work in twenty-four hours.

There are architects and architects, and in some cases it is a blessing for the public that the District Surveyors are competent and experienced architects, can point out the weak spots in the construction, and save collapse and, perhaps, loss of life.

I have never met the machines named; a very difficult Act has to be interpreted, and the learned bodies agree with the public that the District Surveyors are a credit to the profession to which they belong.

Surely "An Architect" knows that "light and air" is regulated by common law and not by the Building Acts.

The Guild Court may answer for the little towns of Scotland as the district councils do for the provincial towns, but the experience of sixty years shows that the independent officer is the best arrangement for London.

DISTRICT SURVEYOR.

CHARING CROSS ACCIDENT.

SIR.—More than thirty years ago a lamp-post fell down in Marylebone-road through internal oxidation. The lamp-post was moulded horizontally and the fracture took place at a deeply-indented annular moulding. I wrote to the *Builder* at the time stating that ironwork required internal protection, especially tubular ironwork and parts of ironwork not externally visible.

Since then the lamp-posts in this town have been replaced by others moulded vertically only and fluted like columns from top to bottom, which is a much safer construction. I also suggested internal painting.

The best colour for ironwork is Prussian blue, which is made from hydrocyanic acid of iron and has, of all ferric colours, the strongest affinity for that metal. A gateway at Hardwick Hall, Bury St. Edmunds, was painted with this colour before 1836, and when I saw it in 1889 it had kept its colour ever since and probably has continued so to this day.

WALTER SCARBILL.

Colechester.

ARTS AND CRAFTS EXHIBITION.

SIR.—Referring to your notice of a chair in the Arts and Crafts Exhibition, while admitting the justice of your remark, "seems rather a small matter to have occupied the resources of four designers," may we be allowed to say that the chair in question forms only one item in a complete scheme for the decoration and furnishing of a house on which we are at present working.

Had it been possible, we should have been only too pleased to have exhibited the whole scheme.

For the "Guild of Four Designers,"

LANSYAP P. BUTTERFIELD, Secretary.

CONGREGATIONAL CHURCH, NEWLAND, HULL.—A new Congregational church has been erected in Boverley-road, Newland. The building is of brick, with terra-cotta facings. The interior is original with a chancel, and the pitched roof covers the entire body of the church. Mr. J. H. Fenwick was the builder, the architects being Messrs. Moulds & Porritt, of Bury, Manchester, and London.

GENERAL BUILDING NEWS.

ST. JOHN'S CHURCH, WAKEFIELD.—The new chancel of this church, which has just been completed, was erected from the designs of Mr. J. T. Middlethwaite at a cost of 4,000*l.* In addition to the chancel proper, an organ chamber and vestry have also been provided.

BOYS' SCHOOL, BARRY.—On the 6th inst. the new boys' department of the Council schools in Romilly-road, Barry, was opened. The building provides accommodation for 346 children. There are several classrooms, each communicating separately with an assembly hall 62 ft. long by 32 ft. wide. Mr. G. A. Birkenhead, architect, prepared the plans for the work, and the contractor was Mr. W. Britton. The total cost of the work, including furniture, amounted to about 4,800*l.*

CHURCH EXTENSION, GLASGOW.—The Catholic Apostolic Church in Catherine-street, Glasgow, has been enlarged by the addition of a north aisle, south and west porches, baptistry, and a ladies'-room. The work has been carried out from designs prepared by Messrs. Salmon & Son & Gillespie, architects, of Glasgow, at a cost of about 3,500*l.* The original church was built under the supervision of the late Bailie Salmon from sketch designs by Pugin.

CHURCH-ROOM, HEATH END.—On the 4th inst. the Bishop of Winchester opened a new church-room at Heath End. Mr. A. J. Stedman prepared the plans and Messrs. Cesar Brothers were the builders.

PARISH ROOM, MARKET DRAYTON.—A new parish room, which has been erected on the old bowling-green, Market Drayton, was opened on the 8th inst. by the Duchess of Sutherland. The building was designed by Mr. G. A. Craig, architect and surveyor, of Market Drayton, and contains a hall 53 ft. by 30 ft., a stage 21 ft. by 20 ft., and a reading and recreation room. There is also a kitchen, and the entire premises are heated throughout with hot water and artificially lighted by electricity. The cost was 1,500*l.*

DISTRICT LIBRARY, GLASGOW.—The new Dennistoun District Library, which has just been opened in Craigpark-street, makes the sixth district library opened by the Corporation since the adoption by the city of the Public Libraries Act, all having been built from designs by Mr. Rhind. The lending department is situated in the centre of the ground floor, in front being the ladies'-room, and in the rear a general reading-room. On the upper floor are reading-rooms for boys and girls. The general reading-room provides accommodation for 330 readers. The cost of the building, exclusive of site, is estimated at a little over 7,000*l.*

BROADSTRAK INN, SCENE, N.B.—The Broadstrak Inn, on the estate of Leddach, Skene, has just been reopened after having been rebuilt. Messrs. Jenkins & Marr were the architects for the work, the contractors being as follows:—Messrs. George Duncan, Inverurie (mason); Moir, Inverurie (plasterer); Calder, Cults (slater); Stewart, Blackfriars-street, Aberdeen (plumber); Hall, Mile-End, Aberdeen (joiner); Watt & Sons, Aberdeen (painters).

LIBRARY, WINDHILL, SHIPLEY.—The Carnegie Library at Windhill, in the Shipley district, was opened recently. Situated at the junction of Leeds-road and Fountain-street, near the bottom of Carr-lane, the building occupies a central position. Passing through the vestibule and a hexagonal entrance-hall, the visitor reaches the lending library, on each side of which are the reference library and the reading-room. Accommodation has been provided for about 8,000 volumes in the lending department and for fifty readers in the reading-room. The librarian's room is placed between these two, the floor being raised to afford full supervision. Upstairs is a students' room, a ladies' room, a patent journal room, and lecture-hall, with anteroom and public lavatories for both sexes. The lecture-hall affords accommodation for 150 persons nominally, but by the adoption of the sliding partition system the whole of the accommodation on this floor has been made available for one room in case of necessity. In the anteroom provision has been made for the preparation of tea. The elevations are carried out in local stone, and the whole of the interior woodwork is in pitch-pine, varnished. The floors are constructed of steel and concrete, the vestibule, entrance-hall, and landing being laid with terrazzo mosaic and the remainder with pitch-pine boards. The furnishings are of pitch-pine and teak. The building is warmed on the low-pressure hot-water system and lighted by electricity. Mr. Ahm, Sharn, Bradford, was the architect, and the work has been carried out under his superintendence by the following contractors:—Masons, Messrs. Wilks & Ingham; joiner, James Deacon; plumber, Mr. Samuel Jackson; plasterers, Messrs. J. & W. Bates; slater, Mr. Thomas Thornton; scaffolders, Ahm, Fulman & Sons, Ltd.; heating, Mr. S. Rushworth; ventilating, Messrs. P. H. Walker & Co.; carver, Mr. S. Charnock; tiling, T. & R. Boote, Ltd.

KENT AND CANTERBURY HOSPITAL.—The Kent and Canterbury Hospital has just been

re-opened after renovation and partial rebuilding. The result of the restoration has been the provision of a new ward (the Blackman Ward), the erection of a new mortuary and post-mortem room, a reorganisation of the out-patient department, the substitution of hard wood for the worn-out deal flooring, and a general putting of the institution into hygienic and sanitary condition. In addition to this work in the hospital proper an enlargement of the Nurses' Home has been carried out by the provision of seven additional bedrooms at a cost of about 350. The walls of the corridors and walls of the hospital have now been finished with terrazzo to a height of 4 ft. 6 in. and above that with hard plaster. New heating and ventilating arrangements have also been introduced and certain alterations made in the internal structure. An anaesthetising room has now been provided adjoining the operating theatre, and this latter has been practically rebuilt upon modern principles. The lighting has been improved, the walls and ceiling finished with opaline lining throughout, a terrazzo floor provided, and new fittings put in. The drainage of the hospital was remodelled some few years ago, but new sanitary fittings have been put in throughout. Mr. W. J. Jennings, of Canterbury, architect and Diocesan Surveyor, was the architect, and the work has been carried out by Messrs. Gann & Co., of Whitstable.

SOCIETY FOR THE PROPAGATION OF THE GOSPEL.—At the last monthly meeting of the Society, held on January 19, it was officially announced that Sir William Emerson had been appointed architect of the new premises to be built for the Society, and that the new scheme would be prepared forthwith.

NEW PAVILION AND CAFÉ FOR THE BRIDLEINGTON CORPORATION.—Contracts have been settled this week for a new pavilion to hold 3,500 persons, designed by Messrs. Mangnall & Littlewoods, architects, Manchester. The building will have an inclined floor, gallery round three sides communicating with outside balcony, and proscenium with stage thoroughly equipped for theatrical performances, artists' retiring-rooms, etc., also a large café communicating with pavilion.

WORKING MEN'S COLLEGE, LONDON.—On Saturday last week, Sir William Anson, M.P., opened the new buildings of the Working Men's College, which have been erected in Crowndale-road, N.W. The architect is Mr. W. D. Carie, and the builders are Messrs. V. Johnson & Co. (Limited). The accommodation is sufficient for over 1,000 students, comprising, besides the ordinary class-rooms, three laboratories (physical, biological, and chemical), art-room, hall, library, museum, coffee, common, and club rooms, and a gymnasium. The cost of the site was 6,600, exclusive of expenses; the estimate for the building was 22,475, and for furnishing and equipment 1,000.

APPOINTMENT.

MR. MARCUS HOSKINS, of Mumbles, has been appointed the Estate Agent and Valuer to the Swansea Corporation.

SANITARY AND ENGINEERING NEWS.

PROPOSED RESERVOIR, STANDISH, WIGAN.—Colonel A. J. Heywood, F.S.O., R.E., Local Government Board Inspector, recently attended at the Council Offices, Standish, and held an inquiry into the application of the Council to borrow 2,900, for the purposes of constructing a reservoir on land adjoining Green-lane, Standish. Mr. W. Lees (Law Clerk) said the only place available for the site was the top of Prospect Hill, and the Council proposed to lease a plot of land containing 444 sq. yds. The capacity of the reservoir would be 300,000 gallons. Mr. George Heaton, the engineer for the scheme, was called, and in answer to the Inspector stated that the bottom of the reservoir was to be made of cement and concrete.

WATER SUPPLY TO TENEMENT HOUSES.—The Public Health Committee of Holborn Borough Council reported on Monday that in March last they instructed the Medical Officer of Health to take steps wherever necessary for the serving of notices with a view to securing the provision of a proper and sufficient supply of water for the tenants of every floor of all tenement houses in the borough. A number of notices had from time to time been served since, and in the majority of instances the owners had complied with the local authorities' requirements. In some cases, however, the Committee had been satisfied if one additional water supply was provided about midway between the basement and the top floor. In two cases it had been found necessary to take legal proceedings, and in both orders were made by the magistrate for the provision of a proper and sufficient water supply. The Committee were informed that similar proceedings which had recently been instituted by the Councils of other boroughs at the Marylebone and Paddington Police Courts had been unsuccessful. In the Paddington case, which was dismissed with costs, the magistrate held that the words

of the section of the Public Health (London) Act, 1881, "proper and sufficient supply" referred to the sources of the supply and not the provision of taps within the house. The matter having been brought before the Parliamentary Committee of the London County Council, that Committee stated they were advised that it was by no means clear that the present law was sufficient to meet the case. Having regard, however, to the adverse decision above referred to, the Committee of the Holborn Borough Council was of opinion that it was desirable that the existing law should be amended with a view to enabling local authorities to enforce the provision of an adequate and accessible supply of water to floors in tenement houses, and they had decided (subject to the usual sanction) to urge the London County Council to take the necessary steps to obtain an amendment of the existing law.

FOREIGN.

FRANCE.—The Société des Artistes Décorateurs have organised at the Galleries Museum an interesting exhibition of art applied to the furnishing and decoration of rooms. A marble tablet in memory of David d'Angers has been placed on the house, No. 85, Rue d'Assas, where d'Angers had his studio and where he died. A collection of 85 copper plates engraved by Rembrandt has been found in Paris, belonging formerly to the Collection Mariette. The plates, which represent, among other subjects, The Descent from the Cross, and Raising of Lazarus, the Death of the Virgin, Doctor Faustus, etc., have been purchased by the proprietors of *L'Artiste*, and by them presented to the Ryks Museum.—M. Tony Robert-Fleury has been elected President of the Société des Artistes Français (Old Salon), and M. Félix de la Société Nationale (New Salon). The Ministry of Public Education has authorised the marriage of a young artist who is a pensioner student at the Villa Medici. This is an unheard-of privilege, as heretofore celibacy has been obligatory on students of the Ecole Française at Rome.—The work of restoration at the Chateau of Saint-Germain-en-Laye, commenced 43 years ago under the Imperial Government, is now to be taken up again and completed.—The Municipality of Dijon have voted 740,000 francs for various architectural work, among which is the restoration of the Salle de Flore in the Palais des Etats de Bourgogne.—The works for a new museum and school of drawing have been commenced at Mentone.—A monument to the memory of Gérôme is to be erected at Vesoul by public subscription, M. Grosjean is the architect of the monument, and M. Fevrier the sculptor commissioned, and M. Fevrier has been elected a member of the Conseil Supérieur des Beaux-Arts, in place of M. Bonnat.—The Conseil-Général des Alpes Maritimes has voted a sum of 237,000 francs for the enlargement of the Hotel of the Prefecture at Nice.—The Municipality of Paris has purchased a fine statue of Madame de Sévigné, by M. Massoule.—The annual Art Exhibition of the Cercle Volney has just opened. It includes pictures by MM. Jules Lefebvre, Cormon, Gabriel Ferrier, portraits of children by M. Vollen, portraits by MM. Chabas and Raphaël Collin, landscapes by M. François Cachon, and sculpture by MM. Sicard and Delays Fuchs.—It is announced that a Conseil Supérieur des Arts Décoratifs is to be established, the first business of which will be to organise, for 1907, an international exhibition of Applied Art.—M. Emile Friant has been appointed professor of drawing at the Ecole des Beaux-Arts, as successor to M. Olivier Merson.—A large prison building is to be erected at Brives (Corrèze).—The work will be shortly commenced for deepening the channel of the navigable portion of the Loire. These works, which will cost 22 million francs, will be completed by improvements of the Port of Nantes, at a cost of 23 million francs.—The Municipal Council of Loudun has voted a credit of 612,000 francs for the construction of a new college.—It is announced that important excavations are shortly to be commenced at Périgueux, a town already so interesting for its archaeological monuments.—M. Joannès Mallet has been elected President, for the present year, of the Union Architecturale de Lyons.—The municipality of Digne have voted a sum of 800,000 francs for the erection of a thermal establishment at Chauchets.—The works for the enlargement of the Carnaval museum are to be commenced shortly. The scheme includes the two stories of galleries surrounding a court, at right angles to the front on Rue Sévigné, reproducing the architectural style of the old Hotel of Mme. de Sevigné. This first portion of the work will be ultimately completed by the addition of new galleries surrounding a second court which will be prolonged to the Rue Pavenne.—The death was announced a few days ago, at the age of fifty-seven, of M. Louis Labbé, architect and "Inspecteur des Edifices" for the diocese of Bordeaux. He was also professor at the Ecole des Beaux-Arts of that town, and President of

the Société des Architectes Bordelais. M. Labbé was especially distinguished for the work carried out under his supervision at the Cathedral of St. André, in the course of which he brought to light the "Porte Royale," for a long time hidden by old houses. He built, in collaboration with his brother, M. Albert Labbé, the fine General Hospital in Rue Pellegrini at Bordeaux.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. F. C. Moscrop-Young, architect and surveyor, has removed his offices from No. 2, Lancastrian-place, Strand, to Waldorf Chambers, Aldwych, W.C.—Messrs. Chambers & Martin, architects and surveyors, have removed their offices from No. 2, Lancastrian-place, Waterloo Bridge, to Waldorf Chambers, Aldwych, W.C.—The firm of "Sheppard & Harrison," architects, of Bargate, Newark-on-Trent, was also altered to Sheppard & Lockton.

EVERY HILL, ELSHAM.—The London County Council have resolved to devote not more than 10,250, in adapting and equipping the mansion at Every Hill, with its stabling and machinery house and about four acres of land, for purposes of a women's training college to accommodate 60 residential and 200 day students—being, we believe, the first of its kind to be established by their Education Committee. The house is chiefly remarkable for the great sums of money which were expended, though by no means always in the best taste, upon its decoration and fittings. The original house was altered and enlarged, in red brick with Portland stone dressings, for the late Colonel J. T. North, who was known as the "Nitrate King," and for the most part under superintendence and directions of Mr. T. W. Cutler. Our readers will remember that some differences which arose between the late owner and his architect became the subject of litigation. The best feature of the house were the marble Turkish bath-room fitted with fixtures having a Moslem character in design, picture gallery and ball-room, winter garden 100 ft. square, fernery, and conservatories. Of the beautiful materials so lavishly and yet, as it seems, somewhat hurriedly employed, the Mexican onyx presented some of the finest specimens known of that marble. When the whole property, extending over 143 acres, was offered for sale in July, 1896, the auctioneer stated that from 250,000, to 300,000, had been spent on the house, stabling for twenty-four horses, stud farm, etc. On that occasion only one bid, for 50,000, having been made the reserve, 100,000, was declared. In 1902 the London County Council bought the house and 84 acres of the grounds as an open space, for 25,100, and the grounds were opened to the public on May 23 in the following year.

DALLING THEATRE AND LYRIC RESTAURANT.—The Dalling Theatre was closed on the night of December 29, the block of buildings of which it forms part, in the Broadway, having been purchased for nearly 50,000, with a view to the conversion of the theatre into a music-hall. The theatre, restaurant, and "Perceval" and "Montague" assembly rooms were erected six or seven years ago, upon the site of the old Lyric Hall, from the plans and designs of Mr. Walter Emden (who was the consulting architect for the theatre portion) and Mr. G. H. Pargeter. The block, built by Messrs. Beer & Gash, contractors, extends over an area of nearly half an acre, and comprises a masonic temple, shops, administrative offices, etc. The property was offered for sale in May, 1902, and withdrawn at a bid of 30,000.

ST. PETER'S CHURCH, MAIDSTONE.—This old structure, which has lately been returned to its former uses, after a long period of desecration, was originally the chapel of a hospital founded in the West Borough, and dedicated to SS. Peter, Paul, and Thomas the Martyr by Boniface of Savoy, Archbishop of Canterbury in 1240-70. The hospital was devoted to the use of travellers and of pilgrims to the shrine at Canterbury; the foundation was known as that of the New Work of Presens Helle. The chapel was restored and enlarged about sixty-five years ago.

THE LATE MR. H. C. RICHARDS, K.C. M.P.—The testamentary dispositions of the late Mr. Richards comprise a bequest of either 5,000, for the rebuilding and up-keep of Paul's Cross on the original site near the north side of St. Paul's in acceptance of two of his relatives, or, failing the acceptance of the bequest by the Dean and Chapter, of 1,000, for a stained glass window in the nave of the cathedral in memory of himself and two relatives; a bequest of 500, with a further 50, if nine others will contribute that amount, towards the provision of a swimming-bath and gymnasium at the Redhill Philanthropic School; 200, for the purchase of a pair of silver altar candlesticks for the Temple Church; 300, for a set of tubular bells and the completion of the tower, St. Peter's, and a memorial window to himself and his late brother in St. Andrew's Mission Church, Newlyn; his books upon London topography, legal subjects, etc., with 200, for the cases, of the City of London College; 1000, apiece to the churches of St. John, Hackney, and

St. Luke, Old-street, for memorials of his associations with the two parishes; and 200*l.* to the Society of Gray's Inn, of which he was Treasurer, for a Bishop Andrews memorial window. Mr. Richards presented to Gray's Inn Chapel the two panels commemorative of Laud and Thomas à Becket, and the Sir Thomas More window (designed by G. Ostrhan) in the church of St. Lawrence Jewry.

SHIRE HALL, BEDFORD.—Plans and designs for additional offices to form an extension of the Shire Hall, Bedford, have been prepared by Mr. W. H. Leete, county architect. The former Sessions House (1753) in St. Paul's-square was rebuilt in 1878-82 after Alfred Waterhouse's designs, at a cost of 20,000*l.*, as the Shire Hall for the assizes and sessions and headquarters of the county constabulary.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on the 18th inst. at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W. The Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects:—Building new churches at New Somerby, S. Anne, near Grant-ham, 125*l.* for the first portion, and South Bed-dington, S. Michael and All Angels, Surrey, 200*l.* for the first portion; towards rebuilding the church of S. Michael, Cottenham, near Crewe, 125*l.*, making in all 225*l.*, and towards enlarging or otherwise improving the accommodation in the church of St. Martin, S. Andrew, near Peterborough, 20*l.*, making in all 45*l.*; Great Iford, S. John-the-Evangelist, Essex, 100*l.*, making in all 250*l.*; Keelby, S. Bartholomew, near Brockesby, Lincs., 15*l.*; Skirbeck, S. Nicholas, near Boston, Lincs., 75*l.*; and Stanton Harcourt, S. Michael, Oxon, 65*l.*, in lieu of a former grant of 35*l.* Grants were also made from the Special Mission Buildings Fund towards adapting a building as the Mission Church of S. Martin, Woolwich, Kent, 25*l.* The following grants were also paid for works completed:—Iford, S. Alban, Essex, 200*l.*, making in all 700*l.* on account of a grant of 1,000*l.*; Clydach, S. Mary-the-Virgin, near Swansea, 175*l.*; Southgate, S. Andrew, Middlesex, 100*l.*; Crewe, S. John, 25*l.*, making in all 100*l.*; Haverfordwest, S. Mary, 120*l.*; Thurstone, S. Saviour, near Penistone, Staffs., 130*l.*; Rushall, S. Matthew, Wilts., 20*l.*; and Hackett, S. Paul, near Thornbury, Glos., 20*l.* In addition to this, the sum of 222*l.* was paid towards the repairs of nineteen churches. The Society has been elected to the Society. The Society likewise accepted the trust of a sum of money as a repair fund for the church of S. Michael and All Angels, South Barnet, Herts.

RESIGNATION OF A LEADS ENGINEER.—Mr. Thomas Hewson, jun., Deputy City Engineer, has sent in his resignation, after twenty-two years' service with the Corporation. The Improvements Committee accepted the resignation with regret, and passed a resolution placing on record their appreciation of the valuable services rendered by Mr. Hewson during the long time he has been in the service of the Corporation. The committee also expressed their best wishes for his future career. Mr. Hewson is about to start in private practice as a civil engineer and surveyor.

ELECTRIC DESK LAMPS.—The Concordia Electric Wiring Company send us an illustration of their "Flexible Arm" electric lamps for placing on writing-desks, etc. There is a short stand with a broad circular base, from which branches a flexible arm which, as we gather, will remain in any position in which it is placed, so that the light can be brought exactly over the spot where it is wanted. The electric glass shade with its filament projects horizontally from the end of the flexible arm, with a green shade, lined with white enamel, on the upper side of it. The Company make a lamp of the same type with two flexible arms, one at each side.

LONDON COUNTY COUNCIL AND THE BUILDING LINE.—The General Purposes Committee of Camberwell Borough Council reported on Tuesday that in October last they decided to ask the London County Council why the provisions of the London Building Act were not being complied with as regards the Victoria-road school, inasmuch as the boundary wall of the site was not 20 ft. from the centre of the road. The London County Council replied, claiming that the provisions of the Act did not apply to the school in question. The Borough Council thereupon asked the County Council to apply the same rule as was applied in the case of a private owner. On December 6 the County Council wrote asking if the Borough Council would be prepared to bear the cost of pulling down the portion of the wall already erected and erecting it on the new line, and would also pay the *pro rata* cost of the land surrendered. The Borough Council, in reply to this, sent a letter asking the County Council not to adhere to its rights, but to carry out the building in the spirit of the Building Act, especially in view of the narrowness of the thoroughfare. A communication had now been received from the County Council, stating that as no definite

reply had been sent by the Borough Council the architect had been instructed to proceed with the erection of the boundary wall.

LIBRARIES FOR ST. PANCRAS.—On Tuesday the Libraries Committee of St. Pancras Borough Council reported having received a letter from the President of the Royal Institute of British Architects submitting the following list of architects whom he suggested should be invited to send in competitive designs for the Central Public Library:—Mr. Edmund Wimperis, Mr. J. S. Gibson, Messrs. Wills & Anderson, Messrs. Mallovs & Cross, Mr. Maurice B. Adams, and Messrs. Russell & Cooper. The President asked to be furnished with a plan of the site, showing the positions of the surrounding buildings and the levels of the same, also the depth and position of the sewer, and particulars of any rights of lights which must be respected in connexion with adjoining premises, and also any special requirements which the Council might wish to have embodied in the conditions for the competing architects. The committee had decided that as regards the question of the rights of light which must be respected, the President should be informed that it was desirable that the competing architects should inspect the site and judge for themselves. Instructions had been given the Borough Engineer to prepare a plan of the site showing the positions of the surrounding buildings and the levels of the same, and also the depth and position of the sewer. This, when ready, will be forwarded to the President of the Institute. The committee are considering the number and size of the rooms to be provided and also other special requirements which it may be desirable to have embodied in the conditions for the competing architects. The committee hoped to be able to report shortly with regard to sites for branch libraries in Camden Town and Euston-road, also on the desirability of erecting another branch library in the Regent's Park-road and Gloucester Gate district. Up to the present a suitable site had not been found for the proposed branch library in the Gospel Oak district. The committee had decided in favour of carrying out the work of erecting the branch library at Chester-road by direct labour as far as possible.

BRITISH VERSUS INDIAN GRANITE.—It is announced that the Bombay Port Trustees have resolved to use Indian in preference to British granite, not only for parts of the new docks entrance, but also for the piers of the dock walls, in place of the ordinary blue trap used in the older docks. It is intended, however, that some of the larger stones requiring very fine dressing to complicated patterns shall be obtained from Great Britain.

NEWFOUNDLAND SHALE.—Mr. H. W. Le Messurier, Assistant Collector of Customs at Port St. John's, Newfoundland, has sent to the Board of Trade a sample of shale, which he writes, occurs in large deposits in Newfoundland, adjacent to limestone. The analysis shows—silica, 54.72; oxide of iron and alumina, 28.76; magnesia, 4.22; sulphur, 0.41. "Five parts of limestone and one part of the shale make the very finest of cement."

CASES AT THE INSTITUTE OF ARCHITECTS.—In our brief notice of the President's "At Home" last week, we mentioned the interesting collection of casts of ivory carving which were exhibited on the occasion, observing that we could not ascertain how they came into the possession of the Institute. Mr. Dircks, the Librarian, kindly writes to inform us that the casts in question were the gift of former Fellow of the Institute, the late J. M. Lockyer.

ROOD SCREEN, KILHAMPTON.—A rood screen has been placed in Kilhampton church as a memorial to the late Mrs. Trynne. The screen is the design of Mr. G. Fellowes Pryme, Messrs. Heins & Sons, Exeter, executing the work.

CAPITAL AND LABOUR.—Employment in the building trades continued dull in December. It showed no marked change as compared with a month or a year ago. Returns received through the trade correspondent from 59 London employers showed that in the last week of December they paid wages to 9,399 workpeople of all classes, as compared with 9,311 in November and 10,672 in December, 1904. The state of employment was much the same as in the previous month, but compared unfavourably with a year ago. Bad weather interfered somewhat with outdoor work. Returns were received from employers' associations for 84 districts outside London. In the great majority of districts there was little alteration. The following are the more important towns in which employment showed some improvement:—Ashton, Blackpool, Chester, Ipswich, Bath, and Portsmouth. In Bradford, Halifax, Birmingham, Norwich, Croydon, Newport, and Swansea there was some decline, and in the great remaining districts there was little alteration. Compared with a year ago, employment was reported worse in 39 of the districts; in 37 it was about the same, and in 8, including Oldham, Bury, and Blackpool and the Potteries, it was better.—*Labour Gazette.*

Legal.

TRIBUNAL OF APPEAL CASE:

ROY v. LONDON COUNTY COUNCIL.

The Tribunal of Appeal sat at the Surveyors' Institution on Tuesday to hear an appeal made by Messrs. Hilder, Thompson, & Dunn, solicitors, on behalf of Mr. Robert Roy, against the certificate of the Superintending Architect of Metropolitan Buildings, under sections 22 and 29 of the London Building Act, defining the general line of buildings on the western side of Fulham Park-road, between Fulham-road and Landridge-road. Mr. Bartley Dennis appeared for the appellant, and Mr. Godfrey represented the London County Council.

Mr. Godfrey raised the objection that both the Superintending Architect and the London County Council had been made respondents to the appeal. The Superintending Architect had been called upon to define a line, and had done so, and issued his certificate, and the appellants appealed against that, and cited the London County Council. He suggested that it would be a hardship if the London County Council had to come in to support the Superintending Architect on every certificate he gave when called upon by a person to give such a certificate. He wished to have nothing to do with the appeal. He submitted that the Superintending Architect was the court of first instance, and it would be an undignified position for the Superintending Architect to come there and argue that what he had done as a judge was the proper thing.

Mr. Dennis asked if it was contended that he had no right of appeal.

Mr. Hudson said at present it appeared to him that the appellant had the right to appeal, and if no one appeared he would be in the happy position of having no evidence against him, but at the same time there would be no one from whom costs could be obtained.

Mr. Dennis asked if it was to be supposed that if the Superintending Architect made a gross error he was simply to stand aside, and that, after the appeal had gone to all the expense of the appeal, there was to be no jurisdiction as to costs. They were bound to serve notice on the County Council.

Mr. Hudson said the serving of a notice did not make the London County Council parties. If no one appeared to oppose, then the appellant would have to satisfy the Tribunal as to his case.

Mr. Godfrey then withdrew from the case. Mr. Dennis asked that the Tribunal should hear the appeal and then adjourn the question of costs so that he might look up the matter.

The court accepted the application.

Mr. Dennis said the estate with regard to which the appeal was made was the Herriage House Estate in the Fulham-road. There were four old-fashioned suburban villas with large gardens on the estate, and it was proposed to pull these houses down and erect modern residences. The Superintending Architect was asked to define the general line of building and to determine the street or streets in which the property was situated. The appellant now appealed against the decision of the Superintending Architect that the land was in Fulham Park-road, and also against the building line, which cut off 25 ft. of his land. There was no general building line at present, for these were only suburban villas standing in their own gardens. He asked the Tribunal now to fix a line. Subject to any other regulations to the contrary, he contended that they were entitled to build up to the boundary of their property.

Mr. C. Botterell, surveyor to the appellant, stated that he had prepared the plans attached to the appeal, which were correct.

Mr. Hudson said that whatever might be the legal question with regard to costs, the Tribunal felt that it was a great pity they had not the assistance of the London County Council in this matter.

Mr. Godfrey said he would convey the remarks of Mr. Hudson to the proper Committee.

After considering the plans, the Chairman said the Tribunal had decided to reverse the decision of the Superintending Architect, and they found that there was no general line of building on the north-eastern side of the site coloured pink on the plan accompanying the application.

On the application of Mr. Dennis, it was decided to adjourn the question of costs to allow him, if he thought fit, to make a further application.

DISPUTE AS TO A BUILDING ESTATE.

In reference to the case tried in the Chancery Division of the High Court, before Mr. Justice Swinfen Eady, in our report last week, page 73, we gave the names of the litigants as Gurney v. Packman & Sons; it should have been "Gurney v. J. Parkin & Sons, Ltd., of Blackpool and Newcastle."

The action related to a sale of the late Dr. Gurney's estate at Gosforth. Mr. Duker, on behalf of Dr. Gurney's executors, stated that matters had been settled between the parties, and he had to ask his lordship to stay all further proceedings. The defendants had paid the sum for

which the estate had been sold to them. He quite agreed that they had made the trespass under a mistaken view of their legal rights.

Mr. Gatey, for the defendants, said that the purchase was only delayed by reason of a question of duty which the vendors had to pay. The defendants had the money ready to pay the whole time, and, knowing that it could be paid at any moment, they thought they were entitled to act as they had done. It was done perfectly bona fide, without the slightest intention of trespassing.

His lordship made an order staying all further proceedings.

COMPENSATING WORKMEN.

In the City of London Court on the 8th inst, a case was tried under the Employers' Liability Act before His Honour Judge Lumley Smith, K.C., when James Bunce, labourer, sued Messrs. Turnbull & Son, builders, Fenchurch-street, for damages for having had his thumb torn while working for them.

Mr. Doughty appeared for the plaintiff, and Mr. Lever for the defendants.

The plaintiff, who was removing concrete and bricks from a warehouse, was holding a chisel 4 ft. long while it was being driven into the ground by another man. Suddenly a large mass of concrete gave way and took the chisel with it. As a result his thumb was torn to the bone. For twelve weeks he had been unable to follow his occupation. He admitted that the defendants had sent him some money under the Workmen's Compensation Act, but added that it had been returned by his solicitor because the allowance under that Act was insufficient.

The defendants said the plaintiff had no case under the Employers' Act as they had not been guilty of any negligence.

The jury found for the defendants, and judgment was given for them, with costs.

The plaintiff then proceeded under the Workmen's Compensation Act, and was awarded £1.

The Judge said £1 must be deducted to go towards the costs under the Employers' Liability Act, which ought never to have been brought.

—City Press.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

28,017 of 1904.—SIEMENS BROTHERS & Co., LTD. (SIEMENS SCHUCKERWERKE, G.m.b.H.): Safety Device for Lifts and Hoisting Apparatus.

This relates to a safety device for lifts, which consists in so arranging the cage rests of the shaft in connexion with the lift mechanism that all the rests at those stages of the shaft at which the lift cage is not intended to stop are automatically withdrawn or are prevented from being protruded by giving the signal for starting the cage, while the rests at those points where the cage is to stop are automatically withdrawn if the cage approaches them at an excessive speed.

28,834 of 1904.—A. ENGLEFIELD: Dovetail Slide Support for holding Frames, Boards, Book Rests, and the like, in sloping positions upon Tables or Desks.

This relates to a means of supporting detached frames, boards, book rests, and the like, upon tables or desks, at varying angles, and so that either of the two larger surfaces of the frame, board, book rest, or the like may be available for the purposes of reading, writing, or drawing, and consists of a fillet of a dovetail section, working freely in a groove or slot of a corresponding shape cut out or constructed upon one end of a bracket or arm, the fillet being cut upon or attached to the whole length of one or more of the sides of the frame, board, book support, or the like.

29,349 of 1904.—C. BRADER: Heat Insulating Coverings.

This relates to an insulating covering having the form of an elastic and flexible strip, and consists of reels arranged in layers and woven, bound, or otherwise attached to a flexible heat-conducting material such as asbestos, peat fibre, felt, cloth, or the like, so as to form a continuous band, which may be easily applied to the objects to be protected against heat or cold.

29,505 of 1904.—H. DANMLAN: Construction of Flooring.

This relates to a method of connecting or bonding the boards employed in the construction of the elements of wood flooring, and is characterised by the foundation in the under part of the element of grooves, the sides of which are parallel at the centre part and diverge at the outer parts thereof, and by the combination with said grooves, of cross pieces or members having parallel sides split at their extremities, which extremities are opened outwardly after the cross pieces are laid in place by the action of wedges, which thus serve to lock such extremities in the diverging parts of

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

the grooves, and thereby effect a sure and rigid connecting or bonding of the boards constituting the element.

165 of 1905.—J. G. BUCHANAN, (A. B. PRICE): Piston Tap for Preventing Waste of Water Supplied to Water-closets and other Apparatus.

This relates to a water-waste-preventing apparatus in the form of a tap, comprising a rotatable plug provided with two internal chambers, one for the piston to work in and the other for the valve to move in to seat itself alternately, upon one or the other of two seats in the said chamber, thus alternately opening the opposite sides of the piston to pressure and exhaust when the plug is operated.

4,927 of 1905.—W. S. GOWIN: Machines for Moulding Various Materials, to form Bricks, Tiles, Briquettes, or the like.

This relates to a machine for moulding various materials to form bricks, tiles, briquettes, or the like, and consists in the combination of a rotatable table intermittently moved in known manner, feed hoppers of known form mounted above the table, and adapted to feed material to moulds in the table as they are successively brought under the compression on plungers operating to compress the material in the moulds, ejector mechanism operating to eject the formed blocks downwards, means for operating the feeding, block forming and ejecting mechanism at each stoppage of the table, and means for transferring the ejected blocks to conveyors for removing them.

7,238 of 1905.—A. MANNINGTON: Unfastening and Opening of Doors, Gates, or the like.

This relates to an apparatus for unfastening and opening gates, doors, or the like, by means of foot pressure, and consists of the arrangement of lever mechanism connected to the door handle adapted to be operated by the downward pressure of the foot on one side of the door in such a manner as to unlatch the said door and push it open, by the upward pressure of the foot on the other side of the door in such a manner as to unlatch said door and push it open.

7,955 of 1905.—W. S. DENNIS: Means for Securing Gutters and the like to their Supports.

This relates to roof gutters and the like, formed or provided with a boss or thickening for each screw hole, and consists in the boss being adapted to be filled with putty, red lead, or the like.

7,987 of 1905.—J. GASTEIGER: Apparatus for Drying Walls.

This relates to an apparatus for drying walls, the distinguishing feature being the employment of a movable stove to which is attached a flat box which is open at the rear for the purpose of forcing the products of combustion to pass over the whole surface of the wall to be dried before escaping into the open air.

11,024 of 1905.—W. T. MORRIS: Casement or Hinged Windows.

This relates to casement or hinged windows, and consists of a hinge comprising an arm rigidly fixed to the style, mullion, head, or stationary frame, and a link hinged to said arm and to the casement, in combination with means for locking the arm and link together.

3,332 of 1905.—M. KRAUS: Mixing and Washing Machine for Concrete, Gravel, and the like.

This relates to a rotating drum for a mixing and washing machine for concrete, gravel, and the like, and consists of radially and upward slanting discharge channels, which channels are provided, near or immediately on the circumference of the drum, with openings so that the concrete, gravel, or the like is, on the drum being rotated, conducted to the channels and is, after rising in the same, automatically discharged into barrows placed under the drum.

3,783 of 1905.—THE ASSOCIATED PORTLAND MANUFACTURERS, LTD., AND A. BROOKS: Manufacture of Cement.

This relates to a hard slow-setting cement to which a green colour is imparted by the use of chrome, alum, or of a mixture of potassium bichromate and ammonium sulphate.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 15.—By DUNN, SOMAN, & COVERDALE.
Maida Vale.—By 15, 17, 25, and 27, Delaware, and the mansions (flats), ut. 95 yrs., gr. 350l., e.r. 2,038l. £9,000

8, 12, and 14, Castellan-mansions (flats), ut. 94 yrs., gr. 240l., e.r. 1,250l. 10s. 5,700

By LONG & SONS.
Hammersmith.—48 and 50, Gayford-rd., ut. 71 yrs., gr. 10l., w.r. 52l. 315

Notting Hill.—89, 15, 17, and 27, Delaware, and the mansions (flats), ut. 91 yrs., gr. 315l. 220

7l., y.r. 35l. 300

8, 9, and 10, Sagarate-st., ut. 60½ yrs., gr. 134, 106s., w.r. 71l. 10s. 300

By WEAVER & GREENE.
Streatham.—11 and 19, Tankerville-rd., ut. 73 yrs., gr. 18l. 18s., e.r. 80l. 530

January 18.—By ALDER & Co.
Chigwell.—Hainault-rd., Ambleside, l., e.r. 48l. 550

By NEWBON, EDWARDS, & SHEPHERD.
Holborn.—7, Robin Hood-yd., l., e.r. 50l. £350
Fulham.—Fulham-rd., l.g.r. 6l., reversion in 20½ yrs. 430
Kingsland.—High-st. (63), with cottage and yard, l., y.r. 60l. 1,230
Barnesbury.—184, Long-la. (s.), l., y.r. 65l. 1,100
7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, also l.g.r. 8l., reversion in 15 yrs. 600
Highbury.—8, Highbury-hill, l., e.r. 110l. (including fixtures) 1,470
Barnesbury.—1 and 5, Arundel-st., l., y.r. 100l. 1,230
Holloway.—23, Isledon-rd., ut. 37 yrs., g.r. 6l. 10s., e.r. 40l. 310

By STIMSON & SONS.
Peckham.—Hall-rd., a corner plot of freehold building land 250
34, Gellatly-rd., ut. 53½ yrs., gr. 5l. 5s., e.r. 32l. 305
2, Russell-rd., l., w.r. 36l. 8s. 340
New Kent-road.—No. 206, ut. 18 yrs., g.r. 10l., y.r. 45l. 150
Walworth.—143, Walworth-rd., ut. 37 yrs., g.r. 9l., y.r. 50l. 380

January 19.—By GILBERT & HOW.
Strood Green.—19 and 18, Mount Pleasant-rd., ut. 62 yrs., gr. 10l. 600

By W. B. HALLETT.
Holloway.—40 and 42, Queensland-rd., l., e.r. 52l. 850
Penze.—76 to 90 (even), Arpley-rd., ut. 60½ yrs., e.r. 394l. 670

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; l. for leasehold; c. for copyhold; j. for leasehold; p. for possession; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; h. for half; st. for street; rd. for road; sq. for square; pl. for place; t.r. for terrace; cres. for crescent; av. for avenue; gins. for gardens; yd. for yard; gr. for grove; bh. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

TO CORRESPONDENTS.

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

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

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

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are typewritten.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

FRIDAY, JANUARY 26.
Junior Institution of Engineers (Westminster Palace Hotel).—Honorary members' lecture of the 25th session. "Notes on Boiler Trials," by Professor J. D. Cornack, B.Sc. 8 p.m.
Institution of Civil Engineers.—(Students' meeting.) 8 p.m.

SATURDAY, JANUARY 27.
Junior Institution of Engineers.—Visit to the engineering laboratories of University College, during which Professor Cornack will demonstrate the methods of conducting a boiler trial. 3 p.m.

MONDAY, JANUARY 29.
London Institution.—Paper by the Rev. Canon W. Benham, E.S.A., entitled "A Walk through Westminster," illustrated. 5 p.m.
Surrey's Institution.—Mr. F. Marshall, K.C., on "The Valuation of Machinery for the Purposes of Rating," 8 p.m.

TUESDAY, JANUARY 30.
Society of Arts (Applied Art Section).—Professor J. M. Thomson on "The Chemistry of Artillery Explosives in Relation to their Composition and Permanence." 8 p.m.
Institution of Civil Engineers.—Mr. F. R. Epcott on "The Railway-Gauges of India." 8 p.m.

WEDNESDAY, JANUARY 31.
Architectural Association Discussion Section.—Mr. A. C. Dickie on "Internal Steps and Stairs and their Treatment." 7.30 p.m.
Society of Arts.—Mr. T. Adams on "The Garden City and the Cheap Cottage." 8 p.m.
Northern Architectural Association.—Mr. A. W. S. Cross, M.A., on "Rome in the Augustan Age," with lantern illustrations. 7.30 p.m.

Institution of Civil Engineers.—Students' visit to the Greenwich Generating-station of the London County Council Electric Tramways. Assemble at the works. Train from Cannon-street Station to Maze Hill, 2.9 p.m.

THURSDAY, FEBRUARY 1.
Civil and Mechanical Engineers' Society.—Mr. F. L. Watson on "Destructor Bye-Products." 8 p.m.

Society of Arts (Howard Lecture).—Professor Silvanus Thompson on "High Speed Electric Machinery, with special reference to Steam Turbine Machines." Ill. 8 p.m.

Birmingham Builders' Exchange.—Mr. H. Browning Norton on "The Underground Slate Quarries of North Wales," illustrated by lantern slides. 8 p.m.

Junior Institution of Engineers.—Mr. K. Edgcombe on "Some Recent Electrical Engineering Measuring Instruments." 8 p.m.

Saturday, February 3. Sanitary Inspectors' Association.—Twenty-third annual dinner, Holborn Restaurant. 6 p.m.

The Clerks of Works Association.—The twenty-third annual dinner, at the Criterion Restaurant. 6.15 p.m.

PRICES CURRENT OF MATERIALS.

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

BRICKS, &c.

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

STONE

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

STONE (continued).

Table listing prices for Hopton Wood (Hard Bed) in blocks and other stone types.

SLATES.

Table listing prices for various types of slates, including In. In., 20x10 best blue, etc.

TILES.

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

WOOD.

Table listing prices for various types of wood, including Deals, Battens, Foreign Sawn Boards, etc.

JOISTS' WOOD.

Table listing prices for various types of joists' wood, including White Sea, Third yellow deals, etc.

WOOD (continued).

Table listing prices for Joists' Wood (continued), including Dry Walnut, American, etc.

Prepared Flooring, etc.—

Table listing prices for prepared flooring, including 1 in. by 7 in. yellow, planned and shot, etc.

JOISTS, GIRDERS, &c.

Table listing prices for Rolled Steel Joists, Compound Girders, etc.

METALS.

Table listing prices for various types of metals, including Common Bars, Staffordshire Crown Bars, etc.

LEAD, &c.

Table listing prices for Lead, Sheet, English, 3lb. and up, etc.

ENGLISH SHEET GLASS IN CRATES.

Table listing prices for English Sheet Glass in crates, including 15 oz. thirds, 2 1/2 oz. fourths, etc.

OILS, &c.

Table listing prices for various types of oils, including Raw Lined Oil in pipes, etc.

PRICES CURRENT.—Continued on page 105.

List of Contracts, etc.

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*DESIGNS FOR FREE PUBLIC LIBRARY	Swadlincote U.D.C.	25s., 15s., 10l.	Mar. 24

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Temporary Stables, Badminton Hotel, Acton Turville.	Bridlington New Spa Co.	F. W. Wills, F.R.I.B.A., 8, St. Stephen-street, Bristol.	Jan. 29
Ornamental Cast Iron Entrance to New Spa	Powell Duffryn Coal Co.	I. Dyer, Architect, Bridlington	Jan. 30
128 Houses at Capcoch.	Capcoch Building Club	T. Broderick, Architect, Clifton-street, Aberdare	do.
32 Houses at Capcoch.	Southern Maltrath Railway Co.	do.	do.
Deck Bridges	Darwen Corporation	Secretary, 46, Queen Anne's-gate, S.W.	do.
Free Library, Darwen	East Indian Railway Co.	Haywood & Harrison, F.R.I.B.A., Church-street, Ayrington	do.
Brass Boiler Tubes	L. & N. Western & G. W. Ry.	C. W. Young, Secretary, Nicholas-lane, E.C.	Jan. 31
Pont Shops, Castle Foregate, Shrewsbury	Repton R.D.C.	R. Collins, Surveyor, Public Offices, Belvedere-road, Burton	do.
Scavenging	Slough U.D.C.	C.F. Chamberlain, Clerk, Union Offices, Edinburgh	do.
Tools and Stores	Wanstead U.D.C.	Surveyor, 1, Mackenzie-street, Slough	do.
Making-up Heronage-road	Enfield U.D.C.	E. L. Bressay, Surveyor, Council Offices, Wanstead, N.E.	do.
Making-up Alma-road, Enfield Lock	Leicester Corporation	R. Morris, City Architect, Public Works Offices, Edinburgh	do.
Wire Fencing at Blinbrook Farm	Blaydon U.D.C.	R. Biggins, Council Offices, Blaydon-on-Tyne	Feb. 1
Scavenging, etc.	Manchester Corporation	H. Gilbert-Wilyat, Borough Engineer, Town Hall, Leicester	Feb. 2
Underground Conveniences	Manchester Corporation	C. Nielson, Gas Department, Town Hall, Manchester	do.
Materials	Guilford Guardians	E. L. Linn, Architect, 36, High-street, Guilford	Feb. 3
Excavating and Concrete for Purifiers at Gaythorn	Chettenham Corporation	J. S. Pickering, Bond Surveyor, Municipal Offices, Chettenham	do.
Boundary Walling, etc., Linton Workhouse	Whickham U.D.C.	J. B. Repton, Surveyor, Council Offices, Whickham	do.
Alterations at Ghyll House, Wreay	Newburn U.D.C.	T. Gregory, Council Offices, Newburn	do.
Materials	Manchester Corporation	S. Jackson & Son, Architects, Tenthreden-embury, Bradford	do.
Water Meters	Manchester Corporation	Secretary, Waterworks Offices, Town Hall, Manchester	do.
Road Works, Eldin-road	Bury Corporation	A. W. Bradley, Borough Engineer, Bury	do.
*PULLING DOCK SHIP, KINGSTON-ON-THAMES.	Sutton (Surrey) U.D.C.	C. C. Smith, Surveyor, Municipal Offices, Sutton	do.
Surface Water Sewer, Mid-lane	Landon & Provin. Bank Ltd.	A. Mason, Archt., Broughton-chambers, Victoria-st., Slough	do.
Stoneware Pipe Sewer, Finkle-street	Bolton-upon-Dearne U.D.C.	Surveyor, Council-buildings, Station-road, Bolton-upon-Dearne	Feb. 5
Aerial Ropeway (1,300 yds.)	Lanndon Foot, D.C.	S. B. Bannister, Surveyor, Luddenden Foot	do.
Stores and Works	Wolverhampton Corporation	E. S. Woodward, Town Hall, Wolverhampton	do.
Concrete Retaining Wall at Wharf, Grovehill	Metropolitan Water Board	A. B. Pilling, Clerk, Swaycourt, Strand, W.C.	do.
Enlargement of Baldon Woodbottom Provided School	Beverly Corporation	J. G. Smith, Borough Surveyor, Guildhall, Beverley	do.
Enlargement of Ballon-on-Deane Goldthorpe School	West Riding Education Com.	J. Yecker-Edwards, County Archt., County Hall, Wakefield	do.
Alteration of Crigglestone Provided School	do.	do.	do.
Alteration, Barnoldswick Wesleyan School	do.	do.	do.
Alteration of Barnborough Provided School	do.	do.	do.
Reconstruction of Part of Hospital, Ormskirk	Wolverhampton, etc. Hospital Comms. of H.M. Works, etc.	N.E. Sanitary Inspection Assoc., 9, Albert-st., Manchester	do.
SUPPLY OF ROAD MATERIALS FOR ROYAL PARKS	Stamroy Borough Council	H.M. Office of Works, Storey's-gate, S.W.	do.
TWO UNDERGROUND CONVENIENCES	Tynemouth Corporation	J. F. Smith, Borough Surveyor, Tynemouth	Feb. 6
280 yds. of Crossed Timber Fencing, Preston Cemetery	Sunderland R.D.C.	T. Young, Surveyor, Council Offices, Sunderland	do.
Extension to Fever Hospital, Ford	South Indian Railway Co.	Company's Offices, 55, Gracechurch-street, London	do.
Twenty-one Locomotives with Tenders	Coventry Corporation	Waterworks Engineer, 9, Baylons, Coventry	do.
Gas Engine, Set of Well Pumps, etc., Spon End	Heston and Isleworth U.D.C.	P. G. Parkman, Engineer, Council House, Hounslow	do.
Making-up Alexandra-road (second portion)	West Riding County Council	County Surveyor, County Hall, Wakefield	Feb. 7
Strengthening Land Arch, Grey's Bridge	Peole Corporation	F. W. Lacey, M.I.U.C.E., Municipal Offices, Bourne mouth	do.
Permanent Way Construction, etc., Parkstone Extension	do.	do.	do.
Permanent Way (New Passing Places)	do.	do.	do.
Overhead Equipment, etc.	do.	do.	do.
Feeder Cables, etc.	do.	do.	do.
Alterations, etc., to Schools, Ridley, near Tarporey	Sub-Com. Norwich Union	H. Bewick, County Architect, Newgate-street, Chester	do.
Sewer (No. 1 Contract)	Glasgow Corporation	City Engineer, 64, Cochrane-street, Glasgow	do.
Extensions of Cheddington Asylum, near Leck	Staffordshire County Council	M. F. Blakiston, Clerk, Stafford	do.
Road Materials	Birkenhead Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead	do.
*DRAINAGE WORK, BELMONT ASYLUM, SUTTON	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
*PAINTING WORK, ORCHARD HOSPITAL, DARTFORD	do.	do.	do.
*CAST-IRON POSTS, NORTHERN HOSPITAL	do.	do.	do.
*OAK RAILS, GRAVEL BOARDS, PALES, NORTH HOSP.	do.	do.	do.
2,500 yds. of Galvanised Iron Water Tubes	Reeth R.D.C.	A. B. Hudson, Clerk, Reeth	Feb. 8
40,000 Tons of Filter Sand, Headingley	Leeds Waterworks Committee	Lewis Waterworks Committee	do.
Sewerage Works, Stoke	Hullford Town Council	C. G. Mason, Borough Engineer, Bridge-street, Guildford	do.
Stores	Trustees R. Clowdsley's Char.	General Stores Department, Belfast	do.
*MAKING NEW ROAD, ISLINGTON	Hale U.D.C.	Horace Porter, Surveyor, 16, Russell-square, W.C.	Feb. 9
Making-up part of Finchley-road, Hale	Stoke Newington	F. E. Boaz, Surveyor, Council Offices, Hale, Cheshire	Feb. 10
Materials	Blackburn Corporation	Storekeeper, Belfast Works, W.C.	Feb. 12
Waterworks Pumping Plant	Epsom U.D.C.	W. V. Graham, M.Inst.C.E., 5, Queen Anne's-gate, S.W.	do.
Wrightwork and Slaters, Dykebar Asylum	Renfrew District Lunacy Board	T. G. Abernethy, Architect, County-place, Paisley	do.
Materials	Warrington Corporation	Clean-up Superintendent, Central Sanitary Depot, Warrington	do.
Electrical Cable and Conduits, Millation	River Weaver Navigation	J. A. Sauer, Engineer, Weaver Navigation, Northwich	do.
Making-up Roads	Clyde Navigation Trustees	G. H. Baxter, Mechanical Engr., 16, Robertson-st., Glasgow	do.
*ANNUAL CONTRACTS	Hendon U.D.C.	F. Harris, Engr., Broadway, Southborough, T. and B. Wells	do.
Private Street Works, Stockton Heath	Combridge R.D.C.	Combridge Stn., Council's Office, The Burrows, Hendon, N.W.	do.
Boreland Bridge, Hutton and Corrie	Hendon U.D.C.	R. Garnett, Surveyor, 45, Sankey-street, Warrington	Feb. 13
Ironmongery Stores	Pontypridd U.D.C.	J. E. Measall, Engineer, Pontypridd	do.
Elementary School, Blakiston-street, Fleetwood	Lancashire Education Comm.	H. Litter, County Architect, 16, Ribblesdale-place, Preston	do.
Granite and Slag	Long Sutton U.D.C.	S. S. Massop, Clerk, Long Sutton, Lincolnshire	do.
Boreland Bridge, Hutton and Corrie	Lockerbie Dist. Com., Dumfries	Mr. Paterson, Road Surveyor, Beattock	Feb. 14
Road Materials	Holnborough R.D.C.	H. J. Brecher, 33, Earl-street, Maidstone	do.
Highway Materials and Pipes	Bexley U.D.C.	W. T. Howe, Surveyor, Council Offices, Bexley Heath	do.
*ADDITIONAL STOREY, CHILKEN'S RECEIVING WARD	Chiswick U.D.C.	J. Barclay, Surveyor, Town Hall, Chiswick	do.
WORKHOUSE BUILDINGS, ACTON-LANE, N.W.	Edmondton Union	Stuart Hill, 108, Cannon-street, E.C.	do.
Elementary School, Manchester-road, Droydsden	Crown Estate Paying Comm.	The Loder, Park-square West, Regent's Park	do.
Elementary School, Market-street	Willenden Guardians	Northerly, Neighbour, & Nicholson, 9, Regent-street, S.W.	do.
Elementary School, Mark-street	Lancashire Education Comm.	H. Litter, County Architect, 16, Ribblesdale-place, Preston	Feb. 15
Cooling Towers, Pumps, etc., Roath Power Station	Cardiff Corporation	A. Ellis, City Electrical Engineer, The Hayes, Cardiff	Feb. 16
Road Materials	Belper R.D.C.	R. C. Cordon, Surveyor, Duilick, near Droydsden	Feb. 17
*NEW SCHOOLS, NAUNTON PARK	Gillingham Town Council	J. L. Rodden, Boro. Engineer, Corporation Offices, Gillingham	Feb. 22
Pump-room and Steamboiler Chimney	Cheltenham Education Comm.	Cheltenham & Smithson, 17, Regent-street, Cheltenham	do.
Atmospheric Steam Heating and Machinery, Horton Lane Hospital	Bradford Guardians	F. Holland, Engr., 11, Paradise-st., Champs., Huddersgate, Brad.	Feb. 26
Stores	do.	do.	do.
Extension of Hydon-road Electricity Station	Stoke-upon-Trent Corporation	A. Burton, Borough Surveyor, Town Hall, Stoke	Feb. 28
	Sunderland Corporation	J. F. C. Snel, M.Inst.C.E., Town Hall, Sunderland	Mar. 2

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc. Supplied by, and Tenders to be delivered. Includes entries for Cottage Houses, W. Hartlepool, and various school buildings.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Includes entries for Temporary Architectural Assistant and General Foreman.

AUCTION SALES.

Table with 4 columns: Nature and Place of Sale, By whom Offered, Date of Sale, and Price. Includes entries for Nursery Stock, South Woodford, and Contractor's Plant at Gospel Oak Brickfields.

* Those with an asterisk are advertised in this number: Competition, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xvi.; Auction Sales, xxvi.

PRICES CURRENT.—Continued from page 103.

Table listing prices for various varnishes and oils, such as Fine Pale Oak Varnish, Pale Copal Oak, and Superfine Pale Elastic Oak.

Table listing prices for various iron and steel products, including Cromer, Exmouth, and Stanton Iron Co. items.

Table listing prices for various engineering and construction services, including Keswick and London projects.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied direct from the office to residents in any part of the United Kingdom at the rate of 10s. per annum (52 numbers) PREPAID.

Table listing prices for various iron and steel products, including Exmouth, Stanton Iron Co., and MacLaren & Co. items.

Table listing prices for various engineering and construction services, including London projects.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays.

Table listing prices for various iron and steel products, including Fowey, Stanton Iron Co., and MacLaren & Co. items.

Table listing prices for various engineering and construction services, including London projects.

Table listing prices for various iron and steel products, including Weston, Stanton Iron Co., and MacLaren & Co. items.

Table listing prices for various engineering and construction services, including London projects.

Table listing prices for various iron and steel products, including Castleford, Stanton Iron Co., and MacLaren & Co. items.

Table listing prices for various engineering and construction services, including London projects.

LEIGH (Essex).—For making-up three streets, for the Urban District Council. Mr. J. W. Liverdred, Surveyor, Council Offices, Leigh-on-Sea.—

Table with 3 columns: Oakley Park Drive, Leigh Hall-road, Leighton-avenue. Rows list various contractors and their costs in £ s. d.

LONDON.—For repairs to pontoon and dolphins at West Wharf, Townmead-road, Fulham, S.W., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief.—

Table listing contractors for West Wharf repairs, including Westminster Construction Co., G. Munday & Sons, etc.

LONDON.—For the erection of municipal buildings at the corner of Braxton-hill and Ardenlane, for the Lambeth Borough Council. Messrs. Warwick & Ball, architects, 13, South-square, Gray's Inn. Quantities by Mr. Charles W. Bewley, 9, Staple-inn, Holborn Bars, W.C.—

Table listing contractors for municipal buildings, including Holland & Hanor, Dove Bros., Leslie & Co., etc.

LONG ASHTON.—For system of sewerage and sewage disposal works for the Rural District Council. Mr. A. P. I. Cotterell, engineer, 28, Baldwin-street, Bristol.—

Table listing contractors for Long Ashton sewerage works, including W. & J. Bennett, J. Coles & Son, etc.

PONTYPRIDD.—For erecting new infant school at Hawthorn, for the Urban District Council Education Committee. Mr. P. R. A. Wiloughby, Surveyor to Council, Pontypridd.—

Mr. J. E. Evans, Roath Park, Cardiff £3,555 5 0

LONDON.—For building new filter to reservoir at North-Easton Fever Hospital, St. Anne's-road, Tottenham, N., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief.—

Table listing contractors for North-Easton filter, including Aldridge & Son, Muirhead, Greig, etc.

SUTTON.—For wire guards for radiators and pipes at Belmont Asylum, Sutton, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief.—

Table listing contractors for Sutton wire guards, including R. J. Foggan, C. J. Dickson, etc.

YOXALL (Burton-on-Trent).—For alterations and additions to buildings at Bond End and converting same into a milk factory, for Yoxall and District Co-operative Dairy Society, Ltd. Mr. W. Sharp, Architect, Burton-under-Newwood, Burton-on-Trent.—

W. Sharp & Sons, Burton-on-Trent* £575

J. J. ETRIDGE, J^r.

SLATE MERCHANT, SLATER & TILER.

Penrhyn-Bangor, Oakeley-Portmadoc,

and every other description of Slates, except American, ready for immediate delivery to any railway station.

Red Sandfaced Nibbed Roofing Tiles always in Stock.

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The Builder.

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Sedilia, Siena Cathedral.....Drawn by Mr. Lionel U. Grace.
Working Men's College, Camden Town.....Mr. W. D. Caros, F.R.I.B.A., Architect.
The Grammar School, Lincoln.....Mr. Leonard Stokes, F.R.I.B.A., Architect.
School and Houses at Brisbane, Australia.....Messrs. Hall & Dods, Architects.

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The Cyprus Museum of Prehistoric and Ancient Pottery.



In recent years a great deal of popular interest in the study of the primeval world has been encouraged by discoveries in various parts of the world, in fact, wherever the surface soil or the mountain caves have preserved the traces of the first men. Amongst other famous early sites of human origin Cyprus must always be of paramount interest to the student, but Cyprus also exhibits the curious fact that in matters archaeological there is a tide of what may be called a certain popularity, which spreads over certain provinces—a tide which has its ebb. For a quarter of a century Cyprus was a quite extraordinary field of research; it was perhaps one of the first portions of the Levant to be studied to some extent scientifically. But the earlier efforts at exploration were most disastrous. Its ancient tombs were dug up by contract at so much a hundred, and its temple sites, after being the battlegrounds for consular agents and Turkish pashas, were sifted over by women and children under the supervision of Turkish zaptehs. The brothers Di Cesnola regarded the speculations they entered into more with the idea of making their fortunes in the antiquity trade than with any scientific purpose in view—they were mere "treasure-seekers."

The scientific exploration of Cyprus dates from after the English occupation of the island. The British and Berlin Museums employed certain archaeological students to excavate tombs and the sites of Salamis, Poli, and Paphos, during the seventies and eighties; but since 1897 no one has visited the island on exploration or excavation bent, and, indeed, it is about fifteen years since any important remains have been exhumed. In 1889 the last, and perhaps the most important monument of extreme antiquity in the form of the Royal Tombs of Tamassos (Politico) was discovered under the auspices of the Berlin Museum. About the same time the British Museum cleared some part of the site of Salamis from its sand-drifts.

Very few archaeological districts have ever been exploited by the "digger" in the same manner or on the same scale as Cyprus. Di Cesnola claimed to have turned out the contents of more than 2,000 tombs of different sizes near Larnaca, and about 1,500 tombs at Dali. Then after the passing of Cyprus into the English control came vast excavations of burial places all over the island by the British Museum (Sir C. Newton and many others), South Kensington Museum (Hake), and the Berlin Museum (Richter). In the early nineties 312 tombs were dug up near Limassol, 300 at Amathus, and smaller collections elsewhere by the British Museum. We may perhaps imagine without fear of much exaggeration that during the quarter of a century succeeding the period of Di Cesnola's early ventures

more than 10,000 graves of a remote antiquity were rilled of their contents—and these contents now go to form the treasures of prehistoric museums all over Europe and America.

During the quarter of a century above referred to much excavation of an illicit or surreptitious character has gone on, because certain more or less inoperative old Turkish laws and customs have tended to check the open exercise of this comparatively modern system of treasure-seeking. The quantity of pottery which has been exhumed since the natives of Cyprus overcame a somewhat natural prejudice against disturbing dead bodies, which they could not be expected to distinguish from those of their actual ancestors, must have been enormous. This remarkable ware, with its concentric ring decoration and bands of chessboard ornament suggestive of some comparatively modern savages, is to be found in all the archaeological collections of the world. It has been carried across the Atlantic by tons weight; the museums of France and Italy are full of it; and, considering how it is piled up in the remarkable museums at Constantinople, there is very little doubt of its having found its way into Russian and German archaeological circles through the Bosphorus. It is commonly reported that much of the ware, together with other Cyprus antiquities of greater intrinsic value, has been exported within barrels of Cyprus wine and brandy to European ports by the little Greek polaccas and feluccas of the Levant.

Although so much of this pottery has been exported from the island, immense quantities of it still remain, heaped up in disused prison-yards, quarantine sheds, and other places where Government lumber tends to accumulate. There is also the nominal museum in the Victoria-road, Nicosia, which is almost entirely composed of the "thirds" left behind by successive excavators who, according to Turkish law, are obliged to divide their "finds" into three portions, one to belong to the fuder, one to the owner of the land, and one to the Ottoman Government. This remarkable system, dating probably from the times when the Turks were made aware of the value of "antikas" by the removal of the Elgin marbles to London, is certainly the best method for obstructing scientific archaeology ever invented by human ingenuity. As a consequence the contents of tombs, which lose all their historical interest by being scattered, are divided in such a way that part may be in New York, part in Constantinople, and part left for sale by some Greek priest in Cyprus. The destruction of the temple enclosure groups in this way has, of course, been especially deplorable. Some of these temple groups, if they had been preserved in the style of the modern excavations of Pompeii, would have been amongst the most curious remains in the world. We should have been able to appreciate with realism the appearance of a temple with its furniture of so long ago as the Bronze Age, or at least of an age antecedent to the Ptolemaic. Now, unfortunately, the sites have been swept of their crowds of votive figures, and an opportunity of receiving an impression of a remarkable antiquity has been for ever lost.

The market for Cypriote antiquities has very much weakened at the present day, but still a considerable amount of enthusiasm remains amongst the peasants for what must have been twenty years ago a very considerable and lucrative trade. The visitor is still viewed as a possible prospector for "antikas," and the natives point out with eagerness such places as they think will reward a search. Anxiety to be employed on digging contracts suggests, however, that the value to be discovered no longer reaches the standard of twenty years since, or the interested persons would doubtless do the work on their own account, instead of soliciting the introduction of capital in the form of wages.

Within the last few months, however, a very marked revival of local archaeological interest in Cyprus has taken place. A popular law has been passed by the Legislative Council of the island (a sort of Parliament) founded to a great extent on the Italian "Uffizio Regionale" regulations. It is more especially framed with a view of arousing the dormant interest of the people in the past history and archaeology of their native land. Under this law and the patronage of the English Administration several Cypriote gentlemen have been induced to form a new committee of management for the building of a museum in Nicosia, and for the suitable upkeep of the many national monuments. Towards the new museum a sum of 600*l.* has already been collected, but, of course, such a sum will

go but a short way towards a suitable building, even in Cyprus, where building is still cheap. There are also the expenses of furnishing and classifying the museum. The new committee is, therefore, appealing for public subscriptions towards the fund now started.

The upkeep of the national monuments, a subject which will appeal still more perhaps to the outside world than the building of the museum, is one which calls for an immediate expenditure of money. The magnificent Gothic churches are all now used for Mohammedan purposes, and the ancient Byzantine convents, etc., are, of course, in the hands of the Orthodox Church; these two classes of buildings are, therefore, outside the pale of any antiquarian control. But the classic remains of Salamis and other sites, the prehistoric ruins of Tamassos and Larnaca, would well repay being cleansed and rendered presentable to visitors now that travellers are visiting the island in greater numbers since the formation of the new port of Famagusta, and the railway into the interior of the country.

It is perhaps considered by many people—and with some reason—that the archaeological interest in Cyprus was exhausted in the eighties and nineties of the past century. At the same time, although Mr. J. L. Myer's "Catalogue" of the museum may be considered a final word on the prehistoric pottery of the island, there still remain many ancient monuments of great interest which cannot be transported along with all the best of the antiquities to New York or other places. For the purpose of preserving these often unique objects it is to be hoped that the new committee will receive abundant support. Hitherto the natives of Cyprus have not been in a position to realise the importance and evident advantages to their country which these antiquities confer. Now they are sufficiently educated in such matters to perceive that the Tombs of Tamassos or the ruins of Salamis, if properly cared for and exhibited to the public, may become as attractive to tourists as Baalbek or the monuments of Egypt.

The few English residents in Cyprus cannot be expected to show very much interest in archaeology. They are merely government officials who have certainly not been attracted to the island by any particular affinity for such studies. The Cypriots must, therefore, rely upon themselves and their friends amongst the antiquaries of Europe or America for the funds necessary to enable the Committee of the Cyprus Museum to carry out its mission and achieve a real success.

A COMPENSATION AWARD.—Mr. Daniel Watney, a Past-President of the Surveyors' Institution, has awarded a sum of 25,116*l.* in compensation to the London and North-Western Railway Company, who claimed about 45,000*l.* in all, in respect of a compulsory sale of their parcels and booking-office near Oxford-circus, W. The premises, known as the "Green Man and Still," covered an area of 718 sq. ft. at the corner of Oxford and Argyll streets and were required by the Baker-street and Waterloo Railway Company, whose valuer, Mr. G. A. Wilkinson, estimated the amount at 20,830*l.* Mr. James Boyton, President of the Auctioneers' Institute, Mr. Leslie R. Vigers, and Mr. A. R. Stanning, F.R.I.B.A., gave expert evidence on behalf of the defendants; the claimants' experts were Mr. J. H. Townsend Green, Mr. W. H. Ewell, and Mr. B. F. Anson Beach, Fellows of the Surveyors' Institution.

A WIDE OUTLOOK.

By PAUL WATERHOUSE, F.R.I.B.A.

THINK it sometimes happens to those who are engaged in daily contact with the realities of building craft that, labouring in a restricted field of expression, they practically come to ignore the existence of other fields. Indeed, now that I have put this down in black-and-white it reads as a *banal* truism; but perhaps, after all, it is a fact in human dynamics which is worth restating, if only for the reason that these platitudes sometimes cover truths so obvious as to be practically unnoticed.

It is not merely inertia that prevents a productive architect from taking stock of styles or manners other than those in which he finds his own expression. I do not mean to imply that any architect worthy of the name is incapable of self-realisation except in one manner. The necessities of his duty compel every conscientious architectural worker to exhibit an ability, if not a facility, in more methods than one. But if evidence were wanted of the fact that the nimblest faculty of pure expression can co-exist with a certain almost noble indifference to the idiom of alien methods (methods alien to the brain of the particular artist), we have only to think of some great names among those who have achieved high deeds in architecture during the past fifty years. To look further back would be to enter the period in which blind partisanship and limitation was a matter not of choice only but of conscience.

In truth the architect who strives for purity of expression must often feel of his particular sphere of manifestation what Patmore felt of woman; that it (or she) is

"A foreign land
Of which, though there he settle young,
A man can ne'er quite understand
The customs, politics, and tongue."

Not, indeed, that he is for ever fumbling with an inability to turn thought into idiomatic bricks and mortar—there never was an age so quick in expression as ours—but that he is ever realising more and more the wealth of medium that lies before him—the inexhaustible depths and intricacies of his vehicle of expression. In the same way a thoughtful writer may, one imagines, sit spell-bound before his own mother-tongue, realising that to become perfect in the use of that single language is a task so vast as to preclude any wish for flights in the speech of other lands. Such a shrinking is no sign of timidity but of a great reverence for language in general—a reverence focussed by reason of the shortness of life and the length of art on one single phase of speech.

But if he limits his expression to one tongue this enthusiast will take his reading in others, and here I have brought myself at last to my subject. Mr. Spiers' volume of collected writings* is a book of the kind that is good for those whose self-imposed limitations keep them gazing down a single avenue of architectural intelligence. Mr. Spiers is

* "Architecture East and West," a collection of essays written at various times during the last sixteen years by B. Phéné Spiers, F.S.A., F.R.I.B.A. Published for the Spiers Testimonial Committee by B. T. Batford, London, 1905.

architectural cosmopolitan, a true zen of the world. Architecture is hitherto to him (not archaeology), whether it bleaches on Syrian sands or grows under the sunshine of Spain. What more, he approaches his architectural duties with the warm heart of a water-colour artist, and when he leads you by hand to Persepolis, Cairo, or Ctesiphon on the Tigris you have a pleasant sense that your companion is no mere dry-as-dust antiquarian, but one in whose eyes the laws of building are laws of beauty, to whom a piece of architecture is the true sense a work of art. Mr. Spiers is, in fact, an amateur, if that be the best name that we can give to the unlearned appreciator.

It would, of course, be unfair and unreasonable to judge this book either as a composite whole or as an efficiently representative effort. It is, and pretends to be, nothing more than a gathering together of stray essays prepared at various dates during the more recent literary career of a well-occupied man. But, as I have studied its pages in moments of leisure, I have been struck not merely by the well-argued conclusions which the individual articles severally afford, but perhaps even more by the easiness derived from the largeness and variety of outlook which the volume in its entirety affords. That Mr. Spiers could disprove "the cherished belief that painted architecture was brought from the East by the Crusaders," or convince his readers that the connexion between Greece and Persia was the exact reverse of the relation assumed by Fergusson, is important enough from a historical point of view, but I admit that to me the pleasure of these after-dinner musings has come from the realisation that I was, so to speak, in a watch-tower, the window of which gave on Echatana, while others looked towards Vicenza, Jerusalem, and Delhi. It is well to be reminded not merely that art is long, but also that art is wide. And our great art is the longest and the widest of them all. Again, if we begin thinking, as we read, on the possible connexions which make a unity of the apparently separate elements of this widespread human activity, we can find in Mr. Spiers' essays, distinct though they be, many a suggestion as to links and chains of causation. How pregnant, for instance, are the reflections to which the study of Mahomedan art gives rise. In Mahomedan architecture you have the entrancing, astonishing spectacle of a school of building craft controlled in its unity not by clime or race (which we so often proclaim to be the governing factors of style), but purely as it seems by identity of religious purpose. That Spain, Persia, and India should exhibit outbursts of splendid (if somewhat disordered) architecture which owe their impetus and their comparative identity to a religious impulse in Arabian Asia is at least a historical fact which points urgently to the conclusion that a community of spiritual interest is a stronger element in the formation of prevailing architectural manner than any local tradition or instinct of race. Mr. Spiers, judged by this volume, takes little heed of these modern theories that look to the guild or *collegium* as the mainspring of

architectural activity. For as he is to the theory of Byzantine origins at St. Front at Périgueux, he does not go with Rivoira the length of seeing in Ravenna nothing but indigenous art, nor does he concern himself (with Merzario and Leader Scott) in tracing the paramount influence of Masonic *Magistri* in European craft. Yet for all this I rise from the reading of his book with a renewed sense of the unwillingness of our art to be tied by the bonds of geography, or even chronology; a renewed hope that some day or other we shall discover that in the chaos of the dark ages there was at work an ordered unity of craftsmanship which was, perhaps, among a turmoil of unsettled monarchies and seething nations, the most enduring, the most unflinching of human forces.

These essays cover so wide a field that it is difficult to pick out isolated points for comment, but there are some examples and some theories that stand out with special force. The clever illustration (taken no doubt from a water-colour by the author) of the palace or mosque at Diarbekr is enough to remind us how ingrained is our appreciation of the customary proportions and use of the Classic orders, and how horrible is the result of any fantastic derangement of these academic elements. Those belted Corinthian columns, surmounted by a second order of stunted Composite breed, and separated from one another by arches which are sometimes pointed and sometimes haunched, form a nightmare to which even the Cufic inscriptions hardly give artistic respectability, though no doubt the Eastern sun and Eastern colouring would soften the shock. For some reason (perhaps Alberti's skill) the pointed arches in the classical scheme of the Tempio Malatestiano at Rimini are no outrage upon our sense; but this building at Diarbekr is like, let us say, the combination of a frock coat with knickerbockers. After all, this is only an offence against the custom of the eye, but the custom of the eye is everything in architecture.

Then there is that mosque at Ibn-Tooloon, a building about which Mr. Spiers says enough to make us wish that he had said more. As a problem in architectural causation it is astonishing, perhaps unique. Up to 877 Mahomedan architects, finding the world well supplied with second-hand materials, had used such columns and capitals as were within reach, and with them had incorporated in their buildings at least a strong *souçon* of previous style. But the architect at Ibn-Tooloon made a stand for pure originality, as other men have done since. The other men have failed, but at Ibn-Tooloon there exists, as a contradiction to all theory, a really successful and (to judge from the photograph) a really beautiful building, every feature of which is a startling innovation on previous methods. "With the building of Ibn-Tooloon," says the writer, "a new era commenced, and henceforth the new style takes its independent position." It were well if this mosque were more truly the start of a new style as well as the abandonment of an old one, but I fear there were many buildings of the subsequent years that owed little to its example. In truth, the Mahomedan

style is a very uncertain performance. Perhaps its inequalities are explained by the theory that it is good in detail (or even in whole features), but bad in composition. Certainly it is difficult to believe that the genius that could produce the "doorway of a private house" in Cairo, which Mr. Spiers gives as one of his illustrations, could also design the minaret of the mosque of the Emir Yakhor.

Mr. Spiers is often very reticent as to his own travels and personal researches. One of the most interesting buildings that he describes is the Great Mosque at Damascus, and it is only from a footnote to an illustration that we realise that forty years ago the author sat beneath its central dome to make a water-colour sketch of the north transept. It is, or has been, a magnificent building, and the fact of its partial destruction by fire in 1893 and subsequent restoration on unduly vigorous lines renders a history of its previous condition and past history specially interesting and valuable.

Of the remaining sections of the book the most important are some interesting notes on the churches at Jerusalem, a review of Dieulafoy's investigations at Susa, a chapter on Sassanian architecture, and an essay on stalactite (or honey-comb) vaulting.

The necessity for hurried publication led, perhaps inevitably, to a good many misprints, and the compiler of the table of corrigenda has omitted to note that the heading "Saint-Front at Périgueux" is lacking on page xvii. of the list of illustrations. The heading "Jerusalem Churches" is also missing.

NOTES.

THE Report of the Finance Committee of the London County Council on the proposal to pay District Surveyors by salary is printed in full in our report of the proceedings of the last County Council meeting. We are glad to see that an amendment that the subject should be referred back to the Building Act Committee was carried, though not by a very large majority. The Council have been on the eve of initiating a change in the administration of District Surveying of which it does not appear that they have realised all the possible consequences. The Report of the Finance Committee appears to us to be conclusive against it in regard to the probability of any public saving being effected by such a measure, and the idea of saving money seems to have been at the root of the proposal. The requirements of staff and offices for the salaried surveyors have obviously been quite underestimated. There is something to be said in favour of the payment of a fixed sum to a District Surveyor, as it relieves him from the odium of being supposed to be prowling for the discovery of infractions of building law in order to increase his fees (which is what many of the outside public wrongly imagine); but on the other hand it would render the position a less honourable and independent one, and there would be less inducement for a good class of men to take it

mp. Our own opinion is, and always has been, that the County Council made a serious mistake when they decided not to appoint practising architects any longer as District Surveyors; nor have we ever heard any good reason in favour of that step. Under the old conditions, the County Council could and did secure the services, as District Surveyors, of men in a high position in the architectural profession, whose name and position commanded respect; and we have never heard it asserted that these practising architects did not carry out their District Surveying efficiently. Forbidding the District Surveyors to carry on private practice was one step towards reducing them to the position of subordinates of the Council; the substitution of salaries for fees would be the next and final step, and would certainly not tend to render the District Surveyors either more respected by the public or more efficient in carrying out their duties. If the London County Council were wise, they would make this an opportunity of returning to the old system, and appointing practising architects as District Surveyors: but we have no hope that they will do so.

Breaking-up Streets. THE decision of the Divisional Court in the case of the Commercial Gas Company v. the Poplar Borough Council should be noted by those who have to take up the roads for private purposes. The Gas Company, for the purposes of laying, altering, or repairing their gas pipes, had broken up certain streets in Poplar, and the Borough Council, under sect. 114 of the Metropolis Management Act, 1855, had themselves undertaken to reinstatement and make the streets up. The parts of the roads taken up were of three descriptions—in portions stone setts were placed upon concrete, in portions stone setts were placed on the earth, and in others there were no stone setts. To avoid subsidence in the road the Council made the existing concrete 3 in. thicker than it was before along the line of excavation, and where there was no concrete a course of concrete was laid along the line of excavation. The Gas Company asserted that under sect. 111 and 114 of the Metropolis Management Act they were not liable to repay the Council the cost of this extra concrete. The Court held that the Act contemplated the street not only being made as good as it was before, but being placed in a state to remain as good, and to attain this object the use of the concrete was reasonable and necessary. Sect. 82 of the Metropolis Management Amendment Act, 1862, provides that the liability to make good shall extend to those parts affected which were contiguous to the portion of the streets broken up, and this obviates fine distinctions being drawn as to the exact limits of the work necessary to be carried out.

Collapsing Strength of Tubes. UNTIL quite recently the only extended and systematic experiments made as to the collapsing strength of tubes were those of Sir William Fairbairn instituted half a century ago at the

suggestion of the Royal Society and the British Association. Therefore considerable interest attaches to the paper read by Mr. A. P. Carman, of Illinois University, before the American Physical Society, describing the results of an investigation undertaken for the purpose of testing the formula deduced by Fairbairn from his experiments, and particularly for fixing a limit on the length of tube to which that formula is applicable. From this paper it appears that the narrow limits and the inadequacy of Fairbairn's formula were soon shown. Consequently, attention was next drawn to the purely theoretical formula proposed by Mr. A. E. H. Love about 1892. Inspection of the tables and diagrams given in the paper suggest that there is a minimum length for every tube, beyond which the collapsing pressure is constant, that this minimum length is quite definite, and that for lengths less than the critical minimum length the collapsing pressures rise rapidly. Mr. Carman's experiments were made upon seamless brass tubes of small diameters, which were responsible for a certain amount of error due to inevitable differences in annealing, but arrangements are now being made for a second series of tests upon steel tubes of diameters such as are used in actual boiler construction with the object of further testing the reliability of the new formula.

The New Croton Dam, New York. It may be remembered that since the construction of the Croton dam was commenced, some important changes were decided upon as the result of the report by a board of experts, and were due in the first instance to recommendations made by Mr. W. R. Hill, the chief engineer, to the effect that the Embankment section of the dam at the south end, about 275 ft. in length, should be removed and replaced by an extension of the masonry section of the main dam. This change was authorised by the Aqueduct Commissioners in 1902, and occasioned considerable discussion in engineering circles at that time. Mr. Charles S. Gowen, who was resident engineer in charge of the works from the beginning until their practical completion, took the opportunity of expressing his opinions on the subject in a paper read last month before the American Society of Civil Engineers. The author does not agree with the conclusions formed by the board of experts, and believes that the city of New York have been induced to waste nearly 200,000*l.*, and at least two years of valuable time, in carrying out unnecessary alterations. The grounds for these opinions are fully stated in the paper, upon which there will probably be a somewhat lively discussion. American views as to what is safe and what is unsafe in engineering construction do not always accord with British views on the same subject. In this case we have no reason to doubt the wisdom of the recommendations made by the expert engineers to which this important matter was referred, and to whom every credit must be given for admitting and rectifying what we regard as a serious original error.

Emptying Cesspools. In the case of Wandsworth Borough Council v. Baines, commented upon by us in a recent issue, the liability of the Local Authorities as to the removal of house refuse was the subject of decision, and now in Stainland Provision Society, Ltd., v. Stainland Urban District Council a question has been decided as to the liabilities of cleansing cesspools. The local authority had given notice to the appellants, the owners and occupiers of certain premises which had been erected before the year 1890, to empty and cleanse their cesspool. This notice was given pursuant to certain by-laws made by the local authority in 1890. In the year 1894 the local authority had passed a resolution that they themselves would in future undertake "the scavenging of privies, closets and ashpits, and that dry earth closets be emptied and cleansed monthly, privies and ashpits every three months." The appellants contended that by this resolution the local authority were bound to undertake the cleansing of the cesspools by virtue of sect. 42 of the Public Health Act, 1895, but the Court held that the local authority could undertake only part of the duties specified in sect. 42, and that this was all that they had done. The by-laws as to cesspools therefore remained in force, and the appellants were bound to empty their own cesspool.

The Papal Palace, Avignon. In our Notes of July 18, 1896, and January 12, 1901, we commented upon the demolition of the Porte Lambert, a part of the old fortifications, and of the ancient gateway facing the modern suspension bridge across the river, which constituted salient features of the walls around Avignon—a notable relic of mediæval France. We now learn that steps are about to be taken for completing a restoration which was begun in the early years of the last century of the Popes' Palace at Avignon, and for converting the buildings for purposes of a museum of religious art. After the Revolution the palace was taken for a prison and soldiers' barracks, the great hall, wherein the groning and shafts remain, being divided into floors for dormitories. In 1309 Clement V. (Bertrand the Goth) removed his Court from Rome to Avignon, which Phillip III. had ceded to Gregory X. in 1273; Benedict XII., also known at Rome as Nicholas V., began the erection of the palace in 1336, and, by one account, his successor, Clement VI., bought the land from Joanna of Sicily for 80,000 florins. Until Gregory XI. restored the papal chair to Rome, in 1377, Avignon formed the seat of seven occupants of the papal throne. During the schism of 1378-1447 it was the seat of several of the Anti-Popes, and it continued in possession of the See until the deposition in 1798 of Pius VI. The palace, which covers more than 1½ acres of ground, and combined the structural features of a monastery and a feudal castle, was surrounded with high walls and towers. The Tour de Tronillas in the northern block was built by the architect Pierre Orberri for Benedict XII.; it was used as a state prison and there, it is said, Rienzi was incarcerated. Giotto decorated

the lower chapel for Clement V.; the frescoes in the "Salle de l'Inquisition" are attributed to Spinello Arefano; but the greater portion of the mural paintings and decorative work have suffered irreparable injury. The grand tribune has a continuous groin; the walls of the "question-chamber" were built so as to contract above in the shape of an inverted funnel in the belief that they would prevent the passage of sound.

The members of the London Municipal Council who visit Paris next week will have an opportunity of seeing a great deal of the best that is to be seen of Paris architecture and art. On the 6th the list of places to be visited includes the Bourse, with its recent architectural additions; the Palais de Justice, one of the finest buildings of its kind in Europe, to which an eminent architect devoted for years his whole time and care; and the two saloons of art on the Champs Elysées, the smaller one of which is one of the most noteworthy and individual architectural creations of our day. On the 7th they are to see the Sèvres porcelain factory, and on the 8th the Natural History Museum, with its remarkable sculptured and pictorial decorations, the Gobelins tapestry works, the Panthéon, and the Sorbonne. The succeeding days are to be devoted to seeing schools. It seems odd that no mention is made of the Carnavalet Museum, the Municipal Museum of relics of Old Paris, the study of which might perhaps have prompted steps towards the formation of a similar museum here for relics of Old London.

LETTER FROM PARIS.

As the French Constitution requires that the Ministers in office should send in their resignation to the new President on the 18th, M. Dujardin-Beaumetz will have to abandon the office of Under-Secretary of State for Art, which he has occupied for a year with great distinction. It is hoped that this gentleman, who is a true artist in spirit and thoroughly acquainted with his subject, will, in virtue of his special qualifications, find a place in the new cabinet. Among the last acts carried out in the exercise of his functions, we may especially mention his re-organisation of the Conseil Supérieur des Arts Décoratifs. Occupied as he was with the development of our national collections, M. Dujardin-Beaumetz had also projected the erection of a new and much larger building for the Luxembourg Museum, in the gardens of the Seminary of St. Sulpice; and it is thanks to the impulse which he has given that the Malmaison Museum is now in great part organised. With the funds acquired by a special vote of Parliament, the Salon Doré on the ground floor, the former bed-chamber of the Empress Josephine, the Library of Napoleon, and other rooms in the Château, have been restored to their original condition, and will be opened to the public in the course of the summer. It is to the same influence that we owe the project of the monument in the Cours-la-Reine to the memory of the great French landscape-painter.

A committee has been formed in Paris for the erection of a monument to Bouguereau by public subscription. This monument will be a testimony both of appreciation of his artistic acquirements and also of gratitude for the services which he rendered to French art and artists by his work in connexion with the professional institutions which he presided over and administered.

The Municipal Council has instituted an architectural competition for the façades of houses for the portion of the Rue Réaumur comprised between the Place de la Bourse and the Rue Palestro. The jury have

awarded premiums to MM. Walwein, Montarnal, Bousson, and Heinant.

The gallery set apart at the Petit Palais for the works of Henner will shortly be opened, and in the same museum and at the same time will be opened the room containing the collection of drawings presented to the City by M. Harpignies, who has also presented to the Luxembourg a fine collection of views made by him between 1850 and 1860, principally in the Roman Campagna and in the south of France.

During its coming session the Municipal Council will be largely occupied in the consideration of various schemes of decoration, foremost among which is the completion of the decorative scheme of the Petit Palais. Externally this will consist in the addition of a number of statues, and internally there will be a division of the galleries into separate salons connected by long galleries, in order to give more hanging space for the constantly increasing collection of paintings. Large skylights are also to be formed above the different rooms in order to improve the lighting, which is not all that could be wished. The Council will also be occupied with the final arrangement and treatment of the large basin in the Place de la Nation, in the centre of which stands Dalou's group of the Triumph of the Republic. According to Dalou's idea, this group was to be accompanied by figures of fabulous animals spouting up water; and it is this scheme, for which the sculptor had left sketches, which the Council intend to carry out, giving a commission to some eminent animal sculptor, such as M. Gardet, to execute models to be carried out either in bronze or lead, in the same manner as the decorative groups in the fountains at Versailles. As in addition to this there are to be commissions for memorial busts of Cernuschi, the Duchesse de Galliera, and Paul Meurice, and statues of Theodore Roussel and Baron Taylor, it will be seen that the Municipal Council is doing its part in the encouragement of French sculpture.

The next of the series of exhibitions of applied art at the Musée Galliera will be an exhibition of silk in its various applications to art and industry, which will be open in the spring. This exhibition, which is specially to present a kind of analysis of the work of the last ten years, will include also a retrospective exhibition of XIXth century wares and also of silk textiles of earlier dates.

The use to be made of the Château de Bagatelle seems to be at last decided on. The Municipal Council will authorise the holding in it of a series of historical or retrospective art exhibitions, of the same kind as that which was attempted last summer by a group of amateurs, whom the authorities made the mistake of not encouraging.

NOTES ON NEW BUILDINGS IN LONDON.—VI.

At the corner of Bond-street and Piccadilly is a new building, fronting to both streets, which is rather typically representative of the new London architecture. Where there is anything more than mere building, nowadays, we see generally the attempt at the picturesque; at gables and skyline, and piquant varieties of detail. There is something restless and wanting repose in this, but there is at any rate a certain life and interest in it. The Bond-street front of the building in question illustrates a feature which we have observed in various other quarters to have become rather a favourite one—that of carrying a kind of angle post in stone the whole, or nearly the whole, height of the angles of a bay or other feature. Where, as is generally the case, this apparent post of stone does not start from the ground but from a bracket or corbel, and still more in some cases where it starts from a visible support at all, but its lower end finishes in the air, it is an un-pleasant form of stone design; and we see instances (perhaps to be noticed hereafter more specially) where it becomes absolutely an imitation of joinery construction, and the stone angle post looks like the newel of a stair. In the building we are now considering this has been avoided so far that the bay towards Bond-street, projected over an arched opening on the ground floor, has a sufficient

corbel to carry it, and the post-like angle feature resolves itself in the upper story of the bay into an angle colonnette, thus at any rate returning to a masonic form at the finish. The front towards Piccadilly, with its large gable, is effective; so also is the manner in which the projections of the two lofty bays on this front are connected by balustraded balconies flush with the outer faces of the bays. The fault of this building is the want of unity of style and scale in the details. Some are too heavy for the general style of the building; others too light. For instance, the new practice has been adopted of leaving the stone mullions and transoms of the windows with a plain square section, with no moulding. There is no beauty in this treatment of mullions, which have come across lately in many places; its sole recommendation over a moulded mullion is its novelty, moulded mullions being apparently regarded as "played out"; but it assimilates very well with a building of plain, solid, and massive character. In the case of a building like this, treated mostly in a light and rather playful manner, the square section mullion is too heavy for its surroundings. In fact, the architect does not seem to have been sure what architectural character he was aiming at; window dressings are decorated with flimsy little floral pendants, put there from an idea that something ornamental was wanted, but which have no accordance with anything else in the design, any more than the simously-curved heads of the top windows of the angle bay, which do not look well. Both in the roof balustrade and in the balustrades of the balconies towards Piccadilly a form of balustrade much lighter in proportion than usual has been adopted, coupled with a very massive balustrade section, which is quite out of keeping with the proportions of the balustrades; this is especially noticeable in the balustrades of the balconies, where the balustrades are in themselves of a graceful and pleasing design, but are quite crushed by the massive proportions of the balustrade rail over them, which they seem inadequate to support. The worst mistake in the building is, however, one which the architect probably considered to be a virtue. The ground floor at the angle is a shop, as usual nearly all glass, but the architect has endeavoured to remind us that the upper part of a building ought to stand upon something solid, by introducing very narrow thin apparent piers of masonry, just enough to hide the iron supports. It would have been far better and more architectural to have candidly shown the iron standards and treated them with paint or in some other way which would not have disguised their existence. As it is, we look at these thin stone uprights, rather than piers, which make believe to carry the building, and at once expect to see them crack to pieces. This is certainly not architectural treatment.

We have only to walk down St. James's-street to realise the contrast between what may be called the tentative picturesque and the certainty and unity of true architectural style. Here, at least, in the Alliance Buildings at the south-west angle of St. James's-street, is a piece of real architecture—solid, severe, all composed with one definite aim, and with no tricks of detail anywhere. Of course, it must be conceded that the architect has had an immense advantage here in not having a shop on the ground story, and in being able accordingly to erect his building on a solid ground story of masonry; but apart from this, the remainder of the design forcibly illustrates the power of reserve and subordination of detail in architectural design, and the effect to be obtained by simple and well-chosen treatment of masonry and mouldings, with hardly any ornament at all. The ground story is not merely solid, it is almost Cyclopean in treatment, at least on the east front facing Pall Mall, with rustication of the holdest character, and great semicircular arches of more than 2 ft. reveal. As in the building next to the Gaiety Theatre (which we may take to be essentially the production of the same designer,* whether carried out by him or

* We have purposely obtained, in these notes, from giving the names of architects, and even from inquiring them where we were not aware of them; our object being simply to consider how a building strikes the spectator, apart from any personal considerations.

not), the ground floor arches show a subtle inference to the spacing of the openings above them, and are quite massive enough to do this: though here, as in the Gaiety building, we feel that we would rather not have seen the keystones directly quarrelling with the sills of the windows above them.

The form of rustication employed (sketched here) is not one that we are fond of, and, as will be seen on the return of it round part of the south front, when it comes to voussoirs over a comparatively small arch, it is apt to cut up into rather awkward-looking lumps. It works quite well, however, for the large arches on the east front, and is undoubtedly a very powerful form of mural expression. Above the ground story the main range of upper windows (really the second story, though on the east front it appears externally as the first story) is treated with pedimented heads and consoles, which consoles form the only exterior detail that does not seem quite satisfactory, as they strike us as somewhat too thin and light in proportion for the character of the other details; but it is a small point, and there may be two opinions on it. This range of windows is decorated with iron balconies of rich design and sufficiently massive character, designed with a fine sweep outwards from the base, falling in again to the top rail; these balcony grilles form almost the only detail on the building which can be classed as ornament; the rest is simple masonry and moulding, crowned with a plain modillion cornice. The treatment of the top-story windows, square-headed openings with a keystone carried up to the soffit of the cornice and the wall between finished with a small moulding returned into the window-jamb, is particularly refined and well studied.

The large arched windows on the ground story form really, as already hinted, two stories of windows, at least over a part of the building, the first floor being a mezzanine floor level with the springing of the arch, and consequently having semi-circular windows starting from the floor level—not a convenient form of window internally. But externally we have a building which in dignity and coherence of architectural style is worthy of the best traditions of the Florentine Renaissance. Young architects may have the opportunity of adding to the street architecture of London should study this building, and learn to see how much may be done by real solid building and by well-considered masonry design and moulding, without bedizening a front with what is often falsely called ornament.

POINTS FOR THE CONSIDERATION OF MUNICIPAL COUNCILS.*

THERE is a point which is of great importance in the general appearance of a town, and that is the position of public buildings. How many of our great halls and handsome buildings are hidden in out-of-the-way corners, just as so many of our great thoroughfares lead to nowhere and nothing? I do not want to seem unpatriotic in continually quoting other countries, but we cannot blind ourselves to the fact that in most Continental cities great attention has been paid to these points. Public buildings are always well placed. If you go down a great street or avenue on the Continent you are practically certain to come to an architectural feature of the town. Similarly, if you find the town hall you are equally sure of finding the main thoroughfares converge thereto. We find too often here that economy is almost the prime factor in securing a site, and cheap sites are not usually the best for such a purpose. You may, of course, save a few hundreds in purchase money, but when you are putting up a public building to cost 50,000, to 100,000, and to last for generations, it is foolish to grudge even a few thousands extra if by spending you get an ample site and a commanding position—two qualifications that should be secured in the erection of all our public buildings. Cheap

* Part of an address by Mr. T. T. Rees, President of the Liverpool Architectural Society, delivered on Monday, January 22.



and nasty may exist even in the matter of sites.

One department in which municipalities could with advantage exercise control is that of advertisement hoardings, the necessity for supervision of which is glaringly instanced in every town. As a beginning they might have the power to define areas in each town where alone hoardings should be erected, and if a few private owners anxious to let their land for advertisement purposes were slightly prejudiced they must remember that in this, as in other things, the desires and interests of the community take precedence. One rule I should suggest is that under no circumstances should it be permissible to deface the gable ends or fronts of buildings with advertisements. Nor would I permit buildings that have been damaged by fire or fallen into decay to stand like ugly skeletons plastered over with posters, eyesores to all that pass and a disgrace to the town in which they exist. Power should be obtained to compel the owner to raze such buildings to the ground; better to have an unoccupied piece of land than a nightmare of a building. There is, further, the desirability of censorship over the nature or character of the posters themselves. It is really distressing to see the class of thing with which most posting stations are decorated, and the evil effect of some ultra-sensational picture has been definitely traced in more than one instance. The Continental authorities have a censorship of the kind suggested, and, indeed, they have large powers in other directions as to the size and construction of advertisement designs. We might follow the example of Continental towns and cities in their restrictions, or the lead of Chicago, where no bill-boarding may be erected in a residential street unless by consent of three-fourths of the frontagers. Edinburgh has been the pioneer in securing for the Council as representing the community the right to say where advertisements may be placed, and probably they were roused to energetic action by the threatened disfranchisement of their lovely and beloved Princes-street. At any rate, they were actuated by the desire that their beautiful city should not be injured in its attractiveness, a quality by no means profitless to the city. Of course, for really objectionable posters we may rely to some extent upon the common law and the police authorities; but, from the aesthetic point of view, we do undoubtedly need more power. Glasgow, the most go-ahead of British cities, sacrificed a solid financial advantage of 4,000, a year by deciding to abolish advertisements on their tramcars.

Take, for instance, the hoarding around the monument in Liverpool to the late Queen; it got on one's nerves, and really it was up so long that we wondered if it was to remain for ever. Why should buildings be enclosed by tall, unsightly palisades? Personally, I see no reason why a hoarding should not be made, say, 4 ft. solid from the ground, and above have spaces left between the boards, with a capping on top, no hoardings to be higher than 8 ft. to 10 ft. If the work is good, there is no necessity to hide what is going on behind.

The Manchester Improvement Committee have decided to keep free from advertisements all hoardings placed round buildings which are in progress of erection or where alterations are being made. In Leyden they go still further, the municipality managing all advertisements of the poster class. I would, before leaving this part of my paper, like to say how much one appreciates the efforts of such firms as Pears', Bovril Company, Nestlé's Milk, Vernon's, and others in their attempt—and, I think you will agree, successful attempt—to produce pleasing posters. The Brussels Municipal Art Society have gone to the extent of instituting competitions for tradesmen's signs, which were most successful, the result being that many of those who competed received orders to decorate shops with suitable signs and name-boards. Such a competition might easily be got up in Liverpool.

Perhaps the most degrading kind of advertisement known to modern towns is the sandwichman, the employment of whom is a disgrace to any civilised nation, while to take advantage of the necessities of women to put them to such an occupation needs stronger condemnation than I care to put

into words. There must be something wrong somewhere when men and women turn themselves into walking sign-boards. It is at least something to the credit of the community that in London there was such outcry against the employment of girls in this capacity that the employers were compelled to cease this degrading style of advertisement. This is what we want—so to rouse public opinion on the question generally by the actions and speeches of spirited citizens that a pride will be taken in their city and a jealousy for its fair name excited.

Still another nuisance that ought to be modified is the smoke, which so pollutes our atmosphere, and, according to the opinions of all experts and every thinking man, exercises so evil an influence on the health of a town. One result which proves the effect is the London fog, the density of which is admittedly due to the enormous quantity of smoke poured forth by the hundreds of thousands of houses which form the congeries of towns. I do not think that our municipalities exercise their full power over offenders, and, personally, I would like to see still more stringent regulations in force, for not only is it a menace to health, but also causes destruction to the plant life of a city. It is difficult to persuade some people of the injury that the smoke issuing from tall factory chimneys, which a city suffers to float over it like so many black flags, does because they believe that smoke means industry, and industry wealth. Personally I believe that it means defective stoking of the furnace.

Now, what do all these things lead us to? They are the approach, in my opinion, to a city wherein the inhabitants shall have beautiful things to help them in mind, and healthy conditions to maintain the vigour of the body. People desire to live in a good, clean, and beautiful town, and if you give them such surroundings you will not only benefit the inhabitants, but you will attract new residents from other places. Your houses will be well occupied, their number will increase, and, so long as the increase goes on proper lines, you will have unending possibilities of increasing the rateable value and thus keeping your rates at a desirable level. Visitors coming into the town will covet the privilege of being residents there, and your municipality will have a good name throughout the land. Manufacturers, too, will be attracted both by the population and the conditions of life; in fact, the pleasanter you make your town the greater will be the probability of its becoming a self-contained community, possessing all the means of ministering to the needs—physical, intellectual, and moral—of those within your borders.

This is done in many Continental towns, indeed, a body of gentlemen composed of architects, artists, and engineers is recognised as a necessary part of the municipal body, and, personally, I consider it would be a very great honour to any member of this and other societies if they were asked to attend a committee and assist in formulating an improvement scheme; not that I believe officials are incapable, for I would be the first to give them every credit, but I believe they in years get into an official groove, which it is almost impossible for them to get out of.

We hear often of architects complaining, and read continually in our journals of building surveyors designing and carrying out public buildings. I see no reason why they should not if they are able; but if the members of our profession want to put a stop to the practice, then let them make their influence as a society felt, and I believe recognition will be the result.

I fancy I can hear some say, Why read such a paper to an architectural society. It is unsuitable for an audience of professional men; it would be all right for a number of town or city councillors. We know all these things and see them every day, and agree that a remedy is needed. Quite right; I understand such a point of view, but are architects not the proper people to awaken civic pride? Ought we not to condemn in season and out of season these flagrant eyesores? Ought we not to do all we can to educate the tastes of the people? Personally, I think we ought.

I am sorry to say that I have a grievance against the City Council of Liverpool, and it

this—that it does not recognise a Society for ours as it ought to be recognised; and, on the other hand, I am of opinion that our Society does not make its influence felt. Councilors want education as well as those outside the Council chamber. How can this be done? One way I would suggest is this, that when any paper touching upon city affairs is being given—and we ought to have one at least every year—the Councilors ought to be invited to attend our meetings. Another way is that we ought to form a committee of this and kindred societies, whose duty it is to watch what schemes are being brought forward, whether it be buildings, laying out streets or parks, and report; and, if as a Society, when necessary, ought to make such recommendations to the Council as will help them to properly carry out such schemes. If this were done I believe that before long the Council would ask our President, and perhaps some of the senior members, to meet the Council committee and discuss matters relating to the city improvements.

THE PHENE SPIERS TESTIMONIAL.

We have received the following statement from Mr. Schultz, the hon. secretary for the Spiers Testimonial Fund, which we have pleasure in making public:—

"The executive committee of this testimonial have now wound up the matter and closed the accounts. After paying all the costs in connexion with the various items of the testimonial, it was found that there was a balance to the credit of the fund of 79s., and that only 124 copies of the volume 'Architecture East and West' remained unsold at Christmas, 1905. The committee have handed over the balance of 79s. to Mr. Spiers to deal with in any manner he thinks fit, and have instructed Mr. Batsford to transfer the remainder of the edition of the book to Mr. Spiers's account.

This settlement of the matter may be looked upon as highly satisfactory to all parties concerned. When it was decided to publish the volume, it was not anticipated that after paying the costs of publication there would be any appreciable balance to deal with. The success of the publication is largely due to the zeal and energy of Mr. Batsford, who gave a great deal of personal time and trouble to the matter, and also, of course, to the excellence of the matter in the work itself, which caused the volume to be well received and taken up.

We understand that Mr. Spiers is going to devote the sum of money which has been handed over to him to a useful architectural purpose, and we may expect from him shortly an announcement on this subject.

The statement of accounts and balance-sheet, which has been signed by Sir Austen Webb, and the other members of the executive committee, is open to inspection by any subscriber who may wish to see it, at the office of the hon. secretary and treasurer, Mr. R. Weir Schultz, 14, Gray's In-square, W.C."

It is rather a singular coincidence that the above statement, which only reached us on the morning of going to press, should, quite accidentally, have been sent in for publication in the same issue in which we had already arranged for the publication of Mr. Paul Waterhouse's article on "Architecture East and West," which will be found on another page.

A PAGEANT AT WARWICK CASTLE.

MR. LOUIS N. PARKER has prepared the libretto of a historical pageant which will be held in July at Warwick Castle, and of which he will act as "master of the ceremonies." A tableau representing the history of Warwick will form the closing scene; amongst the episodes that will be illustrated are the state visit in 1502 of Queen Elizabeth, with Robert Dudley, Earl of Leicester, on her progress to Kenilworth, the capture (at Northampton) of Henry VI. by Richard Nevill, the "king-maker," the trial and condemnation, at Blacklow Hill, of Piers Gaveston, the siege of Kenilworth Castle when held by Simon de Montfort, and the legendary slaying of the Dun Cow by the redoubtable Guy, Earl of Warwick, who, we may mention by the way, is commemorated by a bas-relief in Warwick-lane, Newgate-street, where was the London inn of the earls of that house. King Alfred's daughter, Ethelfleda, Countess of Mercia, reinstated, after its destruction by the Danes, the fort which Rons of Guy's Cliffe (*obit* 1491) the historian of the county ascribes, with Camden and Dngdale, to the British King Cunobelin. Now represented by Warwick Castle, had been rebuilt as one of those established by Ostorius Scapula, in the later province of *Flavia Caesariensis*, along the line of the Fosseway from Bath to Lincoln.

Warrenmunde, father of Offa, King of Mercia, rebuilt the town, calling it Warre-wyke—a name which appears as Werhica upon a coin of Hardiknut. An area of nearly three acres is encompassed by the outer walls of the subsisting Castle, which constitutes the perhaps finest example of a feudal fortified residence in England, remarkable for the great interest of its gatehouse and system of military defence, enhanced by the beauty of its position upon a rock by the Avon. A road winding upwards from the riverside leads to the main gatehouse, flanked by two towers, and having a barbican or outer fortification. In the north angle of the enceinte stands Guy's Tower, 128 ft. high, and duodecagonal on plan, with an embattled parapet resting upon corbels, built at the close of the XIVth century by Thomas Beauchamp, Earl of Warwick, who renewed the curtain walls and some of the minor towers, and made the large vaulted substructures beneath the Castle. In the opposite angle is the earlier Caesar's Tower, quatrefoil on complete plan, and having a machicolated parapet with an upper battlement rising above, as at Pierrefonds and Chateau d'Elampes, and at Craigmillar—the last-named being a rare example after that kind in Scotland. On an acclivity to the south-west was erected Ethelfleda's keep, replaced, probably in the late XIIIth century, with a shell keep of stone; on the south-east lies the range of private apartments. The great hall and the domestic apartments in the eastern wing were restored by Anthony Salvin (who had done some work there in 1863-6) after their destruction by fire in July, 1871. In a greenhouse, erected for its reception, was deposited the Bacchic vase, or bathing basin, of Lysippus, discovered in 1770 in the bed of the old lake Pantanello, near Hadrian's villa at Tivoli, and brought to England by Sir William Hamilton—confer Piranesi's "Vase e Candelabra." The present house of the Earls of Warwick and Brooke derives from William Greville, citizen of London, *tempo* Richard II., who, in 1398, purchased the manor of Milcote, co. Warwick, from Sir Walter Beauchamp; his epitaph at Campden describes him as "the flower of woolstaplers." His descendant, Fulke Greville, of Milcote and Alcester, and of Brooke House, Holborn, the learned and accomplished courtier, obtained from King James I. a grant of Warwick Castle with its dependencies, and expended large sums of money there. He was elevated Lord Brooke, Baron Brooke, of Beauchamp's Court, co. Warwick, on January 18, 1621. The stately monument which he erected for himself in the chapter-house of the formerly collegiate church of St. Mary, Warwick, bears the inscription:—

"Fulke Greville, servant to Queen Elizabeth, counselor to King James, and friend to Sir Philip Sidney, Trophaeum Pectati."

William I. made Hyde de Newburgh castellan with the title of Earl of Warwick, and surrounded the town with walls and a ditch, whereof some vestiges remain, and which gave the name of Wall-dyke to a part of the town. Roger de Newburgh, second Earl, made the parish church collegiate in 1123, incorporating with it the Collegiate Church of All Saints, which then stood within the castle precincts. The fire of September 5, 1694, consumed more than one-half of the town, and the tower, nave, and transepts of St. Mary's as rebuilt in the latter half of the XIVth century by the eleventh and twelfth Earls of Warwick (Beauchamp). Sir William Wilson, of Leicester, architect and builder, rebuilt the nave, jointly, it is said, with Wren, whose drawings of the church and some sketches of proposed new works are at All Souls' College, Oxford. Mr. J. A. Chatwin restored the fabric in 1896. On January 31, 1891, we published Mr. Harold Brakspear's set of measured drawings of Richard Beauchamp's Chapel of our Lady (1443-64) on the south side of the chancel of St. Mary's: some sketches of the town and Castle will be found in our Volumes LVIII., p. 65, and LXXV., p. 129, for 1890 and 1898.

ROOD SCREEN, ST. PAUL'S CHURCH, BEDFORD.

A new rood screen of English oak has been placed under the chancel arch of this church. The work was carried out by Messrs. Rattee & Kett, of Cambridge, from designs by Mr. G. F. Bodley, R.A., and the cost was about 650*l*.

THE SURVEYORS' INSTITUTION.

An ordinary general meeting of the Surveyors' Institution was held on Monday evening at No. 12, Great George-street, Westminster, S.W., when a paper, by Mr. Frederick Marshall, K.C., on "The Valuation of Machinery for Rating Purposes," was read.

The author said that, during the last thirty years, a feeling of uncertainty as to the application of the principles as to the rating of machinery had been gradually growing until it had developed into something like two rival views, having little in common with each other. It was agreed that machinery could not be directly rated, and that the only way in which the parish could put it under contribution was to regard it as enhancing the value of the hereditament with which it was connected, and which was the direct subject of assessment. But how to do this was the problem which had given rise to so much difference of opinion. On the one side, it was contended that the only practical way of measuring the enhancement was to consider what the machinery was worth as it was and where it was, and to put on such a percentage as a landlord could afford to let it at and a tenant would be reasonably likely to pay, as representing the addition that should be made to the rent of the building for the purpose of assessment. On the other side, the argument was that capital values and percentages were entirely beside the question, and that what the valuer had to find was the additional amount which a tenant would be willing to pay for the convenience of having the machinery *in situ*, and the building adapted to it as a going concern. Unfortunately, the course of law had not given much assistance to the valuer of late years in deciding between the rival contentions, viewing it rather as a question of fact for him to settle with the help of his experience and good judgment than as a matter of law upon which any definite rules ought to be laid down for his guidance. Incidentally, however, some light was thrown upon the subject by the cases which had been from time to time decided, and especially the earlier ones.

The author then dealt with a number of legal cases bearing on the subject, mostly subsequent to the year 1840, when the Act for exempting personal property from rateability was passed. In the case of the King *v.* Lord Granville, in 1823, a lessee of a coal mine, who was also the occupier, had erected a steam engine and laid down a railway for the working of the mine. His royalties amounted to 80*l*., and he was rated at 98*l*., the difference of 18*l*., being charged in respect of the engine and railway. He was held to have been properly rated at the larger sum; the court remarking, in reference to one point raised in the case, that it was immaterial whether the engine and railway had been put in by the tenant or the landlord. In that case, however, the additions were pure fixtures, and became part of the realty by their physical attachment to the soil, so that the case did not help with regard to the debatable articles of machinery which formed the chief subject of contention at the present time. The case of the Queen *v.* Guest, though decided before 1840, proved that personal property was not charged to the poor rate in the parish where it arose, so that it stood on the same footing as the cases after the passing of the Act of 1840. The important part of the judgment was that Lord Denman said that "real property ought to be rated according to its actual value, as combined with the machinery attached to it," drawing no distinction whatever between the method of valuing the building and the machinery, although the latter was not built into the walls or floors, but only secured to fixed frames, and was easily removable. In the Queen *v.* the Southampton Dock Company (1851) the question was, whether a percentage on the whole value of the machinery in dispute should be deducted on the ground of its being part of the tenants' capital, and the effect of the judgment was that the deduction was not allowed. As 25 per cent. was allowed for tenants' profits, the result was that the assessment on the freehold was increased by 25 per cent. on the existing value of the machinery in dispute, less repairs. This was, in effect, making the machinery rateable, and rateable to the full amount of its value. In 1860, in the North Staffordshire

case, the judgment in the Southampton case was confirmed, and the well-known division of machinery, etc., into three classes was made by the court. First, things movable, such as the furniture; then, things so attached to the freehold as to become part of it; and thirdly, things which, though capable of being removed, were yet so far attached as that it was intended that they should remain permanently connected with the railway or the premises used with it, and remain permanent appendages to it as essential to its working. This classification had never since been disturbed. The effect of the decision was to exclude the machinery in question from tenants' capital, and the percentage allowed upon its entire existing value would therefore be added to the amount at which the property was rateable. In the *Queen v. Lee*, one might fairly come to the conclusion, in reading the judgment, that if a machine, though attached to the building where it was found as part of the plant, was attached for the enjoyment of the thing itself, that was to say, for its better working, it would not be rateable, and should not be taken into consideration by the rating valuer. And this was the decision of the same court in the following year, in the case of the *Queen v. Halstead*. Up to this time there had been no distinction drawn between machinery which was to be taken as part of or combined with the freehold and that which was to be regarded as merely enhancing its value for rating purposes. There had been a classification in the terms he had quoted, but, if the court held that the debated articles were rateable or the contrary, they were transferred bodily from one category to the other, and the premises as such were rated accordingly. In *Chidley v. West Ham*, however, Mr. Justice Blackburn used an expression which, repeated as it had been in various subsequent cases, had given rise to the existing divergency of views among rating surveyors and text writers. The question there was as to the rating of certain tanks, mash tuns, and similar articles in a distillery; and Mr. Justice Blackburn, in giving judgment, said: "Whatever is fixed to the realty so as to pass as landlord's fixtures in a demise of the premises must be taken to be part of the premises for the purpose of ascertaining its rateable value. . . . I am not prepared to say that the various articles described in the present case may not be taken into account as enhancing the value of the premises, but that question is not asked, and we are only to say whether the things are rateable." He added that all the items in that case were nothing more than chattels which steadied themselves by their weight or with the slight assistance of a screw, and that they were not fixtures, and not rateable as part of the premises. The question therefore arose whether, in similar cases, though the disputed articles were not fixed into account as enhancing the value of the premises, and, if so, on what principle. As already stated, except where fastenings and connexions were mentioned, all the things in dispute were retained in their places by their own weight merely, and all of them were bought and sold as separate articles. It was not clear whether these things would have been held rateable under the previous decisions—he was inclined to think not. For it was to be remembered that, in all the previous cases but one, the articles in dispute were in fact attached to the North Staffordshire, where there were certain electrifying and weighing machines which were unattached. It was not quite clear from the judgment whether these were held rateable or not; but as "things movable, such as office and station furniture," were held exempt, probably these were included in the exemption. It was perfectly clear that Mr. Justice Blackburn would have called them chattels, and he was a member of the court by which the North Staffordshire case was decided. If that be so, we had a distinction, observed at any rate down to the year 1874, when the West Ham case was decided, that machinery fixed to the freehold, so as, in intention and in fact, to form part of it, was held rateable, while machinery unfixed and movable was held not rateable, though in Mr. Justice Blackburn's view it might be taken into account as enhancing the value of the premises for rating purposes. And the fact that

the latter had pipe connexions, or was worked by gearing, or was fixed for the purpose of steadying it, made no difference.

The author then dealt with the cases of *Laing v. Bishopwearmouth*, and the Tyne Boiler case (1886), which last case did not purport to extend the principles already laid down, and it scarcely touched the question as to the mode in which the machinery in question was to be taken into account. Other cases dealt with were—*Gifford v. the Chard Union*, and *Kirby v. the Assessment Committee of the Hunslet Union*, decided last year. The Recorder in the Kirby case would not adopt the 20% given by the respondents as representing the value of the machinery, but halved it; but in the rider finally explaining his judgment, he said:—"I held that, in inquiring what was the gross estimated rental and the rateable value, the basis of the problem was to ascertain what was the rent which a hypothetical tenant would give for the engineering works as a combination of land, buildings, and scheduled machines on a demise which included the right to use the scheduled machines, that is to say, on the assumption that the hypothetical tenant would get as part of the consideration for his hypothetical rent the right to use such machines upon the premises during his tenancy, and that in this way the scheduled machines were being properly taken into account as enhancing the rental and rateable value of the freehold. I also hold that the value of the user of the machinery was not necessarily to be arrived at by taking the cost or value of the machinery and putting a percentage on such value, as had been done by the respondent valuers. . . . Not necessarily," of course, but as the most obvious way, he (the author) suggested in the majority of cases. The Recorder did undoubtedly take the value of the user of the machinery as representing its rent, and that was something tangible, which there was not much difficulty in getting at. The naked words of the judgment of the Divisional Court would seem to leave the whole matter to the discretion of the valuer, but the affirmation of the Recorder's decision must be taken as an affirmation of the principle he adopted.

In the Court of Appeal Kirby's case was fully argued for the appellant, but the respondents' counsel was not called upon, the court holding that they were bound by the Tyne Boiler case. In the House of Lords, Lord Halsbury said:—"The overseer has a comparatively simple problem to solve, although it is difficult enough sometimes; he sees the place being conducted as a brewery or an iron foundry, or what not; he looks at the premises, he looks at the furniture which is necessary for carrying on the business as a brewery or foundry . . . and he says to himself, 'Well, looking at the whole of the place, such and such is the rent that would probably be paid by a tenant from year to year for such an establishment as this.'" It was a question of the rent which the hypothetical tenant would give for the combination of land, buildings, and machines.

As a whole, it was almost impossible for any impost to be in a more unsatisfactory position. It was not only levied with uncertainty where the law purported to be carried out, but, owing to the tendency of the impost to put a fetter upon industry, there were in many localities the strongest reluctance to levy it at all, amounting in a large number of instances to a positive refusal. Hence the practice as to the rating of machinery in different places was of the most divergent kind.

A hearty vote of thanks was accorded to the author.

THE EDINBURGH BUILDING TRADE.—At the Edinburgh Dean of Guild Court on the 25th ult., Lord Dean of Guild Wilson presiding—plans were passed representing in all about 40,000. There were twenty-seven cases on the roll, and twenty warrants, including several permits to the Barrh Engineer, were granted. Warrant was given to J. & G. Cox, Ltd., glue and gelatine manufacturers, for new buildings at Gorgie Mills. This is an addition to the present works of the company, and it is estimated that the cost will be about 10,000. There will be two three-story buildings, and these will cover about three-quarters of an acre of ground, while the footage over the water will extend to 1½ acres. The buildings will be constructed from the designs of Messrs. Geo. Beattie & Son of brick and steel, with timber roofs.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS.

I.—NEW SESSIONS HOUSE, OLD BAILEY, E.C.

THE current series of spring visits commenced on Saturday, January 27, when a large body of members inspected the new buildings of the Central Criminal Court now nearing completion. This is the second occasion upon which the Architectural Association has been privileged to examine the work. An account of the first visit was given in our issue of February 25, 1905, and at the time the absence of the architect, Mr. E. W. Mountford, from reasons of health, was much felt, and it was further regretted, upon the present occasion, that similar reasons prevented the author attending. In his absence Mr. F. D. Clapham described the design and materials, and explained the various difficulties contended with.

The recent removal of scaffolding affords a good general view of the façade, and we find, on comparing the building with the competition design, published in the *Builder*, June 30, 1900, that a great deal of architectural freedom has been introduced.

We see, for instance, that the pediments on the Old Bailey front now have their horizontal members broken and stopped short above the pilasters. Into the tympanons some florid work arising from the fenestration has been inserted. The allegorical figures which predominate have little to do with the space, their low relief is unsatisfactory, and the work is sculpture not in relation to architecture. The pediments themselves have too flat a projection. The tower and dome, although hidden from the street by scaffolding, appear to have been subjected to the same free application of current popular detail when compared with the original proposal. The restraint and feeling for tradition in the original design are lost.

The elevations show that the solids and voids are not happily managed. The "rustication" scale is too small, but it is perhaps owing to the re-using of the stones from the old building that there appears to be an absence of harmony with the new features. The blocks in the architraves to the windows are disturbing to the play of surface, which is felt to be required, and the lead glazing of the windows is not suitable.

Internally the foregoing remarks are applicable, and we see the important semicircular arches of the first design replaced by features of segmental form with a corresponding coarseness of detail. It is safe to say, however, that the effect of the main halls, corridors, and staircase, although not overburdened with light, will be very fine indeed. Ample space is provided in and about the entrances to the courts such as a building of this importance should receive. The decorative aspect of these parts will have a strong character. Marble is used for wall linings in a broad manner and in good choice; for the execution of this Messrs. Leas Brothers, of Bristol, are to be complimented. Some good specimens of Scagliola work are supplied by Messrs. Bellman, Ivey, & Carter, while the vaulted ceilings have been finished in "Stonueville," an interesting stone-like material well worked by Mr. Seale. Other marble linings and floors are provided by Messrs. Anselm, Odling, & Co.

The interiors of the four courts, although far from completion, do not give promise of great architectural conceptions. There is a coarseness of detail in the plaster-work of the domed ceilings and barrel-vaults. This is particularly felt in the pendives of the ceiling in the large court, where the prominence given to the inlet gratings of the plenum ventilation system is unpleasant.

Some excellent design is to be seen in the judges' rooms, library, barristers' smoking-room, etc., which have coved ceilings and oak panelled walls. A number of good ornamental ceilings have been supplied by the Bromsgrove Guild.

The structure generally is the work of Messrs. Holloway Brothers, whose conduct of the great undertaking is seen to be very thorough and well performed.

EXHIBITION AT NUREMBERG.—The Bavarian Jubilee Exhibition of Trades, Industry, Arts, and Crafts is to be held at Nuremberg from May to October, 1906, under the patronage of the Prince Regent.

THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Sir E. Cornwall, M.P., presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Poplar Borough Council £1,058, for paving and channelling works, and to sanction the borrowing by Finsbury Borough Council of £6,000 for repairing works.

Payment of District Surveyors by Salary.—A long discussion took place on the report of the Building Act Committee on the payment of District Surveyors by salary. The report was printed in our issue for December 16 last. The Finance Committee have since submitted the following report on the same subject:—

"The Building Act Committee have forwarded to us particulars of a proposal which they are about to submit to the Council for the payment of district surveyors by salary, and for the substitution of the existing system of remuneration by fees which the district surveyors collect from builders and others. The Building Act Committee in their report, which is set at large in the Council's report, express the opinion that it is desirable to substitute fixed salaries for the present system of remuneration, and, as the adoption of this course would involve expenditure on the part of the Council, they recommend that the Council would be entitled to receive, it devolves upon us, under standing order No. A 150, to report upon the matter.

sect. 138 of the London Building Act, 1894, provides that "the Council may at any time by order cause such fixed salary as they may determine to be payable to the district surveyors by way of remuneration instead of fees, so that the amount of such remuneration be not less than the amount of the average of the fees for the last seven completed years." The Council have accordingly determined that the fees which would have been payable to such district surveyors in pursuance of this Act shall be paid to the Council, and carried to the credit of the county fund.

The return submitted by the Building Act Committee of the fees received during the seven years ended 1904 shows that the average annual receipts of district surveyors from fees amounted to 50,748*s.* 6*s.* 6*d.*, with the exception of one year, there was a continuous increase in the fees received, and that in 1904 they amounted to 52,331*s.* 15*s.* 6*d.*

It would therefore appear that, in the event of the Council deciding to exercise the powers conferred by the section, the salaries to be paid to the district surveyors would average the figures for the year 1905 shall be found to follow the upward tendency of recent years, result in a balance in favour of the Council of upwards of 2,000*s.* a year.

The proposal of the Building Act Committee, however, is not limited to the substitution of salaries for fees on the basis above referred to. The more important part of their proposal is to institute a model scheme to be brought into operation gradually as circumstances permit, under which the Council instead of paying salaries covering all the expenses of the district surveyors for assistance, office accommodation, etc., should pay to the district surveyors the salaries of the salaries of any necessary assistants, the cost of offices, etc. The committee state that owing to the fact that there are now several vacant districts, and that others are likely to occur in the near future, the present time is opportune for the Council to make any such change of system as is proposed.

The Building Act Committee state that, in the event of the model scheme being adopted, the total annual cost of the service would ultimately be reduced to about 40,245*s.*, and that there would thus be an increased margin to be set aside for the payment of a surcharge on fees, etc. The model scheme provides for the division of London into thirty-three districts instead of fifty-seven, as at present, and it is indicated that the salaries of the district surveyors would be 1,000*s.*, 800*s.*, or 500*s.* a year, in accordance with the importance of the district. It is proposed that in all but two of the sixteen districts where the salary is to be 1,000*s.* there shall be one or two professional assistants, and, in one case, three assistants, at a uniform salary of 200*s.* each. In the other two districts and also in the eleven districts at 800*s.*, and the six districts at 500*s.*, no assistant is proposed. Every surveyor is to be provided with a boy clerk at the rate of pay of 15*s.*, rising to 25*s.* a week, and allowances for office expenses are suggested at 150*s.* or 200*s.* a year, according to the district.

We do not find ourselves in a position to judge whether the suggested amount of professional and clerical assistance is sufficient, but having regard to the fact that it is proposed that the district surveyors shall collect the fees which will in future be receivable on behalf of the Council, it will be necessary for their accounts to be kept in such a manner as to be easily examined and audited by the Council. We have therefore considerable misgivings whether the provision for staff will be found to be adequate.

With regard to office expenses, we feel that so soon as district surveyors become the salaried officers of the Council there would be a tendency to regard many of the present offices as unsuitable, and to secure more expensive accommodation in prominent positions. We are, moreover, advised that, in the event of district surveyors being paid by salaries, the Council will probably have to provide them with more legal assistance than at present, and the cost of taking any necessary proceedings for recovery of fees would also fall upon the Council, the increase of expenditure for this additional legal work being estimated at 200*s.* to 300*s.* a year, for which no provision has been made in the above-mentioned estimate of 40,245*s.* We are informed by the Building Act Committee that of existing thirty-three offices comprised in the model scheme

would involve additional expenditure not included in the estimate of 500*s.* but this, of course, would only occur once, viz., on the establishment of new offices.

We are very doubtful whether the model scheme could be carried out except at a cost considerably in excess of the estimate of the Building Act Committee.

As regards the receipts, we are of opinion that the mere adoption of a salary system would remove some of the incentive at present existing to the discovery by district surveyors of cases under the Building Act in respect of which fees are payable, and would probably lead to a diminution in the total fees recovered; and we are by no means satisfied that, when all the available vacant land in the county shall have been built upon, the present upward tendency of the total fees received might not, in the normal course of events, be replaced by a downward tendency.

We have felt it our duty to urge, from a financial standpoint, the above misgivings as to the benefits to be anticipated from the adoption of the proposed scheme, but it rests with the Council to determine whether the scheme submitted is best calculated to secure the objects in view, and whether the risk which we anticipate in certain eventualities of a possible charge upon the rates from which, under the present system, the Council is secured.

The Building Act Committee now recommended—

(a) That as from and including April 1, 1906, all district surveyors be paid a fixed salary by way of remuneration instead of fees; that the amount of salary to be paid to each of the present district surveyors be equal to the amount of the average of the fees received in his district during the seven years ended December 31, 1905, as provided in sect. 138 of the London Building Act, 1894, and that the Building Act Committee do submit the necessary recommendations to give effect to this decision.

(b) That the model scheme submitted by the Building Act Committee for the ultimate reorganisation of district surveyors' districts and for the payment of district surveyors by salaries be adopted, and that with regard to the existing and all future vacancies the Building Act Committee do submit to the Council such recommendations for filling the vacancies as will be most in accord with the model scheme.

Captain Hemphill, Chairman of the Building Act Committee, in moving the adoption of the Report, said that it was true that the District Surveyors' Association were opposed to the scheme, but he did not think that the reasons they put forward should induce the Council to reject it. At present many district surveyors devoted much of their time to private work, and it was desirable that this time should be given to the public service. As to the suggestion that the scheme, if carried out, would not attract men of the highest capacity, the salary proposed would be from 500*s.* to 1,000*s.* clear of expense. The Council had long ago decided that it was undesirable for architects in practice to act as district surveyors, and all new district surveyors were forbidden to practice, and the salaries proposed under the scheme would compare favourably with those obtaining in other similar occupations. There were, of course, those who did not like the committee's proposals, but those proposals, if carried out, would be an improvement in the general condition of affairs. It was not a perfect scheme, but the Council had a definite opportunity of deciding that district surveyors should be paid by salaries instead of by fees, and that the districts of London would be remodelled and reconstituted in accordance with the requirements of to-day.

Mr. Goldsmith moved that the matter be referred back to the Building Act Committee. He said that the Report was carried only by the casting vote of the Chairman. The calculations of the Building Act Committee were quite misleading. Under the present arrangements the district surveyors paid for assistance and office expenses, etc., and there was no charge on the ratepayers in such matters, whereas under the proposed scheme assistants and office expenses would be no longer paid by the surveyors. Moreover, the surveyors would want better office accommodation under the Council. In seventeen districts it was proposed to give the district surveyors no assistance beyond a boy clerk, and how was it to be expected that the surveyors could carry out all their duties under the Act? It was impossible for the work to be carried out efficiently. How could one man look after an enormous district like Lewisham? A much larger staff would be wanted by the surveyors, and a larger staff would be required at the central offices. The scheme was based on the assumption that the fees would remain the same, but in the future it was probable that the amount of the fees would be reduced when the whole of the

land in the county was built upon; and it was possible, when the surveyor no longer worked for fees, that there would not be quite the same zeal in their collection, though he did not say that the surveyors would not carry out their professional work with zeal. Again, the position would be an absurd one if this scheme were carried. Under the last Act the surveyor could collect and retain fees; under the 1904 Act he would collect fees and hand them over to the Council; and under the Dangerous Structures Act the fees would be paid over to him by the Council, who would collect them.

Mr. Goodman seconded. As an old London contractor who knew district surveyors he felt sure that it would be impossible to carry out the scheme. If a surveyor had an enormous district to look after, and assistants had to be left to look after builders, and say how the Act was to be carried out, he wondered what sort of buildings would be put up in London. Surveyors under the proposed scheme would not feel the same responsibility as they do now. As to the collection of fees, he had known a surveyor wait for two and a half hours for the fees, which the builder had had to obtain from a solicitor who financed him. Would a surveyor under the proposed scheme be as zealous in the collection of the fees? In Islington there were 47,700 assessments, and if one surveyor was going to look after that number of buildings he did not know how it was going to be done. He felt sure that the cost to the Council would be considerable, and he hoped the scheme would not be agreed to, especially as the surveyors did their duties well, and any difficulties were occasioned by the assistants to the surveyors.

Mr. J. Lewis said he was opposed to the scheme, and he regarded it as a dangerous one. What was proposed was more drastic than appeared at first sight. It would undoubtedly involve an immense amount of cost, though in the first year that might not be the result. Under the present system there were some very excellent men, and the Council would not get these men to take up the work at a fixed salary. More than that, under the new scheme there was the danger of a system of patronage which might be put in the hands of these officers, and the Council did not want to repeat the maladministration of the Metropolitan Board of Works.

Mr. Phillimore said he thought the scheme ought to be carried out. The Council had set up the standard that, as far as possible, they should employ their officers direct, and pay them by salaries, and not by fees. The scheme would be found to be more economical than the present system. The advertisement canvasser to the Tramways Department was paid by salary, and not by commission, although that was the usual method of payment. It was said that the present system worked well; it worked fairly well, but that was because there was strict supervision, and in the past the system had not worked particularly well. The Council had really extraordinarily little control over surveyors and their assistants. It was said that it was doubtful whether the fees would be collected as well under the proposed scheme as they were now, but if the Council put that confidence in the surveyors which they thought they were entitled to put in them he believed that they would do their duty towards the Council in the matter. Even now the collection of fees was not very efficiently done, and he knew of a surveyor who had not troubled to collect all his fees. As to the anomalies mentioned by Mr. Goldsmith, it would be quite possible to pass an amending Act if surveyors would not voluntarily come into line. The reason for the increasing fees was that London was being built upon more and more, and as the view that fees would diminish in amount as soon as the remaining land of London was built upon, the rapid decay which went on was such that, even if the whole of London were built upon, in a very short time it would commence to be rebuilt.

Mr. Stuart Sankey said that sometimes, when small alterations were carried out on buildings, the surveyor's legal fees were greater than the cost of the work, but under the present arrangement those fees were rebated by the surveyor. If the proposed scheme were carried, would the Council

have the same power to rebate absurdly disproportionate fees as the surveyor had? At present for a little alteration costing 4l. the fees might be 40l.

Sir Melville Beachcroft said that the question of the status of the district surveyor and his fees had been under discussion for over thirty years, and surely the time had come when the whole question should be considered. The Council had the power of making a very drastic reform, and he hoped they would deal with the question not with the idea of making the surveyor a paid officer, but of deciding what those duties are. The position was peculiar, for the power of the surveyor was of a very arbitrary character. On the one hand, a settlement of the difficulty seemed to be that the work of the district surveyor should be carried out by the borough surveyor; but, on the other hand, it seemed desirable for him to be in an independent position. Would the proposed scheme result in greater efficiency and economy? As to economy, he was not at all convinced, and, as to efficiency, he had yet to learn what would be the actual effect on the district surveyor if they converted him into a salaried officer. The Council ought to have a report from the superintending architect as to whether this divided responsibility in regard to the supervision of building in London was good for London, and a report from surveyors also. By the proposed scheme the Council ran the risk of getting an inferior class of men and inferior supervision.

Mr. R. A. Robinson said that the question was a very difficult one, which wanted full consideration. In the provinces the work of the borough surveyor and the district surveyor was carried out by one authority. He was opposed to the proposed scheme.

Colonel Rotton said that the present arrangement was a fairly satisfactory one; would the proposed scheme prove equally satisfactory? He had his doubts. The staff of the Architects' Department would have to be largely increased if the scheme were carried.

Mr. Howell J. Williams said he was in favour of the payment of district surveyors by salaries as a consequential step to the alteration made in the status of the district surveyor some time ago. As the London County Council was responsible to London for the administration of the Acts, payment by salaries would make the district surveyors the real agents of the Council, as they should be. But no scheme should rob the surveyor of his independent authority so long as he properly administered the Acts. The objection to the present scheme was that it would set up another district surveyors' system, and result in a lot of duplicating and overlapping work at headquarters, and the tendency would be for the clerks at headquarters to interfere with and destroy the authority of the surveyor. For that reason he should vote against the scheme.

Mr. Davis said that if the scheme were carried it would be an evil day for London. If, as they had been told, a surveyor could neglect to collect his own fees at present, how much more likely was he to neglect to do so when the fees were for someone else? At the present time the responsibility of seeing that the law was carried out rested with the surveyor, but under the new scheme the superintending architect would have the responsibility. He hoped that the present arrangement would continue.

After further discussion, the amendment was carried, on a division, by fifty-five votes to forty-nine.

Sites for New Schools.—The following recommendations of the Education Committee were agreed to:—

(a) That the estimate of expenditure on capital account of 9,725l., submitted by the Finance Committee in respect of the acquisition of the sites named in the subjoined table, be approved.—
Table A.—Site for new school: Norwood, Craster-road. Table B.—Sites for J.M. school, schoolkeepers' houses, etc.—(a) Clapham, Home for Little Boys, King's-road (land at rear); (b) Fulham, Horwood-road (house for schoolkeeper); (c) Lambeth, N. Walnut-tree-walk (house for schoolkeeper); (d) Lewisham, Hither green (land for J.M. school); (e) Lewisham, Silkenes-road (house for schoolkeeper); (f) Newington, W. Beresford-street (house for schoolkeeper); (g) St. George-in-the-East, Gloucesters-street (house for schoolkeeper); (h) Southwark, W. West-square (house for schoolkeeper); (i) Stepney, Baker-street (house for schoolkeeper); (j) Stepney, Senabers-street (1. use for schoolkeeper); (k) Woolwich, Ansona-road (1. use for schoolkeeper).

(b) That expenditure on capital account not exceeding 9,725l., in respect of the acquisition of the sites named in resolution (a), be approved; (c) That the Education Committee be authorised to take all the necessary steps in connexion with the acquisition of the sites named in resolution (b); that the valuer and the surveyor do complete the purchases, and that the seal of the Council be affixed to the necessary documents when ready.

(d) That the estimate of expenditure on capital account of 8,550l., submitted by the Finance Committee in respect of the acquisition of the sites named in the subjoined table, be approved.—Deptford, Arden-road (site for new school); Kennington, N. Mary-place (site for school for mentally defective); St. Pancras, S. Manchester-street (site for laundry and house-keeping centres, etc.); Wandsworth, Fountain-road (additional land); Woolwich, Mulgrave-place (house for house-keeping centre).

(e) That expenditure on capital account not exceeding 8,550l., in respect of the acquisition of the sites named in resolution (d) be sanctioned.

Tramways.—The following recommendations of the Highways Committee were agreed to:—

(a) That the estimate of expenditure on capital account of 12,200l., submitted by the Finance Committee, in respect of the reconstruction (excluding miles) of the existing system of tramways in Goswell-road, between Cierkenwell-road and Upper Ashby-street, for the underground conduit system of electric traction, be approved; (b) That the capital estimate of 6,600l. approved on March 1, 1904, in respect of the reconstruction of tramways in Goswell-road, be cancelled.

Acetylene and Cinematograph Regulations.—The following recommendations of the Theatres and Music Halls Committee were agreed to:—

(a) That the unalterable alterations be made in the regulations made by the Council on January 28, 1902, with regard to the use of acetylene gas in theatres and premises licensed by the Council;—(1) That the following regulation be substituted for the present regulation No. 1: "(1) Under no circumstances will the production or use of highly compressed or liquefied acetylene in theatres and premises licensed by the Council be permitted." (2) That the following regulation be inserted as regulation No. 2, and that the necessary consequential alterations be made in the numbers of the remaining regulations: "(2) In the case of gas generated and stored, its pressure must not exceed that necessary for driving it through the burner. This pressure shall not be greater than 20 lb. in the generator or 5 lb. in the holder or service pipes." (3) That the words "or starting" be omitted from regulation No. 3 (old number).

(b) That the following words be substituted for the words "The use of acetylene gas will not be permitted" in No. 5 of the regulations made by the Council on October 16, 1900, with regard to the use of cinematograph lanterns, etc., in theatres and premises licensed by the Council: "The use of acetylene gas, other than 'dissolved acetylene,' will not be permitted. When 'dissolved acetylene' is used the conditions set out in order No. 6 of the Secretary of State, made under the Explosives Act, 1875, must be complied with, and the gas must not be allowed to come into contact with copper or copper alloys."

Fall of Parapets, etc., in Akerman-road, Brixton.—The Building Act Committee brought up the following report:—

"We have to report that on January 24, 1906, portions of the front parapets and cornices of Nos. 47 to 53, Akerman-road, Brixton, fell on the pavement below, with the result that one person was killed. The premises were subsequently inspected by the district surveyor, who condemned as dangerous other portions of the front wall, and statutory notices have accordingly been served. The parapets and cornices of the adjoining premises, Nos. 35 to 45, Akerman-road, which were also condemned as dangerous, have been taken down. In view of the fact that the matter is being considered by the coroner, we do not propose to make any observations thereon at present, but we are of opinion that the Council should be reminded that in most cases they are the results of faulty construction."

New Post-Office Building, Hanover-street, Peckham.—The Building Act Committee reported that in August, 1905, Mr. J. Wager, on behalf of His Majesty's Office of Works, forwarded for the information of the Council copies of the plans of a new sorting office on the north side of Hanover-street, Peckham. The plans, which showed a building having a one-story projection about 15 ft. in advance of the building line in the street, were not such as the committee could have recommended the Council to sanction had an application for permission been made by a private individual. By sect. 202 of the London Building Act, 1894, any building, structure, or work vested in, and in the occupation of, any Government department is exempted from so much of the provisions of the Act as relate to buildings and structures; but the committee reported that it had been decided to accede to the wishes of the Council in the matter, and to keep the new building back to the line of the adjoining cottages.

Inspection of Theatres.—The Theatres and Music Halls Committee brought up recommendations to the effect that, on and after April 1, the chief officer of the Fire Brigade should be responsible to the Council for the inspection of the electric lighting installations and heating and other mechanical arrangements of theatres and other places of public entertainment licensed by the Council, and that for the purpose an electrical and mechanical engineer, at a salary of 400l. a year, and an electrical engineer, at a salary of 200l. a year, be appointed in the brigade.

Mr. H. R. Taylor said this was an important matter, which members had had very little time to consider, and he asked that it might be held over until the next meeting.

Mr. Yates said he had no objection to that course being followed.

The report was accordingly adopted.

Tube Railway Dangers.—Mr. Lewin Sharp, the chairman of the Fire Brigade Committee, in reply to a question put by Mr. E. Smith, said the Fire Brigade were not called to an alarm of fire on the City and South London Railway. The Council had absolutely no control over tube railways; the Board of Trade had sole control, and consequently the committee had no report to present on the matter. The Board of Trade had, however, approached the Council, with the view to promoting certain regulations dealing with new tube railways. The committee had cooperated with the Board of Trade on the subject, and had formulated a model set of by-laws, and now all promoters of new tube railways would have to carry out those regulations.

Suggested London Improvements.—Captain Swinton asked the chairman of the Improvements Committee whether his committee had ever seriously considered the following schemes, which bear on the improvement of London:—(1) A suggestion which a private citizen had published and put before His Majesty's Board of Works that the entrance to Hyde Park at the Marble Arch should be remodelled, with the view of doing away with the constant congestion of traffic at that point? (2) The opening up of the Mall into the Strand through a narrow opening alongside of Drummond's Bank, which will have the result of causing a continuous stream of east and west traffic to be carried across the north and south traffic on a dangerous slope in the neck of the Whitehall bottle? (3) The proposal of the Traffic Commission that an elevated road should be constructed from Blackfriars Bridge nearly to the Holborn Viaduct, to carry the cross traffic over the junction of the Embankment and Queen Victoria-street, over Ludgate-circus, and so enable the South London tramways to be joined on to the North London tramways?

Mr. E. J. Horniman, in reply, said the Marble Arch matter had never been before the Improvements Committee, but when it was brought forward as a concrete scheme by somebody in authority the committee would consider it. The opening of the Mall on a dangerous slope had also not been before the committee, because no actual plans had been published as to how the Mall was to be taken into the Strand. He promised, however, to make inquiries as to whether the intention was only to have a very narrow entrance. With regard to the Blackfriars elevated road scheme, the Improvements Committee would, without fail, consider any suggestion that was brought forward by any person in more than a tentative form.

The Council then adjourned until February 13.

ARCHITECTS IN PARLIAMENT.—Mr. T. Ball Sibcock, of the firm of Messrs. Eacock & Reay, architects and surveyors, of Bath, was returned as member for Somerset (Wells). He is a director of Bath College, a governor of the Grammar School, a member of the Bath City Council, Chairman of the Housing Committee, Vice-Chairman of the Technical Education Committee, and a member of the Bath Education Committee. He has served as Mayor, member for Cleobury Morton (Sutherlandshire), member for Peterborough in 1889-95, and a Common Councillor of the City of London, is an architect and surveyor practising in London. Mr. John Tudor Walters (Sheffield, Brightside) is an architect and surveyor in that city, and formerly practised in Leicester, and has served as Mayor, Bath, K.C. (Taunton), is a Fellow of the Surveyors' Institution, and practised as an architect before he was called to the Bar twenty years ago.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

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

Lines of Frontages and Projections.

Lewisham.—Five shops on the south-east side of Staplehurst-road, two houses on the south-west side of Leahurst-road, and one house on the north-east side of Fernbrook-road, Lewisham (Mr. F. Roche).—Consent.

Bethnal-green, North-east.—One-story shops and a one-story addition at the rear of No. 379, Bethnal-green-road, Bethnal-green, to abut upon Teccdale-street (Mr. C. M. Shiner for Mr. W. A. Balls).—Consent.

Wandsworth.—That an order be issued to Mr. R. G. P. Gordon sanctioning the formation or laying out of two new streets for carriage traffic on the Durnsford park estate, Merton-road, Wandsworth, in continuation southward of Ravensbury-road and Acuba-street (for Mr. A. Wise).—Consent.

Dulwich.—That the application of Mr. A. Keen, for Miss J. Bechlin, for an extension of the period within which the erection of buildings with bay windows and one-story shops on a site abutting upon the west side of Peckham-rose and south side of East Dulwich-road, Camberwell, was required to be commenced and completed, be granted.—Consent.

Islington, North.—That, at the request of the Leicester-square Society, Limited, the Council do permit the retention of a showcase on the forecourt of No. 451, Holloway-road, Holloway.—Consent.

Hammersmith.—The retention of two two-story shops in front of Nos. 2 and 2A, The Grove, Hammersmith (Mr. L. V. Hunt for Mr. J. Bedford).—Refused.

Marylebone, West.—An iron and glass shelter in front of No. 20, Upper Hamilton-terrace, Marylebone (Mr. G. A. Sexton for Mr. J. Peters).—Consent.

Marylebone, West.—Retention of a projecting sign in front of No. 392, Oxford-street, Marylebone (Messrs. W. Castle, Limited).—Consent.

Norwood.—The retention of a conservatory at the flank and a summer house at the rear of No. 20, Wyndham-road Camberwell, abutting upon Elmwood-road (Mr. A. E. Percy).—Consent.

Strand.—Alterations to the iron and glass shelter at the entrance to the Empire Theatre, Leicester-square (Mr. F. T. Ventry).—Consent.

Watwich.—Bay windows to Nos. 34 and 40, Glenhouse-road, Eltham (Mr. J. J. Bassett for Mr. A. Cameron-Corbett).—Consent.

Westminster.—A projecting one-story shop in front of No. 131, Victoria-street, Westminster, and a projecting one-story shop at the rear to abut upon Ashley-place (Mr. W. Woodward).—Consent.

Lewisham.—A building on the northern side of Elmer-road, Catford (Mr. E. Wright for Mr. H. Amey).—Consent.

Rotherhithe.—The retention of two showcases in front of No. 233, Southwark Park-road, Rotherhithe (Mr. E. Hoad).—Consent.

Strand.—Retention of an iron and glass shelter at the entrance to Nos. 37 and 38, Savile-row, St. James (Messrs. H. Poole & Co.).—Consent.

Fulham.—A building at the rear of No. 431, North End-road, Fulham, to abut upon Eustace-road (Mr. T. J. Evans for Mr. A. Dell).—Refused.

Hampstead.—Buildings on the west side of Burgess-hill (late Belle Vue-crescent), Finchley-road, Hampstead (Messrs. Brown & Barrow for the trustees of the Burgess estate).—Refused.

Kennington.—A projecting one-story shop in front of Nos. 151 and 153, Upper Kennington-terrace, Kennington (Messrs. J. A. J. Woodward & Sons for the executors of the late George Broom).—Refused.

Kennington, North.—Bay windows and porches to twenty-six houses on the south side of Oxford-gardens, Kennington (Messrs. Traut, Brown, & Humphreys for Messrs. Daley & Franklin).—Refused.

Newington.—That the council do not accede to the application of Mr. H. Harris, on behalf of Mr. H. Samuel, for permission to retain a sign-board in front of No. 11, Walworth-road, Newington.—Refused.

Strand.—Projecting piers and oriel windows in front of Nos. 59, and 60, Pall Mall, Strand (Mr. E. G. Dawber for the London and Lancashire Fire Insurance Company).—Refused.

Wandsworth.—One-story shops in front of Nos. 170 to 182 (even numbers only) inclusive, Putney-bridge-road, Wandsworth (Mr. W. Barthelmev for Mrs. Bell and Mr. J. A. Graham).—Refused.

Hammersmith.—Projecting one-story shops in front of Nos. 338 and 340, King-street, Hammersmith (Mr. J. F. Ward for Mrs. Masterson).—Refused.

St. George, Hanover-square.—Enclosing of the portico in front of No. 21, Hill-street, Berkeley-

square (Messrs. Keeble, Limited, for Captain H. S. Clay).—Refused.

Width of Way.

City of London.—Buildings abutting upon Rod Lion-court, Fleet-street, City, with external walls at less than the prescribed distance from the centre of Rod Lion-court (Messrs. Griffin & Woodard for Mr. A. Rust).—Consent.

Southwark, West.—A building on the south-eastern side of Barron's-place, Southwark (Mr. A. E. Chasemore for Mr. W. Sumpton).—Refused.

Woolwich.—A one-story shop on the south-west side of Cross-street, Woolwich (Mr. W. C. Poole for Mr. J. T. Smith).—Refused.

Width of Way and Lines of Frontage.

Hammersmith.—A coal store on the western side of Illey-road, Hammersmith (Messrs. J. Dorey & Co., Limited, for the trustees of the Godolphin and Latymer Girls' school).—Consent.

Lewisham.—An addition and a wing at the "Hanover Arms" public house, No. 32, Wells-road, Sydenham, with external walls at less than the prescribed distance from the centre of the roadway of such street (Mr. A. J. Stylo for the Dartford Brewery Company, Limited).—Consent.

Wandsworth.—An addition to No. 90, St. Ann's-hill, Wandsworth, abutting upon the western side of Allarthring-lane (Mr. W. West for Mr. F. B. Turtle).—Refused.

Kensington, South.—Retention of an iron and glass covered way to the entrance to No. 3, Douro-place, Victoria-road, Kensington (Miss F. A. Lee).—Refused.

Width of Way and Space at Rear.

Greenwich.—Two buildings on the east side of Georgette-place, King George-street, Greenwich, with external walls at less than the prescribed distance from the centre of the roadway of Georgette-place, and with an irregular space at the rear of the northernmost of the two buildings (Mr. H. Adams).—Consent.

Lines of Frontage and Construction.

Hammersmith.—Retention of a building at the rear of a stable on the west side of No. 93, Goldhawk-road, Hammersmith, abutting upon the east side of The Grove (Mr. W. B. Eyre).—Consent.

Strand.—An iron and glass shelter in front of the hotel "Maison Jules," Jermyn-street, Strand (Mr. G. D. Martin).—Refused.

Formation of Streets.

Whitechapel.—That the application of Mr. R. Plunbe, for an extension of the period within which the widening and adaptation as a street for carriage traffic of the northern portion of Romford-street, Mile End Old Town, was required to be clearly defined throughout by posts and rails or so otherwise as the Council might permit, and thrown open to the public as a highway, be granted.—Consent.

Norwood.—That the Council accede to the request of Mr. J. Wilson, with regard to the formation of proposed streets on the Highview-park-estate, Canterbury-road, West Norwood, for permission to define the roadways of the proposed streets (where not already defined by the erection of buildings or by a cutting 4 ft. in depth) by posts 10 ft. apart and a trench 1 ft. in depth between, and in a line with, such posts.—Consent.

Space at Rear.

Kensington.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to No. 2, Charles-street, Kensington, with an irregular space at the rear, and with a portion of such building extending above the diagonal line (Mr. A. B. Rumball).—Consent.

Space at Rear and Alterations to Buildings.

St. George, Hanover-square.—A deviation from the plans approved for the erection of an addition at the rear of a building on the north side of Farm-street, St. George, Hanover-square, so far as relates to the substitution of a iron's mess-room on the first floor for the dwelling rooms shown on the approved plans and the construction of the flat roof of such mess-room of wood, covered externally with lead, in lieu of iron and concrete (Mr. J. W. Bradley for the Council of the City of Westminster).—Consent.

St. George, Hanover-square.—Additional rooms over the stables at the rear of No. 81, Eaton-square, St. George, Hanover-square (Messrs. G. Trollope & Sons for Mr. H. D. Brecklehurst).—Refused.

Buildings for the Supply of Electricity.

Fulham.—A deviation from the plans approved for the construction and erection of iron, brick, and concrete additions to the generating-station, Townmead-road, Fulham, so far as relates to the formation of an opening in the wall of the stove building, the removal of the brick partition in the boiler house (the ground floor over the opening formed being supported by steel beams) and an alteration in the steel construction of the roof of the stove building (Mr. A. J. Fuller for the Council

of the Metropolitan Borough of Fulham).—Consent.

Dwelling-houses on Low-lying Land.

Peckham.—A dwelling-house on low-lying land situated at Colmore-road, Peckham (Mr. S. Bryant).—Consent.

Woolwich.—A shop and dwelling-house, with stable and coachhouse at the rear, on low-lying land situated at the corner of Abbey-wood-road and Bostal-lane, Woolwich (Mr. Patterson).—Consent.

Southwark, West.—Two blocks of dwellings on low-lying land situated at the corner of Webber-street and Barron's-place, Southwark (Mr. W. Sumpton).—Consent.

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

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society, on Thursday, the 25th ult., Mr. A. Needham Wilson read a paper on "The Architecture of Southern France," Mr. H. S. Chorley in the chair. The lecturer said:—"I propose to deal with the influences which governed the production and development of architecture after the withdrawal of Roman domination in the south of France, and particularly Provence. A student visiting the south of France for the first time cannot fail to be struck by the examples of Romanesque architecture more than by anything else, and in Provence he will be bewildered by the impression that no intermediate styles seem to bridge the gap between the degenerate Romanesque and the late Gothic, or even the Renaissance. To deal with the subject as a whole would hardly come within the scope of a single paper, and, with your permission, I will deal in particular with the Romanesque in Provence. May I be pardoned if I dip briefly into history, but a rough outline is necessary on which to base the other aspects of the subject." The lecturer then dealt with the occupation of Provence by the Romans, the influence of the Franks, and the rapid advancement of learning and arts under Emperor Charlemagne, and the permanent state of civil war. "There remains the ecclesiastical aspect. I will not stay to dwell upon the part that Arles has played in the history of the church, on Constantine, or on the church councils; rather let me emphasise the noble part played by the church during the horrible centuries which preceded the Renaissance of the 11th century. Having now sketched the conditions and influences under which these isolated religious communities existed, we must glance at the architecture which they produced. As Viollet-le-Duc says:—"The fragments of architecture which remain to us of the VIth and VIIIth centuries are but pale reflections of the Roman art, often of debris thrown together haphazard by unskilful workmen executing masonry and brickwork with much difficulty."

In Provence, as well as in its vicinity, many buildings appear to incorporate Roman fragments—we are told that these are slavish copies, but it would be wrong to jump to too hasty a conclusion on the point. There are some typical examples, as the porches at Notre-Dame, at Avignon, and at Aix en Provence, which appear to bear the stamp of Roman work, and a little consideration will tell us that they are not slavish copies; but, coming nearer, we find a delicacy of execution which seems to indicate that they are either genuine Roman fragments or copies by craftsmen who were certainly not ignorant of traditional training; also the positions occupied by these fragments frequently indicate an incongruity of treatment quite incompatible with original work. One of the first problems which confronted the Provincials was the covering of their buildings. The country produced no suitable timber, but stone in plenty. The School of Provence contented itself with the simple pointed barrel-vault over narrow, low naves only, trusting to the massiveness of the wall to resist the thrust, or, where aisles were adopted, formed a kind of continuous flying buttress, and raising the walls over the arcades sufficiently to be pierced with windows." The lecture was illustrated by numerous sketches. Mr. Butler Wilson, in proposing a vote of thanks to the lecturer, said that he noted with pleasure the individuality of the architecture of Provence, and the way they had overcome the difficulties by purely local materials. Mr. A. E.

Kind seconded, and Messrs. Chorley and Hope supported the resolution, which was carried.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—At a meeting of the Sheffield Society of Architects and Surveyors which was held on the 25th ult. Mr. C. F. Innocent delivered a lecture on "English Renaissance Architecture, 1550 to 1700." Mr. W. J. Hale presided. The lecturer first explained the smaller local buildings of the period, and showed that they were still in their details Jacobean, with mullioned and transomed windows and label moulds and strings. It was only in a certain stiffness and formality in the arrangement of the parts that there was a difference from the work of the preceding period. Walkley Old Hall was an example of this. In remote districts, such as the Little Don Valley, Gothic details still lingered on, even until the early years of the XVIIIth century; and the porch of Mithope Church was an example of this. There was thus less than half a century in this district between the last of the Gothic work and the first building of the Gothic revival: the Ravenfield Church, designed in 1756 by John Carr, of York. During this period English garden design attained its greatest perfection under the influence of the great French garden designer, Le Notre, and the period was interesting as being that of the transition from the formal to the landscape school of gardening. The walled-in gardens and courtyards of Eyam and Derwent Halls were examples of the earlier idea; and the spacious garden at Sprotbro' Hall, which was built in the reign of Charles II., and was a fine example of the Restoration period. The great houses of the neighbourhood were naturally much purer in their style than the smaller, and Chatsworth House, designed by Talman, the rival of Wren, and the most important building erected in the neighbourhood during the period, was pure Renaissance, and exhibited no trace of Jacobean design. It was difficult to realise that Eyam Hall was only a few years earlier in date than Chatsworth, but such is the case. At the end of the XVIIIth century the people of Sheffield indulged in a new Town Hall. The accounts had been preserved by the Town Trustees, and the cost of the building appeared to have been about 500l. The hall stood at the church gates, across what now is the bottom of Church-street, and was pulled down a century ago. The doorway now preserved in Weston Park had been supposed, without any evidence, to have been the entrance of the hall. In this district during the period the use of timber-work for outer walls was given up, and in the south, where good building stone was not so plentiful, great advances in the use of brick-work were made under the influence of Sir Christopher Wren. The necessary rebuilding of London after the Great Fire of 1666 gave Wren his opportunity, and, in addition to St. Paul's Cathedral, halls of the City companies, and other buildings, Wren rebuilt fifty of the burnt churches. The lecturer concluded with a general description and analysis of these most interesting buildings, in which for the first time and with complete success the requirements of Protestant worship were met. The lecture was illustrated by lantern slides. At the conclusion, a hearty vote of thanks was accorded, on the proposition of Mr. E. M. Gibbs, seconded by Mr. J. B. Mitchell-Withers, and supported by Messrs. H. I. Paterson, J. W. Green, and the Chairman.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—On Friday, January 26, Professor J. D. Cormack, B.Sc., delivered the hon. member's lecture before this Institution, taking for his subject "Notes on Boiler Trials." After pointing out the objects and uses of such trials, he set forth the requisite balance-sheet, and indicated the measurements, etc., necessary, and the chief statements to be made, proceeding to deal with the methods of starting, stopping, and conducting. Observation sheets and analysis of flue gases followed, and special reference was made to the system of conducting trials recommended by the Committee of the Institution of Civil Engineers. As a supplement to the lecture, a visit was paid on the following afternoon to the engineering laboratories of University College, Gower-street, where Professor Cormack

demonstrated the methods of conducting a boiler trial, one being in progress at the time. All the various observations, measurements, and analyses necessary were shown. An interesting collection of calculating machines, etc., was exhibited by Professor Pearson, and Professor Fleming's electrical laboratory was also open to inspection. In the mechanical engineering laboratory the whole of the apparatus was on view and in operation. Although about one hundred visitors were present, the arrangements made by Professor Cormack were so admirably conceived and carried out that each member was enabled to see everything to great advantage. The thanks of the Institution to Professor Cormack for all that he had done to render the occasion so interesting were expressed by Mr. Geo. H. Hughes (member of Council).

WESTMINSTER CITY COUNCIL.

The usual fortnightly meeting of this Council was held on Thursday last week, at the City Hall, Charing Cross-road, W.C. **Trade Union Rate of Wages for Employees.**—The General Purposes Committee submitted a letter from the Lambeth Borough Council inviting the various borough councils to send delegates to a conference to be held at an early date at Lambeth Town Hall "with a view of framing and bringing into existence a uniform scale of trade union rate of wages and conditions for the employees in each department of the different borough councils." It was agreed to acknowledge receipt of the letter.

Subways at Charing Cross.—The Works Committee reported having had before them detailed plans of the subway for foot-passengers proposed to be constructed by the Baker-street and Waterloo Railway Company between the south side of Charing Cross, opposite the Phoenix Fire Office, and the company's station in Trafalgar-square. The Committee stated that the Council were to remove and reconstruct their underground public conveniences at Charing Cross to the west of their present site at the expense of the company. The plans were approved.

Street Improvements.—The Improvements Committee submitted a lengthy report dealing among other matters with the setting back of the building line in Horseferry-road (south side). It was agreed to purchase for a sum not exceeding 1l. per foot super, about 882 ft. of land, the property of the Ecclesiastical Commissioners, to provide for a widening of 45 ft. It was further agreed to ask the London County Council to contribute towards the cost.

The Committee also reported having received a letter from Mr. Mark H. Judges Hon. Secretary of the "Further Strand Improvement Committee," forwarding copy of a memorial to the London County Council advocating a revision of the planning of the Strand, so that the roadway might have its natural course from St. Mary-le-Strand Church to the Law Courts, and requesting that the Council and the individual members of the Council should join in the memorial. It was agreed that no action should be taken in the matter.

Correspondence.

APPOINTMENT OF DISTRICT SURVEYORS.

SIR,—Referring to the letter from "District Surveyor" in your last issue, there are some points in it that I should like to be allowed to reply to.

If "District Surveyor" will trouble to read my letter again he will find nothing to indicate that I suppose "light and air" is regulated by the Building Acts; on the contrary, I refer to the overlapping of Acts. There are many conditions which under the Building Act might be allowed to exist, and to which a district surveyor would have no right to object, but which the law relating to "light and air" and the Public Health Act could prevent; this position I consider to be an unsatisfactory condition of affairs and not as it should be. In my letter I was considering matters from the architect's point of view, and I submit that his position is the better one of the two, to allow an accurate opinion to be formed of the value of existing arrangements, than that of a district surveyor. An architect has to keep in view the requirements of his client as well as the Acts relating to building, light and air, public health, and the requirements of local authorities. The district surveyor has to attend only to the part relating to the Building Act, which is often of far less importance than is generally supposed, and in the same way the sanitary authorities have only to deal with the points governed by the Public Health Act, and so on. The architect may have six jobs in as many districts and finds that in each the officials have their own ideas as to how the various Acts should be interpreted, and it is quite pathetic at

times to view the mental gymnastics they go through to try and support their pet fads, and aware that these are architects and not architects, but there are also district surveyors and district surveyors. When writing I had in my mind that an "architect" would be a man of experience in his profession and not of the "house-agent" type. May I remind your correspondent that the architects existed before district surveyors, and it was the fact that a large and increasing number of buildings were being erected by builders and others without the aid of an architect that brought about such an undesirable state of affairs that it became necessary in the interests of the public at large that this condition should be altered—hence the appearance of district surveyors. If architects had in all cases been employed the reason for having district surveyors would never have arisen, and I consider the reasons apply now. There are many things about a building which, outside all artistic considerations, add to its improvement, about which neither the district surveyor or sanitary inspector has a voice, and it was not for the architect's work not to be done.

With regard to the "blessing" to the public of having "district surveyors" who "are competent and experienced architects," all I can say is that no architect who is worth his salt depends on the district surveyor or sanitary inspector for help, as there is an occasion for him to do so. He is in a much better position to know what is necessary than either of them; and I can only liken it to a physician inquiring of a chemist and dentist for their opinion as to the right treatment for a child suffering from the innards, as for the architect to be guided by the "blessings."

I am glad that "District Surveyor" admits the fact that "a very difficult Act has to be interpreted"; it is for that reason I advocate "a clear, simple, but thorough system" to take its place.

The system I suggested would not require the "poor unfortunate builder" to wait two months, as consent would be obtained before he would be invited to tender; there would be no reason for him to wait twenty-four minutes a ter signing a contract. Architects do not prepare their drawings after the work is started, so the supposed advantage of not having to wait more than twenty-four hours counts for nothing, to say nothing also about it being a very misleading line of argument. "District Surveyor" does not seem to recognise the amount of work that has to be done through by the architect before the matter comes under the notice of the district surveyor.

In Scotland it takes about ten days to settle all questions relating to the Building Act, sanitary requirements, and the rights of the adjoining owners; this can all be done while the quantity surveyor is at work. There a two-months' notice is not required for party wall matters, nor a month for party fence walls; light and air questions, as we understand them, do not exist, as there is not allowed to touch on his neighbours' rights. Having obtained consent, no power exists that can prevent the building being completed as approved. Think of that, ye architects in the first City of the world! and reflect upon the advantage it would be to you, to your clients, and to the appearance of London if such a state of affairs existed here; soon would London cease to be the place of mutilated conceptions. I have had a good many years' experience of this system and its workings in the "little towns" of Edinburgh, Glasgow, and other parts, and it leaves nothing to be desired.

It is the attitude taken up by "District Surveyor" and others of his way of thinking that accounts for the public being saddled with "a very difficult Act"; and I appeal to "District Surveyor"—if his mind is sufficiently open to admit that it may be possible (however remote) that places other than London exist where things may be managed better—to look into the question and become familiar with the subject.

I apologise for the length of this letter, but interest in my native city makes me anxious to see it sharing some of the improvements to be found in other parts. AN ARCHITECT.

Books.

Residential Flats of All Classes. By SYDNEY PERKS, F.R.I.B.A., author of "Party Structures," etc. London: B. T. Batsford, 1905.

While the illustrations (209 in number) are undoubtedly the principal feature of this book, the text also is distinctly interesting and useful. The author has taken pains to gather together a representative collection of plans and views of British and foreign residential flats, and has redrawn nearly all the plans which have been reproduced. The first chapter is "Mainly Historical," and forms an appropriate introduction to the work. It is followed by chapters on "The Plan," "Artisans' Dwellings," "Different Classes of Flats—Comparison of Plans," "Practical

Notes, "Foreign Flats," "Financial Matters," and "Agreements." The last chapter might have been termed with greater propriety "an appendix," as it is merely a reprint of eight forms of agreement "in use for well-known buildings in London."

The fourth chapter, on different classes of flats, is the most important, and contains upwards of eighty illustrations of large and small flats, nearly all of which have been built in London. The author's notes respecting the plans are very brief, and adverse criticisms have been carefully avoided, for the obvious reason that, with the exception of one design by the author, all the plans of modern English flats have been lent to the author by other architects. The author's views can, however, be indirectly ascertained from the favourable remarks which are made in certain cases, and more directly from the chapter on "The Plan." The information on "Financial Matters" is useful and to the point.

Surely the entrance to the kitchen in Fig. 84 is not "through the larder," as stated on page 110, but through a lobby adjoining the larder, and in Fig. 87 the pantry is shown without a window, although one of the walls is an external one. The plan of the flats in Sloane-square (Fig. 112) is lettered "Amos F. Faulkner, architect," and the view (Fig. 112A) is given as the work of Mr. Mountford, but nothing is said in the text as to this collaboration. These, however, are trifling details, and we have pleasure in congratulating the author on having produced an interesting and useful book on an important subject. The publisher has carried out his part of the work with equal success.

The Law of Compensation, with Appendices of Forms, Rules, and Orders, etc. By ALFRED A. HUDSON, Barrister, assisted by H. E. MILLAR, W. A. PECK, and S. HUMPHRIES, Barristers. Two Vols. (London: The *Estates Gazette* Office and Sweet & Maxwell, Ltd. 1906.)

THIS book, one of great size—the two volumes contain, without the index, 1,597 pages—is interesting and valuable from its design; for the authors have endeavoured to place their subject before the reader to a certain extent in the form of a digest with illustrative cases. While the work has unquestionably been well and accurately done, the subject scarcely lends itself to this form of treatment; still it is work in the right direction, and if not wholly successful in making the subject matter clear in places, no one can say that this new book on Compensation is not excellent. It may perhaps be useful to illustrate the character of the work. Under the Lands Clauses Act, 1845, on the subject of notice to treat we find the head—"When Notice to Treat is Unnecessary." This is followed by (a) "as to yearly tenants," as to whom a cross-reference is given, and then by (b) "No notice to treat need be given when the promoters of the undertaking and the owners of the interest in the lands have entered into an agreement to refer the question of compensation for determination by an arbitrator." This statement of the law is made clear by an illustration embodied in the case of Collins v. R. the South Staffordshire Railway, the facts of which are concisely stated in small type. Unquestionably, so far as cases are concerned, this illustrative method is more satisfactory than the usual practice of placing at the foot of a page a number of decisions as authorities in an unselected state. On the other hand, the difficulty of obtaining true legal dicta out of a mass of technical statutes is very difficult. But though, as we have said, the result of the courageous attempt is not altogether satisfactory, this arises not from want of knowledge or ability on the part of the authors but, from the inherent difficulty and intricacy of their subject.

Axel Herman Haig and His Work. By E. A. ARMSTRONG. (London: Fine Art Society, Ltd. 1905.)

TO SPEAK truth, the appearance of this work comes rather as a surprise to us, seeing that the popular artist himself is alive, his works still in request, and that they are not of a nature to require a learned critique for their exposition or appreciation. The Fine Art Society, we remember, organised, not so

long ago, a special exhibition of Mr. Haig's now well-known etchings, and the result of this exhibition has doubtless prompted the Society to issue a popular book on the etchings and the etcher.

As a biography Mr. Armstrong's book is not enthralling; for Mr. Haig's life has not been so full of incident, nor the artist himself so celebrated as to make it so; indeed, his training was just what any intelligent student of his work would suppose it to have been; but he has been widely appreciated, and to both dealer and collector he has so far proved to be a commercial success.

As an artist Mr. Haig is rather difficult to place. He can draw "mighty well," as Peypys would have said. His water-colours are agreeable, his pencil studies charming, his etchings interesting, and, at the same time, perplexing. Yet all his work lacks that "something" which, because indefinable, it seems nowadays almost affectation to allude to. As etchings, we confess to preferring (among the moderns) those of Whistler or of Mr. Brangwyn. Nevertheless, Mr. Haig produces—it cannot be denied—many admirable effects. He has a fine, if somewhat theatrical, sense of black and white and of composition; but we think that his aims would have been better expressed in mezzotint, and we are fortified in our opinion by observing how often his actual methods are those of the mezzotinter rather than of the etcher.

After all, Mr. Haig's reputation will probably rest on his skill as an architectural draughtsman, and this skill seems, to our mind, to be more charmingly displayed in his pencil drawings and studies than in either his water-colours or his widely-circulated etchings. Of the pencil drawings illustrated in Mr. Armstrong's book that of "Rheims Cathedral Under Repair" is the best. It is certainly finer and shows more concentration in black and white than does the pretty drawing of an old Hamburg street (reproduced opposite p. 38). Compared to either of these drawings however, that of Leon Cathedral (p. 137) appears excessively dull, hard, and lifeless, besides exhibiting, as do most of the Eastern studies, that worst of engraver's faults—a tiresome, unrestrained record of the pettiest detail, irrespective of its place and worth in the whole composition. The drawing of the Piazza San Marco, however, captivates us in spite of this defect, and is a good example of Mr. Haig's treatment of figures as a real part of his picture, and not as a finishing touch to an academic builder's drawing.

We have only to add that Mr. Armstrong's book is well printed, and that its descriptive list of engravings should prove useful to collectors of Mr. Haig's work.

The Writers' and Artists' Year Book: 1906. London: Adam & Charles Black.

THIS is a small kind of directory "for writers, artists, and photographers." Its chief value is in its list of magazines and periodicals, with brief indications of the nature of their contents, and (in some cases) of the kind of articles from outsiders which may have a chance of consideration. There are also lists of publishers (English and American), colour printers, and literary agents. The advice to would-be contributors, added in the case of several periodicals, "a preliminary letter is advisable," should have been added also in the case of the *Builder*. We do not accept any contributions without knowing something about the writers first, and correspondents have often given themselves unnecessary trouble by sending us articles, good in themselves, on subjects which had already been fully treated in our pages.

Dilapidations: a Text-book in Tabulated Form. By PROFESSOR BANISTER FLETCHER. Sixth Edition. Revised and largely rewritten by BANISTER F. FLETCHER, F.R.I.B.A., and H. PHILLIPS FLETCHER, F.R.I.B.A., Barrister. (London: B. T. Batsford, 1906.)

THE fact that this book has reached a sixth edition renders comment on its material or form unnecessary. It contains a great amount of information, accurately stated, in a very small compass. We suggest, however, that in the next edition an extract from an article in the *Saturday Review* (p. 67) might be left out. We have some doubt also whether it is desirable to include

in this book such parts of the Agricultural Holdings Act as apply to purely agricultural details.

Fifty Years Ago.

FROM THE *Builder* OF FEBRUARY 2, 1856.

ON THE PAST AND PRESENT CONDITION OF THE THAMES.

INSTITUTION OF CIVIL ENGINEERS.—At a meeting on January 22, Mr. Robert Stephenson, M.P., President, in the chair, the paper read was "On the Past and Present Condition of the River Thames," by Mr. H. Robinson.

Some of the principal statistical facts connected with the river having been enumerated, the numerous shoals now exposed at low tide, the mud-banks covered with putrefying matter and animalcules, the disgusting state of the water itself, the numerous crazy wood-propped wharfs, the numerous crazy still serving for steam-boat piers, were referred to, as justifying the opinion that, were it not for the noble bridges spanning it, the Thames, within the limits of the metropolis, would be a disgrace at home and a reproach abroad, and it was remarked that in no town in the world was there a noble river so neglected and deformed.

The various schemes for embanking the shores were then alluded to, and the partial good already effected was noted. Among the larger designs were those of Sir Christopher Wren, Mr. Martin, Messrs. Walker & Burgess, and others. The removal of the obstruction of Old London Bridge had seriously altered the condition of the river at or near low tide, not only by exposing shoals, which impeded the navigation, and, by leaving a very large surface of mud, giving off exhalations dangerous to health, but also by so quickening the current as to enable it to scour away the bottom near to the foundations of structures built in the channel, and thus seriously endangering several of the bridges and wharfs.

The various causes which had induced the present polluted condition of the Thames were described to be, first, the demand made upon it to serve as a town sewer as well as a land drain. This would, however, have been of little moment if London had been beyond the influence of the tide, so that the stream could have run always in the same downward direction; but, exposed as the river was to the ebb and flow of the tide, the impurities and sewage, which had been discharged into the ebbing tide, were again brought back by the flood. Nor was this all: in consequence of the low level of a considerable part of the London sewers, the sewage was necessarily stopped back for many hours, and egress could not be afforded until the water had fallen considerably; the consequence of this was, that it was only during a portion of the ebbing tide that the sewage was enabled to travel down the river, but it was returning upwards during the whole period of the flood tide, so that the impurities not only returned to the place whence they started, but were even carried higher up; and it was asserted that some of the putrefying matter, exhalating pestilential odours on the mud-banks in Westminster, was actually discharged from sewers at Bermondsey or Southwark.

Illustrations.

SEDILIA, SIENA CATHEDRAL.



THIS carved walnut screen upon the right side of the altar in Siena Cathedral dates from about 1670, and is used only by the officiating clergy during the ceremony of singing mass. The figures surmounting the upper portion are all represented as singing, with the central figure holding a chalice; the lower panels being filled in with carving representing various vestments and utensils used during this ceremony. The central coat of arms is, I believe, that of the Piccolomini.

The walnut has become a particularly rich colour with a fine polish. The central perforated carved panels are in rosewood.

An original sketch for these sedilia, very black and partly wanting, is still to be seen in the museum connected with the cathedral.

L. U. G.

WORKING MEN'S COLLEGE, CAMDEN TOWN.

These buildings have been erected to form a new home for the college, which has just celebrated its jubilee since its foundation, by Frederick Maurice, in Great Ormond-street, in 1854. The old premises, which are fine examples of Queen Anne work, and which, it is hoped, may be preserved as such, have passed to the Children's Hospital.

The new building has been designed of a very simple character, fitted to its purpose. It contains a great hall, common-rooms, club-

rooms, gymnasium, science schools (for simple teaching), classroom, museum, and library.

As an education on the literary side is a feature of the college teaching, special attention has been devoted to the library. This and the hall form the block seen on the right-hand side of the illustration.

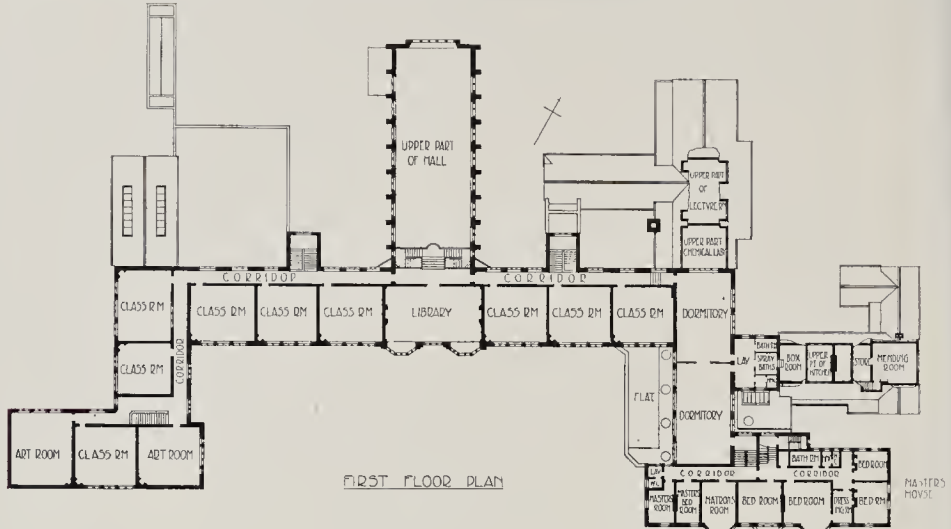
The general contractors were Messrs. W. Johnson & Co., of Wandsworth; for the heating, ventilation, and electric lighting, Messrs. Wippell Brothers & Row, of Exeter. Mr. W. D. Caroe is the architect.

Should there be any intention of demolishing

No. 44, Great Ormond-street, it would be most valuable that a record should be kept. It contains many features of beauty and interest. W. D. C.

GRAMMAR SCHOOL, LINCOLN.

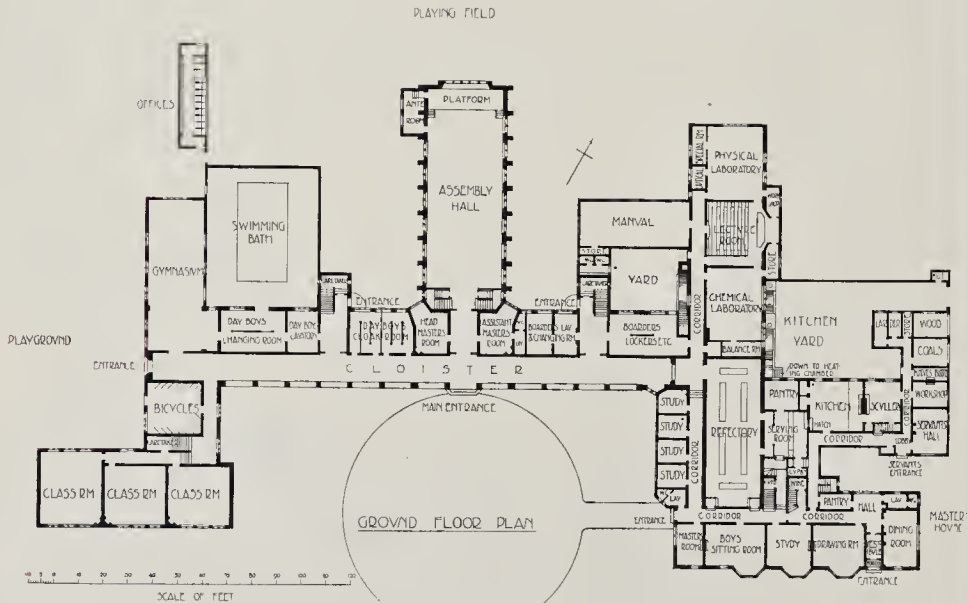
The new buildings for the Lincoln Grammar School, illustrated this week, are being erected on a large open site to the east of the cathedral, Mr. Charles Wright, of Leicester, being the contractor. Ancestre stone is being used in conjunction with some specially-made local facing bricks of a greys



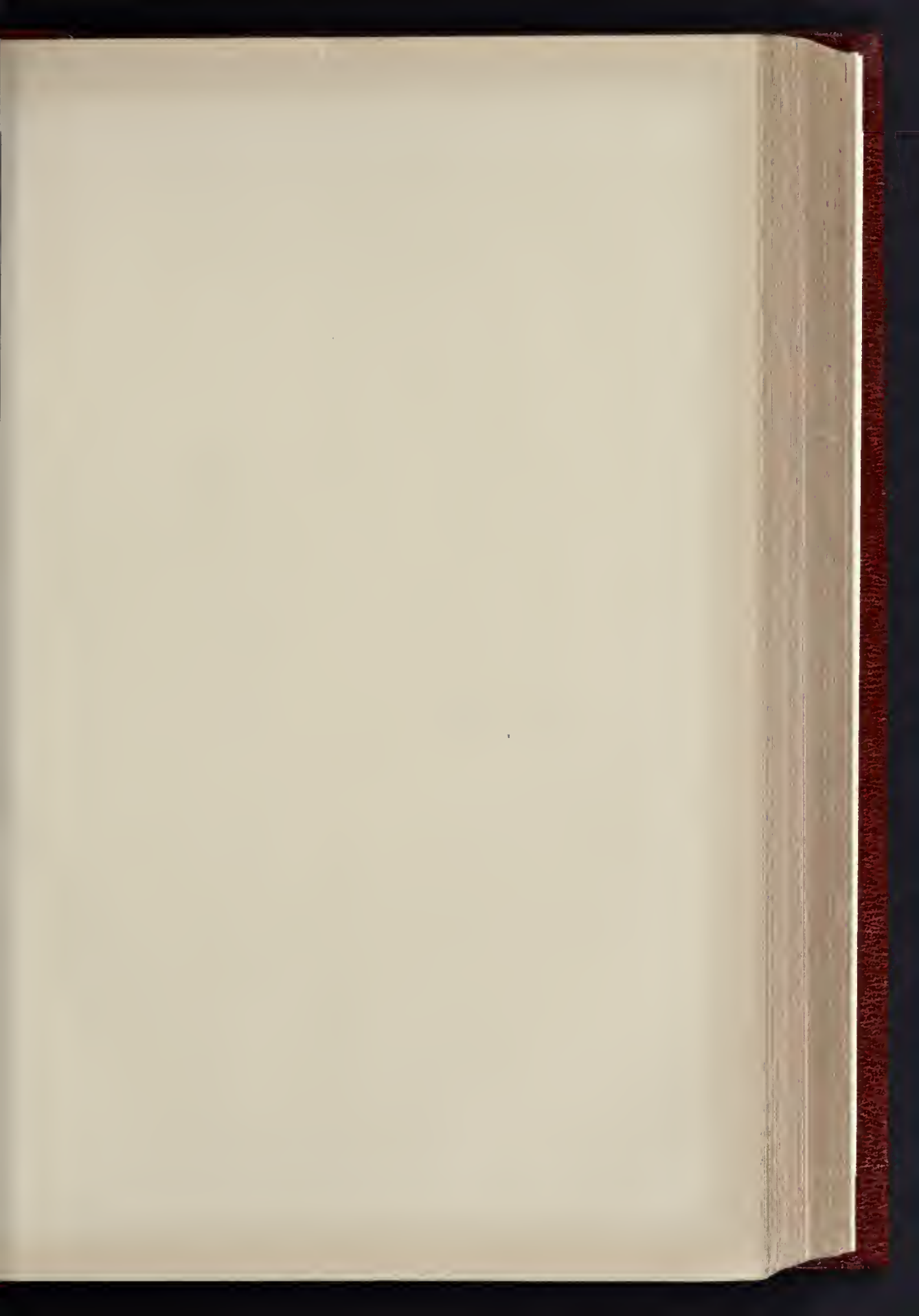
FIRST FLOOR PLAN

ACCOMMODATION ON SECOND FLOOR

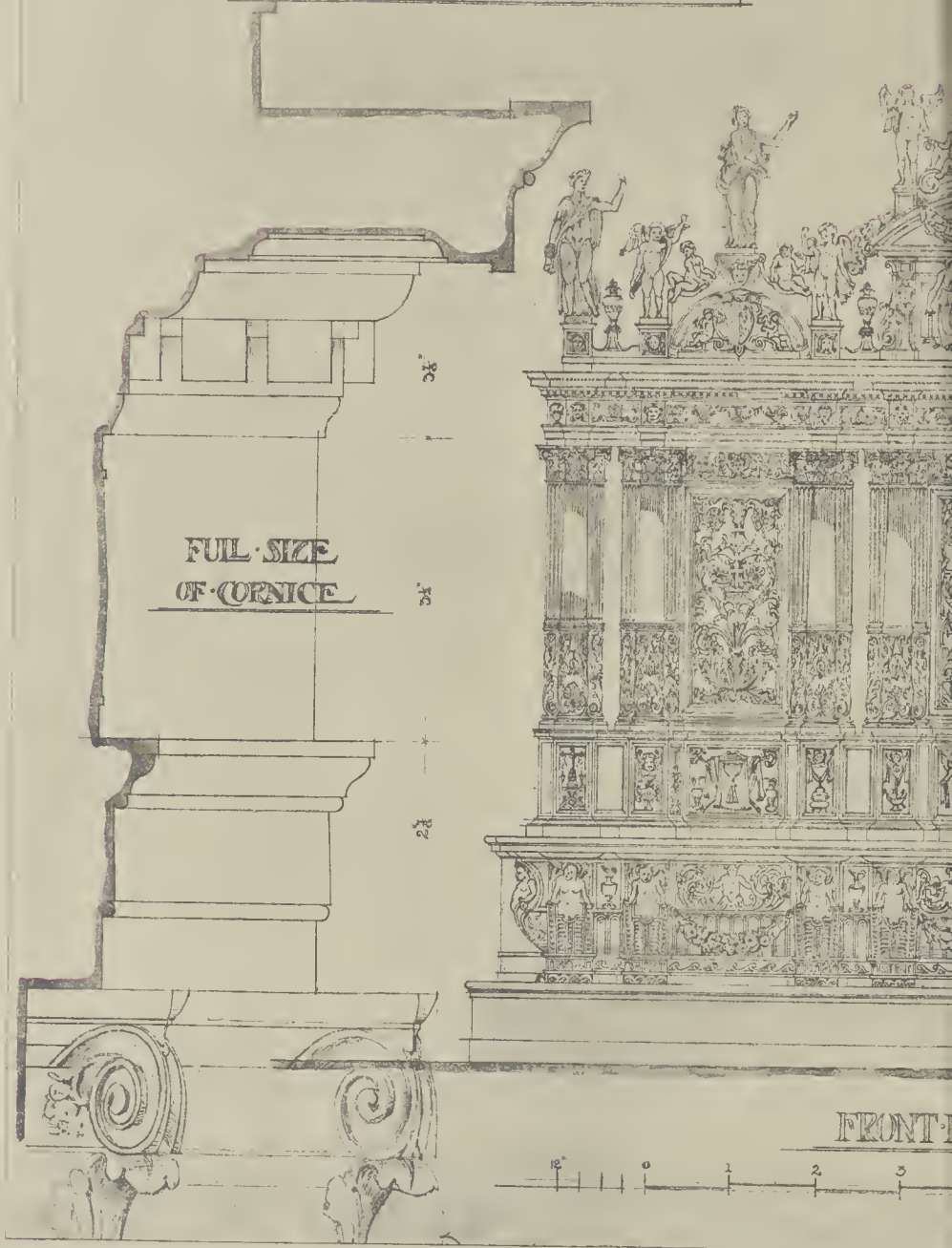
1 MASTERS BED ROOM, SIX ROOMS IN MASTERS HOUSE AND 6 ROOMS IN MASTERS HOUSE.

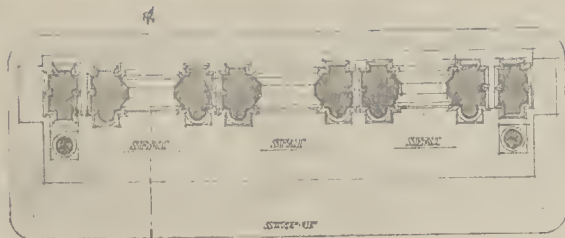


The Grammar School, Lincoln. Plans.

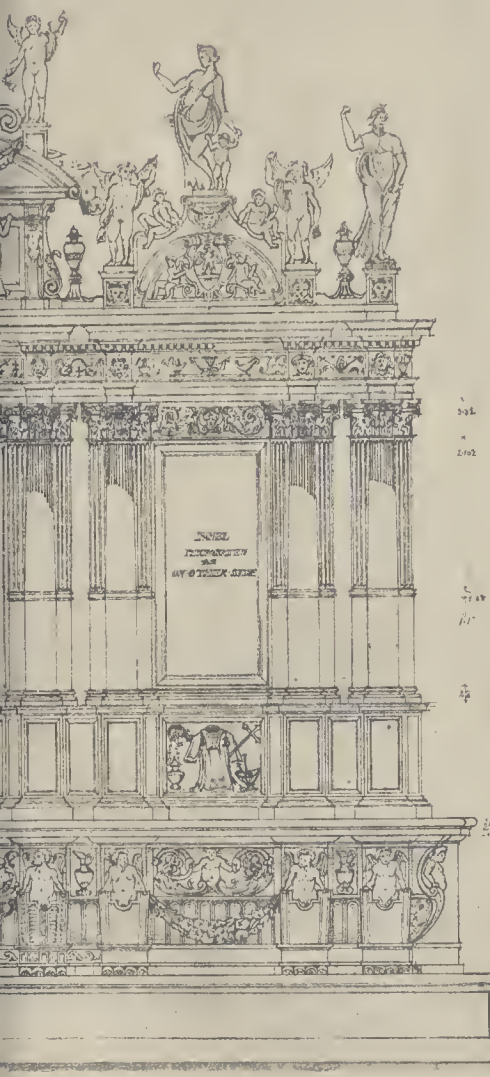


SEDLIA · FOR · CELEBRATION OF · THE · MESSA · GANATA · SIENA · CATHEDRAL





• PLEN •



7'9"

7'2"

3'2"

2'10"

6'3 1/2"

7'11"

11'

7'4"

3'2"

1'6 3/8"

11'

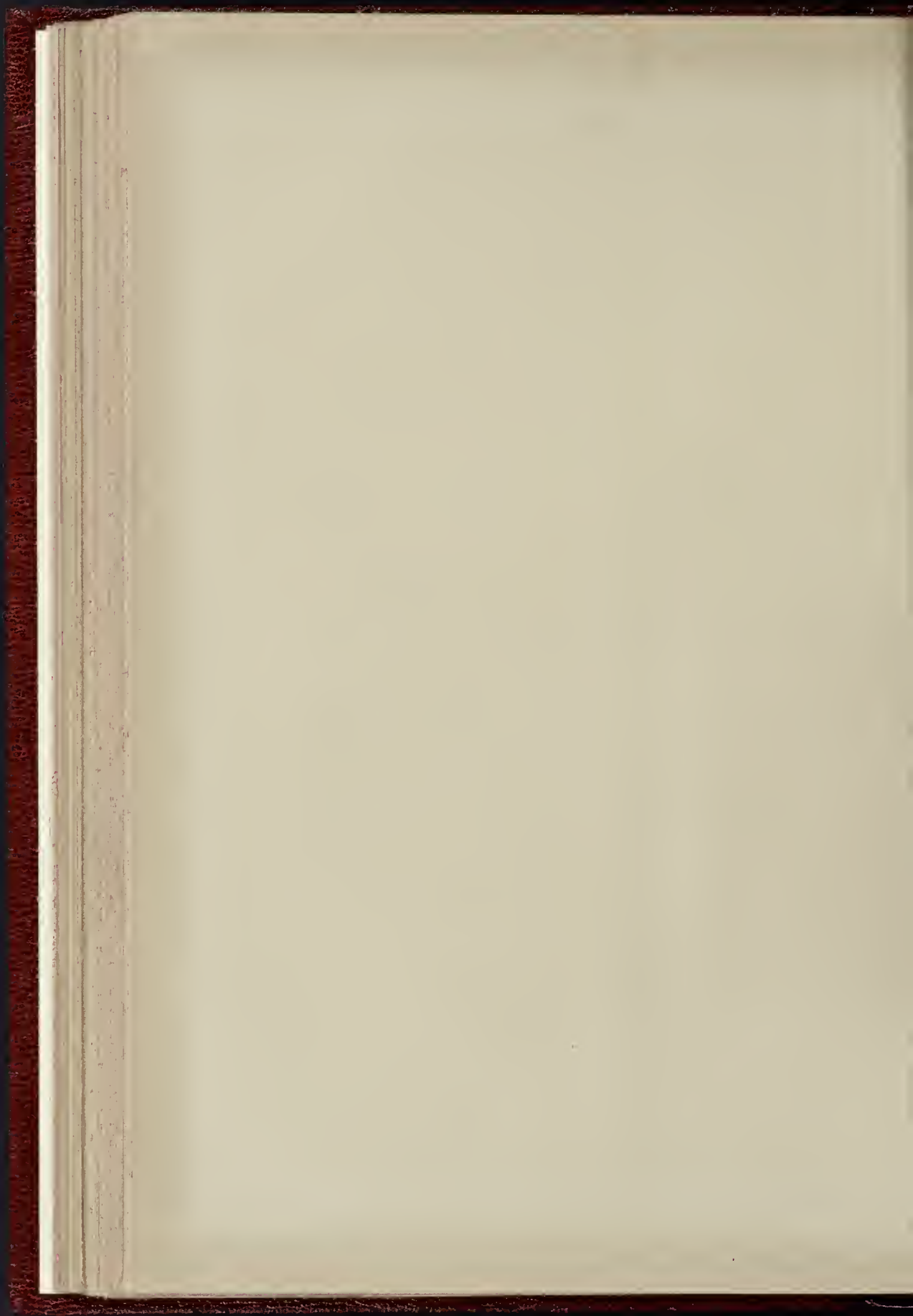


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SECTION · A ·

Loret-U. Grace 1904.



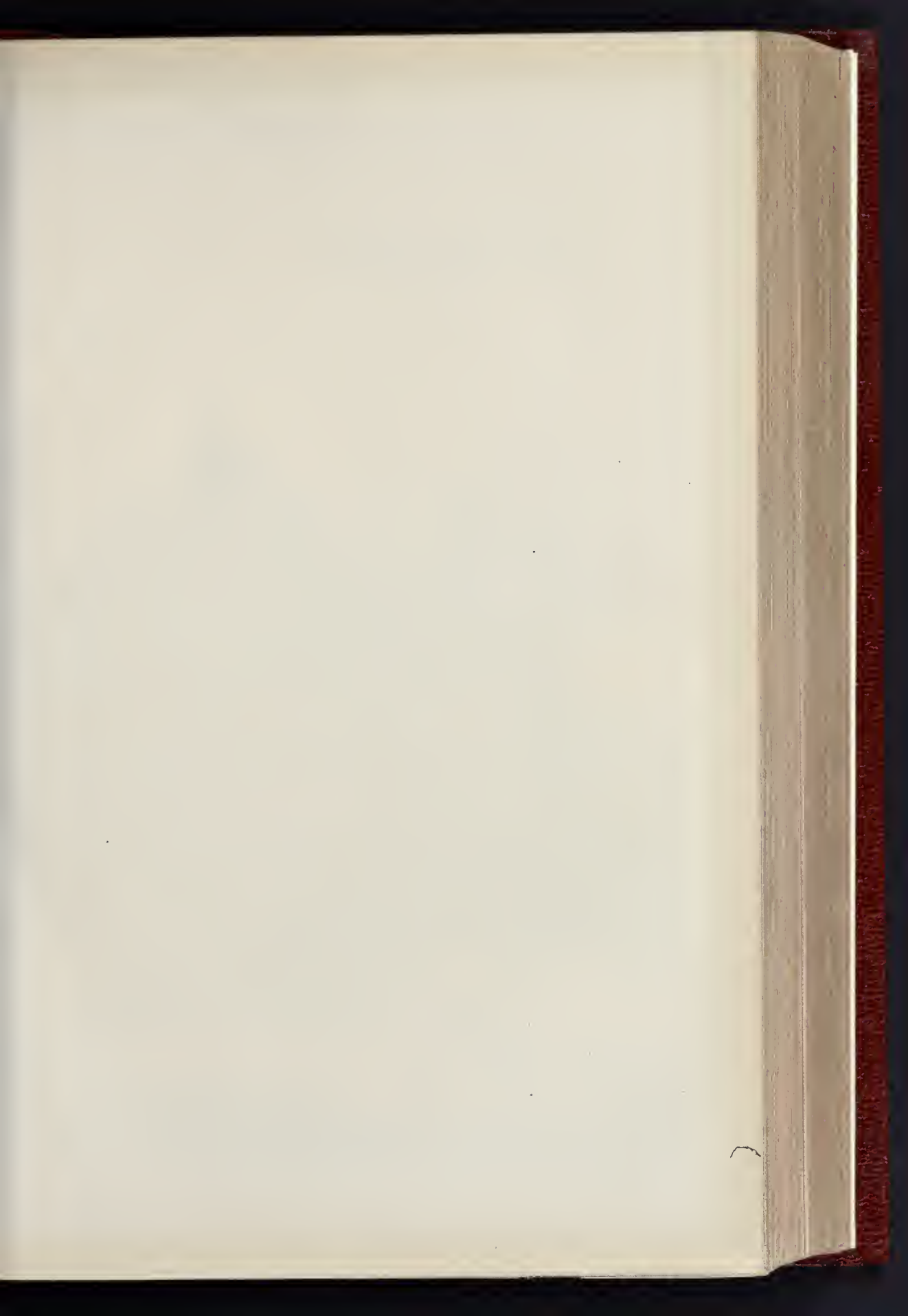




INK PHOTO. PRACHE & CO. LONDON & 5 EAST HARDING STREET FETTER LANE E.C.

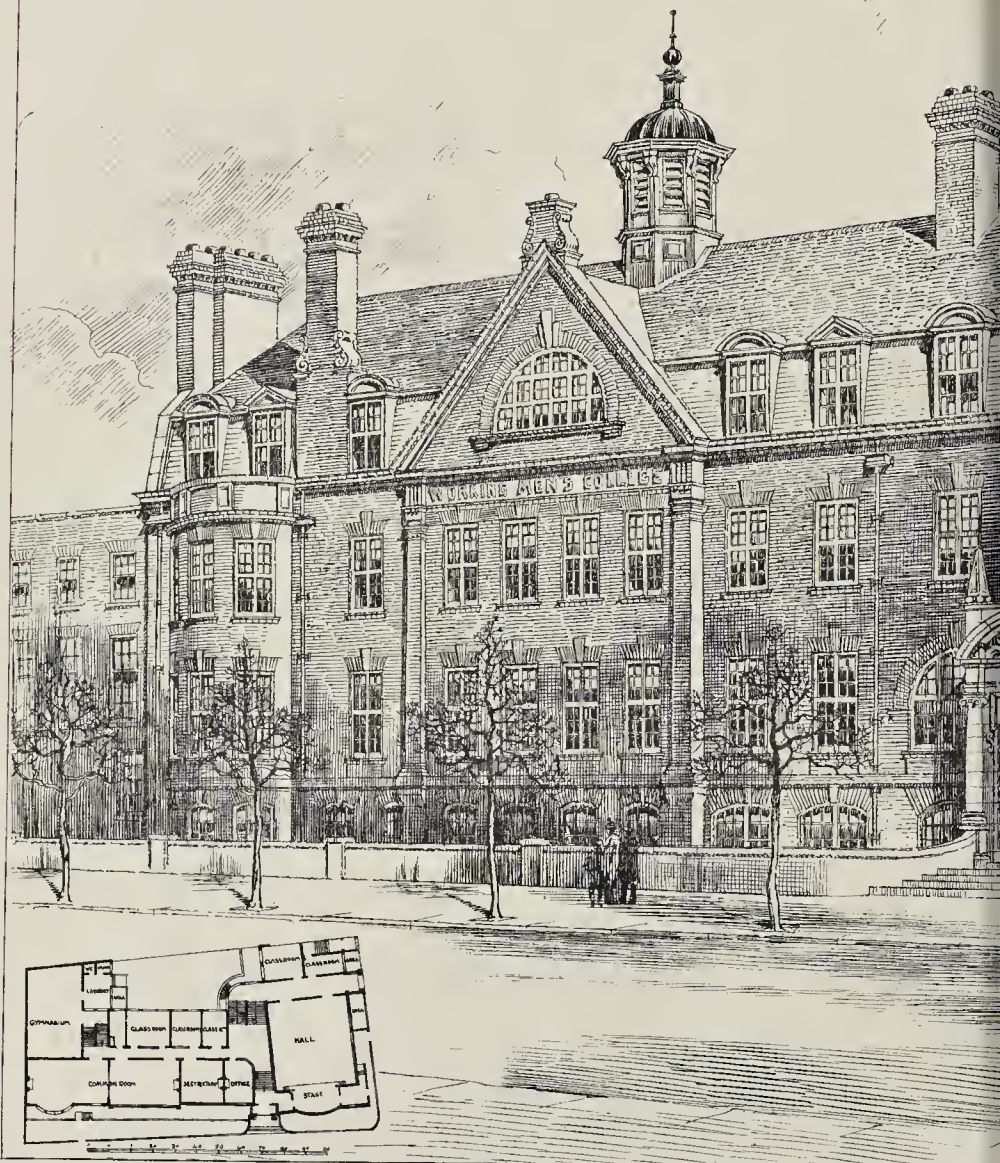
THE GRAMMAR SCHOOL, LINCOLN.—MR. LEONARD STOKES, F.R.I.B.A., ARCHITECT





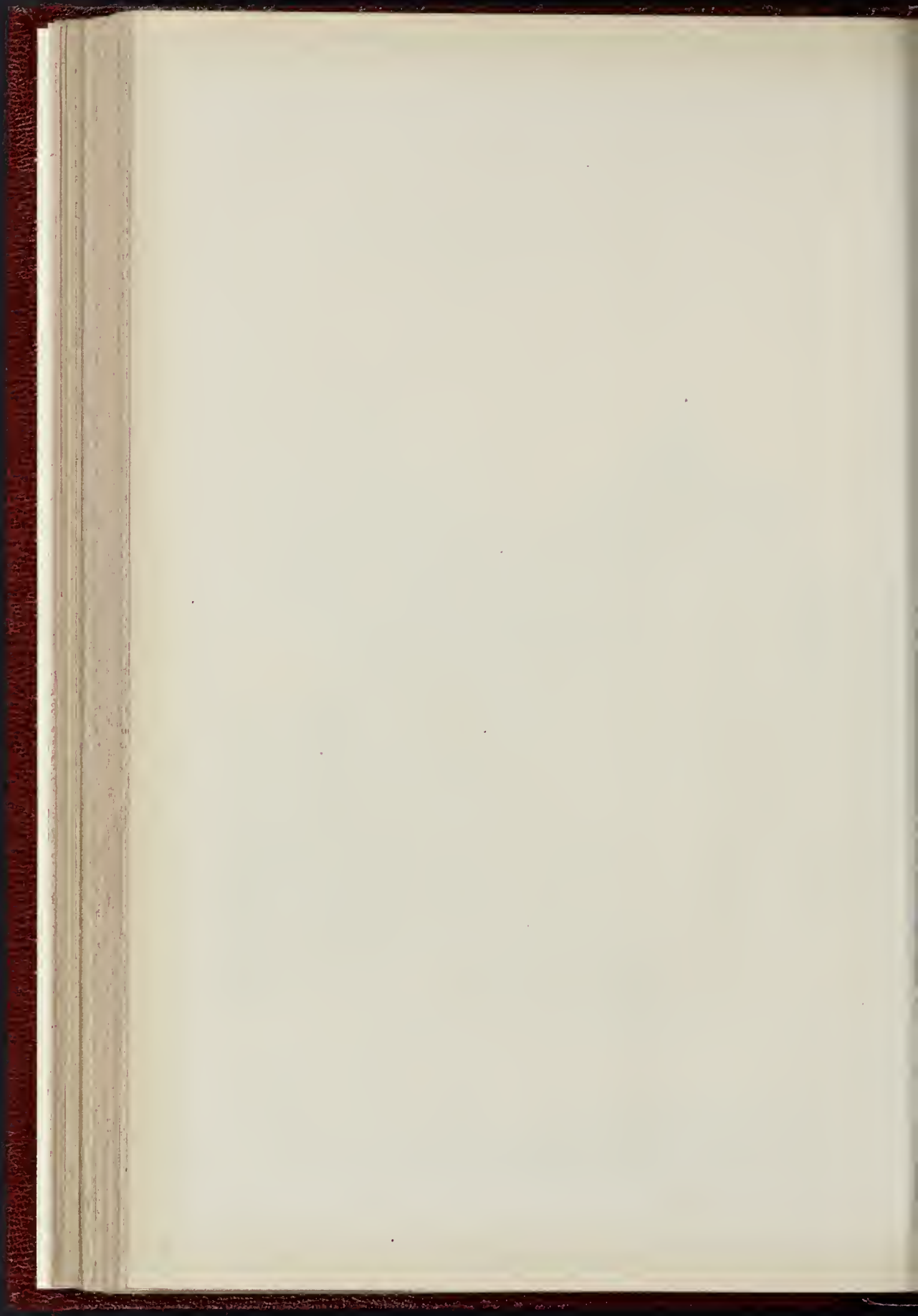
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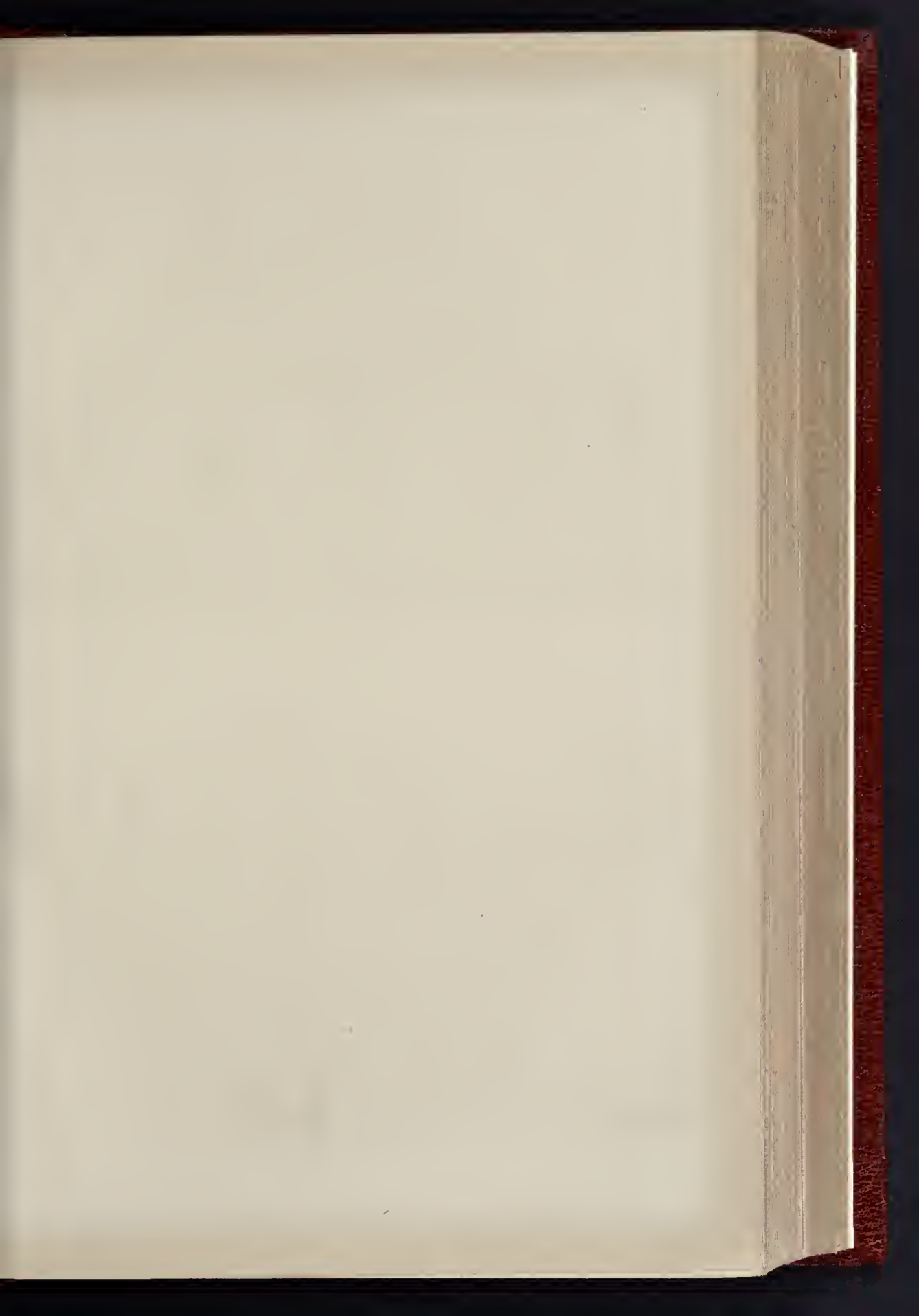
· CAMDEN TOWN ·

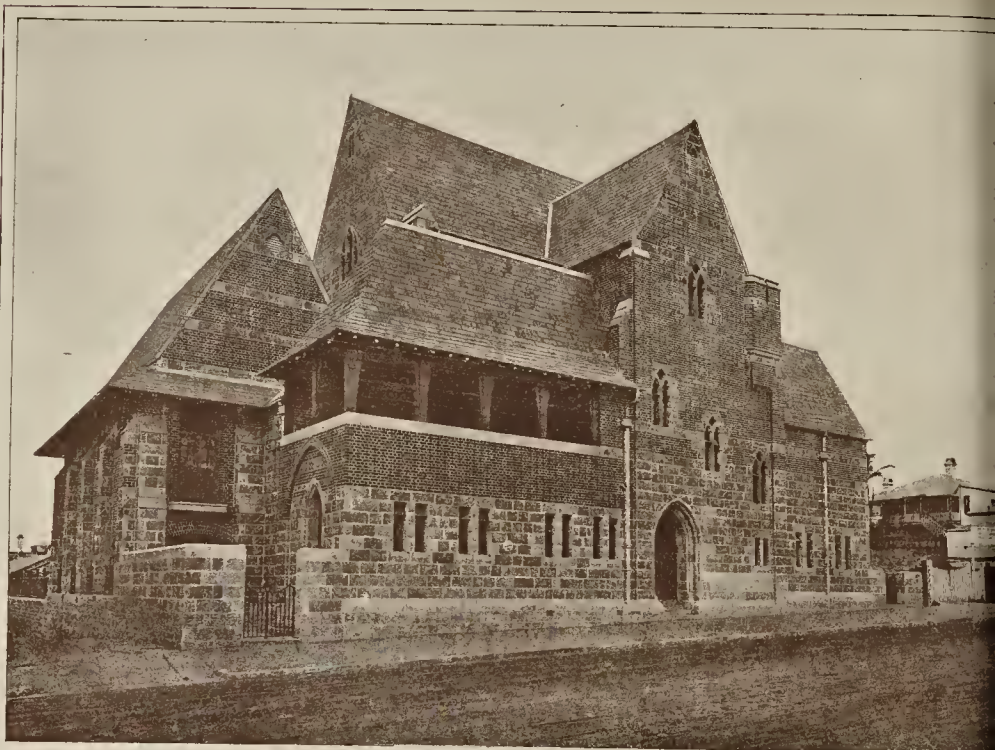




W.D. Fane
Architects
1904







ST. JOHN'S SCHOOLS.



HOUSE IN SUBURBS.



HOUSE IN SUBURBS.



"NEW FARM," MR. DODS'S HOUSE.

INK PHOTO SYRACUSE N.C. L. 4 B.S. EAST HARDING STREET FETTER LANE E.C.



our, with red brick dressings to the master's house instead of stone, the latter being used as dressings to the school house over only.

The illustration was exhibited in last year's Royal Academy. Mr. Leonard Stokes is the architect.

SCHOOL AND HOUSES, BRISBANE.

Of the buildings illustrated, the school is, I believe, built to a great extent from the materials of the old church, which has been pulled down to make way for the new cathedral, to be erected from the designs of the late Mr. Pearson. The three houses are examples of the type of suburban house of the neighbourhood. One of them appears on the drawing to be tiled or slated; the other two have iron roofs, which we understand are necessary in view of the tremendous hailstorms experienced there, where the hailstones are large and heavy enough to crack slates with their impact.

The architects are Messrs. Hall & Dods, Brisbane. Mr. Dods, the younger partner, is working in London offices for two or three years recently, and may be remembered by some of our readers.

COMPETITION.

BRANCH LIBRARY AT WEST GREENWICH.—The report of the assessor (Mr. A. W. S. Ross, M.A., F.R.I.B.A.) on the competitive designs sent in for the Branch Library at West Greenwich to be erected by the Borough Council was made known on Monday. The assessor stated that he had carefully weighed the merits and demerits of each design with regard (a) to its plan, (b) to its architecture, and (c) to its probable cost of construction. The first premium of 25*l.* was awarded to Messrs. Wills & Anderson, the second premium of 15*l.* was awarded to Mr. Henry Oldsmith (Manchester), and the third premium of 10*l.* went to Mr. Henry A.rouch. A design sent in by Mr. Albert L. Guy was placed next in order of merit. The designs will be placed on public exhibition in the lending library for a limited period. With the designs will be exhibited a critical report by Mr. Cross.

BOOKS RECEIVED.

THE CARE OF ANCIENT MONUMENTS. By Baldwin Brown, M.A. (Cambridge University Press.)

BURT'S RAILWAY RATES TIMBER TABLES. By E. A. P. Burt. (William Rider & Son, 6*d.*)

ARCHITECTURAL SKETCHING AND DRAWING IN PERSPECTIVE. By H. W. Roberts. B. T. Batsford, 7*s.* 6*d.*)

THE MODEL VILLAGE AND ITS COTTAGES: BURNVILLE. By W. Alexander Harvey. B. T. Batsford, 8*s.* 6*d.*)

DILAPIDATIONS. By Banister Fletcher. Sixth Edition. (B. T. Batsford, 6*s.* 6*d.*)

ELECTRIC POWER: WHAT IT IS, AND WHAT IT CAN DO. By A. W. Marshall. (Percival Marshall & Co. 3*d.*)

LAXTON'S BUILDERS' PRICE BOOK FOR 1906. Eighty-ninth Edition. (Stimpkin, Marshall, & Co. 4*s.*)

TRADE CATALOGUES.

The Titan Lift and Electric Company send us a pamphlet describing electric lifts worked on the Titan push-button system. As practically all forms of lift makers have now adopted this method of control, there is obviously nothing new in this particular example, except the details of construction. Before us, as these are not detailed in the pamphlet, it is impossible to pronounce any opinion upon their merits. We may mention, however, that the Titan lift is stated to be provided with all the latest and best safety devices, including automatic safety locks for landing and cage doors, a powerful brake on the motor shaft, and a special type of circuit breaker attached to the gear, which comes into operation if the descending cage is stopped by any hindrance, if the speed exceeds a certain limit, or if the cage passes the normal highest or lowest point. The illustrations in this pamphlet, being of popular character, are not of particular interest to technical readers.

The New Expanded Metal Company send us the fifth edition of their handbook of

practical tests and tables relating to the employment of expanded steel in concrete and plaster work and in fire-resisting and building construction generally. We have referred on many previous occasions to the distinctive qualities and varied uses of expanded metal, and for this reason it is not now necessary to discuss these points. The handbook contains 170 pages, with numerous drawings and photographic views illustrating the application of expanded metal in architectural and engineering practice. A noteworthy feature is the extended use that is evidently being made of the material as a constituent of concrete-steel, a purpose for which it is admirably adapted. Much of the matter in this edition has come before the notice of our readers in previous issues, but several newly-executed works are now described, and much additional information is given in the letterpress. One thing lacking is a more complete index, for the solitary page allotted to this detail does anything but justice to the comprehensive collection of useful information presented in the book, which ought to find a place in the office of every architect and engineer.

Messrs. Gittins (Birmingham and London) send us a small pamphlet of designs for gas and electric fittings, which we have pleasure in being able to praise unreservedly. They are in the best possible taste; there is none of the effort to be "ornamental" which we see in so many of such illustrated lists; they are all quite simple in line and detail, but the forms are graceful and well considered, and such as to be satisfactory to the eye of an artist. We may commend especially the electric light bowl fitting (E 101A); the electric light pendant in wrought brass (E 89); the outside lantern (G 112); the bronze gas pendant (G 131); the wrought brass bracket lamp for incandescent gas or acetylene (G 126); and the electric light lantern pendant (E 105). Judging from this booklet, those who wish to furnish their houses with electric light or gas fittings in good taste, without going to the expense of getting them specially designed, could not do better than select from Messrs. Gittins's stock.

The General Electric Company send us a small illustrated catalogue of their electric glow radiators for domestic heating. We have every sympathy with this method of warming rooms, which is almost an ideal one where expense is not a first consideration; not that the radiators here shown are expensive in themselves, as first cost, but the expense of keeping a house warmed by electricity is at present prohibitive except for the wealthier classes. But why do not the General Electric Company employ someone who is an artist in metal work to design radiators for them? They show one, for instance, described as "a very ornamental type" (No. 1,500), which we can assure them no artist would have in his house at a gift; it is the worst thing in the collection; and some others—1,280 and 1,292, for instance—are nearly as bad. Nos. 1,542, 1,545, and 1,553 are much better, and seem to have been designed by someone with a feeling for the treatment of metal work; it is a pity they do not all show these characteristics. The two in fire-proof wood (1,524, 1,530) are suitable and pleasing, at least there is nothing in them to offend the taste; but such a design as No. 1,500 is enough to frighten architects off at the first glance.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—IV.

Numerical Definitions.

HAVING dealt sufficiently with the general nature of numbers and systems of notation and numeration, we will now define and consider briefly the different kinds of numbers frequently occurring in arithmetic, and other numbers to which reference is made by mathematical writers.

For the convenience of students we deal with the present section of our subject in the form of an alphabetically arranged series of definitions, which will be available and suitable for subsequent reference.

After each of the definitions such illustrations and examples are given as appear necessary to

make clear the nature and use of the numbers included in the category.

Numerical Definitions.

Abstract number.—Any number whose properties are considered without application to or connexion with any concrete quality or thing. The same as *numerical number*, and the converse of an *applicate, concrete, or numerate number (q.v.)*.

Example: When used without qualification, as 1, 5, 7, 20, numbers are regarded as *abstract*.

Abundant number.—A number, the sum of whose aliquot parts is more than the number itself.

Example: 18 is an abundant number, as the sum of its aliquot parts (1 + 2 + 3 + 6 + 9) = 21.

Algebraic number.—A root of an algebraic equation having whole numbers as coefficients.

Example: 2 + $\sqrt{2}$ is a root of the equation $x^2 - 5x^2 + 6x - 2 = 0$.

The height of an *algebraic number* is its position in any arrangement of such numbers.

Aliquot part.—A number forming part of a larger number and capable of measuring it without remainder.

Example: 3 is an aliquot part of 24.

Alternate numbers.—(1) The even and odd numerals form two series of *alternate numbers*.

(2) The term is also applied to units such that the sign of the product of any two is changed if the order of the factors be reversed. These units are not really numbers, but algebraical symbols, sometimes called *Hankel's numbers*.

Example: $ab = -ba$.

Amicable numbers.—Any pair of numbers each one of which is equal to the sum of the aliquot parts of the other.

Example: The aliquot parts of 220 are: (1 + 2 + 4 + 5 + 10 + 11 + 20 + 22 + 44 + 55 + 110) = 284; and the aliquot parts of 284 are: (1 + 2 + 4 + 71 + 142) = 220.

Antilogarithm.—The *natural number* corresponding to any *logarithm* (see *artificial number*).

Applicate number.—A number applied or used with reference to some concrete quality or thing. The same as a *concrete* or a *numerate number (q.v.)* and the converse of an *abstract* or *numerical number (q.v.)*.

Example: 1 house, 5 tons, 7 yards, 20 inches.

Articulate number.—A power of ten or a number consisting of tens.

Examples: 10 (= 10¹), 40 (= 4 × 10), 100 (= 10², or 10 × 10).

An *article* is the number 10, or any number ending with 0.

Artificial number.—A number derived from the series of ordinary numbers. Among *artificial numbers* are *logarithms, Bernoullian numbers, diametral numbers, Euler's numbers, figurate numbers, etc. (q.v.)*

Bernoullian numbers.—A special series of numbers originated by Jacob Bernoullian. (Only used in abstract mathematics.)

Binary number.—One composed of two units.

Cardinal number.—Any one of the series 1, 2, 3 and upwards in contradistinction to 1st, 2nd, 3rd and upwards, the latter being *ordinal numbers (q.v.)*.

Cipher.—The symbol 0, denoting *ought quantity*, and occupying a neutral position between positive and negative reckoning. Having no value when standing alone the cipher increases or diminishes the *relative value* of other symbols according to its position. Thus each 0 placed after a whole number increases its value 10 times, or placed before the numbers in a decimal fraction decreases its value to one-tenth of the original value.

Circular number.—A number which occurs as the last figure in all powers of the number itself. The numbers 1, 5, 6, and numbers ending with these numerals are *circular numbers*.

Example: 6² = 36, 6³ = 216, 6⁴ = 1,296, 6⁵ = 7,776, 6⁶ = 46,656, and so on.

Coefficient.—(1) In algebra a number or other symbol representing a fixed quantity placed before and multiplying any quantity expressed by a letter or letters.

Example: 2a, 3 (b + c), 2xy.

(2) In physics, a numerical quantity constant for a given substance, and employed to measure any one of its properties.

Example: E = the coefficient of elasticity. (See definition, p. 43 ante.)

Complementary number, or Complement.—The difference between any number and 10 or the next higher power of 10 above the number.

Example: 2 is the complement of 8; 23 of 77; 450 of 550, and so on.

Composite number.—Any number that can

be exactly measured by a number exceeding unity.

Example: 12 is measured by 2, 3, 4, or 6.

Concrete number.—A number applied or used with reference to some concrete quality or thing. Same as an *applicate* and a *numerate* number (*q.v.*). The converse of an *abstract* or a *numerical* number.

Notes.—(1) It is important to remember that concrete numbers cannot be multiplied into each other. That is to say, six shillings cannot be multiplied by six shillings. This statement may appear to be contradicted by the fact that dimensions are multiplied one by another. Thus inches \times inches = square inches, and square inches \times inches = cubic inches. In reality, however, these processes do not constitute exceptions to the rule as the appellations are purely conventional and simply intended to express in a convenient way the product of two or three dimensions.

(2) A concrete number, however, can be divided by another concrete number, but the result is an abstract number.

Example: 120 lb. divided by 6 lb. = 20, not 20 lb., meaning that 6 lb. is contained twenty times in 120 lb.

(3) When a concrete number is divided by an abstract number the result is a concrete number.

Example: 72 ft. divided by 6 = 12 ft., meaning that 72 ft. has been divided into 6 parts, each consisting of 12 ft.

(4) A concrete number cannot be used as the divisor of an abstract number.

Congruent number.—A number is described as congruent to another number relatively to a third number called the *modulus*, when the first two numbers give the same remainder on division by the modulus.

Constant.—(1) A quantity known or assumed to be invariable; (2) a fixed numerical quantity denoting some physical property of any substance.

Decimal.—An expression used to denote a decimal fraction, or a part of unity whose denominator is a power of 10 however it may be written. Thus $\frac{1}{10}$ and 0.1 are decimals or decimal fractions.

Deficient number.—A number, the sum of whose aliquot parts is less than the number itself.

Example: 15 is a deficient number as the sum of its aliquot parts (1 + 3 + 5) = 9. (See also *abundant* number and *perfect* number.)

Denominator.—A number constituting the lower term of a vulgar fraction, and indicating the value of the fractional part of unity to be taken.

Diametral number.—(1) A number equal to $\frac{1}{2}(1 + \sqrt{2})^n + \frac{1}{2}(1 - \sqrt{2})^n$, where n is any integer or whole number.
(2) A number that can be resolved into two factors, the sum of whose squares is a square.

Example: 120 is such a number, of which 15 and 8 are factors, and $(15^2 + 8^2) = 17^2$.

Digi.—Any one of the nine numerals 1, 2, 3, 4, 5, 6, 7, 8, 9. Some writers include 0 among the digits, but this is wrong because the term — derived from the Latin word *digitus* (a finger)—means one of the single numbers which were formerly indicated by the fingers.

Dividend.—A number that is to be divided into parts.

Divisor.—A number by which another number is divided.

Euler's numbers.—The numbers E_2 , E_3 , and upwards, only used in abstract mathematics and occurring in the development of sec. x by Maclaurin's theorem.

Factor.—One of the numbers, in a mathematical expression, which when multiplied together make a given product, also an expression or quantity by which another expression or quantity may be divided without a remainder.

Examples: In the expression $(9 \times 5) = 45$, 9 and 5 are factors giving the product 45. In the expression $45 \div 9 = 5$, 9 is a factor by which 45 can be divided without a remainder.

Factorial 9, or 9!—The number which is the product of all the natural numbers up to 9 inclusive.

Example: $9! = (1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9) = 362,880$.

Feminine number.—An even number, as 2, 4, 6, 8, in contradistinction to a *masculine*, or an *odd* number.

Figure.—In arithmetic any one of the characters or symbols used to express numbers (see *cipher*, *digit*).

Figurate numbers.—A whole number belonging

to a series having unity for its first term, and for its first difference another series of figurate numbers or a constant number.

The nature of figurate numbers is explained by the following table:—

<i>Natural.</i> —	1, 2, 3, 4, 5, 6, 7, etc.
<i>Triangular.</i> —	$\left\{ \begin{array}{l} a. 1, 3, 6, 10, 15, 21, 28, \text{ etc.} \\ b. 1, 4, 10, 20, 35, 56, 84, \text{ etc.} \\ c. 1, 5, 15, 35, 70, 126, 210, \text{ etc.} \end{array} \right.$

Here the natural numbers in the top line are taken as the basis of each of the three series of figurate numbers, which are formed by successive additions, in series (a), of the natural numbers, and, in series (b) and (c), of the figurate numbers in the lines immediately above the series to be formed. Instead of using a series of natural numbers whose difference is 1, we may take any other series whose differences are 2, 3, 4, 5, and upwards, and from any such series we can form a series of figurate numbers. Figurate numbers of the first order are termed *polygonal* numbers, and the terms *triangular*, *square*, *pentagonal*, etc., are given according as the difference of the basis is 1, 2, 3, and upwards. Figurate numbers of the second order are termed *pyramidal* numbers, and are said to be *triagonally*, *quadragonally*, or *pentagonally* *pyramidal*, according to the difference of the basis.

Fractional number.—A part or a number of aliquot parts of unity, or of another quantity, as $\frac{1}{5}$ (of 1); $\frac{3}{5}$ (of 80).

Galilean number.—The quantity g or the acceleration of gravity. (For values of g see Art. II., p. 49.)

Gradual number.—The ordinal number of a term after the first term in a geometrical progression.

Haarlem's numbers.—The same as *alternate* numbers (*q.v.*).

Hendecagonal number.—A number of the form $\frac{n}{2}(9n - 7)$, where n is any integer. Among such numbers are 1, 11, 30, 58, and upwards.

Example: Where $n = 1$, we have $\frac{1}{2}(9 \times 1 - 7) = 1$; and where $n = 2$, we have $\frac{1}{2}(9 \times 2 - 7) = 11$.

Heptagonal number.—A number of the form of $1 + \frac{7}{2}n + \frac{7}{2}n^2$ where n is any integer. Among such numbers are 1, 7, 18, 34, and upwards.

Example: When $n = 0$ we have $(1 + 0 + 0) = 1$; where $n = 1$, we have $(1 + 3\frac{1}{2} + 3\frac{1}{2} \times 1) = 7$; and where $n = 2$, we have $(1 + 7 + 7 \times 2) = 18$.

Heterogeneous numbers.—Numbers having opposite signs.

Example: +3, -5, +1, +6, -7.

Heterogeneous number.—A number consisting of a whole number and a fraction.

Examples: $6\frac{1}{2}$, $14\frac{3}{4}$, $7\frac{5}{8}$, $15\frac{1}{6}$.

Homogeneous number.—A number consisting of a single figure or unit.

Icosahedral number.—A number of the form of $\frac{1}{2}(5n^2 - 5n + 2)$ where n is any integer. Among such numbers are 1, 12, 48, 142, and upwards.

Example: Where $n = 1$, we have $\frac{1}{2}(5 - 5 + 2) = 1$; and where $n = 2$, we have $\frac{1}{2}(20 - 10 + 2) = 12$.

Imperfect number.—A number, the sum of whose aliquot parts is a number either greater or less than the number itself. In one case it is termed an *abundant* number (*q.v.*), and in the other case a *defective* number (*q.v.*).

Incomposite number.—Another term for a prime number (*q.v.*).

Integer.—A whole number in contradistinction to a fraction or part of a number.

Integral part.—The integer or whole number in a mixed number.

Example: In the mixed numbers $69\frac{3}{8}$ and $54\frac{5}{6}$, 69 and 54 are integral parts or integers, and $\frac{3}{8}$ and $\frac{5}{6}$ are fractions, respectively.

Irrational number.—(1) A number whose root cannot be expressed in *rational* numbers, or by an ordinary fraction and can only be denoted approximately by the aid of a continued fraction or an indeterminate decimal fraction.

Example: $\sqrt{2} = 1.41421 +$

(2) A quantity that cannot be expressed in rational numbers.

Example: $\pi =$ the ratio of the circumference to the diameter of a circle = 3.14159 +; ρ or $\rho =$ ratio of the circumference to the radius of a circle = 6.2832 +.

Linear number.—A number relating to length, as, for example, a number representing one side of a plane figure. If the plane figure be a square the linear side is termed a *root*. (See definition, p. 24 ante.)

Logarithm.—An artificial number representing

the power to which a number (constant for each system of logarithms and called the *base* of the system) must be raised in order to produce the natural number, or *antilogarithm*.

Ludolphian number.—Another name for π , or the ratio of the circumference to the diameter of a circle; an irrational quantity, so called because its value was determined to 36 places of decimals by Ludolf van Ceulen. (For value of π see definition, p. 49 ante.)

Masculine number.—An odd number in contradistinction to a *feminine* or *even* number (*q.v.*).

Measure of a number.—A number which is exactly contained in another number two or more times.

Minuend.—The number from which another number is to be taken away in the process of subtraction.

Mixed number.—A number consisting of an integer or whole number and a fraction. The same as *heterogeneous* number (*q.v.*).

Modulus.—A positive number serving as a measure of a function or effect. In one sense the term is synonymous with *coefficient* (*q.v.*).

Multiple.—A number produced by the multiplication of another number by a whole number, as 40 is a multiple of 4, the latter being a *sub-multiple* or aliquot part of 40.

Multiplied.—A number which is to be multiplied by another number.

Multiplier.—A number by which another number is to be multiplied, also termed *multiplicator*.

Natural number.—One of the series of ordinary numbers commencing with 1, in contradistinction to *artificial* numbers (*q.v.*).

Number.—An arithmetical figure, character, or series of such figures denoting a quantity, magnitude, or measure.

Number.—One of the series of arithmetical figures used to express a number.

Numerate number.—The same as *abstract* number (*q.v.*).

Numerical number.—The same as *concrete* number (*q.v.*).

Numerator.—The number in the vulgar fraction indicating how many parts of unity or of another quantity are to be taken.

Example: In the fraction $\frac{5}{16}$, the figure 5 is the numerator, showing that five one-eighth parts of 1 are to be taken; in the expression $\frac{1}{16}$, the numerator shows that five one-eighth parts of 16 are to be taken.

Ordinal number.—Any one of the series 1st, 2nd, 3rd, and upwards, in contradistinction to 1, 2, 3 and upwards, the latter being *cardinal* numbers (*q.v.*).

Perfect number.—A number that is equal to the sum of all its aliquot parts. For example, 28 is a perfect number as the sum of its aliquot parts (1 + 2 + 4 + 7 + 14) = 28.

Prime number.—A number which only can be divided without remainder by itself and by unity.

When two or more numbers have no common measure greater than unity they are said to be prime to each other, although not prime numbers themselves. Thus the numbers 4, 49, 81 are prime to each other.

Product.—The number obtained by multiplying one quantity into another.

Proportional part.—Numbers representing parts of magnitudes such that the corresponding parts taken in their order are also proportional.

Quotient.—The number obtained as the result of division, or the number of times one number is contained in another.

Rational number.—A number whose root can be expressed as an ordinary fraction. The term *rational* is applied to expressions in which no extraction of a root is left, or none indicated that cannot be actually performed by known processes.

Reciprocal.—A number which is the quotient obtained by the division of unity by any number of which the quotient is said to be the *reciprocal*.

Example: The reciprocal of 5 is $\frac{1}{5}$, and conversely, the reciprocal of $\frac{1}{5}$ is 5.

Remainder.—(1) That part of a number which remains after the subtraction of another number.

(2) That part of a number which remains over after the division of one number by another.

Subtrahend.—The number to be taken from another number in the process of subtraction.

Square numbers.—Numbers which represent the squares of the natural numbers consecutively. These numbers are 1, 4, 9, 16, 25, and so on.

Surd.—The same as *irrational* number (*q.v.*).

Significant figures.—The succession of figures in the notation of a number. In a decimal fraction the ciphers coming after the decimal point are not considered, and the first digit after the first significant figure.

Example: In the number 123, the digit 1 is the first significant figure, and in the decimal fraction 0.0023, the digit 1 is the first significant figure.

Triangular numbers.—Numbers that begin in unity and increase by additions of the arithmetical numbers respectively, as 1, 3, 6, 10, 15, 21.

Unit.—(1) A single thing; the lowest whole number.

(2) A single group of things or numbers in plurality of similar groups.

OBITUARY.

MR. WENTWORTH-SHIELDS.—Mr. Francis Webb Wentworth-Shields, M.Inst.C.E., died at his residence at Sholing, near Southampton, on an illness, aged 85 years. He was born in Kilbeg, Co. Meath, and, after having served his articles to Charles Vignoles, went to Sydney and constructed the first railway in New South Wales, where he was appointed inspecting-Engineer to the Government. On returning to England, he was appointed resident engineer for the building of the Crystal Palace at Sydenham, and in 1860 he began to practise in Westminster as a consulting engineer. In the following year the Thames Embankment Commissioners gave their preference to a scheme propounded by Mr. Wentworth-Shields for a subway and culvert under Westminster Blackfriars with a sewer beneath the roadway. The main features of his project were ultimately adopted. In our issue of August 3, 1861, we published the text of the report with illustrations of his two alternative sections, and on January 6 last, p. 19 ante, we briefly described his share in the preliminary measures for that project. Mr. Wentworth-Shields was associated with Sir G. G. Scott in laying the foundations of the Albert Memorial, Kensington Gardens, and in other works; he drew up a report upon means of transit across the Straits of Dover, and prepared designs for a Channel bridge. He was employed upon several important sewerage schemes, including those at Itchen, and elsewhere in the vicinity of Southampton. He was the author of some professional books, one of them being a treatise upon "Strains in Ironwork."

MR. W. REID.—Mr. William Reid, architect and surveyor, Fraserburgh, has just died there from peritonitis. He was born forty-one years ago in Aiton, and his last public work at Fraserburgh, where he commenced business some seven years ago, was the Infectious Diseases Hospital for the burgh. Prior to setting up in Fraserburgh, Mr. Reid had been estate architect on Wharfedale, Forfarshire, and on Haddo, Aberdeenshire, and factor on Dunsinnane, Perthshire.

GENERAL BUILDING NEWS.

ROMAN CATHOLIC CHURCH, EDINBURGH.—Plans were passed in the Edinburgh Deacons' Guild Court on the 11th ult., on the application on behalf of Mr. John Murray for a church and presbytery at Falcon-avenue, Morningside. The church will be known as St. Peter's, Edinburgh, and will occupy a site of 140 ft. at the north-east corner of Falcon-avenue. Only part of the building is to be proceeded with at once, and it will accommodate a congregation of 300, but the completed building will seat about 700. The church, which is designed to be east and west, will be in the shape of a Latin cross, with shallow sanctuary and transept. The nave, measuring from the floor to its highest part 48 ft. and 32 ft. in breadth, will be flanked by narrow aisles which, with the narthex or vestibule, allow a freeway for processions round the church. The whole interior will be whitewashed. The outside will have a small bellry on its south side, and at the north-east a turret containing a stairway to the organ gallery in the north transept. The church will be entered from a courtyard on the south, from which a covered cloister will lead to the porch. There will be a second entrance at the north-east. The design was designed by Mr. R. S. Home, A.R.S.A.

CHURCH, NORWICH.—The new Church of St. Barnabas, North Heigham, was consecrated recently by the Lord Bishop of Norwich. The new church, which is designed to serve the eastern end of the thickly-populated parish of St. Bartholomew, stands in an angle between Russell-street and Dechan-road by either Mancroft-street or Old Palace-road and Devonshire-street. St. Barnabas church consists of nave, north and south aisles, and large chancel. A choir vestry and organ-chamber on the south side of the chancel will be added when funds permit. The architect is Mr. Arthur J. and Thomas Buswell. The general contractor is Mr. C. S. Tinkler, of Sandringham-road. The estimated cost of the building and its fittings is 5,536l.

CHURCH, SWANSEA.—The new Church of St. Michaels and All Angels, at Manselton, Swansea, was consecrated by the Bishop of St. David's on Wednesday last week. The nave of the church is 72 ft. long by 25 ft. wide; north aisle and south aisle each 72 ft. long by 20 ft. 6 in. wide; and chancel 36 ft. by 25 ft. The accommodation is for 700 people. There are also an organ chamber, clergy and choir vestries, and a room for parish meetings under the chancel, all approached by a stone staircase in a small turret. The nave and chancel roofs are barrel shaped. They are divided by moulded ribs carried on carved and decorated angels from the studio of Mr. William Clarke, of Llandaff. These angels are carved in teak wood taken from the old battle-ship *Exmouth*, the ship that Admiral Togo was in. The aisle roofs are also barrel shaped, and all the timbers are left clean from the plane. The east window of the chancel is a five-light, richly-traceried window, and so is that at the west end, and the gables of the aisles and the sides of the windows are four-light, traceried windows, all of a late character. The chancel has a tiled pavement, with seven steps leading to the altar. The material used in the building is local stone, with St. Aldhelm stone dressings to the doors and windows, and the wall facing is rubble work. The dossal and side hangings were designed by the architect (Mr. Bruce Vaughan). The portion of the church already completed has cost 5,000l., and the contractors were Messrs. Lloyd Bros., of Swansea.

NEW CHURCH, HARROGATE.—Plans have been prepared by Mr. Temple Moore, architect, of Westminster, for the erection of the Church of St. Wilfrid in Duchy-road. The building will be in the Early English style, providing accommodation for 400 persons. It is to consist of nave and two aisles, with north and south transepts and choir. The entire length will be 187 ft.; nave, 104 ft.; width of nave and aisles, 54 ft.; length of transepts, 112 ft.; length of choir, 80 ft., and width, 56 ft. The approximate cost, exclusive of tower and spire which will be erected later, is 24,000l.

GREAT GEORGE-STREET CONGREGATIONAL CHURCH, LIVERPOOL.—This church has been resited throughout with American oak seats and re-lighted, reheated, and decorated throughout. The organ, a large and fine instrument, has also been renovated and decorated. The work has been carried out by Messrs. S. R. Henshaw & Son, under the superintendence of the architect, Mr. J. Francis Doyle.

WELSH CHAPEL, BARRY DOCK.—The opening of Carmel New Welsh Wesleyan Chapel, Pyke-street, Barry Dock, took place recently. The new chapel is 55 ft. long by 21 ft. 6 in. wide, and contains seating accommodation for 270 worshippers. The main entrance is from Pyke-street. The building is of Northbridge stone, with Bath stone dressings, in the Gothic style, with open timber roof. The screens, with rostrum and seating, are in pitch-pine. The architect was Mr. George Thomas, of Cardiff and Barry; and the contractors Messrs. Lloyd & Tape, builders, Barry Dock. The new building cost 1,000l.

SCHOOL, DUNDEE.—A new school is to be erected by Dundee School Board from plans prepared by Mr. J. H. Langlands, architect.

The site, which was secured from the Parish Council, has a fall of 9 ft. towards the south, and this enables the architect to arrange for the workshops being located underneath the first-class flats, with entrances and lighting from the south. Accommodation will be provided for 1,110 pupils, and there will be eight classrooms for 45 pupils each, and 15 for 50 pupils each. The rooms for teaching cookery, laundry, and housewifery will be on the upper flat, while there will be necessary accommodation for cloakrooms, lavatories, and teachers' rooms on the respective floors and landings.

CATHOLIC SCHOOLS, SUNDERLAND.—On the 22nd ult. the pupil teachers' centre and secondary schools, erected upon a site of the convent schools in Green-street, Sunderland, were opened. The building has been erected from the plans of Messrs. W. & T. R. Milburn, architects, Sunderland, the contractor being Mr. W. B. Cooper, of Sunderland.

ST. HELEN'S SCHOOL, ABINGDON.—A year or two have passed since Princess Christian laid at Abingdon the foundation-stone of a new school, dedicated to St. Helen. In the interval the work of education has been carried on in a temporary home, while a school building has been raised, about a mile north of the central point of Abingdon, on the Shippon-road. The expense has been some 30,000l., and Mr. F. L. Pearson was the architect.

NEW SCHOOLS, DAWPOOL, CHESHIRE.—These schools, which were opened on the 27th ult., are built to accommodate 100 children, with a master's residence attached. There is a spacious entrance with hat and cloak room for boys and also girls and infants. The main schoolroom is 50 ft. by 22 ft. and 20 ft. high, classroom 20 ft. by 19 ft. and 16 ft. high. The building is faced with red brick and terra-cotta facings and red

tiled roofs, made by Edwards, Raebon. Messrs. John Thomas & Sons, of Oxtow, were the builders, and Mr. J. Francis Doyle, of Liverpool, the architect.

SCHOOL, SOUTH SHIELDS.—A new infants' school has been erected in Gilbert-street, South Shields. The premises provide accommodation for 450 or thereabouts. The school is designed in accordance with the building regulations for planning new public elementary schools as issued by the Board of Education. It consists of a central hall with seven classrooms, arranged round three sides of the hall, and separated therefrom by glazed partitions. The central hall is 71 ft. long, 26 ft. wide, and 19 ft. high. It is lighted by mullion windows along one side. There are four classrooms, each 23 ft. 6 in. square, and each allowing for sixty scholars and a superficial floor area of 9 ft. per child. There are two other classrooms each 27 ft. 10 in. by 19 ft. 6 in.; and another 21 ft. by 23 ft. Cloak rooms are provided in close proximity to the entrances, and included also is a teachers'-room, 15 ft. by 11 ft. 6 in. The floors of the central hall and classrooms have been laid with pitch-pine wood blocks. Internally, the walls have a cream-coloured glazed tile dado. The walls above the dado are distempered. The playground is finished with tar paving; and there is a covered play-shed with seats and drinking fountain. The sanitary fittings were supplied by Messrs. Adams, Ltd. The buildings are heated and ventilated on the Plenum system, and are of brick with red brick facings and stone dressings. The contract price of the building is 5,516l. 4s. 6d., and the heating and ventilating, carried out by Mr. Wm. Key, of Glasgow and London, has cost 581l. The school has been erected from the designs, and under the superintendence of Mr. J. Walter Hanson, architect, South Shields, by the contractors, Messrs. Glen & Moffet, of Jarrow. The sub-contractors were:—Plumbing, Messrs. J. Dagless & Sons; slating, Mr. Digby Nelson; plastering, Mr. T. Anderson; painting and glazing, Mr. Dixon; tiling, Messrs. Emley & Sons, Newcastle; block flooring, Messrs. Nichols & Co., London; furniture, Mr. J. D. Bennett, Glasgow. The electric lighting and the arrangements for the electrically-driven ventilating fan, have been carried out under the supervision of the Borough Electrical Engineer (Mr. Cawthra), by Mr. J. T. Dagless.

CHURCH SCHOOL, Huddersfield.—The cornerstone of new day and Sunday schools for the parish of St. Paul's, Huddersfield, was laid on the 27th ult. by Lady G. Ramsden. The building will provide accommodation for 300 scholars in the mixed department and 150 in that of the infants. Mr. W. Cooper is the architect of the work, the cost of which will be about 5,600l.

GRAMMAR SCHOOL, BRIDLINGTON.—The Bridlington Girls' High School was formally opened on the 29th ult. by Lord Wenlock, Chairman of the East Riding County Council. The building was formerly known as The Elms, and was owned by the Bridlington Corporation, but it has recently been acquired by governors, and remodelled and enlarged to suit the purposes of a school by Mr. J. Wilson, architect, of Hull. A school hall has been added, consisting of an assembly hall on the ground floor, while overhead there is a science lecture-room, store-room, and science laboratory. Attached to the school are grounds and gardens.

SCHOOL, BARROED.—Glamorgan County Council have erected a new boys' school at Barroed, built of Penarth stone, with Forest of Dean and brick dressings, the school has accommodation for 350 children, and in addition to a large marching hall, there are six classrooms, cloak-rooms, and two teachers' rooms. The area of the site is about three-quarters of an acre, and the cost of the work was 6,200l. Mr. John Lewis, Caerphilly, was the builder, and the architects were Messrs. Morgan & James, of Cardiff.

SCHOOLS, OAKLANDS-ROAD, HANWELL.—The Oaklands-road Council Schools, Hanwell, was opened on the 27th ult. The buildings have been erected on a site purchased by the late School Board, the department being arranged as follows: A two-story building for mixed classes and a separate building for infants, each department having a central hall and classrooms. The lavatories, teachers' rooms, storerooms, etc., being arranged on mezzanine floors. The schools afford accommodation for 1,143 scholars, viz.:—Senior mixed, 388; junior mixed, 388; and infants 367. Each department has duplicated entrances, cloak-rooms, and lavatories, and the senior mixed has two staircases. The buildings are heated by hot-water radiators and open ventilating fireplaces. The ventilation is that known as the "Natural" system, having fresh warm and cold air inlets, and the extraction of vitiated air is effected by ceiling ventilators and extract fans. All classrooms in the mixed block have stepped galleries and throughout the buildings the classrooms have left-hand lighting. The floors are fireproof, being constructed of steel girders and concrete, and are paved with wood blocks. Glazed brick dados are provided throughout, and all joinery and exposed timbers are stained and varnished. Covered playsheds are provided

in the playgrounds, as well as a house for the caretaker. Externally the walls are built with stock bricks from the Cowley district, and the roofs are covered with Welsh blue slates. The floors, which the caretaker's cottage is covered with Broseley tiles. The gable copings, sills, strings, cornices, etc., are executed in Stamford stone. The amount of the contract was 18,250*l.* The general contractor was Mr. F. G. Minter, of Putney, whose firm is the firm for the work. The whole of the works have been carried out under the superintendence of Mr. William Pywell, the architect, whose son, Mr. W. J. Pywell, acted as clerk of works.

HOTEL, SHEFFIELD.—Work has just been commenced on a new hotel in Leopold-street, Sheffield. The building will have sleeping accommodation for more than 200 guests. Messrs. Cannon & Chorley, of Leeds, are the architects for the work, the contractors being Messrs. Fidler, of Sheffield.

NEW BATHS, MANCHESTER.—Mr. H. P. Boulnois recently held an inquiry on behalf of the Local Government Board at the Town Hall, Manchester, into the application of the City Council for permission to borrow 39,715*l.* for the erection of public baths at Bradford and 19,144*l.* for the completion and equipment of the Victoria Baths in High-street. Mr. Hudson, the Deputy Town Clerk, said it was proposed to erect three swimming baths, 28 wash baths, and 40 washing stalls. The building would be erected with the best substantial ordinary materials, with plain brick elevation and terraced roof facing. Mr. H. Price, the City Architect, described the plans and stated that, as far as it was possible to ascertain, the estimate of 39,715*l.* would cover the whole of the expenditure and contingencies. The Commissioner next received evidence respecting the Victoria Baths. Mr. Price said there had been no alteration of importance in the plans of the buildings, but certain changes had been made in the materials used. It was proposed to build a laundry in connexion with baths, and his estimate of the cost was 2,100*l.* The City Surveyor, Mr. T. de Courcy Meado, also gave evidence.

FREE LIBRARY, LURGAN.—The free library which has been erected in Carnegie-street, Lurgan, was opened on the 8th ult. The structure has been erected by Mr. Wm. Callaghan, Marafin, from plans prepared by Mr. Henry Hobart, C.E., Drogheda. It is built with brick, and faced from the front with red brick, and Aspatia red sandstone dressings, the latter supplied by Mr. McCornick, Belfast. The building occupies 100 ft. frontage. On the first floor is a vestibule entrance leading to a hall, which communicates through swinging doors with a recreation-room, 25 ft. by 25 ft., and a reading-room, 25 ft. by 40 ft. Leading from the hall is a staircase in three flights, which is lighted with a cathedral glass window bearing the Lurgan town coat of arms. This window and the several stained-glass windows throughout were supplied by Messrs. Campbell Brothers, Belfast. On the top floor is the lending library, 25 ft. by 40 ft. A men's lavatory has been provided on the ground floor, and convenient to the lending library is a cloak-room and lavatory for ladies. The building is heated by a low-pressure hot water system, supplied by Messrs. John Long & Sons, Lurgan.

FREE LIBRARY, STAMFORD.—A new free library has been erected at Stamford, from designs prepared by Messrs. Hall & Phillips, London (whose plans were selected in an open competition), by Messrs. Hinson Bros., builders, Stamford. The site was provided by the Corporation, and occupies a central position in the town, having a frontage on the main street.

FREE LIBRARY, BERMONDSEY.—St. Olave's Library, Bermondsey, has just been opened for the Borough Council. The library was originally St. John's Girls' School, Tooley-street, but the building has been adapted to the purposes of a library. To effect the alterations necessary to adapt the school to the purposes of a library the whole of the walls and partitions which formed the classrooms were swept away, and about 15 tons of steel girders were fixed in forming the various floors, etc. The accommodation in the building as altered consists of a large dry book store and heating chamber in the basement. On the ground floor there is a magazine and news room, 34 ft. long by 24 ft. wide, in which 50 or 60 readers can be accommodated at the newspaper desks and magazine tables. The room is entered directly from the street. There is also a reading room for ladies and a separate one for boys. The first floor is utilised as a lending library, and a reference reading room. Accommodation is provided for the present stock of 8,580 volumes, with expansion room for a total stock amounting to 12,000 volumes. A feature of the lending library arrangement is the long counter with polished mahogany top and an unusually large provision of drawers and cupboards. The reference reading room adjoins the library, and through the glazed dividing partition the reference library books may be inspected by the readers, at the same time securing easy and quick service. The counter already mentioned serves to carry the two indicator frames, containing

numbers representing 10,000 volumes. Apartments have been provided on the upper floor for the use of the librarian in charge. For recreation of the librarian there has been arranged a large room which may be formed into a roof garden overlooking the Tooley-street recreation grounds. The whole of the various rooms forming the library have been divided with ornamental wood screens glazed with plate-glass, and the interior of the building has been decorated in Duresco colours. The building is warmed by hot-water pipes and by electric light. A feature has been made of the angle doorway, which forms the main entrance to the building, and which is constructed in stone, and has a carved representation of the borough coat-of-arms in the pediment. The alterations have been designed by the Borough Surveyor, Mr. R. J. Angel, M.Inst.C.E., in conjunction with Mr. John Frowde, the chief librarian, and carried out by Mr. B. E. Nightingale, Albert Embankment.

FREE LIBRARY, HARGREAVE.—A new free library has been erected at Hargreave facing Victoria-avenue and Raglan-street. It is the first portion of the proposed Municipal Buildings, and is constructed in a way which will readily join up with them when the extension works begin. The entrance is from Victoria-avenue into an entrance hall, which also forms the space for borrowers from the lending library. Leading direct from this entrance hall is the news room, 50 ft. square and lighted both by windows and from the roof. This room will afford accommodation for about 200 readers. The lending library will provide shelving for about 40,000 volumes. In the half basement are a large boys' reading room, 30 ft. by 22 ft., book stores, heating chamber, etc. On the first floor there are a reference library and magazine room, 44 ft. by 22 ft., book stores, and librarian's room. The floors and staircases throughout are of fireproof construction. The heating is by low-pressure hot water. The lighting throughout is by electricity, which will also be used for working a fan for ventilation purposes. The architect is Mr. H. T. Hare, of London. The total cost of the building and furnishing has been a little over 8,000*l.*

THE HOLBORN EMPIRE.—The new theatre of varieties in Holborn is to be known as the Holborn Empire. The new building, which stands on the site of the old "Royal," has been constructed from the plans of Messrs. Frank Matcham & Co. at a cost of 30,000*l.* The old building was a one-tier house, but by taking in the basement and utilising the space hitherto occupied by cellars room has been provided for a circle with a balcony over. The stage, which was originally on the left of the main entrance, now faces it. The main space has been provided with a stage large enough to accommodate any musical production. The theatre has total seating accommodation for 2,000 persons. There is a foyer 40 ft. in length. The decorations of the auditorium are designed in a free treatment of French Renaissance, the colour scheme being white, cream, and gold. The ground floor is divided into fauteuils, stalls, and pit stalls. There are foyers, lounges, and retiring rooms in all parts of the house.

NEW NORTH RIDING COUNCIL BUILDINGS, NORTHALLERTON.—New buildings for the North Riding County Council have been erected at Northallerton close to the railway station. The entrance gates, about a hundred yards from the railway station, open up an extensive piece of ground lying between the front of the building and the road. The front elevation is Renaissance in style, the red brick facing being relieved by white stone dressings. The iron screen gates bear the County arms in the form of shields, beyond which the swing doors lead from the outer vestibule to the arched entrance hall, which is divided into bays by Hopton Wood stone columns. The pillars have black marble caps and bases, and the same materials are used in the grand staircase which faces the main entrance, and the balustrade is of fossil Frosterley. Across the top of the main staircase extends an ante-room or corridor, which, like the rest of the corridors, has a floor of black and white marble, the former Belgian and the latter Sicilian. The Council Chamber is 45 ft. square, and lies at the rear of the building, the ante-room forming the connecting link between the two. To a height of 25 ft. from the floor, which is laid with wooden blocks, rises the domed ceiling of fibrous plaster, light being obtained through four lunettes. On each side is a semi-circular window at a considerable height from the floor. The interior has pilasters and columns of the Corinthian order, and the wall space between them is treated with raised panels of fibrous plaster. A Cuban mahogany paneled dado runs round the room, and on each side of the dais, the paulling is carried to a height of 8 ft. and enriched with carving. The heating and ventilation are on the Pleum system. The Grand Committee-room is approached from the ante-room by way of the second flight of the chief staircase. It is 46 ft. by 28 ft. and has fluted Corinthian columns carrying the cornice. Three other committee-rooms *en suite*, the chairman's room, and members' smoking-rooms complete the

accommodation on the south half of the first floor, the other part being reserved for the county surveyor and clerk of accounts. Coming back to the entrance hall, corridors to right and left gives access to suites of offices occupied by the clerk to the Council, the Education Department, the architect, and building inspector, whilst provision is also made for storage, ammunition, and search rooms. Electric light from the local mains is provided in all parts of the new hall. The estimated cost of the building, including the caretaker's cottage, boundary walls, entrance gate, and railing, laying out of grounds and fore-courts, etc., formation of roads, and the furnishing of the entire building was 33,000*l.*, and it has been carried out within that amount. The building contractors were Messrs. J. Howe & Co., of West Hartlepool. The furnishings were carried out by Messrs. Goodall, Lamb, & Heighway, of Manchester; and the electric light fittings, designed by the architect, were manufactured by Messrs. Singer, of Farnley. The architect is Mr. Walter H. Brierley, F.S.A., of York.

APPOINTMENTS.

BRITISH MUSEUM.—The King has nominated Lord Esler as Royal Trustee of the British Museum vice the late Sir Monstantuar E. Grand-Duff.

CORPORATION OF THE CITY.—Mr. Alexander Ritchie, Common Councillor and J.P., has been elected Chairman of the City Lands Committee of the Corporation of London.

LONGBRIDGE URBAN DISTRICT COUNCIL. The appointed Surveyor and Engineer at Longridge Urban District Council is announced by Mr. James Marshall, Chief Assistant-Engineer to Preston Corporation.

METROPOLITAN MUSEUM, NEW YORK.—Mr. Roger E. Fry has been appointed Curator of the collection of pictures. Mr. Fry is a member of the New English Art Club and a contributor to the *Burlington Magazine*; some years ago he succeeded Mr. F. G. Stephens as art critic to the *Athenaeum*.

FOREIGN.

CAPE TOWN.—The result of the competition for the new Law Courts is as follows:—The first premiated design is that by Messrs. Hawke & McKinlay, the design placed second is that by Messrs. Milne & Sladdin, the third being by Messrs. Baker & Masey, all firms practising in Cape Town. The adjudication of the designs was entrusted to a special committee, appointed by the Government, consisting of Sir Henry de Villiers (Chief Justice), Sir John Graham (Secretary to the Law Department), Mr. Advocate Searle, K.C., and Mr. C. H. van Zyl, with Mr. Mervyn Macartney as assessor. The premiums given were 500*l.*, 300*l.*, and 200*l.* The estimated cost of the building, exclusive of fittings, is 175,000*l.*

SOUTH AFRICA.—The monthly statistical returns compiled by the Johannesburg municipality show that 127 buildings were approved by the Town Council during the month of November last within one mile of the Market-square, 177 from one to two miles, 191 from two to three miles, and 65 from three to six miles, while on the mines 35 were approved. The total estimated cost of the buildings was 320,102*l.*—Tenders are called for by the Lorenzo Marques Construction Department for the erection of sanitary buildings at the wharf. The estimate of the department is 1,350,000*rs.*

TOWNS AND BUILDINGS IN EGYPT.—In the last published report of the Egyptian Public Works Ministry, Mr. Arnold Perry gives a large amount of useful information relative to the work of the Towns and Buildings Department for 1904, although the interest of his account is considerably diminished by the fact that it consists chiefly of statistics. Mr. Perry's duties as Director-General of this branch of the Public Works Ministry are so important and so varied, and the difficulties with which he has to contend are so great, that the annual record of his experience would certainly be more interesting if accompanied by a larger proportion of descriptive matter and comment. Two particularly interesting notes, however, will be found in his last report, one relating to the removal of a large mass of rock which threatened the safety of the Mosque of El-Magnani at Cairo, the other describing the failure of the reinforced concrete roofs of the quarantine cattle-sheds at Mex. The failure of these roofs is shown to have been entirely due to the inferior quality of the concrete, which was neither airtight nor watertight. After the collapse had been investigated by a Commission appointed for the purpose, it was conclusively established that the chief cause of the observed deterioration, in the concrete and iron alike, was the adulteration and partial replacement by local limestone of the cement, which is the only constituent of concrete that affords any guarantee of impermeability, and, we may add, of durability and strength.

BAVARIAN GLASS INDUSTRY.—Reporting on

subject, Mr. Buchmann, H.M. Consul at which, observes that the manufacture of glass is impeded in 1904 by dry weather and lack of horsepower, especially in the Firth district, the centre of the industry. The United States market, once all-important, is being spoilt by the competition and high duties, whilst the Canadian market has been lost entirely by the glass war; the duty on Bavarian blown glass is formerly 20 per cent. *ad valorem*, the duty on German glass has been raised to 26 per cent., and the duty on Belgian glass has been reduced to 10 per cent. If this state of affairs continues, the Bavarian glass industry will soon be a thing of the past, having besides to fight against the keen competition of the Rhine provinces, Silesia, Belgium, and Bohemia. Fifth (Nuremberg) exported in 1890 to the United States glass of the value of 470,000*l.*, which sum fell to 15,533*l.* in 1903, and to 62,834*l.* in 1904. The same place exported up to 1904 mirrors to the value of about 12,500*l.* per annum to Canada, but the new tariff and surtax amount to 26 per cent. of the total value the export trade to Canada is almost killed. Some works have turned to decorative manufactures, others have turned to paper manufacturing entirely. The raw materials necessary to the glass industry have also considerably increased in price—acids, arsenic from 15 to 20 per cent., shellac even 300 per cent., whilst the increase of the sale price was only 10 per cent. This increase was partially due to the depression caused by the strike in Belgium, by which the Bavarian glass industry profited temporarily. The competition, however, of the United Kingdom and Belgium made itself felt in those countries having lost their markets to the East through the war in Africa and seeking new outlets. Stained glass, one of the chief art industries which Munich is famous, suffered in 1904 on account of a decrease in orders. The chief cause of this depression is said to be the order of the Ministry of Education and Worship (Kultusministerium), by which stained glass in modern styles is no longer to be admitted in Bavarian churches. New markets have, therefore, to be sought in North Germany, prices having risen in consequence. The new Order creates a great deal of dissatisfaction, and it is anticipated that the staffs of numerous Bavarian glass painting establishments (there are thirty-six in Munich alone, employing some 2,000 English artists) will have to be reduced, and the establishments will have to be moved to foreign countries, where wages of artists have risen, and the export to Canada and the United States suffers on the surtax and the heavy duty of 45 per cent. the value respectively.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. Bernard Dickson, the District Surveyor for Nottingham and District, of St. George the Martyr, has resigned his district office to Nos. 14 and 16, New Kent-road, S.E. (over the London and Westminster Bank).

A LONG-LIVED STOVE.—The Carron Company send us an extract from a letter from one of their correspondents in Canada, the interest of which to them is obvious, but which we agree with them in thinking is not of interest to our readers. It was on a business trip this fall in the north-east part of Saskatchewan, and saw a box stove of what I thought was a new design in box stoves. On inquiring where the man got it, he said it was his great-grandfather's, and that it was made by the Carron Company 150 years ago. I thought that length of time. The stove belongs to the early settler's family that came out with Lord Selkirk.

ROYAL ACADEMY EXHIBITION.—The sending-in days for the next Royal Academy Exhibition are: For water-colours, miniatures, black and white drawings, and all other works under glass—until Friday, March 30; for oil-paintings—Saturday, March 31, and Monday, April 2; for sculpture—Tuesday, April 3. The hours for the reception of works are from 7 a.m. to 10 p.m.

No. 11, DOWNING-STREET.—The new Ministry have departed from the time-honoured custom whereby they have formed the official residence of the Chancellor of the Exchequer. Mr. Herbert Gladstone, the Home Secretary, has taken up his abode in the house, where some necessary repairs were recently made, and is thus installed in his birthplace, for he was born there during his father's tenure of office as Chancellor of the Exchequer.

DISAPPEARING SURVEYORS' FEES.—The Baths and Washhouses Committee of Wandsworth Borough Council, in a report circulated on Monday, stated that they had addressed a letter to the London County Council calling attention to the excessive fees for small additions to large buildings made by district surveyors. In relation thereto they had received a communication from Mr. I. R. Ford, District Surveyor, offering to reduce his

fee in regard to the new pump-house recently erected at the baths from 18*l.* 2*s.* 6*d.* to 10*l.* 10*s.* The Committee had accepted this offer and had passed a resolution directing that a further letter be addressed to the London County Council and that Mr. Ford be also informed that the object of the Committee had been to call attention to the general question of the excessive fees charged in respect of small additions which, under the London Building Act, are calculated upon the area of the entire building. The Committee had recently decided to postpone carrying out certain work on account of the excessive fee which would be chargeable, amounting to nearly half the amount of the Surveyor's estimate of the cost of the work.

A QUESTION OF PAVING.—The Works and Highways Committee of Lewisham Borough Council reported on Monday having been in communication with the Building Acts Department of the London County Council with regard to the paving of strips of land given up as a condition to plans being passed for the erection of buildings. The Building Acts Committee expressed the opinion that in all cases where a condition is attached to a consent under the Building Acts requiring the surrender of land to the public way, the owners of such land should not be put to the expense of paving it. Under these circumstances the Borough Council Committee had directed their surveyor to carry out the necessary paving work with regard to the land given up.

THE OLD BRIG, Ayr.—The Ayr Town Council, after being in communication with Mr. Oswald and a deputation representing persons interested in the preservation of the Auld Brig, and after considering the best methods of preserving the bridge without rebuilding it, as suggested by Mr. Hall Blyth, have unanimously agreed to the following resolution:—“(1) Mr. Oswald is, as soon as possible after the General Election is over, to convene a public meeting in Ayr, when resolutions will be submitted and a committee appointed to take all steps considered expedient to obtain subscriptions for executing the works necessary for the preservation of the bridge; (2) should the committee, not later than August 1 next, succeed in raising the funds required for the work (which it is presently assumed may cost about 10,000*l.*) the Town Council will allow the committee to carry out the necessary preservative works on the bridge at the sight, and to the satisfaction of an engineer of eminence, to be selected by the committee; (3) the work will be proceeded with without delay, so soon as the necessary funds are raised, and the whole work is to be finished not later than August 1, 1906, when, or at the completion of the work if of earlier date, the committee will cease to have any further connexion with the bridge, the Town Council thereafter resuming full control over it; (4) should the committee find it necessary to rebuild any portion of the bridge, they shall submit plans and specifications of same to the Town Council, along with the offers for the execution of the work, and if the Council approve of same they will bear the cost of such rebuilding out of the Templeton bequest fund. Should the Town Council consider it necessary that a temporary wooden bridge be erected while the structure is being repaired or rebuilt, they shall be at the expense of erecting and maintaining it,” etc. Another important condition laid down was that “the plans and specifications of the whole works to be executed by the committee shall be submitted to the Town Council, that he may assure the Town Council that the proposed works will make the bridge secure for public traffic for the future, and until this assurance is given the work shall not be proceeded with.” It was stated that in the event of Mr. Oswald's committee being unable to fulfil their part of the arrangement the Council would take up the question of rebuilding the bridge where they had left off.

A NEW WINDOW SASH.—Messrs. Recorders, Ltd., have shown us a model of a new window sash entitled “The Magic Window Balance,” which, in spite of a rather absurd name, has much to recommend it. It appears at first sight, when closed, like an ordinary sash window, but there are no hollow casings, lines, or pulleys. The sashes are balanced, and when the lower one is raised the upper is lowered correspondingly—so far it is not new; what is new is that the two sashes are connected by a hinged and pivoted arm, and after being opened perpendicularly for a short distance, the upper edge of the lower sash can be drawn inward, the upper sash following it in a parallel line, so that the two swing pointing downwards and the ceiling, giving the best form of air passage for an upcast current of air into the room. The whole construction is perfectly solid; there is nothing to get out of order, and the outside of both sashes can, by a simple arrangement, be cleaned from the inside. The only drawback, or which may be regarded as such by some people, is that the vertical rise of the lower sash, before it is canted, is limited; it cannot be raised high enough, for instance, to allow one to lean out of the window; but then it may be replied that leaning out of windows is a bad practice. At all events, that seems the only drawback

to what is, on the whole, one of the best and most workmanlike special forms of window sash that we have seen.

BRADFORD MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Bradford Master Builders' Association was held on the 26th ult. at the Royal Hotel, Darley-street. Mr. August Moulson presided, Mr. B. Hanson, in proposing the toast of “The National and Yorkshire Federations of Building Trade Employers,” referred with gratification to the arrangement arrived at last year with the employees for the avoidance of strikes. Mr. Paul Rhodes (President of the Yorkshire Federation of Building Trade Employers), in responding to the toast, said that the employers' federations had not been formed with the object of reducing wages or of fighting the trades unions. On the contrary, the existence of such federations was the best guarantee of industrial peace. He hoped that something might be done by competition to put a stop to the senseless cutting of prices in contract work. Mr. John Dawson also responded to the toast. Mr. A. Gadie, replying to the toast of “The City and Trade of Bradford,” which was proposed by Mr. Archibald Hope, said that for a long time trade in Bradford had been as the builders were concerned, had been deplorable and the reason was that the staple trade had not been prosperous. Builders were always the first to feel bad trade, and the last to benefit by a revival. Should the staple trade improve, building would begin again, and the unemployed difficulty would vanish very soon. Mr. W. Cryer gave the toast of “The Bradford Master Builders' Association,” which was acknowledged by the President. Referring to the retirement of his predecessor in the office, Alderman Holdsworth, the President said that no one in the country had done more to promote the welfare of the building trade, and it was a matter for great regret that he should be laid aside. Continuing, he expressed regret that some of the leading builders in Bradford did not show sufficient interest in the Association. Combination amongst employers was more necessary now than ever it had been before. Labour members had been returned to Parliament in large numbers, and they would have much to say of rights and privileges that had hitherto been denied. Nobody wished to assert that labour had not its rights, but the duty of organizations such as the Bradford Master Builders' Association to see that they were not infringed. Mr. T. E. Taylor also responded to the toast. The toast of “Kindred Associations” was submitted by Mr. R. Raper, who responded to Mr. T. Hillington (President of the Bradford Master Plasterers' Association) and Mr. G. Spencer (President of the Master Painters' Association).

FALL OF COPING.—On the 29th ult., at the Brixton Coroner's Court, Mr. G. P. Wyatt held an inquest concerning the death of Arthur William Moscrop, aged eight years, whose parents, William and Akerman-road, Brixton. The child was fatally injured as a result of the coping of four houses—47, 49, 51, and 53, Akerman-road—falling upon him. Mr. Percy Hunter, District Surveyor to South Lambeth, stated that on visiting the four houses in question the day following the accident he found that the parapet of the front wall to the extent of 72 ft. by 2 ft. 10 in. to 3 ft. had fallen. The weight of the material that had fallen he calculated at about 10 tons. The cement covering of the parapet was cracked, the brickwork rotten through being sodden by water, and there was no proper bond for the party walls. The vibration caused by the traffic, the weather influences, and the defective mortar had each probably contributed to the accident. The frost on Tuesday night had undoubtedly also tended to disintegrate the mortar, and thus played its part in causing the structure to collapse. There was no outside indication that the brickwork was defective, and the actual cause of the accident was the weight of the cornice causing the brickwork to give way. He had served dangerous structure notices upon the owners of the premises, and also upon the owners of the adjoining property, and had also had the remaining portion of the copings removed. A verdict of “Accidental death” was returned.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of Dr. G. F. McGilvary as Medical Officer of Health for the Metropolitan Borough of Hampstead. They have sanctioned the appointment of the undermentioned persons as Sanitary Inspectors in Metropolitan boroughs as follows:—Islington—Mr. T. H. Hancock, as from January 15, 1906. Lambeth—Mr. J. S. Matthews, as from January 1, 1906. Miss L. M. H. Pearson, as from January 1, 1906. St. Pancras—Miss B. Gardiner, as from November 23, 1905. Stoke Newington—Mr. T. Topping, in the place of Mr. G. F. Taverner.

BUILDING TRADES EXHIBITION, MANCHESTER.—A Building Trades Exhibition is announced to be held at St. James's Hall, Manchester, from April 25 to May 5. From the announcements that “no medals or diplomas will be given,” and that “every likely buyer will receive invitation

with free ticket direct from the management," it would seem that it is rather in the nature of a sale than an exhibition in the more important sense of the word.

THE GROWTH OF COVENTRY.—The number of houses erected in Coventry during the past seven years has averaged nearly two per day. Since 1899 4,063 houses and other buildings have been erected. Seven years ago the record for the twelve months was 117 new buildings completed. In 1904 the figures had grown to 746, whilst last year 426 new buildings were put up. It is interesting to note that at the beginning of the XVIIIth century there were under 2,000 houses inhabited in the city, whereas now there are about 17,000 houses tenanted.

"A.A." OLD DAY STUDENTS' CLUB.—The fifth annual dinner of the Architectural Association Old Day Students' Club took place at the Florence Restaurant on January 26. The number of those present was thirty, including Mr. E. Guy Dawber who presided, and Mr. H. Tanner, jun., the Hon. Secretary of the Architectural Association who was present as a guest of the Club. After the usual loyal toasts had been proposed by the Chairman, Mr. H. Tanner briefly proposed the "Architectural Association and the Day School." Mr. Maule, in replying, remarked that he always thought that this annual gathering was an admirable opportunity for taking stock of the position of the School. He briefly ran over the history of the School from its inception in 1901, paying special attention to the numbers working there at different periods down to the present, and remarked that in the year 18 in the second year. He drew attention to the fact that the scheme of work now followed was almost identical with that planned by Mr. A. T. Bolton at the beginning (Mr. Bolton's name being received with general applause). He applauded the feeling of *esprit de corps* present in the School and fostered by the Club, and remarked that every activity should be welcomed as long as it led up to the "larger policy" of the Architectural Association itself. But he would warn the Club against ever intruding intentionally or otherwise upon the work of the Architectural Association itself. All members of the Architectural Association should be proud of their membership of that Society, and he noted as an additional reason for such pride that in the Institute Studentships just awarded seven out of the eleven had been made to Architectural Association men. Mr. Dawber then proposed the toast of "The Club," wishing it every success on his own behalf and on that of the whole Architectural Association Council. In his opinion the Club was an excellent institution, as it helped to keep those fellow-students together in after life who had worked side by side in the School. He reminded those present that they could do much as a Club towards helping the spirit of good fellowship in the Association. Mr. Travers, the Hon. Secretary of the Club, in replying, noted the fact that, although the Club was, and had always been, an unofficial body composed of past students of the School, and not necessarily all members of the Association, yet it had, when opportunity offered, devoted its energies towards the furtherance of that "larger policy" to which Mr. Maule had referred.

THE T SQUARE CLUB.—The first meeting of this Club as newly constituted was held on Tuesday, the 23rd ult., in the International Hall, Monico Restaurant. The proceedings opened with an invitation supper followed by a concert. The chair was taken by Mr. E. G. Rivers, who, in proposing the toast of "the Club," asked for an announcement as to the exact position of the Club. The Secretary, in reply, stated that as now constituted it consisted entirely of members of recognised professions who were solely engaged in professional practice, and the object of the Club was to provide social evenings during the winter months. The entertainment which followed, carried out under the direction of Mr. J. Harry Pitt, was provided by Mr. Arthur Grover, Miss Marie Schulz, Lieut. Col. W. H. Allen, Mr. Fred Curtis, Mr. Harry Vincent, Mr. J. Harry Pitt, Mr. Spruell Groom, and Mr. Wingrove Ives. All information regarding the Club may be obtained from the Hon. Secretary, Mr. W. H. Webber, 7, Great James-street, Bedford-row, W.C.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—A meeting of the Architectural Craftsmen's Society was held on the 26th ult. in the Technical College, Glasgow. Mr. Colin Sinclair presided. Mr. J. Campbell Reid read a paper on "Architectural Censorship." Mr. Reid showed by numerous lantern views architectural mistakes, due to the want of proper supervision of architectural schemes, plans, and references to the relation of new buildings to their surroundings, which were often of real architectural or historical value, and were thrown out of scale by the new structures. The lecturer advocated the appointment of small committees for each district of large towns, who would form an Architectural Court, before whom all plans for proposed buildings would be submitted after having been sanctioned by the Dean of Guild Court. These committees would refer any schemes opposed to

architectural principles to the censor, who would be an architect or artist of repute appointed by the Government, and whose decision would be final. Mr. Reid also advocated the laying out of new streets by architects, who would introduce more varied lines than those laid down by engineers, and thus relieve the monotony of many of our thoroughfares. A vote of thanks to the lecturer was proposed by Mr. C. Ernest Monro and carried.

CHURCH OF ST. JAMES, LOWER CLAPTON.—Sitting in the Consistory Court of London on January 22 Dr. Tristram, K.C., Chancellor of the Diocese, granted a faculty for authorising the vicar and churchwardens of St. James to carry out certain alterations and improvements of the church which was built in 1841 after contributions in the Gothic style, of A. W. Hakerill. The church contains about 800 sittings, whilst the population of the parish amounts to 10,000. The proposed works comprise the building of a chancel, clergy-vestry, and choir-vestry, with an organ chamber above, the re-arrangement of the seats in the nave and transepts, new seating throughout, and the re-lighting of the entire edifice. The alterations will increase the accommodation by about 60 sittings and the vestries will be erected upon part of the ground originally conveyed for the site of the church, no intentions having been made therein. Towards the estimated cost (4,500*l.*) the Ecclesiastical Commissioners have contributed 1,000*l.*, and 2,250*l.* have already been subscribed.

DIRECTORY OF AMERICAN ARCHITECTS.—We have received "The Architects' Directory and Specification Index," being a Directory of names and addresses of architects in the United States, together with a list of manufacturers (material or appliances used in American building. The latter can hardly be of any use to English architects, but the Directory may be useful to those who wish to communicate with architects in the United States. It is published by Mr. W. T. Comstock, 23, Warren-street, New York.

ASPHALT FROM BUENOS AIRES.—Samples of asphalt from Los Garrapatales have been forwarded through the Foreign Office to the Board of Trade by Mr. A. C. Ross, C.B., H.M. Consul at Buenos Aires, and have been placed on view at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, E.C.

THE LOCAL GOVERNMENT ANNUAL.—The fifteenth yearly issue of the Local Government Annual and Official Directory (Farringdon-street, E.C.) has been sent to us. The main portion of this excellent little work is devoted to the Directory, which gives the names and addresses of the chief officials of all corporations, London borough councils, county councils, boards of guardians, urban and rural district councils, county and borough asylums, etc., throughout the kingdom, as well as the public libraries, public parks, and City companies of London. A feature which will be found useful is the insertion of the names of the chairmen of committees in the metropolitan boroughs, also the chairmen of the London County Council committees. Readers will find the telephone numbers of all those London boroughs which have adopted them. The names and addresses of the Metropolitan Water Board are also included, and accompanied by a complete scale of charges in every district supplied by the Board. The other section consists of a list of the various education committees in England and Wales. In addition to the directory there is information relating to the public libraries, baths and washhouses, and electric light undertakings in the boroughs of London, and the work includes an abstract of the local government legislation of 1904. There is also a complete list of all the parks and open spaces of the Metropolis, with the local authorities controlling them. The price of this handy and useful publication is 1*s.* 6*d.*

Legal.

ACTION BY AN ARCHITECT.

The case of Neill & Sons v. Worthington & Co., Ltd., came before the Court of Appeal, consisting of Lords Justices Vaughan Williams, Stirling, and Sir Gorell Barnes, on the 25th ult., on the application of the defendants for judgment or new trial on appeal from verdict and judgment at trial before Mr. Justice Grantham and a special jury in the King's Bench Division.

Mr. Scott Fox, K.C., and Mr. Montague Lush, K.C., appeared for the appellants; and Mr. Tindal Atkinson, K.C., and Mr. Compton for the respondent.

It appeared from the statement of Mr. Scott Fox that the action was brought by the plaintiff, Mr. Neill, an architect, trading under the style of Neill & Sons at Leeds, against the defendants, the well-known brewers of Burton, to recover 56*l.* 8*s.* for work and labour done as it was alleged on the employment of the defendants. The defence was that there was no contract of employment between the plaintiff and the defendants at all and that the people whom the plaintiff

really looked to for payment were Cartell & Gale, Ltd., spirit merchants. The work in respect of which the action was brought was that of making alterations at the Royal Exchange Restaurant, Leeds. At the trial the jury returned a verdict for the plaintiff, but the judge, on being asked by the plaintiff for judgment, returned accordingly. The grounds of the present application were that the verdict was against the weight of the evidence, and that the learned judge had misdirected the jury.

In the result Lord Justice Vaughan Williams gave judgment, said he saw no evidence of any authority being given by the plaintiff to the defendants to pledge their credit in the matter, and he saw no evidence to support the verdict of the jury. He thought the appeal must be allowed and judgment entered for the defendants.

Lord Justice Stirling and Sir Gorell Barnes concurred.

ACTION BY A QUANTITY SURVEYOR.

The case of Clarke v. Brooker and others came before Mr. Justice Walton and a common jury in the King's Bench Division on the 30th ult., an action by Mr. Edmund Thos. Clarke, a quantity surveyor, against Priscilla Anne Brooker, J. W. J. Brooker, and A. E. Brooker, of Darlington, Brockley Park, Forest Hill, the executors of the late James William Brooker, an architect, for 170*l.*, the alleged agreed amount for work and labour done by the plaintiff for and at the request and by the order of Mr. J. W. Brooker.

It appeared that the work in question was done in relation to the Imperial Hall, East Dulwich, together with the erection of the order for the employment was verbally given to him by the late Mr. Brooker on November 13, 1901, and again at the Imperial Hall on November 14, 1901.

The defence was a denial that Mr. J. W. Brooker appointed the plaintiff as alleged or at all, or that he requested or ordered the plaintiff to do the work, or that he agreed to pay him 170*l.*, or any sum whatever. Defendants also said that Mr. Brooker acted as sole agent for the Hall Finance Syndicate and not otherwise. Defendants also alternatively pleaded that it was an implied term of the employment that the plaintiff should perform his work within a reasonable time, and that plaintiff failed to perform his work within a reasonable time and his work was consequently of no value to Mr. Brooker.

Mr. J. F. P. Rawlinson, K.C., and Mr. Rittir, appeared for the plaintiff, and Mr. Clavell Saltor, K.C., and Mr. L. Davies for the defendants.

Mr. Rawlinson, having opened the case, called the plaintiff, who, examined, said that he was a quantity surveyor of twenty-three years' experience. He had acted both independently as quantity surveyor and as assistant to architects. He had known Mr. Brooker since 1886 and had had many previous dealings with him. He always acted as assistant so far as Mr. Brooker was concerned. At the end of 1901 he received a message asking him to call on Mr. Brooker, and on November 13, 1901, he called at his office. Mr. Brooker then told him that he wanted the job in question done, indicating what the job was by the plans on his desk. Witness said he would do it, and the arrangement was to meet on the works the following day, so that he could take Mr. Brooker's instructions—that was at the Imperial Hall, the job being measured up extras and omissions under the contract. The building was not then complete, but was approaching completion. Witness met Mr. Brooker at the Hall, when the latter pointed out each item he required adjusted. Mr. Brooker gave him nothing but verbal instructions. From that time he proceeded to get on with the work. He measured up from day to day as much as they could get through. That went on until about April 1, at which date the whole of his account was done except the last four items which appeared in the summary. He went through the accounts with Mr. Brooker, but on April 23 Mr. Brooker said it appeared to him that witness had made out the account more in the interest of the builder than of his clients, the Hall Finance Syndicate. Witness felt very upset. Mr. Brooker then took hold of the papers, threw them up in the air, and told witness to take them away, and he did so. He saw Mr. Brooker from time to time after that and also Hopkins, the builder.

By his lordship: When he was employed in November, 1901, nothing was said about his remuneration. All he was told was that he was to get on with the work.

Examination continued.
His charges were fair and reasonable—2*l.* per cent. also 1*l.* per cent. for pricing would bring the amount to 186*l.* and then the amount for copying brought it to 190*l.* Witness only asked for the work 170*l.* Mr. Brooker thought that 150*l.* was enough, but the price was afterwards finally settled at 170*l.* Some time in 1903 he had a conversation with Mr. Brooker with reference to the creation of the Finance Syndicate accepting debentures instead of cash payment. Witness consented to accept debentures for the amount of his fees, but he never got the debentures.

Cross-examined by Mr. Davies, he did not at the time he undertook the work know that the (all) Finance Syndicate were the building owners, and Mr. Hopkins the builder. Mr. Brooker's position was that of architect.

Can you point to anything in writing showing that you made any claim on Mr. Brooker personally during his life?—There was a letter of June 23 in which I said I wanted 170*l*.

At this stage of the case Mr. Salter took up the cross-examination of the witness.

He soon found out that the building owners were the Syndicate. He thought the contract price for the building was about 8,000*l*.

What would be a reasonable amount of time or a competent quantity surveyor to measure up variations bill such as this to the extent of about 6,000*l*?—Provided that all the work was done and you could get all your appointments kept it would take from two to three months—that is, on such work as this.

Mr. Salter informed his lordship that the ordinary practice was to add the total amount of the quantity surveyor's charges to the builder's total and the result was that the whole amount was paid by the building owner.

Cross-examination continued.

He had always looked to Mr. Brooker as being liable to pay for the building. He did not look to the Syndicate to pay him.

Plaintiff, in reply to further questions by Mr. Salter, said he always thought he would have to wait for his money until Mr. Brooker got paid. As Mr. Brooker would not pay him and neither would Mr. Hopkins, he applied to the Syndicate.

Did not Mr. Brooker say he should not have a penny, because of your delay in the matter?—No, it was in consequence of the remarks I made about this business.

Then, if you were entitled to the money from Mr. Brooker, why did you apply to the Syndicate?—I tried it as a last resource. In 1903 I repeatedly applied to Mr. Brooker for the money.

When you sent a letter to the Syndicate for the money did you consider yourself a creditor of the Syndicate?—I must have done, by the tone of the letter.

His lordship: When a quantity surveyor is employed by the building owner, according to the usual practice, from whom does he get his money?—The common practice is to have these fees added to the account of the builder and paid to the builder by the building owner, and the builder sends on his cheque to the quantity surveyor.

Mr. Fredk. Henry Hopkins, a builder and contractor, employed in the building of the Imperial Hall, examined in April, 1902, personally to Mr. Brooker, he said he wanted to settle up the plaintiff's account, but he declined to do it without plaintiff's figures. He then saw the plaintiff and got his figures, and these he communicated to Mr. Brooker.

This being the plaintiff's case, Mr. Salter, on behalf of the defendants, submitted that there was no evidence of any contract by Mr. Brooker personally to pay the plaintiff's account.

His lordship said it would be safer not to withdraw the case from the jury.

Mr. Salter, saying he had no evidence to call on behalf of the defendants, Mr. Ritter summed up the plaintiff's case to the jury.

Mr. Salter, in addressing the jury on behalf of the defendants, submitted that their verdict should be for his clients. He said it was clear that Mr. Brooker had never taken upon himself the responsibility of personally paying the plaintiff his account. On the plaintiff's own evidence he knew at an early stage that the Syndicate were the building owners, and the financial position of the Syndicate was well known to him. The correspondence clearly showed that plaintiff had looked to the Syndicate, and to the Syndicate alone, for his fees. The plaintiff had asked Mr. Brooker whether it was through him that the Syndicate were resisting his claim, and Mr. Brooker had replied that it was, as the plaintiff had been guilty of such delay in getting on with the work it was useless. The plaintiff had not dared to set up such a claim against Mr. Brooker during his life, and he confidently asked the jury for a verdict.

His lordship having summed up,

The jury found a verdict for the defendants, and his lordship entered judgment accordingly.

DAMAGE TO PROPERTY BY FLOODING.

On Saturday, the 27th ult., the Official Referee, Mr. Muir Mackenzie, delivered his judgment in the actions brought against the Ilford Gas Company by the Corporation of East Ham and the Ocean Accident Guarantee Corporation; actions brought by the respective plaintiffs against the defendants for damages for having negligently, as it was alleged, caused a large quantity of flood water to overflow the plaintiffs' property in June, 1903, from the River Roding and a stream called the Aldersbrook.

In the action brought by the Corporation of East Ham against the defendants the facts were these:—At the time of the commencement of the

action the East Ham Urban District Council was the urban sanitary authority of the district which comprised the parishes of East Ham and Little Ilford, and by a charter granted in 1904 the district was incorporated as the borough of East Ham, and the property of the district devolved upon the plaintiffs. The defendants owned and occupied certain lands in the urban sanitary districts of Ilford and East Ham abutting upon the River Roding, the Aldersbrook passing through the defendants' lands on which they had erected gas works. Both the Roding and the Aldersbrook were crossed by the Romford-road, which ran east and west on a high bank to the north of the gas works and was carried over both channels by the bridges. There was also a channel between the Roding and the Aldersbrook parallel to Romford-road and immediately to the north of it. By their special Act, defendants were empowered to fill in part of the channel of the Aldersbrook inside their grounds, provided that if they closed any part of it southward from the Romford-road bridge within three years from the passing of the Act (1899) they should maintain, until the Barking-road bridge was reconstructed, a culvert having a diameter of 4 ft. 6 in. from the Aldersbrook to the River Roding through their own lands. The defendants made some changes in the channel of the Aldersbrook within their own grounds, leaving the culvert which was required by the Act, but in August, 1902, they closed up the culvert but did not close the arches of the bridge carrying the Romford-road over the Aldersbrook. Defendants also, for the purpose of laying gas mains, cut and reinstated, with an additional height of 1 ft., the river bank inside their grounds. They also raised the height of the island between the Roding and the Aldersbrook thus forming a sort of pit where any water would collect that might come under the Romford-road bridge along the Aldersbrook. In June, 1903, in consequence of a heavy rainfall, the water rushed along the Aldersbrook and collected on the defendants' ground by the bank of the Roding, the result being that the bank burst, which caused the damage complained of. The case for the East Ham Corporation was, that defendants were liable to maintain in repair the river bank inside their grounds as a protection against flooding, and that it had been weakened by the defendants carrying the gas mains through it and not properly reinstated, and, therefore, that they were liable for the damage caused by flooding. Defendants denied that they were liable to maintain in repair the river bank and that they had failed to keep their portion of the bank in repair. They also said that if any damage was caused to the plaintiffs it was through the overflow of the Aldersbrook, due to an act of God. At the trial, which took place before the Lord Chief Justice and a special jury in the King's Bench Division (reported in *The Builder* of July 15, 1905), the jury found that the defendants were guilty of negligence or want of reasonable care in closing the Aldersbrook and in reinstating the bank, and that the flooding was caused by both. They also found that the flooding could have been prevented by reasonable care, and on these findings his lordship gave judgment for the plaintiffs and directed that the amount of damages should be assessed by the Official Referee.

The action by the Ocean Accident Guarantee Corporation arose out of the same set of circumstances, it being an action by these plaintiffs, who were mortgagees of a number of houses erected near the defendants' works and which had been damaged by the flooding. These plaintiffs also secured a verdict in the King's Bench Division, and the question as to the amount of damages to be paid by the defendants to them was also referred to the Official Referee.

The Official Referee, in giving judgment in the first case, having stated the facts, said that after hearing all the evidence that had been given he was clear that his judgment must be for the plaintiffs. He did not intend to award a sum in respect of each item claimed for by the plaintiffs, but a lump sum to cover the whole. Plaintiffs claimed some 345*l*, in respect of damage done by the water to five roadways and the footways. They said that was the amount they had expended in repairs. Plaintiffs claimed for cleansing sewers and many such minor things, but in his opinion one must take a broad view of the matter and see if the plaintiffs were put to an unusual expense in consequence of the floods. In his opinion the plaintiffs' claim was altogether unreasonable and was founded upon a wrong principle. In view of all the circumstances, the total sum he should award the plaintiffs was 120*l*, with proportionate costs. In the second case the learned Official Referee said the plaintiffs claimed some thousands of pounds for damage done to their property and depreciation in value. He found that the houses were built upon marsh land, unsuitable for houses unless special precautions were taken, and those precautions were not taken. He held that there had been no depreciation, and he assessed the sum to be paid by the Gas Company to the plaintiffs at 15*l*. 15*s*. as sufficient to satisfy their claim for damages.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

408 of 1905.—J. E. NELSON and C. G. NELSON: *Stove Pipe Ventilators.*

This relates to a stove pipe ventilator, consisting of an open-ended tube provided at its forward end with an external annular flange set obliquely upon it, an elastic hook which projects from the flange, and a damper for the flanged end of the tube.

810 of 1905.—P. W. LOCKWOOD and G. J. WEIR, LTD.: *Couplings and Fastenings for Steam Heating Tubes and the like.*

This relates to a steam heating tube and the like, and consists of a cylindrical metal coupling, comprising three separable parts—namely, a barrel part with closed ends having perforations therein, an integral shoulder with mechanical face, and an open screwed end and tubular screwed extension piece therefor, also a solid screwed neck and fixing nut therefor.

1,387 of 1905.—L. ANIDJAH and D. D. REES: *Apparatus for Lowering Persons or Goods from Buildings and chiefly Designed for Use in case of Fire.*

This relates to an apparatus for lowering persons or goods from buildings, and comprises two bars joined together at one end, one of which is pivoted to the sill of the window frame whilst the other is designed to engage with a hook or its equivalent on the said frame, and a block carried by the bars and supporting a rope for lowering the persons or goods.

1,799 of 1905.—W. A. MOORE: *Siphon Flushing Apparatus for Water-closets, Urinals, Sewers, Drains, and the like.*

This relates to a siphon flushing apparatus having a tank or cistern for holding the water or other fluid, and a vertically arranged discharge or outlet pipe fitted therein, and consists of a ring or cylindrical piece fixed round the upper end of said discharge pipe, a plurality of annular grooves round said ring, a short concentric pipe slidably mounted on said ring, a further concentric pipe surrounding the discharge pipe and forming the annular space round the inner concentric pipe and a cover fitted to the upper end of the outer concentric pipe in such a way that the annular space between the concentric pipes communicates with the interior of the inner concentric pipe at the top.

5,025 of 1905.—W. H. FITTON: *Machinery for Sawing Stone, Slate, Granite, Marble, and the like.*

This relates to sawing machinery for stone and the like, comprising a circular saw, mounted at or close to one end of a spindle and carried in bearings fixed to a travelling carriage or saddle, which is adapted to slide on a bridge slide, bed, or way parallel to the plane of the saw, and is characterised by said travelling carriage or saddle carrying an electric motor on said spindle, or geared to said spindle, and geared to the feed mechanism, which is also carried on said carriage or saddle, for moving said carriage or saddle along said bridge slide, bed, or way.

5,209 of 1905.—A. W. BAXTER: *Solution for Rendering Combustible Materials Fire-resisting.*

This relates to a solution for rendering combustible materials fire-resisting, and consists of an impregnating solution obtained by dissolving phosphate of ammonia with boric acid in water.

9,620 of 1905.—G. T. WINNARD and J. BEDFORD: *Pulley Blocks.*

This relates to a pulley block and consists of an arch-shaped grooved rope support, carried by the lower block, either alone or in conjunction with a second grooved rope support carried by the upper block.

12,046 of 1905.—E. G. FERROT: *Reinforced Concrete Constructions.*

This relates to means for reinforcing a concrete or cement construction, comprising a plurality of bars, each having a series of main elements united by web portions integral with said bars, said web portions being partially separated at intervals, by shearing or other means, from said elements, the separated portions being bent at an angle to the main elements to form stirrups.

15,162 of 1905.—A. SENK: *Roofs for Hot-houses.*

This relates to roofs for hot-houses and consists of a girder with channel irons for the insertion of glass plates, and removable wood back, covering the inwardly projecting part of the girder.

17,846 of 1905.—J. MITCHELL: *Air-tight Covers and Frames for Inspection Chambers.*

This relates to air-tight covers and frames for inspection chambers, and consists in the employment of T-shaped nuts fitting into similarly-shaped slots or recesses in the frames, in combination with bolts passing through rebated holes in the covers and screwing into such nuts.

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

1,922 of 1905.—N. JOHNSON: Apparatus for Cutting or Excavating Trenches.

This relates to an apparatus for cutting or excavating trenches, and consists in the combination of a motor-driven carriage, a suspended frame adjustable vertically thereon, a rotary boring head mounted in a carriage so as to be slidable upon the said frame, and an elevator and means for adjusting the position of the said suspended frame and for automatically and vertically feeding and rotating the said boring head.

4,218 of 1905.—W. M. DUCKER: Roofs for Portable Houses.

This relates to a portable house roof having independently covering the respective roof sheets of metal, covering the respective roof sections, and secured thereto prior to the sections being placed in position on the roof, each of said sheets having marginal lips to retain a batten, and flanged sheet metal battens engaging said lips and covering the joints between the sections.

5,711 of 1905.—F. W. MAXWELL: Construction of Fire-proof Curtains for Theatres and like places of Amusement.

This relates to the construction of fire-proof curtains for theatres and the like places of amusement, and consists in the combination of an open metal frame filled in with "plate wall slabs" or other like fire-proof material and provided at each side with trolley tracks running in vertical grooves made in the side walls of the proscenium opening.

8,104 of 1905.—L. P. FRIESTED: Construction of Sea-walls, Breakwaters, and the like.

This relates to a sea-wall, and comprises a series of metal piling sections consisting of channel beams arranged alternately so that their damaged edges interlock, each beam section being provided with Z irons rigidly secured thereto so as to prevent lateral displacement when the piling sections thus assembled are driven into the earth to a solid foundation, the upper ends of the sections extending above the water line.

8,105 of 1905.—L. P. FRIESTED: Construction of Cofferdams, Caissons, and the like.

This relates to coffer-dams and other structures of similar character composed of metal sheet piling sections, and consists in the employment of channel beams arranged alternately so that their flanged edges interlock, each alternate beam section being provided with interlocking Z beams for loosely locking the said sections together and preventing separation when the said sections are driven into place, the arrangement being such that a continuous wall structure is formed.

172 of 1905.—A. BRUCE: Siphon Cisterns.

This relates to a siphon cistern, and consists in the combination of an air inlet valve which is operated automatically by means of a ball or float lever, said valve being connected by means of a pipe with some place outside the lavatory so that the noise caused by the rush of air shall not be heard loudly within the lavatory or water-closet itself.

173 of 1905.—A. BRUCE: Siphon Flushing Cisterns.

This relates to a siphon flushing cistern, which is provided with a water tap or seal whereby the air can be locked in the short leg of the siphon or in a chamber connected therewith. An air escape valve is also provided and this valve is operated by means of a ball or float lever or its equivalent thereto.

451 of 1905.—R. CROSTWHAITE: Stoves for Heating Rooms and the like.

This relates to stoves for heating rooms and the like, and consists in the mode of operating the canopy and the arrangement of parts in connexion therewith in which the said canopy valve which is in a chamber connected therewith. An air escape valve is also provided and this valve is operated by means of a ball or float lever or its equivalent thereto.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing property sales including items like 'January 16.—By ORRILL, MARKS, & BARBEY at Mr. On's Hall, Oxford-st., "The Woodstock" p.h., ut. 34 yrs., yr. 115s., with goodwill. 25,000' and others.

Table of advertisements and notices including 'January 23.—By M. HOLMES & SONS. Cricklewood.—51, Ashford-rd., ut. 87 yrs., p. 5l. 8s., cr. 84l.' and 'January 25.—By CHESTERTON & SONS. Westminster.—Vincent-sq., ut. 554 yrs., g.r. 11l., yr. 68l.'

Table of advertisements and notices including 'January 26.—By MAY & PHILPOT. Streatham.—106 to 120 (even), Wellfield-rd., ut. 63 yrs., cr. 42l. 16s. 300l.' and 'CONTRACTIONS used in these lists.—F.R.G. for freehold ground-ten; L.G.R. for leasehold ground-ten; I.G.R. for improved ground-ten; G.R. for ground-ten; R. for rent; L. for freehold; C. for copyhold; L. for leasehold; P. for possession; etc.'

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MEETINGS. 'FRIDAY, FEBRUARY 2. Junior Institution of Engineers.—Mr. K. Edgcombe on "Some Recent Electrical Engineering Measuring Instruments." 8 p.m.'

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Seventh General Meeting (Ordinary) of the Session. (1) To announce the names of the persons the Council propose to submit as a fit recipient of the Royal Gold Medal, 1905; (2) The President, Mr. John Belcher, A.R.A., to deliver an address to students; (3) Mr. J. W. Simpson to read a criticism of the works submitted for the prizes and studentships, 1905-6; (4) presentation of prizes by the President, 8 p.m.'

Table of notices including 'WEDNESDAY, FEBRUARY 7. Society of Arts.—Mr. Leon Gastor on "Progress in Electric Lighting." 8 p.m.' and 'FRIDAY, FEBRUARY 9. Royal Institution.—Mr. H. P. Newall, M.A., F.R.S., on "Electric Problems and Observations." 9 p.m.'

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

PRICES CURRENT OF MATERIALS.

Table listing prices of materials including 'BRICKS, &c. s. d. Hard Stocks..... 1 7 0 per 1000 alongside, in river. Rough Stocks and Grizzles " 1 4 0 " " " Facing Stocks " 1 16 0 " " " Shippers " 2 0 0 " " " Flintstones " 1 5 6 " " " at railway depot. Red Wire Cut " 11 11 0 " " " Best Fareham Red 3 12 0 " " " Best Red Pressed " 5 0 0 " " " Best Blue Pressed Staffordshire " 4 1 0 " " " Do. Bullnose " 4 6 6 " " " Best Stourbridge Fire Bricks " 3 15 6 " " " GLAZED BRICKS. Best White and Ivory Glazed Stretchers..... 12 0 0 " " " Headers " 11 0 0 " " " Quoins, Bulnose, and Flats " 16 0 0 " " " Double Stretchers 19 0 0 " " " Double Headers " 16 0 0 " " " One Side and two Ends " 19 0 0 " " " Two Sides and one End " 20 0 0 " " " Splays, Chamfered, Squints, 20 0 0 " " " Best Dipped Salt Glazed Stretchers and Header 12 0 0 " " " Quoins, Bulnose, and Flats 14 0 0 " " " Double Stretchers 15 0 0 " " " Double Headers " 14 0 0 " " " One Side and two Ends " 15 0 0 " " " Two Sides and one End " 15 0 0 " " " Splays, Chamfered, Squints, 14 0 0 " " " Second Quality White and Dipped Salt Glazed " 2 0 0 " " " less than best. s. d. Thames and Pit Sand " 6 9 per yard, delivered. Thames Ballast " 5 3 " " " Best Portland Cement " 26 0 per ton, " Best Ground Blue Lime 19 0 " " " Note.—The common lime is exclusive of the ordinary charge for sacks. Grey Stone Lime " 11s. 0d. per yard, delivered. Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

Table listing stone products such as Bath Stone, Portland Stone, and Ancaster in blocks, with prices per cubic foot.

YORK STONE—Bolin Head Quality.

Table listing York Stone products including scappled random blocks and sawn two sides landings.

HARDY YONG—

Table listing Hardy Yong products including scappled random blocks and sawn two sides landings.

Hopton Wood (Hard Bed) in blocks 2 0 per ft. cube, deliv. rly. depôt.

Table listing Hopton Wood products including sawn both sides random slabs.

SLATES.

Table listing various slate products with prices per 1000 or per square foot.

TILES.

Table listing various tile products including plain red roofing tiles, best mosaic tiles, and ornamental tiles.

WOOD.

Table listing various wood products including deals, battens, and planks with prices per standard unit.

WOOD (continued).

Large table listing various wood products such as White Sea, Pitch-pine, and various types of deal and pine, with prices per standard unit.

JOISTS, GIRDEBS, &c.

Table listing joists and girders with prices per ton in London and per standard unit.

IRON—

Table listing various iron products including common bars, Staffordshire crown bars, and sheet iron.

LEAD, &c. (continued).

Table listing lead products such as sheet lead, pipe in coils, and zinc sheet.

LEAD, &c. (continued).

Table listing copper and brass products with prices per standard unit.

ENGLISH SHEET GLASS IN CBATES.

Table listing English sheet glass products in various sizes and quantities.

OILS, &c.

Table listing various oil products including raw linseed oil, turpentine, and kerosene.

VAENISHES, &c.

Table listing various varnish products with prices per gallon.

PUBLISHER'S NOTICES.

Not. Tel. 612, Gerrard. Telegrams, "The Builder, London." THE INDEX (with TITLE-PAGE) for VOLUME LXXXIX...

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER GOVERNMENTS...

PERPAYMENT IS ABSOLUTELY NECESSARY.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY...

ADVERTISERS IN "THE BUILDER" may have Replies addressed to the Office, Catherine Street, Covent Garden, W.C.

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List of Contracts, etc.

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Dates to be delivered
*DESIGNS FOR FREE PUBLIC LIBRARY	Sradhucote U.D.C.	25l. 15s. 10d.	Mar. 21
*DESIGNS FOR COLLEGE BUILDINGS	University College of N. Wales	Not stated	No date.

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Work in Connection with Drainage, Workhouse, Withington	Charlton Guardians	C. Clegh & Sons, Architects, 21, Spring-gardens, Manchester	Feb. 6
Street Works (for one year)	Cardiff Corporation	W. Harpur, City Engineer, Town Hall, Cardiff	do.
Stone for Highway Repairs	do.	do.	do.
Stores	do.	do.	do.
Paints and Glazes	do.	do.	do.
Portland Cement	do.	do.	do.
Improvement of Ventilation, Arthur's-hill School	Newcastle-on-T. Educ. Com.	A. Goddard, Educn. Offices, Northumberland-rd., Newcastle	do.
500 Tons of Macadam	Aldershot U.D.C.	F. C. Urea, Surveyor, Municipal-building, Aldershot	do.
140 local yds. of Stone Wall, Abbey-street	Bancor U.D.C.	J. Milliken, Town Hall, Bancor	do.
Painting Two Chapels and Lodge at Cemetery	Wortley Rural Board	E. Kirk, Cemetery Lodge, Wortley, Leeds	do.
Stores and Materials	Birkenhead Corporation	B. Brownriggs, Borough Engg. & Sur., Town Hall, Birkenhead	Feb. 7
Coal Stages at Hartlepool	N.E. Railway Co.	W. Bell, Architect, Central Station, Newcastle-on-Tyne	do.
Stables and Bollock-houses	Bucksaleigh Co-oper. Society	A. Warren, Architect, Fore-street, Bucksaleigh	do.
High Pressure Steam Disinfecter, Croydon-road	Pence U.D.C.	W. J. King, Clerk, Town Hall, Gravesend	do.
Steel Bull-headed Rails and Fish Plates	East India Railway Co.	C. W. Young, Sec., Nicholas-lane, London, E.C.	do.
400 tons of Cornish Basalt or Penmaenau Spalls	Woolwich Guardians	T. Cutler, Clerk, Union Offices, Woolwich	do.
Paving and Flagging Streets	Gravesend, etc., Guardians	Leeds Corporation	do.
Stoneware Pipe Sewers at Trearlaw, Penryn, etc.	Rhondda U.D.C.	Surveyor's Office, Council Offices, Pentra, Rhondda	Feb. 8
Taking Down and Rebuilding Chapel, Ton, Pentre	do.	T. A. Thomas, Ton Foundry, Rhondda Valley	do.
Girdler Bridges	Assau-Benul Railway Co.	E. H. Parkinson, Architect, Queensgate-chambers, Bradford	do.
Chapel and Schools, Shearbridge-road, Bradford	Trustees late Mannville Chapel	Horace Porter, Surveyor, 16, Russell-square, W.C.	do.
*ROADMARKING, ETC., WORKS	Tristees R. Cloudeley's Char.	Borough Surveyor, Municipal Offices, Kingston-on-Thames	do.
Bulton Council School	Warrington Education Com.	J. E. Wright, Garnett, & Wright, 45, Sankey-st., Warrington	Feb. 9
Granite and Slag	East Retford E.D.C.	T. Henry, Surveyor, Retford	do.
3,500 sq. yds. of Tar Paving	Paddington U.D.C.	M. Hansworth, Surveyor, Elmfield House, Paddington	Feb. 10
Granite	Building Guardians	H. A. Mullens, Clerk, Bulcamp, Halesworth	do.
2,000 cubic yds. of Heavy Retaining Walls, Gyllifellon	Pontypridd U.D.C.	P. R. A. Willoughby, Engineer, Council Offices, Pontypridd	Feb. 12
280 cubic yds. of Heavy Retaining Wall, etc.	do.	do.	do.
House Drainage Work (twelve months)	do.	do.	do.
Ventilating Grids and other Castings	Manchester Corporation	H. Prescott, Manager, House Drainage Depart., Manchester	do.
1,200 tons of Broken Granite	Downham E.D.C.	H. Wayman, Clerk, Union Offices, Downham Market	do.
2,000 yds. of Broken Gravel	do.	do.	do.
Team Labour	do.	do.	do.
Stores	do.	do.	do.
Improvements in South-street and Tay-street	Salford Tramways Committee	General Manager, 32, Blackfriars-street, Salford	do.
Elm-grove Mixed School, Wellington-street	Perth Town Council	R. McKillop, Borough Surveyor, 12, Tay-street, Perth	do.
Furniture for Public Offices	Brighton Education Com.	T. Simpson & Son, Architects, 16 and 17, Ship-st., Brighton	do.
Steam Generator	Pontypridd U.D.C.	L. W. Woodman, Borough Electrical Engineer, Dover	do.
Hardwood Paving Blocks	Dover Corporation	L. W. Woodman, Borough Electrical Engineer, Dover	do.
*WORKS AND MATERIALS	Blackpool Highway Com.	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool	do.
*ANNUAL CONTRACTS	St. Pancras Borough Council	Borough Engineer, Town Hall, Pancras-road, N.W.	do.
Taking Down and Rebuilding Bowland Bridge, Hutton	Hendon U.D.C.	Council's Sur., Council's Office, The Burroughs, Hendon, N.W.	do.
Widening Beelyford (Hundred) Bridge, Hutton	Lockerbie District Committee	Mr. Paterson, Road Surveyor, Boatcreek	Feb. 13
Widening Beelyford South (County) Bridge	Main Roads and Bridges Com.	W. C. Hall, County Bridgmaster, Preston	do.
Rebuilding Peppermint (County) Bridge, Butterworth	do.	do.	do.
Road Repairs, West-lane, Baldon	Baldon U.D.C.	T. Waddingham, Surveyor, Westgate, Baldon	do.
Granite and Slag	Pottersbury E.D.C.	J. B. Fairchild, Surveyor, Pottersbury, Stony Stratford	do.
275 tons of Steel Bridge Girders, etc.	Great Western Railway Co.	Engineer, Paddington Station, London	do.
Inclined Ropery Benches	Stockport Gas Committee	S. Meunier, Engineer, Portwood Gasworks, Stockport	do.
Highway Materials and Stoneware Pipes	Bexley U.D.C.	W. T. Howse, Surveyor, Council Offices, Bexley Heath	Feb. 14
Sanitary Annexes and Mortuary in Workhouse	North Dublin Guardians	J. O'Neill, Clerk, North Brunswick-street, Dublin	do.
Six Iron External Emergency Staircases	Bexley U.D.C.	W. T. Howse, Surveyor, Bexley Heath, Kent	do.
Granite, Flints, Pipes, etc.	Battersea Borough Council	W. M. Wilkins, Town Clerk, Battersea	do.
Stores, etc.	Wills County Council	G. S. Adye, Surveyor, Council Offices, Crowbridge	do.
School at Foxfield	Sub-committee for Nantwich	H. Beswick, County Architect, Newgate-street, Chester	do.
Alterations, etc., to School Buildings, Broomhall	Wortley R.D.C.	G. E. Beaumont, Surveyor, Grosedale, Sheffield	do.
Street Works, Sussex-road, Chapel-town	Thames Conservancy	Thames Conservancy Offices, Victoria Embankment, E.C.	do.
*LICENSES TO WORK SIX STEAM DREDGERS	Newport Guardians	Master of Workhouse, Stow Hill, Newport, Mon.	do.
Lift at Workhouse Infirmary, Stow Hill	Wolverhampton Borough Council	J. Rush Dixon, Borough Engineer, Town Hall, Wolverhampton	Feb. 15
Boat Material, Stores, etc.	Belper R.D.C.	S. R. Lowcock & Phelps, Engineers, 50, Queen Anne's-gate	do.
Sewerage Works, Duffield	Holesey E.C. Education Com.	G. D. Keeney, Architect, Bank-street-chambers, Lincoln	do.
Additions to School, West Halton, near Frodingham	East Retford Borough Council	W. Clifford, Sewage Works, Wolverhampton	do.
Line	Wolverhampton Sewer Com.	A. J. Ross, District Surveyor, Lutterworth	do.
Granite	Lutterworth R.D.C.	N. H. Davson, Borough Surveyor, Town Hall, Banbury	do.
Retubing House and Shop, High-street, Buntingford	Trustees Buntingford Churches	H. C. Marks, City Engineer, 36, Fisher-street, Carlisle	do.
Small-pox Hospital, etc., at Belle Vue	Carlisle Corporation	H. C. Marks, City Engineer, 36, Fisher-street, Carlisle	do.
Alterations and Additions to Ystrad Mynach Parish Church	Rev. H. Thomas	E. M. Bruce Vaughan, F.R.I.B.A., Cardiff	do.
Three Pairs of Attendants' Cottages, Asy. Est., near Charnham	Visiting Com. Duresh Asy.	W. J. Fletcher, F.R.I.B.A., Wimborne	do.
Small Covered Service Reservoir, Logtostone	Chelmsford R.D.C.	J. Dewhurst, Engineer, Market-road, Chelmsford	do.
Road Material	Horncastle E.D.C.	J. E. Chatterton, Council Offices, Horncastle	Feb. 16
*CONVENIENCES FOR CHILDREN, SOUTHWALK PARK	London County Council	Architect's Department, 15, Pall Mall East, S.W.	do.
Hartshill Stone	Richmond (Surrey) Town Council	N. H. Davson, Borough Surveyor, Town Hall, Banbury	do.
*WORKS AND MATERIALS	Banbury Town Council	Borough Engineer, 15, Great Aile-street, Whitechapel, E.	Feb. 17
Paving, Flagging, etc.	Stepney Borough Council	City Surveyor's Office, Town Hall, Bradford	do.
Materials, etc.	Bradford Corporation	J. H. Brierley, Borough Surveyor, Town Hall, Richmond	do.
Painting, etc., Interior of Infirmary Annex, Macclesfield	Richmond (Surrey) Town Council	City of Axdam, Parkside Asylum, Macclesfield	do.
Distinct Road Repair	Committee of Visitors	Clerk of Axdam, Parkside Asylum, Macclesfield	do.
*ADDITIONS, ETC., TO SCHOOL, ST. ALBANS	Cerne R.D.C.	A. E. A. Cole, Clerk, Cerne Abbas	do.
*ENLARGEMENT OF WORCESTER HEAD POST-OFFICE	Herts County Council	Herts County Surveyor, Hatfield	do.
Reservoir in Cwm Dimbath, near Blackmill	Comms. of H.M. Works, etc.	H. M. Office of Works, Storey Gate, Newport, Mon.	Feb. 20
In-lieu Concrete to Footways and Back Streets	Garw Water Co.	T. Rees, Engineer, Con. Exchange-chambers, Newport, Mon.	do.
4,300 yds. of Flints	South Shields Corporation	S. E. Burgess, Borough Eng., Chapter-row, South Shields	Feb. 21
1,930 yds. of Quartzite, Kentish Rag, Mendip Stone	Charley R.D.C.	C. Patrick, Clerk, Union Offices, West-street, Lewis	do.
24,000 Tons of Granite	do.	do.	do.
Painting, Glazing, etc., Dublin	Bucks Highways Committee	R. J. Thomas, County Surveyor, Aylesbury	do.
One 800 H.P. Horizontal Steam Turbo-alternator	Board of Public Works	H. Williams, Secretary, Office of Public Works, Dublin	Feb. 22
Holmer School for 200 Infants	Sharnford Municipal Council	Sharnford Municipal Council	do.
Making up Roads	Hereford Education Authority	J. Parker, City Surveyor, Town Hall, Hereford	Feb. 23
	Southall-Newton U.D.C.	R. Brown, Engineer, Public Offices, Southall	Feb. 27

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
60 lineal yds. of Road, etc., Hillside Park Estate, Woolton	Carryduff Presbyterian Church	P. Davies, 8, Cook-street, Liverpool	No date.
Additions to Works near Lynn	Dublin Corporation	N. Fitzmaurice, Architect, 13, Lombard-street, Belfast	do.
Electric Lighting of Offices, Yards, etc., at Wood Quay	Staffs. County Council	W. Jarvis & Son, Paradise-parade, Lynn	do.
EXTENSIONS AT CHELLETON ASYLUM	The Governors	City Electrical Engineer, Fleet-street, Dublin	do.
NEW GRAMMAR SCHOOL BUILDINGS, BRENTWOOD	Staffs. C.C. Education Com.	Giles, Gough, & Trollope, 28, Craven-st., Charing Cross, W.C.	do.
INFANTS' SCHOOL AT GLYNNE	Essex Education Committee	Chancellor & Son, Architects, Chelmsford	do.
HIGH SCHOOL FOR GIRLS, CHELMSFORD	Univ. Coll. of South Wales, etc.	G. Balfour, Director of Education, Stafford	do.
SUPERSTRUCTURE OF NEW COLLEGE BLDGS., CARDIFF		F. Wykeham Chancellor, Architect, Chelmsford	do.
		The Registrar, University College, Cardiff	do.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
DIRECTOR OF INDUSTRIAL ARTS CLASSES	Glasgow, etc., Technical Coll.	1200. per annum	Feb. 23

AUCTION SALES.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
DEAIS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sim	Feb. 7
MACHINERY, BUILDER'S STOCK AND PLANT—Bridge House Works, East Molesey	Humber & Flint	Feb. 7, etc.
STOCK OF TIMBER MERCHANT—391, Battersea Park-road, S.W.	Harold Griffin	do.
FREEHOLD BUILDING SITE, WHITECHAPEL—At the Mart	C. G. & T. Moore	Feb. 8
TIMBER AND MATERIALS—R. & E. L. Show Ground, Park Royal, Willesden, London	Joshua Baker, Cooke, & Stauden	Feb. 8, etc.
FREEHOLD PROPERTY, CITY OF LONDON—At the Mart	David Burnett & Co.	Feb. 21
CONTRACTOR'S PLANT AND MACHINERY—At Sunbury-road, Hanworth, Middlesex	Fuller, Horsey, Sons, & Cassell	Feb. 21
BUILDING SITE, HAYMARKET, S.W.	Hay & Rowden	Mar. 29

* Those with an asterisk are advertised in this number: Competitions iv.; Contracts, lv. vi. viii. x.; Public Appointments, xix.; Auction Sales, xxxii.

TENDERS.

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

* Denotes accepted. † Denotes provisionally accepted.

ANFIELD PLAIN.—For erecting cart shed, oil house, stable, horse box, etc., at Langley Park Branch, for the Co-operative Society. Mr. G. T. Wilson, architect, 22, Durham-road, Blackhill, Co. Durham:—
E. Lodge £557 0
J. Robson 725 0
E. Butler & Sons 708 0

BEOCKENHAM.—For erecting a school for defective children with rookery classes, the Arthur-road School, for the Urban District Council. Mr. John A. Angell, Surveyor, Beekenhall—
Wright & E. Nightingale £1,990 0
Emmott Bros. 2,193 0
Hall & Jacobs 2,152 8
H. Hesthfield 2,070 0
Wallis & Sons 1,956 0
Ltd. 2,043 0
F. W. Green, 1,994 15
J. Smith & Sons, Ltd. 1,903 0

CARDIFF.—For erecting new Sunday schoolroom, Fitzhugh-embankment, for Rev. H. A. Coe, Mr. A. Groves, architect, 15, Clifford-st., London:—
G. Beames £1,175 0
McMush Bros. 1,097 0
J. S. Shepton 1,043 10
G. Hallett 1,020 0
J. Gibson 880 0
D. Davies & Sons 650 0

FOLKESTONE.—For constructing a shelter, with ladies and gentlemen's conveniences in the Marine Gardens, for the Corporation. Mr. A. E. Nichols, Borough Engineer, Corporation Offices, Folkestone:—
S. T. Binfield £2,378

FOREST HILL.—For new sorting-office:—
W. A. Coombs £3,482 0
F. W. Green 3,000 0
T. R. Roberts & Co. 3,228 0
A. Black & Son 3,119 0
W. Mills 2,995 0
J. Garrett & Son 2,940 0
H. Loney & Son 2,840 0
J. D. Ling 2,800 0
J. E. Saunders 2,774 0
J. H. Groves 2,766 0
J. S. Shepton 2,758 0
J. & C. Boyter 2,739 0

FORDOUN (Scotland).—For erecting hall and janitor's house at Fordoun public school. Mr. G. Gregory, architect, Stonehaven:—
Masonry: J. Murray, Stonehaven } £744 12 6
Carpentry: A. Hendry, Auchincloch }
Slating: J. Lindsay & Son, Montrose }
Plumbing: R. & W. Peter, Bervie }
Plastering: A. Clark, Bervie }

GOSPORT.—For bathrooms and hot-water works at Workhouse Park-road, for Alverstoke Guardians. Mr. H. A. F. Smith, architect and surveyor, Star-chambers, Gosport. Quantities by architect:—
C. Wright £361 0 0
Southey, Ltd. 298 0 0
R. W. Lowe 397 0 0
J. Hunt 390 15 0
R. M. Middle 350 0 0

GRIMSBY.—For erecting a house on the Scarth-road. Mr. E. Goodhand, architect, Osborne-chambers. Grimsby:—
R. G. Kitching £520
J. H. Thompson & Sons 486
G. & J. Smith 478

KEHELLAND (Cornwall).—For erecting a Sunday Schoolroom, etc., at Khehelland, Camborne. Mr. Edwin H. Crispin, architect, Trevelyan-road, Camborne:—
Ford & Son, masons £260
S. Richards, carpenter £346
J. Berryman 350
Ireland & Jory 320
W. Richards 265

LONDON.—For making-up, etc., roadway in front of Nos. 1 to 11, Carlow-gardens, Carlton House Estate, Horse Hill, S.E. Mr. H. E. G. S. Smallman, architect, 8, Queen-street, Cheapside, E.C.:—
Hoffman £609 18 2
J. Tremaine 538 0
S. Kavanagh & Co. 497 0
T. Robinson 479 10
W. Neave & Son 468 0
J. Shelbourne & Co. 405 0
H. Woodham & Sons 393 0
E. Hes, Senr. 377 0

LONDON.—For the construction of additional staging at Belgrave Wharf, Westminster, for the Westminster City Council:—
T. Coultard £214 0
Wright & Son 194 15
Love & Co. 188 10

LONDON.—For means of escape in case of fire at the Upton House Training school, Hackney, S., and the erection of a manual training room for sixteen boys, for the London County Council:—
E. Lawrence & Sons 2,845
L. H. & R. Roberts 844
W. Lawrence & Son 824
C. R. Price 815
J. Stewart 780
J. Grover & Son 777

LONDON.—For the construction of workmen's dwellings on the site of Nos. 20, 21, 22, and 23, Marshall-street, Westminster, for the Westminster City Council:—
Sabsy & Son, Ltd. £3,700
Plastering £540
J. Bickley* £540

LONDON.—For constructing an iron and slate roof over part of the yard at the Destructor Depot, Georgian-street, Camden Town, for St. Pancras Borough Council. Mr. W. N. Blair, Borough Engineer and Surveyor:—
W. Taylor & Co., Lower Mall, Hammersmith, W.* £471

LONDON.—For erection of new Wesleyan East-end Mission Centre, Commercial-road, Stepney, E. Mr. W. Weir, Burrows, & Weir, architects and surveyors, 17, Victoria-street, Westminster:—
Portland Stone. Shop Fronts.
T. Pader & Son £35,056
G. Trollop & Sons 33,100
Colls & Sons, Ltd. 560
F. G. Minter 32,687
J. Canfield 32,648
W. Johnson & Co. 32,308
G. Parker 31,387

LONDON.—For road-making, etc., Adley-street, for Hackney Borough Council. Mr. N. Scorgie, Borough Engineer and Surveyor, Town Hall, Hackney:—
A. T. Catley £278 0 6
W. Griffiths & Co., Ltd. 267 6 4
G. Porter, 2, Arthur-street, Well-street, Hackney, N.E.* 261 15 7

LONDON.—For repairing the yard at the Clerkenwell fire-station, for the London County Council:—
G. W. Killingsback & Co. £210 16 0
J. Mowlem & Co., Ltd. 207 0 0
G. Wimpsey & Co. 168 0 0
J. A. Sward 162 0 0
W. Griffiths & Co., Ltd. 33-9, Hamilton House, Bishopsgate-st. Without, E.C.* 157 15 9

LONDON.—For the supply and delivery of an overhead traveller required at Falcon Brook pumping-station, for the London County Council:—
J. M. Henderson & Co. £330 0
T. Smith & Sons, Rodley, near Leeds* 300 0
J. Booth & Bros., Ltd. 257 10

LONDON.—For the execution of the roadway and playtlaying in connexion with the construction for the underground conduit system of electrical traction of the authorised tramways from Camberwell-green, via Denmark-hill, Champlon-park, Grove-lane, Dog Kennel-hill, Grove-lane, and Lordship-lane, to the junction of Lordship-lane and Crystal Palace-road, for the London County Council:—
W. Griffiths & Co., Ltd. £92,584 14 5
J. G. Ware & Co., Ltd. 92,460 3 4
Muirhead, Greig, & Mathew 89,992 10 10
Dick, Kerr, & Co., Ltd. 89,663 3 3
J. Mowlem & Co., Ltd. 86,548 0 0
A. Krauss & Son 84,978 7 0
R. W. Blackwell & Co., Ltd., London* 82,620 11 11

MERTON.—For constructing roads and sewers on the Merton Abbey Estate. Mr. H. R. G. S. Smallman, architect, 8, Queen-street, Chesham, E.C.:

Table with columns: Roads and Sewers, Old Materials, Net Total. Lists contractors like Wallace & Lums, Hewett & Sons, W. A. Sheppard, etc., with their respective costs.

† Withdrawn.

NEWCASTLE-UPON-TYNE.—For new pavilion, nurses' home, etc., at City Hospital for Infectious Diseases, Walker-gate, for the Sanitary Committee. Mr. F. H. Balfour, City Architect, Town Hall, Newcastle-upon-Tyne. Quantities by Mr. J. Parrell Allen, 21, Cranage-street West, Newcastle-upon-Tyne:

Table listing contractors and their costs for the Newcastle-upon-Tyne project, including W. Hall, Glen & Moffett, W. Ross, etc.

PRESTON.—For levelling, paving, flagging, channeling, etc., Lincoln-street from Barling-street to Peel Hall-street, for the Corporation. Mr. Thomas Cookson, Borough Surveyor, Preston. Quantities by architect—

Table listing contractors and their costs for the Preston project, including J. Mexham & Sons, Preston.

RIVER.—For erecting an infants' school at Common-lane, for the Dover Town Council. Mr. H. E. Stilgou, M.Inst.C.E., Malson Dieu House, Biggin-street, Dover:—

Table listing contractors and their costs for the infants' school project, including J. S. Overton, J. Moran, etc.

SHEPHE.—For the construction of about 4,800 lineal yds. of 12-in., 9-in., and 6-in. earthenware pipe sewers, with the necessary manholes, lamp-poles, ventilators, flushing valves, and storm overflows connected therewith, also for the receiving, sedimentation, and sand tanks, percolating and storm filters, sludge areas, storehouses, road to works, boundary walls, etc., for the Urban District Council. Messrs. J. Drake & Son, engineers, Queensbury, near Bradford:—

Table listing contractors and their costs for the Shephey project, including F. Robinson & Son, Thornton, Bradford.

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The Builder.

VOL. XC.—No. 3283.

FEBRUARY 10, 1906.

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Terra-Cotta Panels, Ingram House.....	Modelled by Mr. Broad.
Pulpit, San Miniato, Florence.....	Drawn by Mr. Lionel U. Grass.
Design for Torquay Municipal Offices.....	By Messrs. Harris & Towse.
House at Massingham, Norfolk.....	Messrs. Wimperis & Best, Architects.
Christ Church Vicarage, Hampstead.....	Mr. A. Maryon Watson, A.R.I.B.A., Architect.

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Mr. Holman Hunt and Pre-Raphaelitism.



It is quite fair to the present generation to say, as Mr. Hunt does in the opening words of his preface—"Art is generally regarded as a light and irresponsible pursuit,

entailing for its misuse no penalty to the artist or to the nation of which he is a citizen." Among fairly intelligent persons at the present day, we think it is understood that art is a pursuit requiring very arduous study, and which is serious in its aims, and a person who maintained the contrary would be thought uneducated. The indictment was no doubt true when Mr. Hunt's career began, but English society has learned something since then. The words however furnish in a way the keynote of the book, which is a record of serious study, one might say struggle, after the attainment of an artist's ideals. A second question is, why was it entitled "Pre-Raphaelitism and the Pre-Raphaelite Brotherhood"? One object of the author, we gather, was to remove some popular misconceptions as to the real origin and the real aims of the Pre-Raphaelite Brotherhood, and in particular to upset what were supposed to be Rossetti's claims to have been the founder of the sect; in regard to which it may at once be said that whether or not Rossetti was the initiator of the movement, his pictures (all but the

earliest) show conclusively that he very soon deserted its standard. But though this subject occupies a few pages here and there, in rather a desultory manner, the book is essentially the autobiography of a painter, and in that sense a most interesting one, as the record of the life-work of one with whom art was nothing if not serious, and who spared no labour and sacrifice to attain his ideals.

Considering the title of the book,* however, we may turn first to the chapter in which the subject is first formally introduced. It may be thought by some that Pre-Raphaelitism is "ancient history" now, but the movement left its mark on English painting too decisively to allow it to be forgotten, besides that it influenced the author of this book throughout the whole of his life's work. The first reference to the expression occurs in the previous chapter, where it seems to have been used in joke by a fellow student after Mr. Hunt and Millais had been, though not irreverently, condemning Raphael's "Transfiguration" "for its grandiose disregard of the simplicity of truth, the pompous posturing of the Apostles, and the unspiritual attitudinising of the Saviour," and agreed that this picture was a signal step in the decadence of Italian art: to which their companions replied, "Then you are Pre-Raphaelite. Millais and I laughingly agreed that the designation must be accepted." But, as it is explained in the following chapter, Pre-Raphaelitism is not Pre-Raphaelism. Raphael in his prime

* "Pre-Raphaelitism and the Pre-Raphaelite Brotherhood." By W. Holman Hunt, O.M., D.C.L. London: Macmillan & Co. 1905.

was an artist of the most independent and daring course as to conventions." The author's view is that the prodigality of Raphael's productiveness, and his training of many assistants, compelled him to lay down rules and manners of work, and his followers accentuated his poses into postures.

"They caricatured the turns of his heads and the lines of his limbs, so that figures were drawn in patterns; they twisted companies of men into pyramids, and placed them like pieces on the chess-board of the foreground. The master himself, at the last, was not exempt from furnishing examples of such conventionalities. Whoever were the transgressors, the artists who thus servilely travestied this prince of painters at his prime were Raphaelites. And although certain rare geniuses since then have dared to burst the fetters forged in Raphael's decline, I here venture to repeat, what we said in the days of our youth, that the traditions that went on through the Bolognese Academy, which were introduced at the foundation of all later schools and enforced by Le Brun, Du Fresnoy, Raphael Mengs, and Sir Joshua Reynolds, to our own time, were lethal in their influence, tending to stifle the breath of design. The name Pre-Raphaelite excludes the influence of such corrupters of perfection, even though Raphael, by reason of some of his works, be in the list, while it accepts that of his more sincere forerunners."

The object of the Pre-Raphaelite Brotherhood was to get behind this conventional posturing and to base everything on the study of Nature; and hence Mr. Hunt says he objected to the habit Rossetti had contracted of speaking of their new principles of art as "Early Christian." There was not to be, in his opinion, any profession of antiquarianism; the principle was to go to the study of nature instead of adopting classical conventionalisms. It was on this head that the Brotherhood considered that they were persistently misunderstood and misrepresented in the press; they were taunted with taking their models

in art from a period when execution was imperfect, and were told that the greatest and best teachers were those who painted when the mastery of the technique of art was complete. The criticism was true in the abstract; it was absolutely misapplied with regard to much at all events of the work of the Brotherhood. The odd thing is that Rossetti's "Annunciation," one of the few Pre-Raphaelite pictures which received favourable notice from the first, really did give countenance to this view, and is a picture which might justly be considered to represent, in Rossetti's own words, "early Christian art"; it has the naïveté and childlike character of that art, both in its conception and in its rather stiff drawing. Millais' "Isabella" and "Christ in the House of his Parents," on the other hand (as we can all see now), had nothing whatever to do with either early Christian art or immature technique; they were works of a master in drawing; their sin, to the critics of the time was, that they represented a simple naturalistic treatment, figures just as they might be in every-day life, of a class of subjects which that generation had been accustomed to see treated in a conventional manner of composition. The "Isabella" especially was the result of an endeavour to show the characters, costumes, and expressions of the dinner company as they might have been in reality. It can still be seen to be a little too flat in its aerial perspective, the background figures come up to the front plane a little too much, in a way in which Millais would not have painted them in later life; a result of the desire to neglect nothing, to make every figure a complete study; for it was against slackness of execution that the Brotherhood also took up arms, and not without good reason. Millais' "Christ in the Home of his Parents," as it is now called, is also a picture entirely free from antiquarianism; it represents the best possible execution of a painter who was to become, if he was not already, the greatest of his day; it is one of his works now most admired by artists especially, who can fully understand the technical mastery displayed in it; that it is "Pre-Raphaelite" in the sense of resembling the works of Raphael's predecessors there is not a pretence for maintaining. But no production of the Brotherhood excited such fierce outcries as this picture. It was stigmatised as "mean, odious, and revolting." It is surprising that even those who were supposed to be art-critics do not appear to have recognised its beautiful technique. But from another point of view the outcry against it was not only not so surprising, it was not without reason. The original title, "Wounded in the House of my Friends," had probably a good deal to do with this. It was felt that the painter had taken a poetical and symbolical sentence from one of the prophets, supposed by the biblical criticism of the day to refer to Christ, and had reduced it to the plain prose of an accident with a carpenter's tool. There was reason in the outcry, though it was expressed in too violent language. A great ideal had been reduced to the most matter-of-fact prose of every-day life. Even now, with the more sober title

which does not appeal to an ideal, does it add anything to our conception of the childhood of Christ? It is a beautifully composed and executed genre picture, with a little touch of domestic pathos in it; that is all. And this consideration touches on the whole question of the pictorial treatment of the story of Christianity. Ruskin was contemptuous about the unreality of Raphael's picture of "Christ's Charge to Peter," and its total want of agreement with the facts of the fishermen's life of the apostles. The answer is that the subject was regarded by Raphael as one which had become a great symbolical church legend, and he treated it symbolically, and made it thereby a greater and more elevated subject for painting than it could ever have been if treated realistically. Millais, by his picture, coupled with its original title, flew in the face of the whole religious feeling of his day, which regarded the life of Christ as a sacred mystery; he reduced it from the ideal to the commonplace (as far as the conception of his picture went); and the outcry against it, from that point of view, was not by any means so unreasonable as the painter and his friends supposed.

The point is of importance in connexion with the work of Mr. Hunt in his search in the Holy Land for materials for realising the life of Christ in painting, which is described in so picturesque a manner and is such interesting reading. No one can feel anything but respect, almost reverence, for a painter who took his art in so serious and thorough a spirit as to undergo all the discomforts which he subjected himself to in the effort to obtain studies which would render his work more perfect according to the ideal he had before him; not only discomforts, but on several occasions serious danger of violent death at the hands of lawless Arabs and other marauders of the waste—dangers only escaped on one or two occasions by his own resource, courage, and coolness. To say that this portion of his autobiography has all the interest of a novel is, in fact, to pay rather too high a compliment to the ordinary run of novels. At a time when pictures are supposed too often to be things to be dashed off under a facile inspiration of "impression," this self-sacrifice and labour to achieve perfection and truth is a quality to be held up to admiration as an example to younger artists. Paintings worked at in this spirit are likely to live, for their technical qualities at all events; and time is not wasted in obtaining realism of surroundings and local colour; they are so much help towards truth of effect. The note of questioning comes in when we think, not of the accessories but of the main object of the painter. Mr. Hunt wished, in a thoroughly earnest and reverent spirit—of that there can be no kind of doubt—to make his art a medium for bringing the life of Christ more fully home to us. The correctness of the surroundings assists towards this, no doubt; but the main thing after all is the conception of the sacred personage in the story; and for that what is needed is not realism but imagination. To find a Syrian model and paint him with the most careful realism helps us little. Does the principal figure in "The Shadow

of the Cross" help us in any way towards a perception of the personality of Christ? Surely not; we should be inclined to add, we hope not. The real beauty of that picture is the figure of the kneeling woman, so admirable in its lines; but it is the only element of beauty in the picture; and then the symbolism of the shadow, and still more that of the "instruments of the passion," as they are called in ecclesiastical language—represented by the tools hanging on the wall, is (if we may be pardoned for saying so) such a poor and perilous kind of symbolism, so far inferior in its nature to the abstract symbolism of Raphael's "Charge to Peter" before referred to. Fortunately there are other and more satisfactory results from Mr. Hunt's labours in Palestine; the "Finding in the Temple" is a masterpiece, but it is so not on account of any probability that the figure portrayed resembles what the youthful Christ may have been, but because of the masterly drawing, composition, and character of the central group; it is a successful and powerful work of art, and "The Shadow of the Cross," whatever its religious intention, is not.

It is singular to consider, in contrast with these efforts after realism, that what has been certainly Mr. Hunt's most popular religious picture, "The Light of the World," is a purely symbolic one: though here again some part of the symbolism—i.e., the different shapes of the openings in the lantern, which (so we are told) are to suggest that spiritual light comes into the world in different shapes though from the same source—is of a rather childish order; and what is the artistic value of a symbolism that requires explaining? The text which has been popularly attached to the picture, "Behold, I stand at the door and knock," which it is understood that the painter did not intend, and objected to, really gave the picture a much broader and better symbolism than the rather far-fetched one of the lantern. One great value of the original picture, the unhappy destruction of which through carelessness is described in the book, was in its remarkable colour; the robe of the figure especially was one of those inspirations in colour which it is impossible to define in words. In its religious aspect we have always thought the work over-rated, and still more do we think so of "The Scapegoat," a most remarkable piece of painting, especially in the distant hills; as a picture of desolation it is admirable; but the popular ideas as to its spiritual significance are only suitable to amuse children with.*

As far as we can gather, it would appear that Mr. Hunt means us to understand that he more than any one else was the real originator of the Pre-Raphaelite movement, or he and Millais together, and that Rossetti was more an adherent than an originator. It is certain at all events that Rossetti very soon abandoned their principles of painting, and that Mr. Hunt is the only painter of note who has adhered to it resolutely throughout his career; so

* Last time we saw the picture exhibited (somewhere in Bond-street), we noticed with some surprise, in the case of a painter usually so accurate in detail, that the markings on the face of the moon are not represented correctly, and appear to be carelessly put in. It makes no difference to the picture, of course, as a whole, but we were surprised to find this detail neglected.

that he furnishes to some extent a kind of test as to the permanent value of those principles in their influence on painting. One regards the result with rather mingled feelings. He is undoubtedly a great painter; the question is whether he would not have been a greater one had he somewhat relaxed the severity of the early Brotherhood tenets or practice. On the one hand painting of such conscientious and thorough finish must always have its value on that account, and can never appear common-place; on the other hand the expression of his subject is often marred by the hardness and want of balance arising from the effort to paint up everything to the same standard of finish. "The Awakened Conscience," for instance, is a powerful work in its main expression, and would in any case always compel interest from its extraordinary minuteness of realism of detail; but it can never be a pleasing picture; it is too hard and violent; every detail seems to fly in your face; the colour is harsh and inharmonious; and the design really looks much more attractive in a small black-and-white reproduction than in the "original" picture. In "Valentine and Silvia" there is real dramatic power, as also in "Clandio and Isabella"; the hardness of detail is less insistent in these, and they are admirable renderings of Shakespeare. The "Strayed Sheep" is a pride of execution which will be the pride of one collection or another as long as it lasts; and Mr. Hunt's pictures are so thoroughly painted and with such knowledge of his materials that they may be expected to last for centuries. Among his larger pictures it is pleasant to feel that the last one completed, "The Lady of Shalott," is perhaps the finest thing he has ever done; the detail, though exhaustively studied and full of meaning and interest, is not so fiercely insistent as in some of his earlier works, and the principal figure is beautiful and fully dominates the whole; it is a really great picture both in conception and execution.

Among the many interesting points to be noted in what, as we have said, is really an autobiography, one is the catholicity of Mr. Hunt's recognition of the merits of painters quite outside of the movement with which he was specially associated; a catholicity which contrasts agreeably with the narrow prejudices and jealousies of Rossetti, of which many examples turn up in the course of the book. Mr. Hunt can recognise fully what was noble and great in poor Haydon's aspirations and efforts. It was to Haydon, he says, that we owed the retention in our country of the Elgin marbles, and the Government invitation to English artists to compete in the decoration of the Houses of Parliament; it was he who originated the idea of the establishment of Schools of Design to improve the deteriorated taste of our manufacturers; "yet he received no sort of recompense or reward, though rewards were given to his adversaries." He has words of appreciation for what was admirable in the work of Landseer, Eddy, Leslie, and MacIse, artists so far removed from himself in principles and practice; and he praises (justly) the quality of "good common-sense" in Ward's "Dr. Johnson

at Lord Chesterfield's." "Many of the Royal Academy Associates of the time," Mr. Hunt observes, "have fallen into unmerited disregard, although their ingenuity in invention will not fail to be observed and appreciated when some of the travesties of art at present in vogue have been condemned as wearisome folly." These are much larger and more tolerant views than we have been accustomed to associate with the fellowship of the P-R. B., and we are heartily glad to find them put on record here. Of Mr. Hunt's life-long friend Millais there is much in the book that is of the greatest interest as to his personality and his ideas on art. It is noted of Millais as a youth, that "he dressed with exact conventionalism so as to avoid in any degree courting attention as a genius"; it would seem that Millais all his life was a gentleman first and a painter afterwards; he had no sympathy with Bohemianism. In the second volume there is a long record of a curiously frank declaration by Millais, late in his life, in defence of the changes in his own art. He did not agree with those who told him that if he painted for the passing fashion his reputation would be the less some centuries hence than if he painted more ambitious subjects of his own choosing. "A painter," he said, "must work for the taste of his own day. How does he know what people will like two or three hundred years hence? I maintain that a man should hold up the mirror to his own times. I want proof that the people of my day enjoy my work, and how can I get this better than by finding people willing to give me money for my productions, and that I win honours from contemporaries? What good will recognition of my labours hundreds of years hence do me? . . . I let the artists of the future work for the future, they will see what's wanted." And on another page—"Why, I have just sold a picture done in two weeks which will pay the expenses of all my family, my shooting and fishing too, for our whole time in Scotland." Dreadful, isn't it? But it was pretty much on the same principle that Titian worked, and does not seem to have wrecked himself with posterity. All this is given by Mr. Hunt without a protest; he obviously thought (and quite rightly) that any opinion of Millais on art was worth something to the world; and whether we agree with it or not, we are very glad to have it; it is the good, honest, healthy opinion of one who, both as man and artist, was healthy to the backbone.

Some expressions of opinion on the French art of fifty years ago, in the account of the author's visit to Paris with Rossetti, are of considerable interest. Delacroix was then the master most in vogue, but Mr. Hunt did not like him, and after years confirmed his impression. Flandrin's paintings in the Church of St. Germain des Prés he notes as admirable for their complete fulfilment of their artist's purpose; Ingres's "La Source" as a great picture notwithstanding its deadness of colour; of Millet he says that "the defect of grace in the figures he portrayed much marred the perfection of many of his designs," a judgment which will probably be the ultimately accepted one. More

interesting for the present moment is the author's summary, in the final chapter, of his opinions on Impressionists and Impressionism, and his indignant contempt for the noisy and almost obscene Bohemianism of some of the younger generation of French artists. "In England, whatever misleading spirit has exercised itself, no such corrupting influence has hitherto been poisoning the art-students' ideals." As to Impressionism as representing a paramount end in art, we may quote the following:—

"Many of the works classified by the public as Impressionist have no evidence of sober common sense; they are without perspective, correct form, or any signs of patient drilling and scholarship. They suggest suspicion that the workman never duly submitted himself to persistent tuition or patient practice, and not seldom on inquiry it will be found that he took up the pursuit of art so late in life as to prove that he had no natural call for her; and he covers his inability to conquer the besetting sins, which every tyro must eradicate from his unactivated disposition, by fine names and theories." And he concludes that such work is "a standing peril to honest and honourable art."

We have only been able to touch on a few of the points in a book which is full of interest to everyone interested in art, and which no one, whatever his views on the objects and principles of painting, can well lay down without a feeling of respect and gratitude to its author.

NOTES.

For years past controversy ^{The} Panama Canal, has raged around the question of the Panama Canal. Many schemes have been brought forward since the project of the French engineers was first formulated, but, speaking generally, all of these come into one of two categories, according as they provide for a sea-level or a lock canal. In itself a sea-level waterway is certainly preferable for very evident reasons, and the difference of level existing in the Atlantic and Pacific oceans does not present any practical difficulty. The chief objections to a canal of this kind are the heavy cost and the length of time required for construction. Americans are particularly anxious that the canal should be completed at the earliest possible moment and at the least possible cost. Consequently it is not surprising to learn that the recommendation of the International Commission in favour of a sea-level project has been virtually set aside by a second commission of American engineers appointed by Mr. Roosevelt. We do not yet know which of the several lock-canal schemes will be adopted. The decision of this point is a matter of some importance, as the merits of the projects vary to a considerable extent and their essential features differ with regard to the exact route to be followed, the height of summit level, the character of impounding dams for water supply, capital expenditure, and time for construction. The most recent proposals were those of Mr. Lindon Bates, which have already been briefly described in our columns, and as these were accompanied by a definite offer to construct the canal at a lower cost and in less time than would be possible under other published schemes, it is probable they will form the subject of careful inquiry.

The International Congress of Architects. IN connexion with the Seventh International Congress of Architects, to be held in the Grafton Galleries, London, in July next, there will be a chronological exhibition of English architecture from the Norman conquest to the death of Sir Charles Barry in 1860. In addition there will be shown a collection of oil-paintings and water-colour drawings by known painters, which treat of architectural subjects. Many of these are scattered throughout the country in private collections. It is hoped that all those who know the whereabouts in private collections of any such paintings or drawings will communicate with the secretary of the executive committee, the Institute of British Architects, 9, Conduit-street, London. Such an exhibition of purely British work should be made as representative as possible, in view of the forthcoming visit of numerous foreign architects.

British School at Athens. WE may draw the attention of our readers to the proposal of the British School at Athens, announced in a letter to the *Times* of Tuesday last by Mr. G. A. Macmillan, to undertake a systematic survey and archaeological exploration of the site of ancient Sparta. Excavations are to be made to ascertain the existence and extent of remains, their character and state of preservation, and what prospects are held out for excavation on a larger scale. Attention will be given also to the remains of the Frankish and Byzantine periods, which are numerous in the province of Laconia, and this portion of the work will be put under the direction of an architect, Mr. Ramsay Traquair, of Edinburgh. Funds are required to assist the management of the British School in this undertaking, which is on new ground, and may turn out to be of the greatest value and interest. We hope that those of our readers who can afford to contribute anything in assisting such a work will keep it in mind.

Powers of Tramway Authorities. A POINT of considerable importance has been decided in connexion with municipal tramways in the case of *The Attorney-General v. The Lord Mayor etc., of the City of Manchester*. The Municipality last April announced their arrangements for the conveyance of parcels and traffic from Manchester to all parts of the United Kingdom and abroad, and for acting as agents to the railway companies, and the action was brought on the relation of a ratepayer to restrain them from so doing, on the ground that it was in excess of their Parliamentary and other powers. The Court, after a very careful consideration of the question, came to the conclusion that the Corporation has power to convey and to deliver parcels and goods on their systems, even employing horses and carts in the delivery, but that it must be restricted to goods which travel or are conveyed along some part at least of the tramway system, that is to say, it must be incidental, or accessory to the tramway undertaking, and not carrier's business independent of it, as long as an expenditure of the borough funds is involved

in carrying it out. The same limitation applies to the Corporation acting as railway agents. This question of goods traffic on tramways is one likely to be heard more of in the future, and it would appear desirable that some limit should be placed on the powers of municipalities in this direction. As long as tramways occupy the public thoroughfares it is obvious that their freights should be limited to passengers, and that goods traffic is entirely unsuitable. It not only would obstruct the roads, but would seriously injure house property abutting on those thoroughfares.

Purchase of Building Land. IN *Hollivell v. Seacombe* a small point of interest to purchasers of real property has recently been decided in the Chancery Division. A certain property was sold by auction under an order of the Court, and one of the lots which was described as building land ripe for development was bid for by the applicant in this case. When the abstract was delivered it was discovered that in 1887 the land had been conveyed to one of the vendor's predecessors in title subject to a covenant that only almshouses should be erected on the land. The purchaser then applied to the Court to be discharged from the purchase and for a return of the deposit, and for the costs incurred in bidding and in investigating the title. The vendor subsequently obtained leave to rescind the contract under clause 7 of the conditions of sale, which provided that when a contract was rescinded the deposit was to be accepted in discharge of all claims, but without prejudice to the rights of the purchaser. The Court held that in sales under the direction of the Court when the purchaser is entitled to be discharged from the contract, the condition as to rescission does not affect his rights, and he is entitled to the costs and expenses which he has incurred. Here there was misrepresentation which entitled the purchaser to be discharged from the contract.

Fires in Public Conveyances. IT is by no means reassuring to hear of occasional fires in tubular railways, where passengers have very little opportunity of escaping from the immediate neighbourhood of flames and smoke, and, even if they are able to get upon the permanent way, can only walk thereon at the risk of their lives. The fire which took place last Thursday week in a train on the City and South London Railway comes as one more hint that the use of non-combustible railway carriages ought to be made compulsory, especially on all underground lines. We are very glad to be able to mention that the Board of Trade have already framed a model set of by-laws with which promoters of new tubular railways will have to comply. But there must also be stringent regulations with respect to existing undertakings of the same kind. We have repeatedly pointed to the necessity for the adoption of fire-resisting carriages on open-air railways, and the recent fires on motor omnibuses show that these vehicles, too, ought to be of fire-resisting construction. It is absurd that any motor omnibus carrying a quantity of highly inflammable spirit should be

provided with a wooden body, and in these times of enlightenment we really cannot understand why any vehicle so built should have been licensed as a public conveyance. If the authorities have no discretionary powers as matters stand, it is to be hoped that the new Parliament will rectify the deficiency at the earliest possible moment.

"Quiet Enjoyment." THE case of *Williams v. Gabriel* (Current Law Reports) is one of importance to lessees of house property. The plaintiffs were lessees of certain portions of a large block of buildings on a lease for twenty-one years terminable at the lessees' option at the seventh or fourteenth year, and the lease contained the usual covenant for "quiet enjoyment." During the currency of this lease some portion of the buildings became out of repair, and an order was made by the County Council under the London Building Acts, ordering the structure to be taken down. The lessor had assigned his reversion in the whole of the buildings, and this operation was being undertaken by the persons on whom the reversion had devolved. The lessee's part of the premises became exposed, and he was compelled to vacate the premises, and he proceeded against the executors of the lessor, who had died, for breach of the covenant for quiet enjoyment. The Court held that there had been an interruption, but held that the plaintiff could not recover, since the acts complained of were not such that the reversioner had the right to do as claiming under the lessor. This is an important limitation on the covenant, as it becomes limited to those acts which can have been contemplated by the lessor, and it does not extend to wrongful or negligent acts on the part of the person to whom the property has been assigned. This raises a serious question since it seems to leave a lessee in a far worse position than he would be in if the property remained in the possession of his lessor. [7]

Destructor By-Products. ALTHOUGH the use of the refuse destructor has been forced upon public authorities as a sanitary necessity by the exigencies of modern social conditions, the residual products possess distinct value as materials of construction, and there are other by-products which can be employed so as to reduce the cost of refuse disposal. At the meeting of the Civil and Mechanical Engineers' Society last Thursday week Mr. F. L. Watson summarised in a useful manner the various directions in which destructor by-products can be utilised, and gave some data relative to the residual products of combustion in furnaces of the kind. The first by-product is obviously heated gas, which is available for drying sewage sludge or other materials, and is largely used in the generation of steam for driving mechanical and electrical machinery, and for heating water to be employed in baths and washhouses. It is worthy of note that the real difficulty in connexion with the utilisation of steam generated at a destructor station is not fluctuation of the supply but irregularity of the demand. For this

reason the most remunerative results can be obtained in places where the generation of electricity is not the only outlet for steam produced by waste heat from the furnaces. Clinker is the chief residual product, whose uses in the manufacture of mortar and concrete flags are already familiar to our readers. Mr. Watson pointed out that the purpose appearing to offer the greatest profit was in making bricks on the system patented by Dr. Schulthess, of Paris. The weight of clinker-lime bricks so made was stated at about three tons per 1,000, and from tests made by Professor Goodman at Leeds University the crushing strength appears to range from 110 tons to 185 tons per square foot. Flue dust is another residual product which finds some use in plastering work and also as a basis for disinfecting powder. Notwithstanding the usefulness of such by-products the authorities owning destructor plants are not always able to sell or to use them so fully as could be wished. The paper to which we refer may be of some service in directing attention to the suitability of the residual products in construction.

THE enormous fall of rock Cheddar Cliffs, from the face of the Cheddar Cliffs, variously estimated at from 70,000 tons to 500,000 tons, should at last arouse the local authorities to the necessity of taking action with the view of curbing the anxiety of quarry owners to destroy this famous landmark. At the same time we are by no means certain that the recent fall is entirely due to quarrying operations. There have been heavy falls of chalk in the neighbourhood of Dover quite lately, where nothing but natural causes can be held responsible. Nevertheless, while the mischief wrought at Cheddar may be chiefly the result of climatic influences, it is highly probable that quarrying has had a large share in the disaster by establishing conditions distinctly favourable to disintegration of the rocks by natural agencies.

THE fire which broke out at an early hour of the morning of January 31 speedily destroyed the interior of the church, and the greater part of the roof, which was lined with match-board and covered with felt. Captain Hamilton's official report states that the fire was caused by "overheat of the furnace flue." It appears that the fire originated in the north-west corner of the building, over the grating above the furnace of the hot-air apparatus which had been lighted on the night before in readiness for a mid-day service upon the next day. The pecuniary loss is computed at 20,000*l.*, but the fabric and its contents had been insured in the Ecclesiastical Office. The church, which stands at the corner of Down and Brick streets, was built in 1864-5 after Francis's designs in the Early English style, upon a three-sided site, the walls being of granite and the plan embracing a nave with a small north transept. It contained sittings for a congregation of about 650 persons, and was enlarged in 1872, when it was fitted with an organ built by Bevington. The vestry, with

the Communion plate, records, and registers, have escaped uninjured, but the organ and the stained glass in the east window above the altar are damaged beyond repair. The window, which represents the scene of the Crucifixion, was set up, at a cost of 1,000*l.*, as a memorial by members of the Hope family of Deepdene, Dorking. In October of last year a window was inserted in the north wall in memory of the late J. T. Wimperis, architect, by his sisters—the glass was executed by Messrs. Bell & Beckham. Christ Church narrowly escaped from a fire on the morning of February 26 last year, when it suffered damage to the extent of nearly 700*l.*

WE have received a print of the plate issued this year to subscribers to the Art-Union of London, which is an etching by Mr. W. L. Wyllie from his large painting "Trafalgar," exhibited at the Royal Academy last year. We have in many cases objected to the large size and sometimes rather coarse execution of the engravings or etchings annually issued by the Art-Union, the tendency of which was to encourage the un-taught in art in the idea that a work in black and white was valuable in proportion to its size. In the present case, however, one feels that the amount of detail in the picture, in which there are no large-scale figures, could hardly have been done justice to on a smaller scale, and the etching moreover is the handiwork of the painter himself, and not of a copyist. Trafalgar, too, is so momentous an event in modern English history that a large etching commemorative of it is a fitting trophy to frame and hang up in any English household; and it is in this sense rendered more valuable by the short account of the battle written by the artist, who of course entered into every investigation before painting the picture, and who, from his pictures and other writings is no doubt enough of a practical sailor to understand the position and the contemporary accounts of the engagement. As an etching it is a very fine production, full of suggestion of colour and atmosphere.

AT Messrs. Dowdeswell's Gallery is a collection of landscapes—a good many of which might be rather termed studies and sketches for landscapes—by Mr. Grosvenor Thomas. Such sketches as "Waves Breaking" (2) and "A Grey Sea" (32) are rather what might be called artist's memoranda than works for exhibition; they are among other examples that we have seen lately of an inclination to treat the sea rather as a subject for experimental sketches than for serious painting. The majority of the works, however, are landscapes, some of the smaller ones very sketchy, but containing fine suggestions of composition and effect; and among the more important works, such as "The Canal" (12), "The River" (24), and "Morning" (30), we may conclude that as much detail is given as the artist thinks compatible with the breadth of effect, and the indication of the poetry of the scene, which are his chief aims; and after all

there is as much detail in these as in many of Constable's works. There are various principles of translating landscape, and this is one of them, though perhaps the tendency to treat landscape as composition in masses of tone, with an ignoring of detail, may be carried too far. However, "Morning" is an unquestionably fine landscape, and "The River" also, though rather too shadowy in treatment. Among the smaller works may be noticed especially "Landscape" (13), a vertical composition with masses of dark trees; "Sketch for Morning" (18); "Sunset" (21); "Marigolds" (23), a fine bit of colour and texture; and "Landscape" (31). In "The Canal," before referred to, the reflection of the light in the house window, considering the apparent distance of the house from the water, could not be seen as low down as it is shown on the water, unless the eye were supposed to be at the water level; a kind of oversight often made in painting. It is a simple question of angles, easily demonstrable by a sectional diagram. The reflection of the light in this case, if seen at all in the water, would be close up under the bank. Painters would do well to study, on this subject, Sir Montagu Pollock's valuable book on "Light and Water" (reviewed in our issue of July 23, 1904).

At the Baillie Gallery, in Baker-street, are two collections of pictures; water-colours by Mr. Oliver Hall, and an exhibition of paintings by what is called "The Liverpool School of Painters." Mr. Hall's water-colours are mostly slight in execution—sketches rather than pictures, but are masterly in their sense of composition and distances in landscape. Among those especially good are "Tower Farm" (101), "Waste Land, Cumberland" (108); "Spring" (113); "Uplands near Silloth" (114); "Along the Shore towards Silloth" (114); and a powerful foreground picture of old ruins, under the title "Abbey in North Wales" (99). As to the "Liverpool School," there is no such thing, as indeed is almost admitted in the first sentence of the preface to the catalogue; but there were, during the middle portion of the last century, several exceedingly clever artists natives of Liverpool (only two of whom, W. Davis and J. W. Oakes, can be said to have obtained a general reputation), whose aims and practice were, however, as different as possible, and who therefore could not possibly be grouped as a "school." Oakes, who moved to London and became an associate of the Royal Academy, is not represented here by his best work, though there are some good small pictures by him. William Huggins, who in his lifetime had no reputation beyond his own neighbourhood, was really one of the finest animal painters of England, as no one can question who looks at his "Cattle Drinking," No. 23 in this collection, which in its way is unsurpassable, and his brilliant paintings of fowls (7 and 11). W. Davis was a landscape painter allied to the pre-Raphaelite school, and produced some most beautiful works in a careful and highly finished manner, but was surpassed in original

genius by Tonge, who belonged to a rather earlier period (1822--1855). Tonge was a most powerful and original landscape artist; his large picture here, "Ormskirik" (53) is worthy of De Wint, whom it a good deal recalls. He made many fine water-colour studies of landscape treated on rough brown or grey paper in a manner of his own; there are no examples of them in this collection, but they were known to and prized by those acquainted with his work. Even in his own neighbourhood, however, Tonge never had a reputation except among a limited circle of amateurs who understood his merits, which were not for the popular taste of that period. Had he lived now, when landscape painting is somewhat better understood, he would have made a reputation. The proprietor of the Baillie Gallery has done well to collect some of these works of little-known painters of genius, which should not be overlooked by those who are interested in painting.

Photographs At the Royal Photographic Society's House in Russell Square is a collection of photographs by Mr. A. Langdon Coburn, one of the photographers who seeks to use photography as a means of producing artistic effect and not for mere mechanical reproduction. This is nothing new of course; Mrs. Cameron started it long ago, and her pictorial effect in portraits has not been surpassed, if equalled, since. Many of Mr. Coburn's portraits are very successful in giving character and avoiding hardness; the portrait of a lady smiling for instance (9); another of a lady (19) in which a charming *espièglerie* of expression has been caught and fixed; those of Mr. Hedley Fitton; Mr. Dobson, Mr. Mark Twain among others; the last named is excellent. In photographs of architecture, as in most of the Roman subjects, the want of sharp definition may be thought picturesque, but it does away with one of the chief values of photography in connexion with architecture—the power of giving clear definition of detail. Some of the photographs of bits of old streets, etc., make very effective pictures, and are well chosen as composition; though in one of the best of these "Via Fonte Marcella, Assisi" (95), with the figure in the foreground, the old houses in the rear ought to stand out much more sharply in the strong sunlight than these do. That is the difficulty in these artistic applications of photography; what suits one portion of a scene does not suit another; a painter has the matter in his own hands.

We record with great regret the death of Mr. J. P. Seddon, an architect of genius who never had a full opportunity of doing justice to what was in him. The remark of the Hon. Secretary of the Institute of Architects, that Seddon was a follower of Pugin, is a misconception; he was an architect of much wider and more original ideas than Pugin; he treated Gothic in his own way, not according to precedent. Though not an actual "P.K.B.," Mr. Seddon was closely associated with the Brethren, and was for some time an intimate friend and

co-worker with Rossetti. Though he carried out many minor buildings (a list of which will be found in our *Obituary column*), his only executed building on a large scale that we know of was his picturesque Aberystwith Hotel, never finished, and afterwards turned into a college. He was one of the twelve invited competitors for the Law Courts, and his wildly picturesque design had a great deal more practical character than appeared at first sight: the conception for a great London Record Tower was a grand one, and a more remarkable idea than anything embodied in the present Law Courts.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

An ordinary general meeting of the Royal Institute of British Architects was held on Monday, at No. 9, Conduit-street, Regent-street, W., Mr. John Belcher, A.R.A., President, in the chair.

The minutes having been taken as read, Count Plunkett, Hon. Associate, was admitted for the first time since his election.

The Late Mr. Seddon.

Mr. Alex. Graham, hon. secretary, said he had to announce—and did so with great regret—the decease of an old and distinguished member of the Institute, who was known to nearly all of them, and who had left behind him a very pleasant memory—i.e., John P. Seddon. The deceased was elected an Associate in 1852, a Fellow in 1860, and was for many years a member of the Institute Council, while, from 1862 to 1867, he acted as one of the hon. secretaries. Mr. Seddon, whose work was known to many of them, was one of those who followed strictly in the old Pugin school, and made a special study of mediæval architecture. They would all regret the departure from their midst of one who fought the battle of professional and artistic life with considerable success. They all sympathised with the widow and family, and he moved that a letter be sent to Mrs. Seddon sympathising with them in the great loss they had sustained, and recording, at the same time, the appreciation of the Institute of the work and merits of their deceased colleague.

The motion was agreed to in silence.

The Royal Gold Medal.

The Chairman announced that the Council had nominated Sir Lawrence Alma-Tadema, R.A., for the Institute Gold Medal this year.

Students' Drawings.

Mr. J. W. Simpson then read a criticism of the works of students submitted in the recent competition for prizes and student-ships.

Mr. Simpson said that the duty laid upon him of criticising the students' work was an honourable one not to be lightly undertaken. It was evident that for criticism to be useful it must be sympathetic; unless the critic could divest himself of personal bias, and regard the work under review from the author's standpoint, he could neither appreciate how far it was successful in attaining the ideal of its creator nor usefully indicate in what respects it might be improved. It was of no help to a student struggling with an imperfectly expressed conception of a XIIIth century church, having a tower at the crossing, to advise him to adopt a plan based upon that of a Grecian temple, and employ a *Systyle* Doric Order. He must be led to an intelligent comparison of his own design with those of the great Gothic masters—to consider the proportions of his tower and the manner in which it would combine with the other features of his building. His mouldings must be criticised in relation to their positions in the work and their effect in emphasising its horizontal and vertical lines respectively; the voids and solids, the sky lines and projections, scrutinised in relation to the general mass and grouping under various aspects.

Before considering the work of the students he would venture a criticism upon

that of the sub-committees who had reported upon the drawings submitted for the several prizes. It had been their duty to examine and discuss them in detail—a duty involving long and anxious consideration of the work by experience was fulfilled with the greatest care and thoroughness. The reports made to the Council by these committees were placed in his hands for the purposes of this paper, and he was struck by the fact that a great part of their labour was, in almost every case, lost to the Institute by reason of their referring only to those designs recommended to the Council for distinction. If the respective secretaries were instructed to embody in the reports some notes of their committee's views upon each design which would be of great value for the instruction and guidance of future competitors.

In regard to the Measured Drawings Medal, Mr. Simpson said—"Messrs. Coombs and Poley well deserve their triumph, and the Council had great satisfaction in awarding the medal to each. The drawings of Christchurch are an excellent and beautiful rendering of a fine subject, and the value of such a study to its delineator is incalculable. . . . The choice of a subject is of great importance to the student who proposes to undertake its measurement, for the ultimate object of the enterprise is not the mere preparation of a set of drawings, but that intimate knowledge of and familiarity with the work which can be acquired only by a patient and detailed analysis. It is to this end that the Royal Institute encourages such studies by the offer of its medal. The opportunities which the architect-student has for dissecting the entire anatomy of an important edifice must be limited by the time at his disposal; and this time becomes, in the natural order of things, more and more difficult to obtain as the other duties of his life increase. Few of us can hope to achieve the complete description of more than one or two subjects of the first class, before other claims compel us to restrict our studies to the work and detailed memoranda of their essential points. We in Great Britain who desire (and who does not?) to acquaint ourselves with the subtle beauties of classic art are under the disadvantage of living remote from the great masterpieces of Greece and Rome. We must be content to study them at second-hand by means of books, or must spend time and money in travel that we may see them ourselves. But we have at our very doors a profusion of the most excellent Gothic work that the world can show, and I commend its study to you, not only as affording the finest possible technical exercise in draughtsmanship, but as tending to great flexibility and freedom in composition. I have troubled you with this disquisition because, in some cases, the subjects illustrated are quite unworthy of the time spent upon them; unless, indeed, as I hope may be the case, they have been measured for discerning patrons who desire the candidates to make 'alterations and additions.' The mechanical delineation of surfaces of brick wall and repetitions of sash-bars can never give the power that comes by attacking and mastering intricate and beautiful detail; and, though I yield to no one in my appreciation of the picturesque qualities of the Renaissance, I hold that, regarded as an aid to the study of classic architecture, it is somewhat worse than useless."

In regard to the Soane Medallion, it was the custom, and rightly so, to set great subjects in this competition as pegs for the students to hang their most magnificent ideas upon. Youth attacks heavy problems with a light heart, and Heaven forbid that "the Soane" should ever fall to a set of practicable working drawings. This year a most happy suggestion by Mr. Statham was adopted, and designs were invited for the realisation of the perfect palace described in Bacon's "de Edificiis." The result was more than satisfactory, and the winner, Mr. W. S. George, had his hearty congratulations on his fine production. It was imagined in a properly grandiose vein, and executed in a way which indicated artistic qualities of a very high order. The "View" was especially meritorious, showing, as it did, a riotous fancy with an admirable sense of pictorial arrangement. This design was, he thought,

the most learned parody of style which he had had since his brilliant colleague on the Council, Professor Pite, startled them with his ideas as to what a West-end club would be like. Mr. Atkinson, who took second place, had sent a capital set, the plan in detail especially well conceived; but he had somewhat lost sight of that domestic quality which differentiates the palace from the public building. The effective and careful execution of the drawing merits special mention.

Next in order came the Owen Jones Studentship, for which the competition had been very keen. Mr. Gascoyne, who was successful in taking the 100 guineas for foreign travel, gave admirable and delicate renderings of Italian work. His water-colour interiors showed a good sense of the pictorial, though not without a certain inclination to a trick effect in lighting, which should be guarded against. Mr. Dawson had sent most meritorious drawings, which would have taken the studentship in any ordinary year. Mr. Davies had a remarkably beautiful set. The clean, straightforward drawing and legitimate effects of his sketches were admirable. There was to be remarked, however, a tendency to hot brown tones in his collected work, which he had emphasised by the warm brown mounts he had adopted. A white or cool grey mount would have cleared and given transparency to his colour. Mr. Nicholson, too, another prize-winner, had not paid sufficient attention to his mounts, a point which it was a great mistake to neglect in a colour competition. Mr. Jackson, the third of the "bracketed second" men, had sent very careful and excellent colour studies of the Santuario at Soronno, and Santa Croce at Florence.

The "Pugin" drawings were in no way below the general standard of excellence. Mr. Drysdale took the silver medal and 40*l.* prize with delightful and effective sketches well worth study by other competitors. His detail was carefully and conscientiously given without unnecessary repetition. The rendering of Bishop Bridport's tomb, and the John Draper chantry screen at Christchurch were quite masterly. His combination of brown ink writing with pencil and colour drawing was very pleasant and characteristic; he had done a great deal of good work, and thoroughly earned the prize he had gained.

The Godwin Bursary was very worthily won by Mr. Inigo Triggs. The only doubt in the minds of the Council was whether the proposal of the author to study the "Laying out of Public Squares and Open Spaces" fell strictly within the terms of the trust deed. Their decision in the affirmative he had learned with relief.

For the "Tite" Certificate and 40*l.* there were no less than twenty-one competitors, the subject set being "An Open-air Swimming Bath." Mr. Horsnell was placed first with a really fine conception. His plan was thoroughly artistic, and the design was naturally and unaffectedly that of an enclosed space and not of a covered building. The pencil perspective was coarse, and did not adequately express the enclosing of the bath, and the $\frac{1}{2}$ -in. detail was unfinished. The merits of the design were so great that it was deservedly placed first; but he would warn future competitors that this success was not to be taken as a precedent for unstudentlike finish in their work. Mr. Pearson took a Medal of Merit for a vigorous and good attempt to deal with a difficult elliptic motive. His outer colonnade, though effective, required more thoughtful planning, to justify it, and the entrance blocks occurred too abruptly, and did not quite wed with the columnar treatment. The drawings were very admirable. Mr. Wright, who received an "honourable mention," had a design marked by refinement of detail. His treatment of the projecting staircase blocks showed want of consideration of their side returns, the projections were not in quite good proportion, and the perspective, as was so often the case, rather revealed defects than unsuspected merits. Those neglected returns in a façade formed fatal traps to those who design in plane geometry instead of cube masses. "Cui Bono" had a vigorously-drawn set showing a really fine sense of massing. The interior was, however, rather "thin" in design, and hardly carried on the solidity of the exterior. The author had destroyed the scale of his perspective by filling in the circular openings

with black, which forced them into undue prominence, and was fatal to all suggestion of aerial perspective. He mentioned this design for its merits, but it was clearly disqualified as not complying with the conditions of the competition.

The Arthur Cates prize of forty guineas had produced only one competitor, and Mr. Markham, to whom it fell, had thoroughly earned it by honest and good work. It was curious that this prize had not attracted more attention, as a great part of the work required was already done by every candidate who passed the Final examination at the first attempt.

The Grissell Gold Medal and ten guineas was given this year for the best design for a "Stone Skew Bridge." The prize was awarded to Mr. Nott, for an excellent and simple scheme thoroughly well worked out. His design for the pylon piers would be better if the niches and brackets in the lower portion were omitted. The upper parts were too thin in proportion, and rather slab-like when viewed from the side. Although this prize was primarily one for construction rather than for beauty of design, it must not be forgotten that construction which results in unlovely form was architecturally bad.

Mr. Simpson concluded:—"Ladies and Gentlemen.—Here is the younger generation knocking at the door, as Ibsen says; and we hear their vigorous strokes for the prizes of the year without any of Harvard Solness' misgivings. The better the students' work the better is the prospect for British architecture; and we welcome all such as are worthy within our portals. I offer my congratulations to the Royal Institute upon its students, and to the students upon their fine performance, commending to them Ben Jonson's description of 'The True Artificer':—

"... He knows it as his only art, so to carry it as none but artificers perceive it."

Prizes and Studentships.

The President then presented the prizes and studentships to the successful candidates in the recent competitions. For a full list of prize-winners and others, see our issue for January 27.

President's Address to Students.

The Chairman then read the following address to students:—

Fellow-students, ladies, and gentlemen,—I propose to put before you this evening a few suggestions as to the methods—or rather I should say method—of constructive thought in design. As a matter of fact, there is only one such method for any artist, whatever be the vehicle he chooses to work in. The arts are all closely allied—at any rate in their methods—and the order of thought-development in each is one and the same. My friend Albert Gilbert the sculptor once insisted that there was another way, called the "fluke," and that he was sure from his observation a great many more designs were produced in that than in any other way. But surely this must be a libel! I won't venture on the statement that I have had no experience of that sort, but I am not anxious to talk about it, and it wouldn't help you if I did. For the one thing the youthful aspirant needs most to have rubbed into him—in season and out of season, if necessary—is that without hard study and adequate thought he will never do anything really good.

The intelligent study of mental processes in design, and the knowledge of the order of thought to be observed, is not unimportant; for, though many follow this order instinctively and unconsciously, yet, seeing that our mental faculties are our armoury, it is good to know what weapons we have at our command, and how and when to employ them.

I am not a philosopher—not even a psychologist; but I have observed and analysed mental processes both in myself and others; I have also gathered light from the analogy that exists in the arts generally—and so I hope that I may be able to say something on this point that will help you in your work. First of all, then, and as a preliminary, a suitable environment must be found. Not necessarily a literal environment of persons, places, and things, but at any rate of thought and mood. Environment is nowadays more a matter of character and temperament than of locality. Whithersoever

a man betake himself, it needs powers of self-government and mental concentration to escape the insistent shouts of commercialism and the prosaic business claims which are so apt to usurp an undue share of our attention. Yet, if the imagination is to be free for visions of beauty or even of dignity, if thought is to rise to the expression of noble purpose, the soul of the man must be able to take flight on occasion into the "serene" of the summer sky, leaving the earth and its cares to look after themselves for a time.

Psychologists tell us that moral education is dwarfed, or even impossible unless a man has a certain amount of leisure time for the free play of his moral faculties. Certainly, too, the soul of the artist will perish within him unless he learn to withdraw himself at will into the higher realms of imaginative vision, where no sordid purpose or ignoble thought can live.

Given the right conditions, we may now proceed to analyse the working of thought in design. Let us remember, in the first place, that architecture "speaks." The power of speech—the noblest of gifts to man—is seen in all true art. In language words are symbols, and by their combination into sentences thought is conveyed; the punctuation of such sentences into primary and subordinate clauses, together with other qualities of proportion and rhythm, determining the value and relation of the several ideas expressed therein. Exactly the same in architecture—forms are combined to appeal to the imagination and express purpose. One form of opening in a wall will convey the idea of ingress or egress, another the means of looking out or receiving light. This may be called the "simple sentence," or, if you like, the prose statement of architecture; but when we proceed to the higher forms of combination, to the moulding of these symbolic forms into sequences and rhythmic order, then we begin both to express and to appeal to the higher kind of poetical and imaginative thought. The same laws or principles hold good for the work of the painter and sculptor, both these arts in their higher qualities possessing the power of conveying to and impressing upon the imagination much more than they actually portray.

In music we have the most ethereal medium for speaking to the heart of man. Just as poetry can convey more than prose, just as there are musical sounds too high-pitched for the ear of man to catch them, so there are thoughts and emotions "too deep for words"—for which music provides the only adequate vehicle of expression. Architecture has been termed "frozen music." Like both music and poetry, it is subjective in its appeal; for the same arrangement of lines and colours will suggest fifty different things to fifty different persons. A fine and imaginative work will reveal to each individual some vein or mood of his own, and this above and beyond what was actually present in the mind and purpose of the architect. Every true work of art possesses an inherent energy which will sway the imagination of others and discover to them meanings of which the artist himself is unconscious. The imagination, then, must be allowed a definite place, both in the production of a design and in that reflection which it induces in the beholder.

A good design usually has a definite origin in a germ idea, from which, as from a bud unfolding itself, must be slowly and patiently evolved the true position and relation of the several objects and parts. In connexion with this process of evolution it is worth noting that in architecture as in language the most powerful effects are sometimes gained by the simplest means. That statement is strongest which is given in fewest words—provided the words be adequate and suitable. Why? Because the mind is quicker than the lips; because the imagination can picture more rapidly than words can paint. So in our art there are occasions when the dignified and simple statement is not only the most appropriate, but also the most effective. Not that this kind of statement affords a ready escape from toil; dignity and simplicity come with experience and thought.

An essential element in the production of a design—whatever the idea and purpose of the work—is "feeling," by which either

sympathy or repugnance is called into play. It is by feeling that an architect makes his selection and develops and encourages definite tastes of his own. Feeling is his own private artistic assessor, to judge in the competition of the many ideas and suggestions that present themselves before his mind's eye, as it were.

In the projection of a design on paper, mental perspective plays an important part. Projected as it is on a plane surface, the relative distances of the several parts of a design can only be distinguished and appreciated at their proper value by an effort of thought. Time was, as you are doubtless well aware, when designs were produced in a kind of geometric perspective, that the author might see all round his subject; now we do this mentally, or by developing each side simultaneously.

During the whole process of development and selection the purpose of the work must be kept constantly in view, with the object of bringing out in stronger relief every feature and detail by which this purpose is to be conveyed. The first "idea" relating to the purpose brings with it resemblances which stimulate the imagination. The interest thus awakened, hacked by knowledge, provokes to further effort, in which original thought is both checked and stimulated by association and comparison, memory and imagination acting and re-acting on one another—both of them under the control of knowledge and recognised principles. The expansion of the initial thought will resemble the circling ripples produced by the stone thrown into still water—every advance leading on to some fresh development, some more extended idea. With these expanding thoughts enter other considerations, such as questions of material and proportion of parts to the whole. Secondary causes also claim our attention as we proceed—viz., incidental local features and surroundings, contrasts, ornamentation, colour, texture, etc. These are the means which the thought of the designer marshals and controls to give expression to such intangible qualities as purpose, character, manner, and disposition.

Architecture furnishes posterity—unconsciously perhaps—with the picture of the prevailing manners, customs, and conditions of life. More than that, it reveals, or, it may be, betrays, the emotions and sentiments which have made each age famous or notorious. These are thoughts formulated ages ago which, having found expression in the work of the architect, are living forces to-day. The student should be impressed with his responsibility, and so systematise his thoughts as that his work may be a fitting and representative expression of the best thought of his day; for if he suffer his work to be infected with the haste and self-assertive methods of modern life, these are bound to betray themselves in every line and detail of his design.

There is something much more subtle and mysterious in an architectural work than a mere orderly arrangement of materials. There is life and speech in it. If a man's character may be read in his hand, certainly it may in his handiwork. The life may be noxious, like that of a poisonous plant, or sweet and beautiful, like that of a flower; or, again, it may resemble that of a noble tree—but life there is. The speech may be that of a Shelley or a Milton, or, on the other hand, of the most blatant type of "yellow" journal, but speak the architect's work must and will. It has a music, too, of its own—whether it be the music of one of Beethoven's sonatas or of the latest comic song. When you realise this—and no one can be indeed an architect who does not realise it more or less—you will approach your work with that due sense of its dignity and importance in which alone you will be able to rise to the "height of the (proposed) argument"—if I may adapt one of Milton's phrases to my own purpose. A clear perception of the possibilities both of good and of evil that open before us when work is entrusted to us—in other words, a proper feeling of reverence for our task—is indispensable if we would accomplish something noble or beautiful, or even suited to its purpose.

If an architect is to speak truly—indeed, if he is to be coherent in his message—he must follow the recognised forms, the articulate

phrasing, the grammatical order proper to his art. Thought-symbols, of whatever kind, are arranged in groups of rhythmic form like musical phrases in relative keys. In architectural design this is effected by divisional lines and grouping of parts, such divisions being regulated on principles akin to those which govern musical progression and a harmony built up of sounds. Again, contrasts are obtained in music by the use of loud and soft passages, and effects by gradations of sound from pianissimo and fortissimo. So architecture makes use of "strength of tone," gradations being secured in this case by the measure or greatness of projections of the different parts; also by the varying plainness or delicacy of surface and detail.

I will not carry these analogies and definitions further. What I have already said is sufficient, I hope, to convince you that there are laws and principles governing good architecture, and that as nobody expects a harmony from a haphazard arrangement of musical notes, so neither will you do good work in your profession by chance combinations or random methods. We have now come to a point when we can indeed analyse no further, for there is always an element of mystery in the best architecture—a sort of haunting personality that, ghostlike, vanishes just when we think we have it in our grasp. This quality of "mystery"—so pre-eminent in Oriental buildings—is one to conjure with. Veiled under symbolic forms which hide as much as they reveal, it continually draws us on and as continually eludes us. The screening of parts provokes the mind to search further and deeper for that which is beyond the immediate range of vision. Given the element of mystery—which is perhaps the "personal equation" of artists but the trained mind can make effective use of it. The personal element is of little avail if we have not painstakingly learnt the methods and principles of our handicraft.

One of the commonest of pitfalls for youthful designers lies in certain fanciful ideas of originality. It is easy enough to be original after a fashion. Any mere novelty will serve to astonish or startle; but if we wish to appeal to the higher faculties we must be content to let our originality find expression within the lines on which those faculties themselves work. The great German poet Goethe relates it as perhaps the greatest lesson of his early manhood—a sort of discovery that he made for himself apparently—that if he would "find himself" and enter upon his inheritance, he must recognise and submit to limitations. Originality does not involve a subversion of all that is orderly. In music the gamut remains the same for one man as for another; certain combinations of sounds are pleasing, certain others displeasing, and will not change their character for anybody. So the architect can neither create new elements nor alter the conventional effects of combinations of elements; his hope lies in so training his powers of perception as that he can move freely and with a sure tread amongst the almost infinite variety of paths that open before him. Then he will find plenty of scope for originality without violating the canons of art or wandering into the realms of the unpleasing.

Sir Joshua Reynolds considered that "excellence is the direct result of trained perceptions." Certainly such perceptions are the foundation; any special powers or qualities that a young architect may be conscious of will find their place and expression at a later stage. You may rest assured they will not be thrust out or obscured; they will only shine all the more brightly for having submitted to limitations. As I have said before, the character and mind of the designer will always reveal themselves in his work. The scholarly treatment of one man will appeal to the intellect, while the grace and charm which distinguish another's work will rather sway the affections. The highest achievement, seen only at intervals, lies in a combination of qualities well balanced and under absolute control.

I have endeavoured this evening to show you that there is a certain order and development of thought in the evolution of a design. Mere knowledge will not suffice. Something more is needed than a reproduction of the past or a mere application of mathematical

formulae. If a student labour with but little thought, he may attain to a dazzling skill, but he will neither stir the heart nor convince the mind. The search for the ideal lies ever upwards and onwards by the way of severe mental discipline. Let us remember, in the words of Philip James Bailey: We live in deeds, not years; in thoughts, not in feelings, not in figures on a dial. We do not live by heart throbs; he lives most who feels most, thinks the noblest, acts the best.

Mr. Edmund Gosse, LL.D., said he had been asked to propose a vote of thanks to the President, and he did so with pleasure. It seemed to him that the world was divided, as regards architecture, into three very unequal divisions. There was the enormous majority of persons who knew nothing about architecture at all—who did not know a good building from a bad one, and who had not the smallest desire to know. Then there was the unimportant division who had a great love and taste for architecture, but who had no practical knowledge of it at all, and to that small and singularly unillustrious body he belonged; and, thirdly, there was the division consisting of the fellows, associates, and students of that Institute who knew everything that there was to be known about architecture.

He came to that meeting in a very humble state, and that humility was turned to absolute depression of spirits when he listened to the brilliant essay which Mr. Simpson had read—an essay written with a pen alternately dipped in viridian and in honey. He knew that one of the functions of the Institute was to insist on the relation of architecture to the other arts, on the fact that architecture was itself one of the fine arts. The present President of the Institute was not merely a brilliant observer of the rules of the art of architecture, but he had been singularly happy and sympathetic in linking it with the kindred arts, and specially with the kindred art which came nearest, surely, to architecture, namely, sculpture. Therefore, he had listened with particular emotion to the very ingenious and striking address which the President had delivered—an address which was fitted to raise their thoughts to a high level. It was a metaphysical address, the keynote of which was sounded in the words which insisted on the importance of order in the development of thought in the evolution of a design as the central ambition which an architectural student should hold before him. He took the whole address to inculcate this lesson, that the student should always aim at purity, dignity, and freshness of design, and should not give way to the incongruous and fantastic. Well, did not they think that we live in an age when the incongruous and the fantastic were very prominent? And was it not really a great blessing for architecture that it could not go into those realms of incongruity and fantasy that painting and even sculpture sometimes allow themselves? It seemed to him that there was an enormous work for architects to do. When he received the invitation from the Council to be present to hear the President's address he happened to be staying in a little coast town in the south of Devonshire, and in that little town there was a good deal of work which the Institute might attend to. That little town was mainly in the hands of one proprietor, and he an absentee proprietor, and it was filled with dull, stupid little houses all exactly like one another, all looking as ugly outside as they were probably uncomfortable inside. The contrast with old times was curious, for what remained of the old town consisted of charming little houses in most exquisite taste. He was told that the modern houses were all built by one gentleman, the surveyor-architect, who had only one set of designs. That did not seem to be enough, seeing that it could never have been a good set of designs. The President had spoken of two kinds of life in architecture, and had said that the life might be noxious, like the poisonous plant or the latest comic song. He (Mr. Gosse) would like to ask them as an Institute whether there was not a third thing, and whether it was not worse even than noxious life, namely, to have no life at all? It seemed to him that so much of the architecture that one saw was of that

tirely dead order—dead and dismal and fit only to be blown-up. The Institute was fighting a difficult and dangerous fight against this universal poverty of design, and here was no end of work to be done throughout the country—not merely in building good buildings, though there was a great deal of work to be done there, but in raising and developing public opinion. Bad taste was being fought by the Institute, to whom they owed a debt of thanks for its effort, in the face of all sorts of difficulties and discouragements and want of appreciation, in directing public taste persistently to the claims of architecture as one of the fine arts.

Professor F. M. Simpson, in seconding the vote of thanks to the President for his thoughtful and thought-creating address, said that in the first paragraph the President struck the keynote that ran through the address *i.e.*, that without hard study and adequate thought no student could hope for success. The President further emphasised the fact that architecture speaks, and that according to the way in which the work speaks, so one could determine the character of the man who designed it. It was not only the good work that lived after one, but the bad work as well, and often it survived longer than the other. It was by a man's work that one judged the character of a man. To take one instance, that of Cockerell. The best idea of the character of Cockerell was not to be had from the accounts of his life or the portrait hanging in that room; neither really gave anything like the same idea of the man himself as his buildings; it was in these that one saw his refinement and scholarly skill, and, above all, the enormous amount of work he did in the shape of study long before he achieved success. The President had ably sketched the evolution of a design, and showed the game of battledore and shuttlecock that went on in a man's mind between his imagination and his knowledge. Those two things were both necessary; one was of little or no good without the other. Imagination was a gift, and knowledge was the result of grind, and it was the mixing of the two things which made for success. It was not enough for a man to possess imagination; he had to work in order to train that imagination so that it should be directed into right channels and not run riot. The President's remark: "It is easy to be original after a fashion" was perfectly true. In an old play there is the character of a would-be wit who, speaking of a friend, says: "His want of knowledge gives him the more opportunities to show his natural parts." Natural parts were pretty crude things as a rule, and it was in the educating and polishing of these that a man's life had practically to be devoted if the result was to be a success. A student was to be congratulated if he possessed the gift of imagination; it was the one thing he could not acquire if he did not possess it in the first instance. They owed their thanks to the President for laying such stress on the fact that two things were necessary—first, the imagination in order to conceive, to obtain, the idea; and, secondly, the educated taste that would enable the student to work it out thoroughly.

The vote of thanks having been heartily agreed to,

The Chairman briefly replied, and said that as to Mr. Gosse's remarks about dead architecture, he had relegated that to the past. They might think he had laid too much stress on building thoughts and castles-in-the-air, and that there was not much 5 per cent. to be got out of castles-in-the-air; but it was necessary to give thought to these matters in order that one's imaginative thoughts might be materialised.

The New Premises.

The Chairman announced that the next meeting would be held on the 19th inst., when Mr. E. Guy Dawber would read a paper on "Furniture."

The Chairman also stated that a special general meeting will be held on Tuesday, the 20th inst., when the following resolution will be moved from the chair: "That the Institute do purchase the freehold site between Nos. 11 and 13, Portland-place, London, at the price of 19,500*l.*, and do erect thereon a building to include the offices and

hall of the Institute at a total cost, including the purchase of the said site and the erection of the said building, of 53,000*l.*, and that the Council be authorised to raise this sum by the sale of stock belonging to the Institute and by mortgage of the said site and building on terms to be approved by the Council, such money not exceeding in the aggregate the sum of 53,000*l.*, as may be necessary for the purchase of the site and the erection of the building.

The meeting then terminated.

ROYAL ACADEMY LECTURES.

MR. JACKSON commenced on Monday last his series of four lectures to Royal Academy students on "Reason in Architecture." He said that architecture had been much talked about and written about, from several points of view. There were the numerous practical works on building construction, which however had not much relation to architecture as an art. There were the pictorial illustrations of architecture, from the mere drawing-room table views to the drawings of Piranesi and other artists in architectural subjects. Then there were the learned treatises of men like Palladio, Serlio, and Vignola, who reduced all architecture to rules founded on the precepts of Vitruvius. There were the numerous illustrative and descriptive works of the men of the Gothic revival. Lectures on architecture had been given at the Royal Academy from time to time for many years past: those by Soane and Cockerell, the leaders of the Greek revival; those by Scott and Street, who dealt with Gothic architecture, and those by his immediate predecessor, Professor Aitchison, on Roman architecture and on Vitruvius. With all this, did anything remain to be said? The observation of the architecture of the past had been so complete, everything had been illustrated so fully, that to have been exhausted. But architecture had another side than the archaeological; we might study ancient architecture not merely in regard to its external facts, but in regard to the principles on which it was developed. Architecture was on a different footing from the other arts in the manner in which its ancient productions were used for study. Sculptors and painters studied ancient work in order to learn from it, not in order to imitate. Canova, Thorwaldsen, and Flaxman, it was true, produced imitative forms of sculpture of the classic type, and Chantrey condemned his portrait statues of eminent modern men to the doubtful clothing of a blanket, in deference to the classic spirit; but in the present day sculpture was essentially modern—it might be said in some cases too modern.

In painting there had never been quite the same temptation to reproduce classic work as existed at one time in sculpture. But with architecture it was different; modern architecture was very largely imitative of the architecture of the past. In excuse for this it must be remembered that an architect was differently placed from other artists, in that he was bound to consider utility; he must combine art with practical convenience, suited to the requirements of his day. Every Englishman, for instance, expected to have in his house a dining-room, a drawing-room, a study, and various other usual rooms, and the usual sanitary appliances and provisions, and this fact tended no doubt to set limits to the architect's invention; for the habits of life changed very slowly, and as long as they remained the same architecture had to accommodate itself to them. The general requirements in churches, as well as in habitations, were very much the same as they had been for a long time past; and hence a certain conservatism, and a reference to the work of his predecessors, was more or less forced on the architect. The difference was that in the present day an architect learned from his predecessors; in the Middle Ages he learned from his contemporaries. But from Brunelleschi and the Renaissance down to Scott and the Gothic revival the eyes of architects had always been turned towards the past. There was another important difference between an architect and other artists; that he did not, and could not, carry out his work with his own hands, as a sculptor or painter did. Sculpture, it was true, had become now-a-days very much a matter of modelling, and the sculptor did

little work on the marble with his own hands; but a painter at all events did his own work with his own hands; whereas the modern architect worked out a design on paper in an office, and could not realise his design without the assistance of a crowd of workmen; and even before the days when the modern architect arose—when the architect was a master mason or chief builder living on the work, though he might have worked with his own hands on the building, it could only have been on a small part of it; some special details of sculpture decoration perhaps. The time was long past when the architect lived on the work, chose the stone, and saw to everything with his own eye; it was a seductive picture, but one impossible to realise in the present day. And that was one reason why there was a paucity of invention in modern architecture; for new suggestions arose in great measure out of experience of difficulties met with in handiwork. The smith who carried out a piece of metal-work came across difficulties in the execution of it which suggested a new treatment to him, but this kind of suggestion from the actual work did not reach the architect who made the drawing for it. Much of the charm and interest of ancient buildings lay in the evidence they gave of the special means taken to meet difficulties arising from accidental or unexpected causes; such difficulties were occasionally the foundation of a change of style; but they were only realised by the architect who was on the spot. Apart from this direct influence of the facts of building, architecture tended, as at the Renaissance, to resolve itself into formulae, such as were represented by the Classic orders. The Gothic revival was in the first instance a reaction against the Classic formula; but while setting themselves free from the Classic fetters, the Gothic revivalists proceeded to forge new fetters for themselves. Batty Langley had even attempted to resolve Gothic architecture into five orders, in imitation of the Classic division; and though his influence did not count for much and his "orders" were not adopted, a new tyranny of precedent was soon developed, not less rigid than the old tyranny of the Classic orders. Forty years ago precedent was everything with the Gothic revivalists; religion even was called into the field; Classic architecture, in defiance of the evidence of history, was branded as "Pagan"; and the nearest possible approach to the reproduction of old work was the test of excellence. A good deal of this influence still survived in Gothic as now practised, more especially in ecclesiastical work; and it must be recognised that the force of historical association was stronger in connexion with architecture than with any other art. We looked at the Elgin marbles as sculpture simply, without being moved to consider too closely who and what were the men who made these; but with buildings it was not so; they were too strongly associated with national history. As Ruskin had said, "we want to know not only how men thought but what they handled" (and, it might be added, how they handled it). So with the pictures of Raphael, for instance; we looked at them for their own sake as pictures, not as history; but with a Perpendicular building, which was of the same date, we could not dissociate ourselves from history in the same way; we could not separate it in our minds from the memory of its founders and of the generation which erected such buildings. As architects therefore we stood so rooted in the past that we could not pluck it away; but let us draw the true lesson from it, and not mistake external forms for principles. Architecture, like history, might be looked at in two ways. There was the old way of writing history—getting up facts and dates and names of kings; but that did not satisfy us now; the modern historian aimed at getting into touch with the people of the time he wrote about; at understanding not only what they did but why they did it—how much was due to individuality and how much to social custom. Thus in like manner there was a true and false way of studying architecture; and unfortunately the false way was the most common. The study of architecture to many was only the study of outward phenomena and dates; a method which was no use for the present day, nor for the true understanding of the past. Architecture was the most reasonable and logical of the

arts; for every change in it there was a reason traceable. To understand the expression of the men of past times in architecture, we must know what it was they were trying to express. Outward forms in architecture were not the suggestion of mere fancy, they arose from special needs and circumstances, from the desire for economy of material. To make beautiful things was different from representing them, as in painting. Architecture did not imitate nature, but it was subject to natural laws. There had been instances, no doubt, of adoption of certain forms for artificial reasons; but apart from such, at the root of every change in architecture had been a change of circumstance. We saw this most clearly when considering buildings in a broad sense; it must not be pushed too far into detail; yet even in tracing the history of a detail in architecture we could sometimes realise this influence of circumstance very clearly. Take the Corinthian capital, for instance, which had been stated by Vitruvius to have been suggested by a basket of foliage with a tile laid on the top, and some of the leaves escaping through the interstices of the basket. Whether that were true, or only an invention after the fact, we discerned plainly in the Corinthian capital certain distinct elements—the abacus on the top, with its concave line, the rounded bell beneath the foliage, the two tiers of leaves, and the *caulicoli* or stalks which emerged from behind them and turned over into scrolls beneath the projecting angles of the abacus. Now it was observable that the strength of that capital lay in the bell, not in the abacus; the angles of the abacus and the scrolls under them could not really carry weight; consequently it was a rule that the entablature was not thicker than the centre diameter of the column, or practically, in other words, not thicker than the bell, which really carried the weight of the superstructure. In a capital from Spalato they would see that the *caulicoli* had altered their form, but the angle was still weak, though the capital was strong enough for what it was required to carry. When the classic column was employed in basilicas with a thick and lofty wall above it carrying a heavy timber roof, the classic capital was not strong enough for its position, and though its form was retained, the Byzantine builders solved the difficulty by placing their peculiar feature of the impost block over it, which spread sufficiently to take the springing of the arch, and was solid enough to carry it. In some later examples, as at St. Sophia and Parenzo, they would see that the main capital had changed its form and become convex in line, and would have sufficed to carry the springing of the arch; but the second capital was still retained as a matter of habit. In an example of a capital from Trieste it was seen that it had been abandoned as a separate feature; it was still really there, but it became part of the main capital, and appeared as a very thick and solid abacus. In an example from the vestibule of St. Mark's, the Byzantine impost was carried over two columns, on the capitals of which it rested. Several other successive variations from Noissac, St. Germain des Prés, and Le Mans were shown; and in an example from Sens it was seen that the old concave abacus line of the classic capital was still visible, but only as a kind of ornament, under the soffit of the real mediæval abacus. In an example from St. Leu d'Esserent the ornamental concave Corinthian abacus had disappeared altogether, and the classical angle volutes had become leaves; all trace of the classic capital has disappeared except only in the still recognisable form of the bell. The well-known Early English form of heavy-lobed foliage was finally an entire departure from the Renaissance of the Classic form of leafage. In England, and in Normandy also, we did not find all the tentative stages of change which had been illustrated. The Norman cushion capital was an easy and natural development out of a plain circular bell like an inverted frustum of a cone; the arch springing above it being rectangular, it was easy to see that there was wasted material between it and the upper circumference of the bell, each face of which was cut down vertically, leaving the cushion capital with its four faces, which was complete in itself; the abacus moulding above this was

only an ornament. At Canterbury, where French influence prevailed, the square form of the Classical abacus remained, but in English Gothic generally the preference for a circular abacus, and the consequent removal of all reminiscence of the angle volutes, did away with the last vestige of the Classic capital; while in such examples as the caps from Southwell chapter-house, later in the style, even the conventional character of the leafage had disappeared, to be replaced by naturalistic foliage so beautifully and delicately executed that it only wanted the colour of nature to make it look real, while it still preserved the supporting character proper to its position.*

The examples of capitals shown on the screen, more numerous than we have been able to mention, afforded a most interesting opportunity of comparative analysis of the growth of the mediæval from the Classic capital.

DEVELOPMENT OF SCULPTURE IN GREECE AND ROME.

At the London Institution, on Monday evening, Mrs. E. Burton Brown lectured on "The Development of Sculpture in Greece and Rome." She said the subject was a large one, but she did not intend to take up every statue to be found in Greece and Rome, but only to deal with the development of the spirit of Greek art and a little with that of Rome, and she would illustrate the general principles on which one system and style of art grew into another. The characteristic of Greek art was generally described as being ideal, and that of Roman art of realism, and these words were right if they understood what they meant, but they each raised so many interpretations that one had to be careful about them. What it really came to was that the Greek artist was a great creator, and the Roman artist was not. The Greek artist never sat himself down before a single man's or woman's form, or before any scene or front of people with the intention of copying or imitating them. That to him was not the nature of art at all. He was a creator and an originator, and he was always working from within upwards, and he made a new thing every time he set out to make a statue or relief. He earnestly watched the moving figures of men and women in order that he might know what attitudes and what beautiful lines each one of them took, and then he made something which was more beautiful than what he had actually seen. If one did not do that it was difficult to say what was the use of having art at all. As Whistler put it, "All the elements of beauty are already existent in the world outside; the artist is born to select and choose." Greek art was ideal, therefore, because it deals with ideals, and strove to create types, and was not merely a copy of existing forms. Roman art was exactly the opposite to that. The Roman was a great maker of history, but he was never a great artist, and perhaps the two hardly ever went together. The Roman was content to imitate actual forms; to make a speaking likeness of the people he saw. In the difference between the two lay the whole difference between two opposite ways of looking at art. They saw in the very beginning, when the Greeks had bad tools and hard stone, and no knowledge of anatomy, and the greatest difficulty in mastering their materials, how they were then striving to make something that, of their own inherent consciousness, was really beautiful. In the period after the Persian wars they began to make very beautiful but still rather stiff and broad, solemn, strong figures, and the 4th century was one when the ideal was strength and dignity. In the 15th century they had greater command, and then tools and materials and the far greater knowledge of anatomy enabled them to make statues with far more effect in repose and freer in line, and, as it were, less dignified, less solemn, and less finer perhaps. They were equally ideal, but the ideal was a new one, and was an ideal of delicate beauty and grace rather than of majesty and solemnity. Then they got to what were called Hellenistic times, and there they found that the old Greek model was

changed, and the old Greek style was modified by various infusions of different foreign ideas. Lastly, they came to Rome itself, where the Roman sculptors, living in a city crowded with splendid masterpieces of the old Greek days, longed to imitate Greek forms, but were themselves always filled, more or less, with their own realistic tendencies, so that Roman art was Hellenistic in a sense. Mrs. Burton Brown proceeded to illustrate by means of lantern slides the different styles. Commencing with views of statues of priestesses, dating probably about 520 B.C., she showed how they were practically only upright stone pillars with just a few lines indicating the drapery. The Greek began by worshipping a tree or trunk, and being an artistic person, immediately began visualising his god or goddess, and tried to turn the pillar into a man or woman, as the case might be. In these early figures they saw the archaic smile which was their only way of showing expression and life. Then in the pediments of Ægina, they found the figures still stiff and rigid, and still with the archaic smile, but there were signs that the Greeks were getting on. In the work of Myron, Polydeus, and Phidias, they got the representation of movement; Myron represented life and movement but no soul; Polydeus represented beauty in pose; but Phidias combined the two, and represented absolutely perfect pose and beauty of line and form combined with soul. In the 5th century men had been drawn together by the Persian war in a great patriotic struggle, and their triumph was expressed in the art of the Parthenon by Phidias and others. In the 15th century men had learned to make sculpture. In the early struggles they believed they owed their victory to the gods, but in the 15th century they began to speculate about the gods, and they found that, in the work of Praxiteles, the treatment of the gods was different. His statue of Apollo, the Lizard Slayer, was very beautiful and delicate, but it was not Apollo, the sun god. It was an ideal, not of strength and dignity, but of beauty and delicacy. Here they began to have dreamy eyes almost closed, and little open lips from which the breath seemed to come and go—the expression of the face and the treatment of the features was quite different. Scopas, his great contemporary, was subject to the same influences, but, whereas Praxiteles was always dreamy, Scopas was full of fiery movement. Then they came to Lysippus, the court sculptor of Alexander, and they began to feel that the end was coming. Next came the school of Pergamon, and they saw how the art had gradually fallen from the desire to represent something noble and fine, and got to be more and more exaggerated. In Rome much the same story had to be told. They excelled in clever realism, but there was no desire to idealise. The connexion between Greek and Roman art belonged to the time of Augustus, when a strong effort was made in Rome to imitate the beautiful Greek models of which the city was full, and in the great relief for the altar of peace they could have nothing more Greek than some of the figures. It was a curious Hellenistic art which combined local feeling with that influence of Greek models which was really what Hellenistic art meant.

RURAL HOUSING.

At the meeting of the Central and Associated Chambers of Commerce held on Tuesday at the Society of Arts, under the Chairmanship of Mr. Courteney Warner, M.P., the Rural Building By-laws Committee presented a report on the reference made to them to consider the whole subject of the Building By-laws as drawn up by the Local Government Board. Having given a brief review of the legal difficulties with which the local authorities are confronted, the Committee said that the problem with which they were confronted was to suggest means by which cheap and healthy dwellings might be erected for agricultural labourers in purely rural districts, and at the same time not to disregard the just claims of local authorities for protection against the jerry-builder, and to preserve the health of the areas over which they exercised jurisdiction. As matters now stood, it seemed almost hopeless to reconcile these conflicting claims. The position at the present moment was that

* With this we cannot agree. The Southwell carving, beautiful as it is, suggests to us to have the defect, in an architectonic sense, of looking as if it were applied round the bell of the capital instead of developing from it.—Ed.

the majority of rural authorities who had adopted by-laws were working under those of 1877, which were really only suited to urban districts. If it were only a question of drawing a sharp dividing line between urban and rural districts there would be no difficulty, as the by-laws of 1877 were quite suitable for urban districts, and those of 1901 fairly met the case of the purely rural neighbourhoods. The difficulty really was that a rural district could rarely be said to be wholly rural. Out of the 668 rural authorities there were seventeen whose by-laws were not based on any model series, and were made before the issue of the first model in 1877. There were 285 who had adopted the 1877 by-laws; 138 were working under those of 1901; and there were still 246 who had adopted no by-laws at all. In the Committee's opinion this was not a desirable state of things, and they could see no reason why the whole country should not be administered under one uniform system, provided such a system were made sufficiently elastic. They considered that the present condition of affairs was not satisfactory, and that no possible readjustment, either by amending Acts or by the exercise of administrative powers, could ever place the matter on a permanently satisfactory footing. An entirely new building code was necessary. They therefore suggested the appointment of a Royal Commission or Departmental Committee to inquire into the subject, which body might consist of an official from the Board of Agriculture and the Local Government Board and representatives of the Royal Institute of British Architects, Institution of Civil Engineers, Surveyors' Institution, Central Chamber of Agriculture, Land Agents' Society, and the Rural District Councils' Association. The Commission should be directed to frame one comprehensive code of by-laws, as to make them equally and automatically applicable to the following classes of buildings: (1) Isolated buildings, (2) buildings partly isolated, (3) buildings in villages, and (4) buildings in towns. Special powers in a new building code should be given to local authorities with reference to exemption, and the principle of a Court of Appeal, such as was to be found in the London Building Act, should also be embodied.

Colonel H. Le Roy Lewis, in proposing that the report be received and sent to the local chambers for consideration, said he felt there was really a chance of some legislation being passed this session, especially as they were not asking for money.

The resolution was adopted.

THE INCORPORATED CLERKS OF WORKS' ASSOCIATION.

The twenty-third annual dinner of the Incorporated Clerks of Works' Association was held on Saturday last week at the Criterion Restaurant, Mr. Henry T. Hare presiding, supported by Messrs. H. Brown (Herts County Council), F. L. Dove, C. G. Hare, E. T. Hall, C. Harrison Townsend, J. Hill, J. Pain (President of the Association), R. Kellond, J. Brady, J. Davies, A. Fincham, and a numerous company of members and friends.

The loyal toasts had been honoured, Mr. Joseph Davies proposed the toast of "The Architects and Surveyors," and in the course of his remarks he referred to the kindness he had received as a clerk of works from the architects and surveyors he had served. It made all the difference to a man and his work whether he received a little appreciation or did not. As to the future of business, times had been hard and bad enough, and he hoped that there would be an improvement in the near future. What the country wanted was land reform, which would give greater employment all round.

Mr. E. T. Hall, with whose name the toast was coupled, in response, said that architects were intimately associated with surveyors, and he could express his gratitude to them for the help they had rendered to him. A good quantity surveyor was of very great assistance to an architect. As to the relations between clerks of works and architects, he had found his clerks of works not only efficient, honourable, and straightforward men, but he had always been on friendly relations with them. Everyone liked to receive a little appreciation when trying

his best to do his duty, and it was but a slight thing for the architect to show his appreciation. As to the work of architects, there were a great many public buildings rising up which he hoped did credit to those who designed them. There was one work—the Queen's Memorial in London—by one of our greatest architects, which would be, when finished, of immense importance to this city, and it was one of the few imperial works which we had undertaken in recent years. In India there was another Queen's memorial, by an architect well known to them, which would be a credit to the time. There were also the War Office, by the late William Young, which he regarded as an admirable building, and the fine block of buildings on the other side of the road, designed by the late James Bryden; and it was to be regretted that in both those great works the architects died before they saw the fruits of their energy and ability. With Mr. Davies, he hoped that the present year would bring plenty of work. It might be said that everyone in that room represented the employment of perhaps many hundreds of men in the course of the year. Military men said that there were two officers in a regiment—i.e., the colonel and the sergeant-major—and in the building trade it might be said that the colonel was the architect and the clerk of works was the sergeant-major, and there was no doubt that as the position of the sergeant-major was one of great responsibility, so was the position of the clerk of works, who really "ran the show" and saw that the work was done. He believed that better work was never done in England than that which had been done in recent years and was being done now, and this work must be continued, to the credit and glory of our generation and country.

Mr. John Davies, in proposing the toast of "The Worshipful Company of Carpenters," referred to the excellent work of the Company in the matter of technical education. The classes and lectures of the Company were very good of their kind and were well attended, and the Company's library had been of much help to him and others. The Association was specially indebted to the Company for finding them a room in which to meet and for housing their small library.

Mr. J. Aitchison said they had hoped to have a representative of the Company present to respond to the toast, but he had pleasure in doing so. As Mr. Davies had said, the classes and lectures held by the Company were specially useful to young men connected with the trade, and he hoped that these classes and lectures would be attended by young men in greater numbers.

The Chairman then proposed the toast of the evening, "The Incorporated Clerks of Works' Association," coupled with the name of the President, Mr. J. Pain. It had been said that the essentials of successful building operations might be classed under the first three letters of the alphabet—i.e., the architect, the builder, and the client; but, while these three were very important component parts, he ventured to think that building operations would in many cases, if not in all, not go on very well without the assistance of the clerk of works. He was almost inclined to think that the client, important as he was in one respect, had no right to occupy the third position in that trio, to the exclusion of the clerk of works, and that a good clerk of works was the third essential to a successful building work. A clerk of works required to have a great many qualifications, and ought to be a sort of Admirable Crichton: he must know everything about the operations of building and building material; he must be a sort of policeman during the carrying out of the work; and, thirdly, he must be a man of tact. If the clerk of works had no tact, it did not matter what his knowledge of building operations might be, or what his firmness might be in the case of inferior work or material; without tact there would be continual trouble in the carrying out of a work. He had been very fortunate in getting clerks of works to carry out his buildings, and he had not been troubled by that friction which sometimes occurred in carrying out building contracts. The clerk of works who had tact was generally regarded by the builder as one of his best friends, for he saved the builder a great deal of trouble and made the work go on

smoothly. The Association had been in existence for twenty-three years, and he was quite sure that it must have exercised a very beneficial influence over the whole of the members. The Association tended towards social intercourse, and gave members an opportunity to exchange views and bring their difficulties and troubles before their friends, and it must be very helpful to all of them. He did not know whether the Association provided any system of training or a curriculum for the education of clerks of works, but they had heard that such classes as were instituted by the Carpenters' Company were largely attended by young clerks of works, and were found very useful. Classes of that sort must be very beneficial, but he did not think that they could take the place of practical training, and any man who was going to be a really useful clerk of works must serve his time at a trade and be at a bench. The best men he had known had gone through a trade and all the phases of it, and had become general foremen and then clerks of works. Those were the best men he had had to do with.

Mr. John Pain, in response, said that the first instance of a clerk of works occurred in 1241, in connexion with certain works at Windsor Castle for Henry III. At those times the clerk of works was attached to the household of the monarch, that being the case in 1641 (Edward III.) and in 1610, when one Ed. Carter held such office in the household of Prince Henry. In those days, however, the engagement of a clerk of works was a rare occurrence, and only in the case of large undertakings; but he thought that a clerk of works should be employed in the case of any building of the value of 5,000. As to the Association, the advantage to any clerk residing in London or the suburbs of belonging to it was obvious. Modern requirements rendered necessary a closer and more intimate acquaintance with sanitary, electric, and other matters than was formerly the case. A clerk had to be well up in these matters, but it was obvious he could not be an expert, and therefore membership of the Association was of great advantage to him.

Mr. J. Brady then proposed the toast of "The Press," coupled with the name of our representative, who replied. In the course of his remarks Mr. Brady referred to the excellent little journal which he edits—i.e., the *Clerks of Works' Association Journal*, which is issued monthly.

The toast of "The Visitors" was then proposed by Mr. R. Kellond and acknowledged by Mr. J. Hill, of the London Brick Company, who remarked that next to the architect the clerk of works was the most important person on a building that the merchant had to deal with. He also referred to the extensive character of the knowledge necessary to make a good clerk of works and to the classes of the Carpenters' Company, which had had a great deal to do with the position occupied by the clerk of works.

The last toast was that of "The Chairman," ably proposed by Mr. A. Fincham, who said that two or three architects had just been returned to Parliament, and the question had been asked: "Why have not more been elected?" He thought the answer was that architects were too busy to be engaged in Parliamentary work. There were to-day architects who were responding to the demands made upon them as well as, if not better than, had ever been the case. Some twenty or thirty years ago most of the buildings erected were a sort of debased Gothic, and architects were twitted for want of originality, but during recent years there had been a development of what might be called civic and municipal architecture, and the architects of these buildings would in time to come be regarded as pioneers and remembered as we remember Pugin, Barry, Scott, and Street.

The Chairman, in response, said it was quite impossible for anyone living now to say whether the architecture of to-day would in the future be considered equal to the architecture of the past. We could not look upon these works with the perspective which was necessary to be able to judge them, but there were a number of architects living who were doing, according to their lights, their level best, and no man could do more than that. Whether their work lived or did not time would decide; but any failure on their part would not be due to lack of effort, for

he knew how honestly and sincerely they tried to carry on their profession.

The proceedings then terminated.

THE SANITARY INSPECTORS' ASSOCIATION: ANNUAL DINNER.

The twenty-third annual dinner of the Sanitary Inspectors' Association was held on Saturday last week in the Venetian Salon of the Holborn Restaurant. The President, Sir James Crichton-Browne, was in the chair, supported by Sir William Broadbent, Sir Wyke Bayliss, R.A., Sir Shirley Murphy, Dr. J. C. Thresh, Mr. Andrew Clarke, and others.

The loyal toasts having been honoured, Dr. J. M. Rhodes, in proposing "Local Government," remarked that the public did not realise what a great amount of work city councillors did, and frequently overlooked the fact that their services were purely gratuitous.

The Mayor of Battersea, in response, said that he thought the difficult and arduous labours of local governing bodies were beginning to be recognised. The civic spirit was being revived, and he attributed this in no small degree to the creation of borough councils. There was much yet remaining to be done by citizens for the improvement of the neighbourhoods in which they resided, and in many places there was a great amount of work for the sanitary inspector yet to do. They needed a broader and more sympathetic system of local government. With all our disadvantages, however, we were far in advance of many other towns.

Sir William Broadbent then proposed "Science and Art." Sanitary inspectors were, he said, in the forefront of the battle against disease, and discharged their duties with zeal and intelligence. He hoped the time would soon come when they would join the medical profession in the battle against tuberculosis, and fight it with as much success as they had fought fevers and similar diseases. It was upon medical officers of health and sanitary inspectors they would have to rely in dealing with that disease.

Sir Wyke Bayliss said, in response, that art and sanitation were not so widely apart as many people supposed. One of the loveliest things in the world was a drain—when it was consecrated by art in the form of a gargoyle on a cathedral. Art was the science of beauty, and sanitation was the science of health, and what were beauty and health if they were not the same thing? A motto of his was: "However old the world may be, art is always young." Might it not only be young, but healthy?

Dr. Thresh also acknowledged the toast, and said there was a good deal of connexion between science and art, and there ought to be more. In a great city they made the difference between beauty and squalor. It was in the mean streets and the hack streets that their work awaited them.

The Chairman then proposed the toast of "The Sanitary Inspectors' Association." He thought the beneficence of the work of sanitary inspectors was now generally recognised, even by those who winced under it. There was, he felt sure, a growing appreciation in the public mind of the value of their services, an appreciation which must take shape one of these days in the granting to sanitary inspectors that security of tenure which was requisite to enable them to do their work without fear or favour, in the provision of adequate means of education, training, and official certification for those who were desirous of entering their ranks. It was satisfactory to note that there was now a steady, intelligent, and sustained interest in sanitary matters throughout the land, and an improved comprehension of them. It was to be hoped that, in the future, with a well-organised intelligence department composed of medical officers of health and sanitary inspectors in every town and county, they would not be caught napping or wait for the scourge of pestilence before putting their house in order, but they should practise that prevention which was better than cure. Diseases that had no business to be about would be caught up and exterminated when they had a thoroughly efficient sanitary police, invested with full authority, and working under a Minister of Public Health with a

sent in the Cabinet. What they had to do was to convince the public of the power and potency of sanitation, and of its pecuniary advantages, and they had, he thought, an opportunity of pressing that lesson home on them in connexion with a disease that was at present attracting much attention—namely, phthisis or pulmonary consumption. An interesting point to note was that the sanitary reforms by which those affected by consumption had benefited were not specially directed against consumption but had other objects than the reduction of consumption in view. Land drainage on a large scale was undertaken in the interests of agriculture, but it abolished malaria in the Fen districts, and caused a heavy fall in the mortality from consumption. The laying of main sewers and house drains and the abolition of cesspools in towns were intended to prevent other diseases; and it was a surprise when it was discovered that they had, no doubt by increasing the dryness of the houses and the purity of their atmosphere, been followed by a marked decline in the fatality of consumption. The window-tax was abolished on fiscal grounds, but by admitting to dwellings that sunlight that was destructive to bacilli and by permitting improved ventilation it also still further restricted the ravages of the disease. The improvements effected in houses, especially those of labourers and artisans in the thickly-populated parts of towns, undertaken mainly on ethical grounds, had largely helped in the suppression of consumption by the clearing away of infected areas. It was clear that every sound sanitary advance had far-reaching and wide-spreading effects, and might accomplish more than was anticipated when it was undertaken.

Mr. W. W. West, Chairman of the Central Executive Council, responded. They had worked during the last year, he said, under great depression on account of attacks which had been made upon them in some of the newspapers. It had been stated that sanitary inspectors, with very few exceptions, were corrupt and failed to do their duty, but such an accusation was entirely without foundation.

The toast of "Kindred Associations" was proposed by Mr. Baldwin Latham, and, in acknowledgment, Dr. Parkinson said that, unless sanitary inspectors and medical officers of health worked together, the health of the country must suffer. He was afraid that their endeavours to secure a Bill for the security of tenure would, in view of the change of Government, have to be put forward again. They had been told that the municipalities would be averse to giving them what they asked for, but he did not see how this could be, as they asked for this protection so that they might do their duty fearlessly, without the risk of not being reappointed on that account.

Other toasts were "The President," proposed by the Venerable Archdeacon Sinclair, and "The Press."

During the evening a presentation was made to Mr. Isaac Young on resigning the chairmanship of the Executive Council, and the Chadwick Medal, with a cheque for fifty guineas, was awarded to Mr. James Lord, of Failsworth, near Manchester.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

At a meeting of the Discussion Section of the Association, held on January 31, Mr. E. W. Wonnacott being in the chair, Mr. A. C. Dickie read a paper on "Internal Steps and Stairs and Their Treatment," the substance of which was briefly as follows:—

The general principles of stair planning, given in my paper of last session on "External Steps," apply equally to internal steps and stairs. No stair can be considered perfect in which comfort and ease have not been studied, together with propriety and fitness in scale. The judgment of comfortable going in a stair is largely affected by length of leg and strength of heart. Tredgold's rule of tread and 2 risers = 24 is a safe proportion. Barry put the perfect proportion at 5-in. risers and 16-in. treads. Palladio gives the minimum of tread at 12 in., with 6-in. riser, and the maximum at 16 in., with 4-in. riser, thus supporting Tredgold's rule. The

minimum width of stair has been fixed at 4 ft., allowing two persons to pass comfortably. Palladio states that no flight should have more than thirteen steps. Barry defended long flights when called to question regarding the flight of twenty-six steps which he designed for the House of Lords, citing Italian examples of much greater number, whose proportion of 16 and 5 made them "as easy as walking on a floor."

The lecturer then read extracts from Palladio on the subject, who laid down certain principles as essential to success.

In domestic work it is never agreeable to expose the stair too soon, as its traffic is usually of a private nature, and needs a certain degree of privacy. On the other hand, the grand staircase of a public building must affect a generous liberality, expressive of publicity, and its position accord with its character. In this class, too, may be included certain palaces and great mansions. In the baronial castles, prior to Elizabethan times, the spiral stone stair was in common use. It was often narrow, inconvenient, and typical of warlike times, and not till the Elizabethan period did the stair give evidence of a more peaceful time. In the châteaux of the Loire valley the spiral stair attained great proportions. In general, the castles in Scotland show great similarity in the management of the plan. A stair should be in character with its building, and sober treatment and proportion apply specially to small domestic examples. In these days of overcrowded gatherings, the hall fills a very honourable position if designed properly, with a well-placed stair. In houses of a fair size, therefore, we may primarily declare for a hall which aims at being something more than a passage, and recess our stair. This may be a newel or geometrical stair; but, perhaps, even better, a close stair house between walls. It is a simple straightforward method. A stair with two flights and a half-landing is always right.

For want of space quarter-landings and two steps between are often substituted—an ill-advised makeshift. The dimensions of a stair are much less elastic than in the other parts of the house. If thoughtfully introduced, winders can often be well used. They should occur near the commencement of the stair, and not at its finish. Head-room requires careful consideration, and for the small house stair should not be less than 7 ft. 6 in. The trimmer of the floor above should not be placed directly over the first riser, but advanced slightly. In our anxiety to avoid cramping the stair we must avoid the other extreme. Dog-legged stairs are not usually happy in effect, as it is difficult to avoid an awkwardness at the meeting of the return flight; however, it is preferable to the contracted well type. The geometrical stair is graceful and pleasant, especially when planned in a complete segment or ellipse, but is really a stone type developed in wood construction. For an open stair the newel and string principle of the Elizabethan period is the most charming. Short, wide flights with quarter-landings find much favour; some have long flights with half-landings, or arched gallery landings, all direct and simple on plan. Newels, strings, handrails, and balusters were all alike massive and richly treated.

Mr. Dickie then described certain types of this work from examples shown on the screen. Continuing, he said he thought the spiral stair might well be used more frequently, and instanced Street's stairs at the Law Courts, as also the various forms shown in Palladio.

Wren's geometrical stair at St. Paul's was a fine example, ninety-two steps in one flight, of 16-in. tread and 6-in. riser. The Château d'Amboix has a fine circular staircase surmounted by a corridor. The way in which the staircase dominates the whole external expression of these French examples was very noticeable.

Turning to Italy, the stairs in the Villa di Papa Giulio were very happy, double segmental flights on either side leading down to a lower hall. A common Italian type was the simple straight flight seen in the arched quadrangle, as at the Gondi Palace.

S. Giorgio Maggiore had a fine and broadly-treated stairs with central flight and landing and flanking flights of thirteen steps each. Palladio showed a simple square staircase of four flights of eleven steps each, and

four landings within a close wall. Another great example was the stair of the Corsini Palace, of fifty-three steps, approached through an arcade. The staircase measured about 75 ft. by 46 ft., with flights 11 ft. 6 in. wide. The Barberini Palace had a beautiful elliptical stairs, rising to a height of about 80 ft. in a continuous helical curve; the intralipse being treated with an order and balustrade carried in twin columns. Stairs must be sufficiently lit throughout, with special care for the lighting of the turnings. The solution, or otherwise, of the lighting problem might make or mar the stair. The works of the great masters formed our guide, and our study would be fruitful only in proportion to our ability to read the works in which their thoughts were so fully expressed.

Mr. Trant Brown, in opening the discussion, pointed out how interest and success in planning revolved on the stair question, instancing the want of interest of the flat or bungalow types. Seeing that stairs were used by people of all ages and sizes, comfort must be sought, not only in proportion, but in frequent landings and suitable surfaces to the stairs themselves. Flights ought not to exceed twelve steps in private houses, preferably nine or ten. A staircase leading to a blank wall is disappointing and depressing. Top lighting needed to be supplemented by side light. The working width of staircase was sufficient if 6 in. wider than the doorways. Winders were to be avoided if occurring only as an occasional surprise, mixed with long and short flights and landings. The single step was to be avoided absolutely.

In the ensuing discussion a good many small practical points were brought out, such as the adoption of a minor flight from kitchen quarters to main half-landing, thereby gaining much of the advantage of a complete servants' stair.

Mr. Lishman mentioned a practical method of determining head-room, by describing an arc from any point of the nosing line at a radius of 5 ft., which should clear all soffits.

Mr. Gerald Horsley, summing up the discussion, emphasised the importance of town staircases where they act as an approach to the reception-rooms, as compared with those in country houses. A stair within walls should be 5 ft. wide. A house of Mr. Shaw's, in Queen's-gate, was instanced as another excellent example of stair within stair. A house staircase with a well could hardly be placed in a space less than 9 ft. square. England was the best place to study the "string" types of stair, and Genoa or Rome the palatial approach stair.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—The first ordinary meeting of the Society of Engineers for the present year was held on Monday, the 5th inst., at the Royal United Service Institution, Whitehall. Mr. Nicholas J. West, the President for 1905, first occupied the chair, and presented the premiums awarded for papers read during that year, viz.:—The President's Gold Medal to Mr. Sherard Cowper-Coles for his paper on "The Metallic Preservation and Ornamentation of Iron and Steel Surfaces"; the Bessemer Premium of Books to Mr. Ernest Rounney Matthews for his paper on "The Parade Extension Works at Bridlington"; a Society's Premium of Books to Mr. Benjamin Laurenson Bradley for his paper on "The Grindiford Stone Quarries and their Working"; and a Society's Premium of Books to Mr. William Pollard Digby for his paper on "Statistics of British and American Rolling Stock." The thanks of the Society were also accorded to Mr. E. H. Thwaite for his paper on "The Transport Possibilities of our Inland Navigable Waterways"; to Messrs. C. S. Meik and Walter Beer for their paper on "The Improvement of London Traffic"; and to Mr. A. H. Smith for his paper on "Machine Drills for Hard Rock." Mr. West then introduced the President for the present year, Mr. Maurice Wilson, who then proceeded to deliver his inaugural address, in the course of which, reminding the members that he had for a number of years been engaged in the early education of engineers, he expressed his opinions as to the training of youths preparatory to their engineering education. He stated that a boy during the

latter part of his school life should be prepared, as far as possible, in the direction that would be most likely to benefit him in after life. He was certain that, at any rate, in reference to engineering, that was not done in the majority of cases. Pointing out that it was fair to take the average boy as an example, he asked how was a boy at one of our public schools taught his mathematics. A boy was not likely to become a good mathematician unless he learnt to follow up with intelligence the various stages of his mathematical training. Many youths began their engineering education, having taken no possible interest in their mathematics at school. He then referred to the bad spelling and execrable handwriting of the youth of the present day, and was emphatic as to the desirability of boys being refused admission to public schools unless they had been properly taught those subjects elsewhere. It was a fact that a large number of youths left school without the slightest idea how to reason out quite simple matters, and whose powers of exercising their common-sense was of the crudest description. A boy was never too young to be taught to think for himself, and problems and other mathematical matters should be placed before him from a common-sense point of view. He did not wish to reflect on the masters, who were a splendid and capable body of men, but on the present condition of rush and hurry, and the necessity for taking boys through a vast quantity of matter in preparation for the many examinations which were held during school life. Taking it broadly, it was not the boy from the large public school, but rather the one from one of the smaller public schools, or from a private school, who was a reasonable being. That pointed to the fact that the forms at many of our large public schools were too big, and that in consequence a master could not give anything approaching to individual attention to the boys under him. The general effect of that state of things was that, on leaving school, a youth usually found himself so woefully ignorant that he was obliged to spend a considerable time in working up all those necessary matters for his engineering education which he ought to have learnt at school, and that without any reference to higher mathematics. As, at any rate, a partial remedy for that, the President suggested that the large forms should be divided, and, if necessary, subdivided, so that a master should not have more than from fifteen to twenty boys to teach at a time. The Institution of Civil Engineers were moving in the matter, and as theirs was the opinion most likely to carry weight, they should be cordially supported by all engineers.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—The eighth meeting of the students of this Society was held on Tuesday last week, and presided over by Mr. Henry Goldsmith, who, after a few preliminary remarks, called upon Mr. James Norquoy to read a paper entitled "Hints on Quantity Surveying." The lecturer, previous to giving the "hints," dealt very fully and ably with the merits of the different methods of taking off quantities. He also showed and gave instances how words had unnecessarily been inserted in the description, to the detriment of the quantities. One special case he quoted was where the word "soil" had been inserted after "excavating and removing," the result being that the contractor refused to remove the clay which underlay the soil unless an additional price was paid him. The Chairman in his concluding remarks corroborated a number of the statements made by the lecturer, and illustrated them with instances which had come under his own observation. He strongly advocated the dividing of each trade bill into heads, as, for instance, the placing of all items in connexion with floors under a heading of "Floors."

LIVERPOOL ARCHITECTURAL SOCIETY.—We were mistaken in mentioning the address of Mr. T. T. Rees last week ("Points for the Consideration of Municipal Councils") as that of the President of the Liverpool Society; Mr. Thicknesse is the President. We were under an impression that the paper from which we made the extract was an address from the chair; it appears that it was an ordinary Sessional Paper.

Fifty Years Ago.

FROM THE BUILDER OF FEBRUARY 9, 1856.

REMOVAL OF TENANTS UNDER THE NEW METROPOLITAN BUILDING ACT.

AT Worship-street the other day Mr. Charles Reeves, the Surveyor to the Commissioner of Sewers, attended before Mr. Haunwell to obtain from him a peremptory order for the expulsion of the occupants of certain houses at Mile End, under the following circumstances:—

Mr. Reeves stated that the prosecution was the first of the kind which had been instituted under the 18th and 19th of the present reign, cap. 122, and which only came into operation on January 1 last. The section of the statute under which he made the application was the 80th, the terms of which enacted that, in all cases where any structure had been certified by a competent surveyor to be dangerous to its inmates, a justice of the peace might, if satisfied of the correctness of such certificate, upon the application of the Commissioners, by order under his hand, direct any inmates of such structure to be removed therefrom by a constable or any peace officer; and if such inmates had no other abode, he might require them to be received into the workhouse established for the reception of the poor of the place in which such structure was situated. In pursuance, therefore, of an intimation he had received from the police authorities, he had that morning proceeded to inspect a locality called Spring-gardens, at Mile End Newtown, where he found a number of houses, consisting of twenty-one in all, the whole of which were in such a state of ruinous dilapidation, as not only to place the lives of the inmates themselves in imminent danger, but also those of any persons passing through the street. It was manifest such a state of things could not be allowed any longer to continue; and he had, therefore, forwarded a certificate to that effect to the Commissioners, who had at once directed him to take the necessary steps for the removal.

After some conversation, the magistrate affixed his signature to the order, and it was handed over to the officers that it might be carried into execution forthwith.

Illustrations.

SCULPTURE MEDALLIONS, INGRAM HOUSE.



THE oval medallions, illustrated in the plate, were modelled by Mr. Broad, of Messrs. Doulton & Co., and are originally burnt in terra-cotta at the Lambeth Potteries, casts being only taken in the case of one pair, the "Youth" and "Age," which were further reproduced in salt glaze, green on a deep blue ground, as points of colour to decorate the spandrils of the main arch of the entrance bay. The terra-cottas, as used internally, are unglazed, and have been coloured with the decoration of the walls. They are placed in pairs, grouped with the large Venetian windows which form the end feature of the principal club-rooms, "Spring and Summer" in the dining-room wing, "Autumn and Winter" in the smoking-room, and "Youth and Age" in the library. These ovals are 2 ft. 6 in. in height, and are burnt in one piece.

The figure of Apollo is a casting in lead, reproduced by Italians in London by the "cira perduta" process, from the clay model by Mr. W. Fagan, of Chelsea. This spandril is about 63 ft. from the ground, and the figure is half as large again as life-size. The photograph was taken from the scaffolding by Mr. Goldsburgh, of the architect's office, and shows some of the surrounding brick detail of the main cornice, etc.

The quatrefoil plaster panel, "Hercules," is the centrepiece of the deeply-coffered ceiling of the middle portion of the dining-rooms at Ingram House. It is about 4 ft. 6 in. square, and was modelled and cast at the building as part of the decorative plaster work carried out by Messrs. Aubrey & Co., of Woking. The design is based on an old French example at Toulouse, which is curiously cut out of the solid planks of the



"Apollo": Cast-lead Figure, Exterior of Ingram House.

ceiling. The treatment has been adapted to the difficult lighting of its position described above. A. T. BOLTON.

PULPIT AND SCREEN, SAN MINIATO, FLORENCE.

The marble screen dates from XIIIth century, and is one of the most beautiful specimens of marble inlay work to be seen in Italy. The screen is of cream marble and the inlay in ebony black, with very small portions of red, as, for instance, the demon's tongue. The columns to the pulpit are of red marble.

The font in Pisa Baptistery is of exactly similar design, although of much later date.

The niello pavement in the nave of the church, according to an inscription, was executed in 1207.

The church has lately been restored. The exterior is in keeping with the original work, but the interior has been greatly disfigured by painted imitation marble walls and string mouldings. LIONEL U. GRACE.

DESIGN FOR MUNICIPAL OFFICES, TORQUAY.

In this competition, held last year, the varying levels of site were such as to warrant consideration in the lay out so that the due advantages of the site could be obtained, and at the same time bearing in mind the dominant idea of concentration of departments, coupled with easy working arrangement. The principal entrance to the municipal offices was arranged from Marychurch-road, with entrance to the town hall and library from Castle-circus and Leamington-road respectively.

The plans being sufficiently explicit, detailed description is unnecessary. A crescent-shaped front, with forecourt bridged across to main entrance, was adopted, as it was considered a solution of the difficulties of levels. The library was purposely planned as a separate building capable of erection and being complete in itself, this being one of the conditions of competition. The architectural treatment is an attempt to depict a restrained monumental and solid dignity conceived to be best adapted to the use of local material, which is blue-grey limestone, and to this class of building. The frieze surmounting the whole building was intended to be of Ham Hill stone.

The drawing was exhibited at the last Royal Academy. E. VINCENT HARRIS.

HOUSE AT MASSINGHAM, NORFOLK.

This house has recently been completed at Massingham, Norfolk, from the designs of Messrs. Edmund Wimperis & Best.

It is faced with red brick and Ancaster stone, the roof being Brosley tiles.

The contract for the house, lodge, and stables was 7,624l., and the contractors were Messrs. Cubitt & Gotts, of Ipswich, the clerk of works being Mr. Chas. Stacey. The Gilmour Door Company supplied the hardwood doors, and the carving was done by Mr. Jago, of London.

The plan and elevation were both largely

influenced by the owner's wish to reproduce the design and character of an existing Georgian house in the same county.

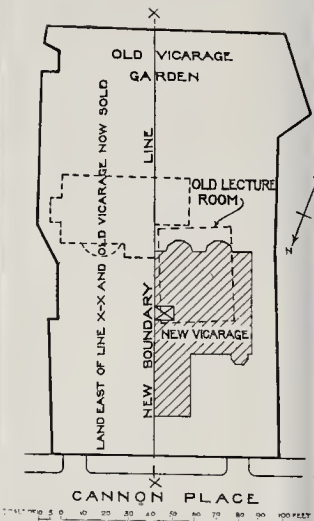
CHRIST CHURCH VICARAGE, HAMPSTEAD.

The main problem to be solved in the design of this house was how to get the accommodation required on a somewhat restricted site without altogether ruining the garden. Half the garden of the old vicarage, together with the house itself, having been sold it was necessary to place on the remainder of the site, whereon had stood a large one-storied lecture-room, the new vicarage, which was to contain, besides the ordinary accommodation, a vicarage-room, where meetings and classes could take place without disturbing the household of the vicar.

The garden is situated on the heights above London; the southern rooms therefore have a commanding view over roofs and spires to the Surrey Hills beyond. No lighting (except by the area over pantry and service lobby) was to be obtained along the eastern boundary. The above were the conditions which suggested the disposition of the plan.

There is a drawing-room on the first floor over the dining-room. Seven bedrooms (including two attics), dressing-room, and bathroom complete the accommodation.

The outside facings are of red pressed bricks, supplied by the Heather Brick and Terra-cotta Company, Leicestershire. The copings and chimney bases are of Campden



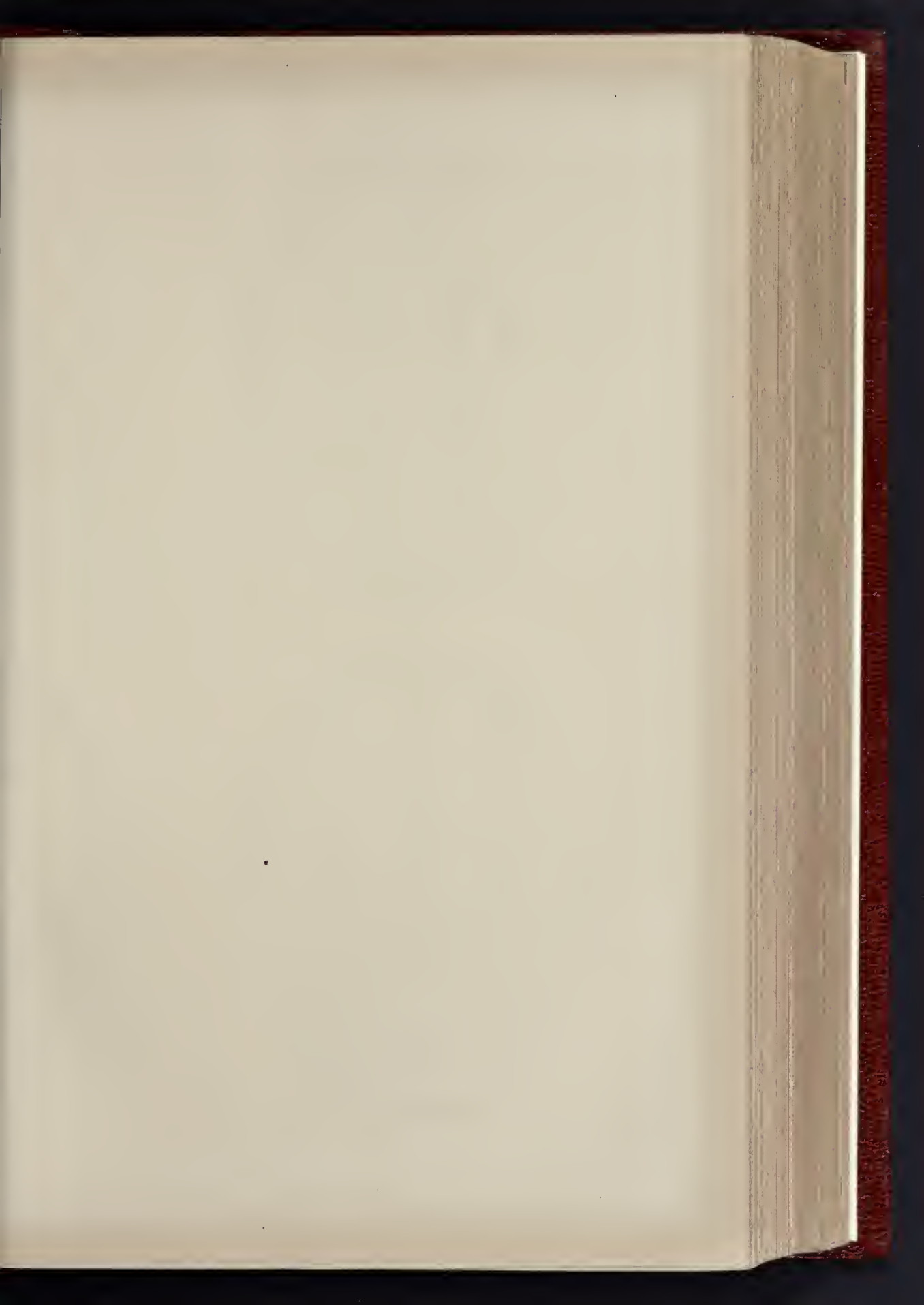
Christ Church Vicarage, Hampstead. Block Plan.

stone. The roofs are covered with Brosley tiles.

The contractor was Mr. John Bentley, of Waltham Abbey, Essex. Our illustration is from a drawing exhibited last summer at the Royal Academy by Mr. A. Maryon Watson (Messrs. J. H. & A. M. Watson), the architect of the house.



"Hercules": Ceiling Centre-piece in Plaster, Ingram House.



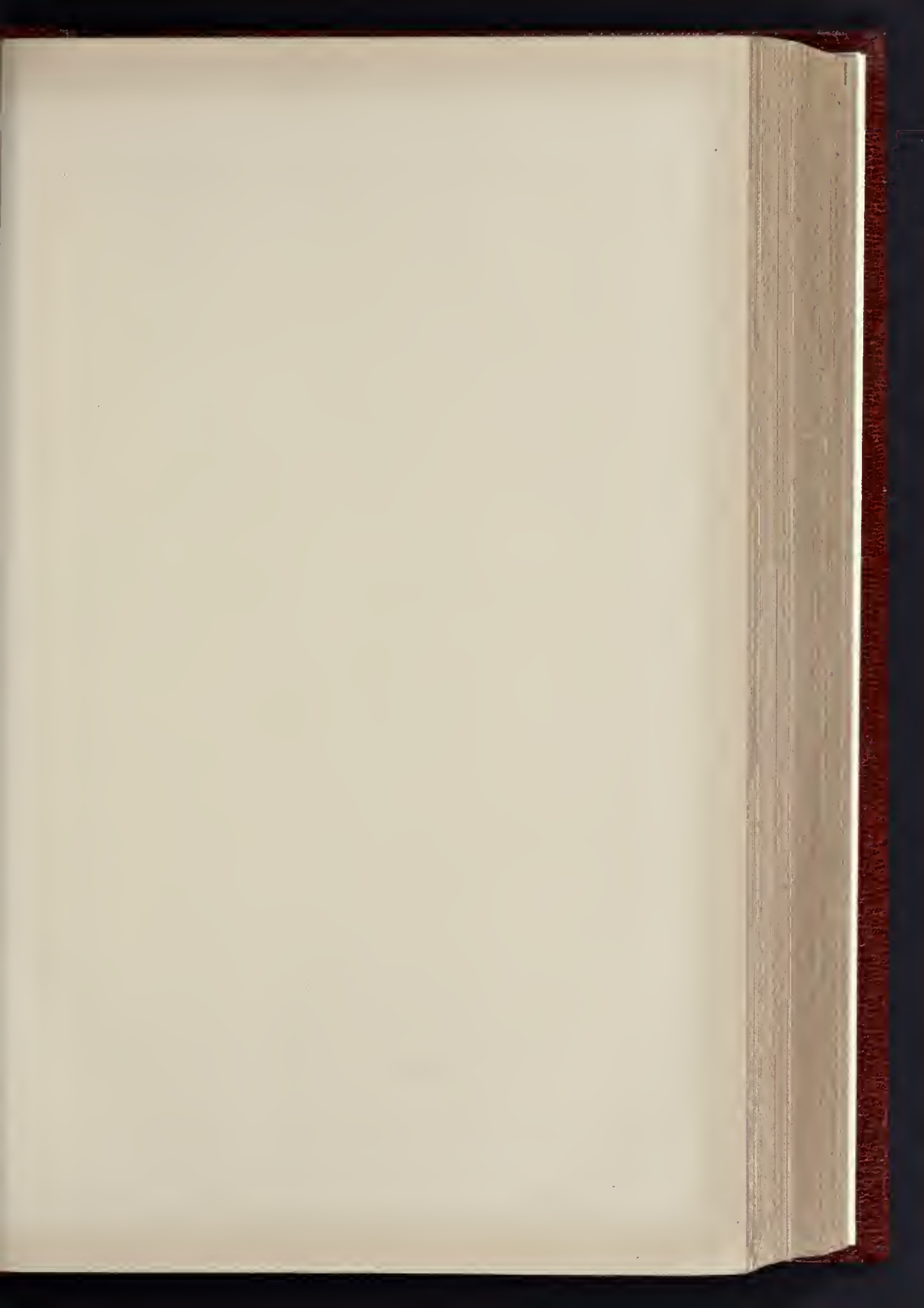


TERRA-COTTA PANELS, INGRAM HOUSE
MODELLED BY MR.



THE PHOTO SPRAGUE & CO. L. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

"FOUR SEASONS," AND "YOUTH AND AGE."
(By Messrs. DOULTON & Co.)





SIDE · ELEV

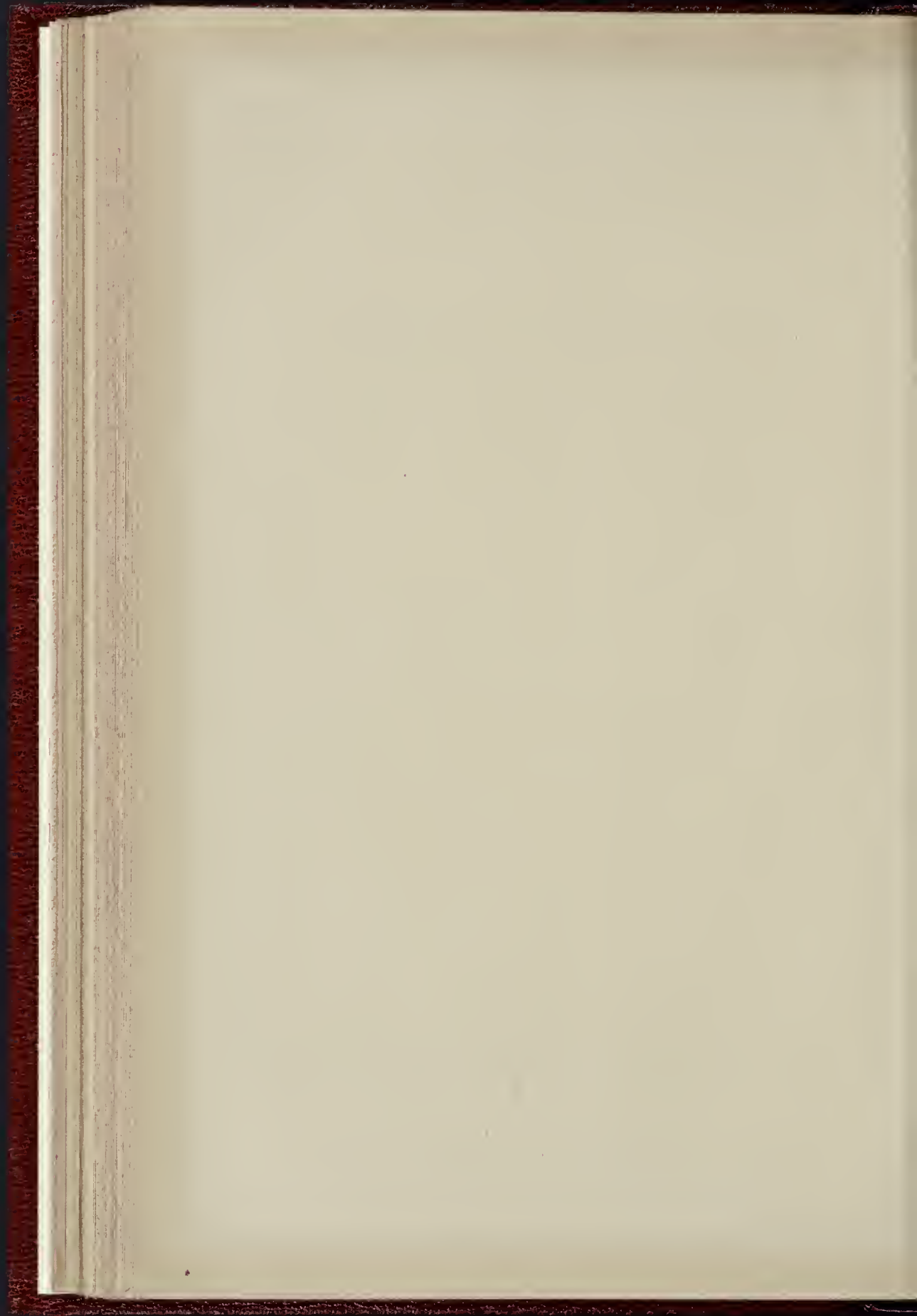
FRONT OF PULPIT INTO MONTE FLORENCE

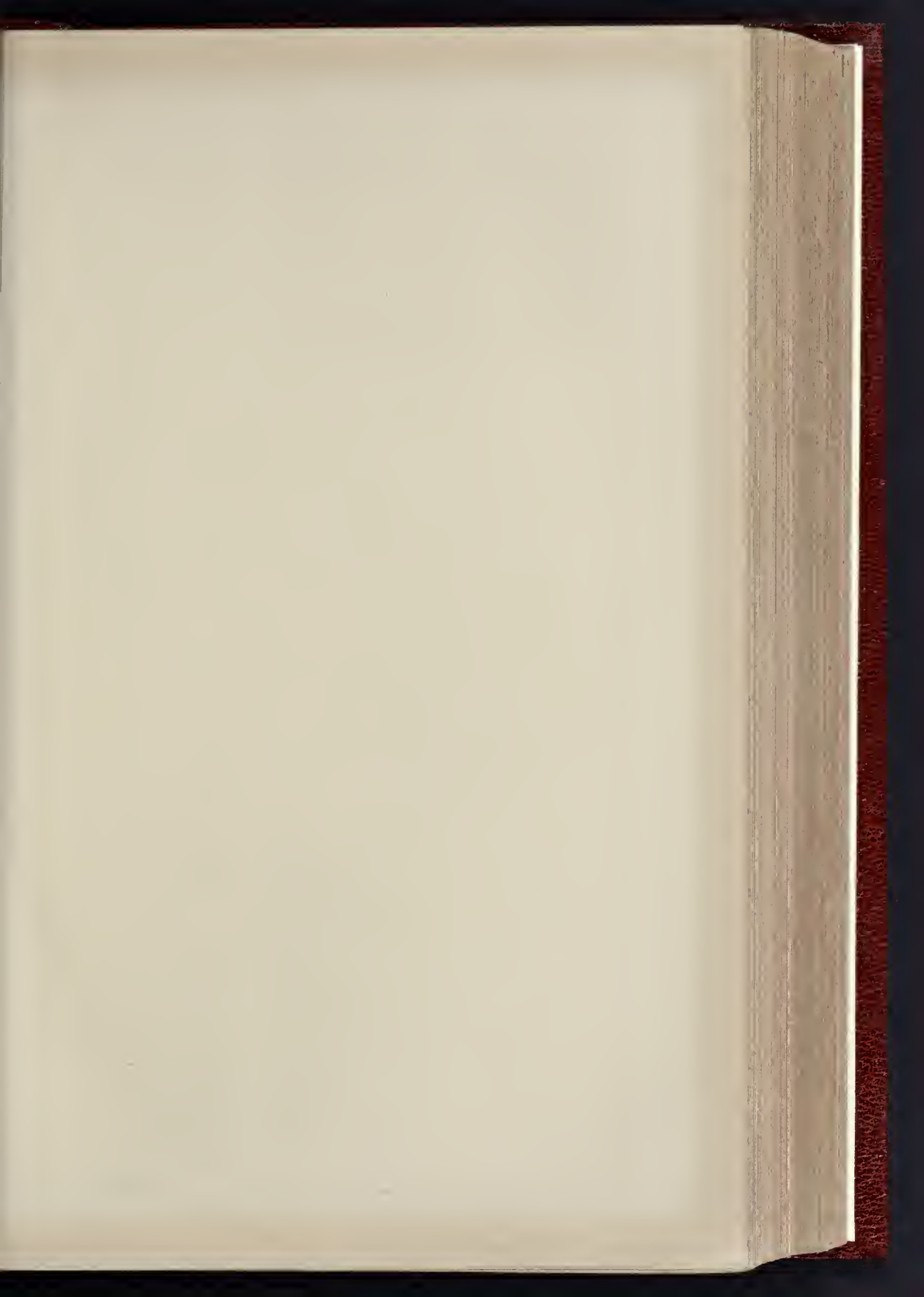


Leon T. U. Grace.

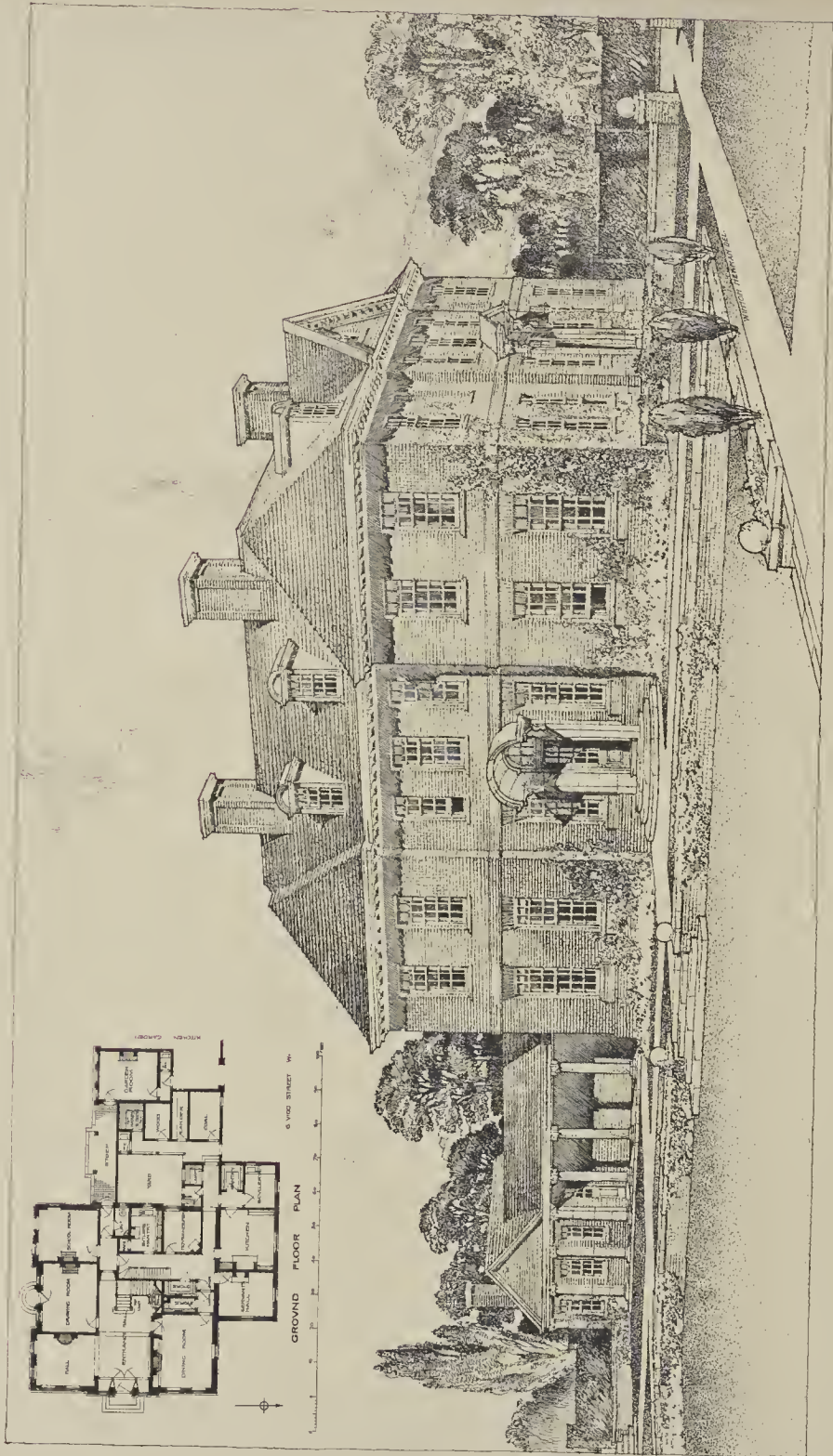
THIS DRAWING MADE OCT 1904.

FRONT - ELEVATION





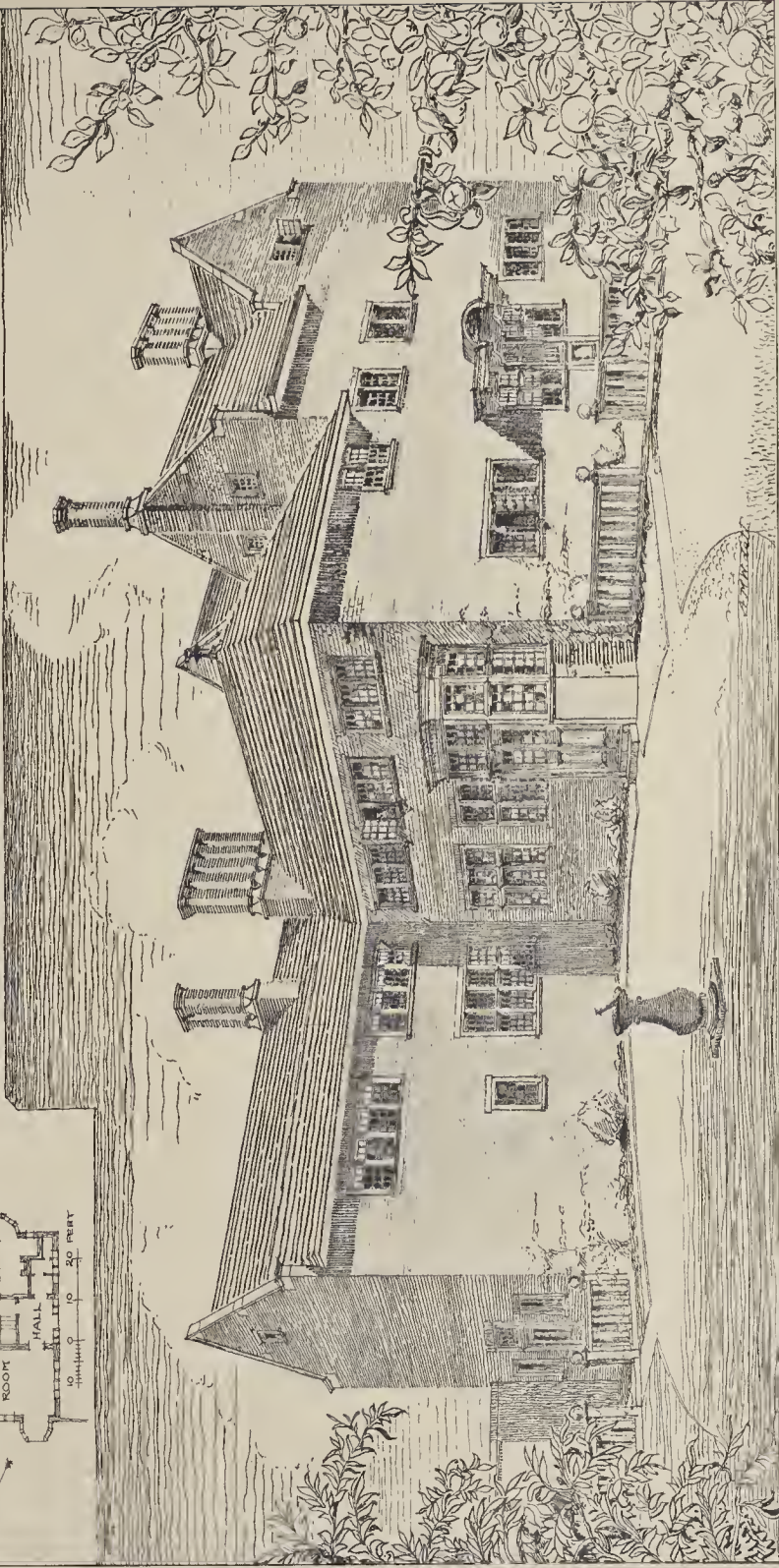
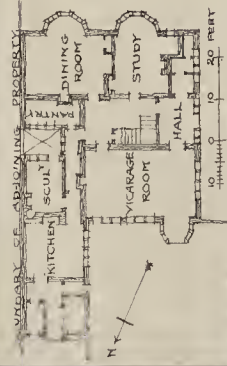
THE BUILDER, FEBRUARY 10, 1906



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

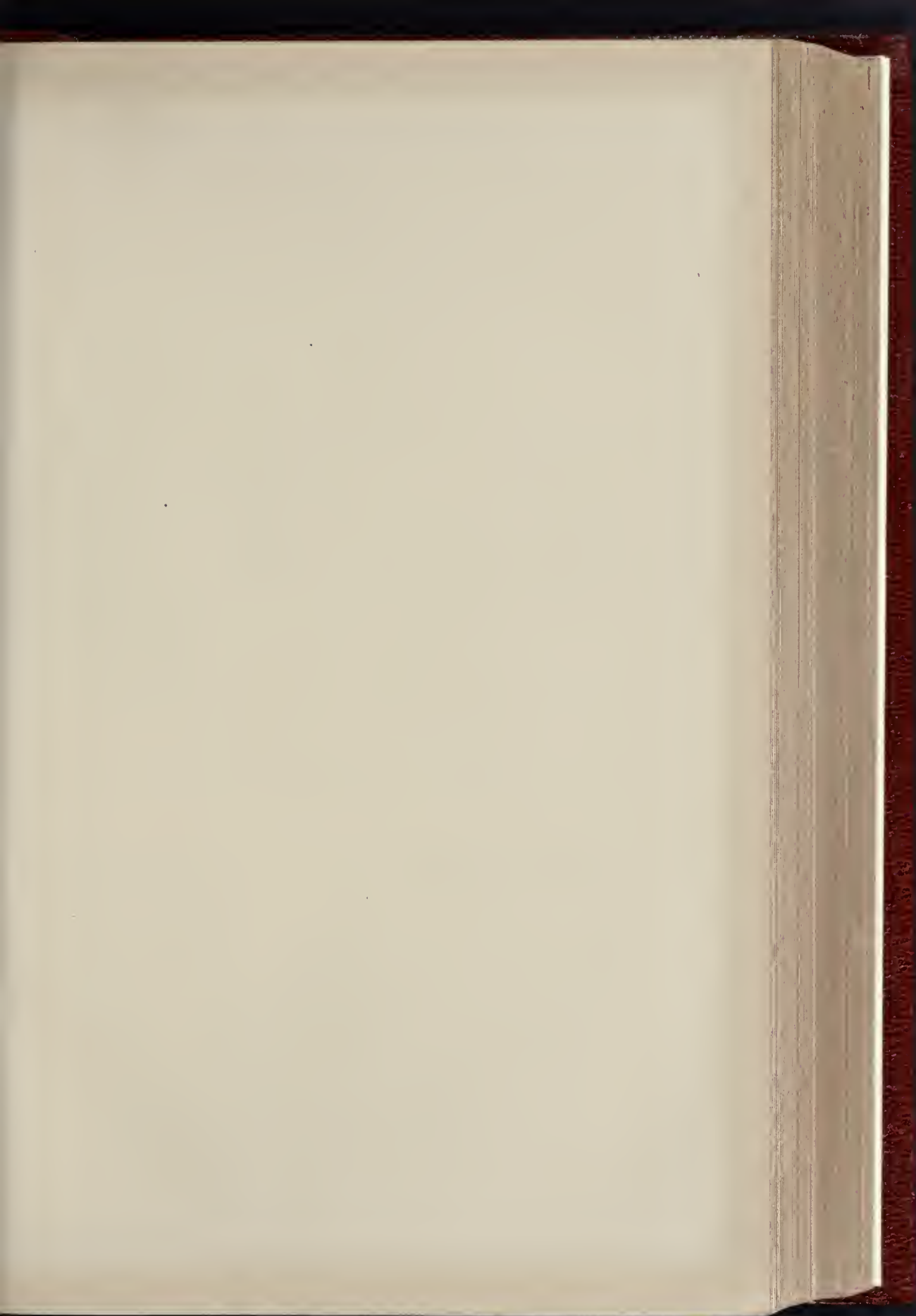
HOUSE AT MASSINGHAM, NORFOLK.—Messesrs. WIMPERIS & BEST, ARCHITECTS

CHRIST CHURCH VICARAGE, HAMPSTEAD. A. MARYON WATSON. ARCHT.



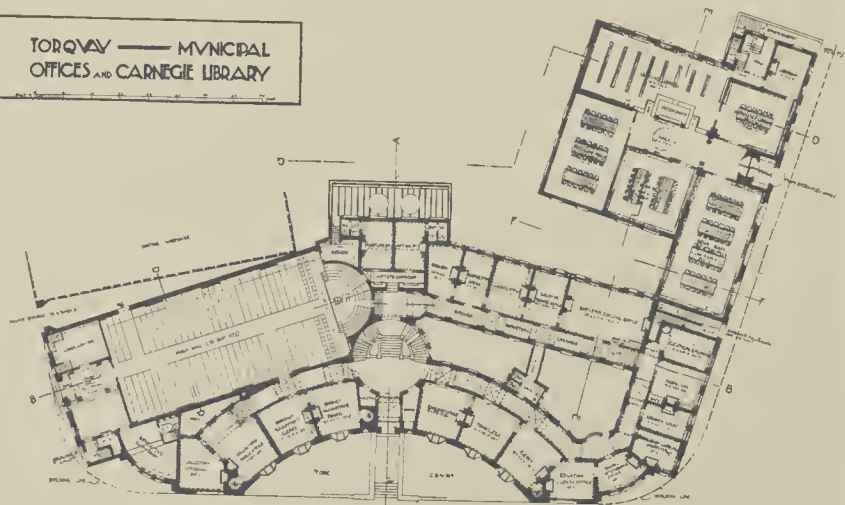
THE PHOTOGRAPHERS: C. L. & S. EAST-AMERICA STREET, LONDON, W.C.



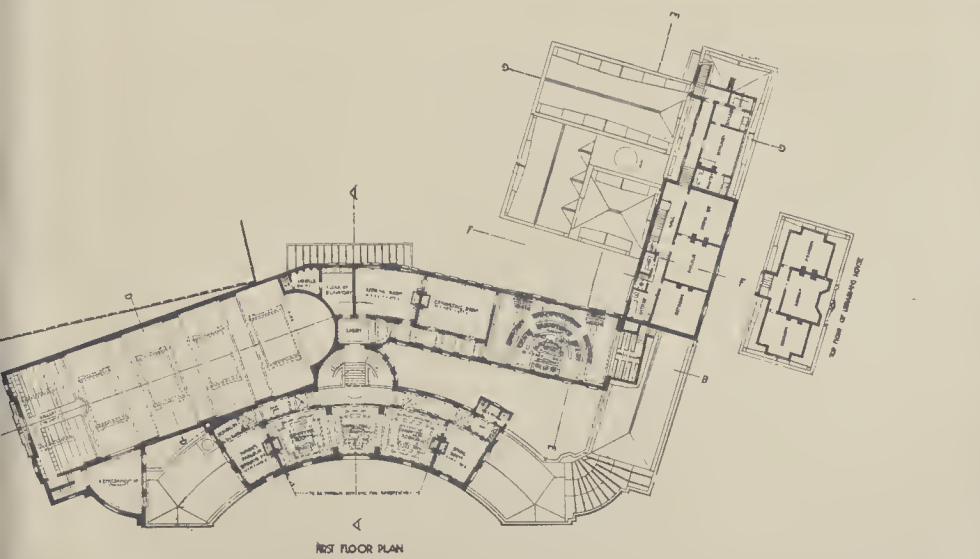




TORQUAY — MUNICIPAL
OFFICES AND CARNEGIE LIBRARY



GROUND FLOOR PLAN



FR. PHOTO, SPRAGUE & C. L. 4 & 5 EAST HARDING STREET FETTER LANE E.C.



COMPETITIONS.

HACKNEY CENTRAL LIBRARY.—The Baths Committee of Hackney Borough Council reported on Monday having granted an application by the Public Libraries Committee for the use of the gallery of the King's Hall on February 26, 27, and 28 for the purpose of exhibiting the architects' designs for the proposed Central Library.

FREE LIBRARY, CROMPTON.—Mr. G. H. Willoughby, F.R.I.B.A., of Manchester, has been appointed assessor by the Crompton District Council in connexion with the Carnegie Free Library, for which about fifty sets of drawings have been received.

BOOKS RECEIVED.

A HISTORY OF ENGLISH FURNITURE. By Percy Macquoid. R.I. The Age of Walnut. Lawrence & Bullen. 2l. 2s.)

THE ROCK TOMBS OF EL AMARNA. Part II. (Archæological Survey of Egypt). By J. de G. Davies. (Kegan Paul, Trench, Trübner, & Co.)

NEW MAP OF METROPOLITAN RAILWAYS, RAMWAYS, ETC. (Edward Stanford. 10s. 6d.)

THE YEAR'S ART: 1906. Compiled by A. C. R. Carter. (Hutchinson & Co. 3s. 6d.)

CREMATORIA IN GREAT BRITAIN AND ABROAD. By Albert C. Freeman. (St. Bride's Press.)

THE ROMAN FORUM. By C. Hudson. Translated by Jesse B. Carter. (Loescher & Co. Rome. 4s.)

THE MUNICIPAL YEARBOOK FOR 1906. Edited by R. Donald. (Edward Lloyd.)

Correspondence.

APPOINTMENT OF DISTRICT SURVEYORS.

Sir.—It is said that the scheme devised by the Building Act Committee of the London County Council was carried by one vote, and it is rather remarkable that the three builders who must have had long experience of the Act and of the District Surveyors were opposed to the report; in fact, one made some very sensible remarks against it. The Chairman seemed anxious for the change; he is an Irish officer without practical experience of building.

Most of the surveyors would benefit by having a salary, and as there is no doubt that building in London will decrease instead of increase, the next ten years will produce about 10,000, less per annum in fees than the past ten years.

One member mentioned that a large fee could be charged for a small alteration to a large building; this is true as the Act stands, but it is well known that the surveyors in such cases make a very large abatement and charge a nominal fee, when, if the fees were collected on behalf of the Council, no such abatement could be legally made.

For more than sixty years the present system has worked well. Men of experience would not care for the appointments under the new scheme, and after many attempts to destroy the position of the District Surveyor they should now be left in peace to pursue their useful work.

The present system of appointment since 1900 is not satisfactory, as a man may be insolvent during his term of office, or if he struggles on with fees varying from year to year, there is no pension at the end, and after giving the best years of his life to the work, he may end his days in the workhouse.

Both the professional societies are in favour of the old system, and there is nobody at the County Hall with any practical experience of the working of the Building Act.

The "Architect" who wrote last week mixes up surveyors and sanitary inspectors, and seems to ignore the fact that District Surveyors know all the troubles of architects, having themselves been actively engaged in the practice of the profession. His ideas are clear as a very small proportion of jobs have an architect, and even experienced architects are glad to have the assistance of an expert in the building laws.

Your "Note" is excellent; worthy of the journal so long conducted by a District Surveyor—the late Mr. George Godwin, who was so highly esteemed by the profession and the public.

FAIR PLAY.

USEFUL WORK FOR THE UNEMPLOYED.

Sir.—Having regard to the serious depression now existing in the London building trade, and the large number of men connected with it who are at present out of employment, may I be allowed to suggest to those property owners who are able to afford the expense, that the most effectual way of relieving the prevailing distress is to put in hand all necessary repairs, painting, etc., with as little delay as possible.

It needs no argument of mine to prove that money spent in this way does far more good than much larger sums given in the form of charity, or as subscriptions to funds for the relief of the unemployed.

One cannot go about London without being struck with the state of despair into which so many houses are allowed to fall; if only a tithe of the work that is required were undertaken, very much of the distress that at present exists would quickly disappear.

I ought perhaps to add that I have no personal interest in the building trade, either direct or indirect.

JOSIAH PRICE NEWTON.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—V.

SHORT CUTS TO MULTIPLICATION.

SOME knowledge of the properties of numbers is most useful, because it facilitates the simplification of various calculations performed by the ordinary rules of arithmetic. It would be inappropriate in the present series to devote attention to such properties, as a special subject for discussion, but a few of them will be mentioned in places where their employment suggests the abridgment of arithmetical processes. This article and its immediate successors will deal with such of the primary and derived rules of arithmetic as lend themselves to the adoption of time-saving methods likely to be of service to the busy professional man.

As a matter of convenience our notes are classified under the heads adopted in ordinary text books.

Contracted Method of Multiplication.

Rule.—Reverse the multiplier so that the units place comes under that figure of the multiplicand which is the lowest place of the required product.

This method is of much assistance in the multiplication of numbers containing or consisting of decimal fractions, or vulgar fractions that can be converted mentally to decimal equivalents. It is particularly intended for use in calculations where the number of decimals in the product need not be so great as the number in the multiplicand and multiplier. To multiply into each other two numbers containing several decimal figures and afterwards to strike off several decimals from the product obviously involves useless expenditure of time, and does not add to the practical value of the result.

For the purpose of comparison the following examples are worked by the ordinary method as well as by the contracted method. It should be noted in connexion with the latter that when a figure, rejected from any of the individual products has the value of 5 or more, the figure next to it should be increased by 1.

Example (1).—Multiply 87315 by 87341 and bring out the product to three places of decimals

Contracted Method.	Ordinary Method.
58645	58645
14378	87341
490160	58645
41052	234580
1759	17595
236	410645
6	490160
	512112945 = 512.2114

In working upon the abridged method we proceed as follows:—

Line (1).—Multiply by 8 to obtain the product 469160.

Line (2).—Multiply by 7, thus: 5 × 7 = 35, the figure 5 being rejected and the figure 3 carried to the next product; but, as the rejected figure has the value of 5, we carry 1 as well as the 3, and add 4 to the product of 4 × 7 or 4 + (4 × 7) = 32, writing down the 2 and carrying 3, and so on for the rest of the line. In this way the product 41052 is obtained.

Line (3).—Multiply by 3: first 5 × 3 = 15, the 5 being rejected and the 1 carried mentally, together with 1 to make up for the 5 rejected; next 2 + (4 × 3) = 14, the 4 being rejected and the 1 carried on; then 1 + (6 × 3) = 19, the 9 being set down and the 1 carried, and so on for the rest of the line, until we get the product 1759.

Line (4).—Multiply by 4: first 5 × 4 = 20, reject the 0 and carry the 2 mentally; next 2 + (4 × 4) = 18, reject the 8, but, as this is

more than 5, carry 2 instead of 1; then 2 + (6 × 4) = 26, write down the 6 and carry the 2, and so on to the end of the line, giving the product 236.

Line (5).—Multiply by 1, and here, as the figure 8 preceding the figure to be set down is more than 5, we carry 1 and write 5 on this line.

The sum of the various products is 512213, and by inserting the decimal point in the correct position we get 512.213.

Example (2).—Multiply 675941832 by 9315764 and bring out the product to three places of decimals.

Here we can abridge the multiplicand to 67594 and the multiplier to 93158, without leading to sensible error, and, working out the result by both methods as in example (1), we have

Contracted Method.	Ordinary Method.
67594	675941832
83158	9315764
608345	270367328
20278	405585092
676	473158224
338	337979160
54	675941832
	202785406
629692 = 629.692	608347648

6296914581639618 = 629.6914

Inspection of the results in the preceding examples shows that the differences are quite unimportant, and that the product given by the contracted method may be regarded as sufficiently accurate for all practical calculations based upon data that are themselves approximate, and for many others that have to be made in every-day practice.

The contracted method can also be employed for the multiplication of large whole numbers in cases where absolute accuracy is not essential in the units, tens, hundreds, or thousands places. Thus if we have to multiply a number of eight figures by another number of four figures, two, three, or even four figures in the product may be replaced by ciphers without seriously invalidating the general result.

For instance, take the number 83641258, which consists of:—

8 × 10,000,000
3 × 1,000,000
6 × 100,000
4 × 10,000
1 × 1,000
2 × 100
5 × 10
8 × 1

These figures show how insignificant are the quantities represented by the digits at the right hand in comparison with those at the left hand, and, as a matter of fact, the collective value of the four last numerals 1258 is only $\frac{1258}{10000000}$, or about $\frac{1}{8000}$ of the whole number. Hence it is obvious that the collective value of the last three, or of the last two, numerals is of little practical account, as shown by the following example:—

Example (3).—Multiply 83641258 by 4657, expressing the last seven figures of the product in ciphers.

Contracted Method.	Ordinary Method.
8364 (1258)	83641258
7564	4657
33457	5854888 6
5018	41820260
418	50184748
59	334587032
38952	389517338056 = 389,517,338,506

which, after adding the necessary ciphers = 389,520,000,000.

For the purpose of comparison we have worked out the exact product by the ordinary method and the approximate product by the abridged method. It will be seen that the difference is 2,661,494, which involves an error of only about $\frac{1}{143,000}$ in excess of the exact product.

Of course, discrepancies of the kind might be of importance if the units were pounds, shillings, or even pence, or if they represented quantities of materials to be bought or sold. But in approximate calculations and estimates such a discrepancy would constitute no disadvantage, and the same would be the case if the two numbers multiplied into each other formed the numerator of a fractional term in a formula so that the product had to be divided by some other large or comparatively large number.

Multiplication by Factors of Composite Numbers.

Rule.—Multiply successively by factors of the multiplier.

This is a method that will be found very

convenient for mental calculations if the multiplier is a number that can be divided readily into factors.

The following are simple illustrations:—

Example (1): Multiply 521 by 64.

Here 64 = 4 x 4 x 4, or 8 x 4 x 2, and the process is—

Arithmetic multiplication table for 521 x 64, showing intermediate steps for (a) and (b) methods.

Example (2): Multiply 432 by 135.

Here 135 = 3 x 5, or (3 x 9) x 5.

Arranging the factors in different orders, we have

Arithmetic multiplication table for 432 x 135, showing different factor arrangements.

Multiplication by Incomposite Numbers. Rule.—Multiply by the factors of the nearest composite number, and add to or subtract from the last product the product of the multiplicand and the difference between the nearest composite number and the multiplicand.

Example (1): Multiply 109 by 67.

Here 67 = 64 + 3 = (8 x 8) + 3 and the process is—

Arithmetic multiplication table for 109 x 67, using the nearest composite number method.

Example (2): Multiply 181 by 47.

Here 47 = 48 - 1 = (6 x 8) - 1 and the process is—

Arithmetic multiplication table for 181 x 47, using the nearest composite number method.

The method of subtracting a multiple of the multiplicand from a tentative product can be applied very conveniently (1) when the multiplier consists entirely of nines, or (2) when the multiplier ends with the figure 9.

Multiplication by Any Number of Nines.

Rule.—Place as many ciphers at the end of the multiplicand as there are nines in the multiplier, and subtract the multiplicand from the result.

Example (1): Multiply 83 by 9.

Here 83 x 9 = 830 - 83 = 747.

Example (2): Multiply 824 by 99.

Here 824 x 99 = 82400 - 824 = 82566.

Multiplication by Any Number Ending in Nines.

Rule.—Multiply by the whole number next above the multiplier, and subtract the multiplicand from the result.

Example (1): Multiply 45 by 19.

Here 45 x 19 = 45 x 20 - 45 = 855.

Example (2): Multiply 334 by 39.

Here 334 x 39 = 334 x 40 - 334 = 19,706.

The same principle can also be applied to multiplication by any numbers conveniently near in value to multiples of 10.

Multiplication by Any Number Near to a Multiple of Ten.

Rule.—Multiply by the multiple of ten next above or below the given multiplier, and subtract or add the product of the multiplicand and the difference between the given multiplier and the multiplier actually used.

Example (1): Multiply 35 by 28.

Here 35 x 28 = (35 x 40) - (35 x 2) = 1,330.

Example (2): Multiply 68 by 31.

Here 68 x 31 = (68 x 30) + 68 = 2,108.

Multiplication by Components of the Multiplier.

Rule (1).—Divide the multiplier where possible into components produced by multiplication of one or more parts of the multiplier.

Example (1): Multiply 67832 by 9612.

Here it is evident that 9612 = 9600 + 12 and 9600 = 800 x 12

Hence the process is as follows:— Multiply the number by 12 and the first product by 800.

Arithmetic multiplication table for 67832 x 9612.

Example (2): Multiply 573688 by 196284.

Here the multiplier consists of— 196,000 = 280 x 700

Hence the process of multiplication is as follows:— Multiply the number by 4, the first product by 70, and the second product by 700.

Arithmetic multiplication table for 573688 x 196284.

Example (3): Multiply 573688 by 392567.

Here the multiplier consists of— 392,000 = 560 x 700

Hence the process of multiplication is as follows:— Multiply the number by 7, the first product by 80, and the second product by 700.

Arithmetic multiplication table for 573688 x 392567.

There are many other numbers besides those given in the last three examples that can be divided into parts bearing definite relations one to another such as enable the process of multiplication to be abbreviated.

Rule (2).—Add to or subtract from the last digit or the last two digits of the multiplier such a number as will make it possible to divide the modified multiplier into components produced by multiplication of one or more other parts.

Example (4): Multiply 678432 by 9609. Add 3 to the multiplier, making 9612, and proceed as in Example (1).

Example (4): Multiply 678432 by 9615. Deduct 3 from the multiplier, making 9612, and proceed as in Example (1).

Arithmetic multiplication table for 678432 x 9609.

Arithmetic multiplication table for 678432 x 9615.

To the product so obtained add 678432 x 3 = 2,025,296. Thus: 652108834 2025296 652313880

To the product so obtained add 678432 x 3 = 2,025,296. Thus: 652108834 2025296 652313880

THE SURVEYORS' INSTITUTION: STUDENTS' PRELIMINARY EXAMINATION.

Of the candidates who presented themselves at the Preliminary Examination of the Institution, held concurrently in London and Manchester on January 17 and 18, the following satisfied the examiners:—

- C. Abbott (Malton); A. P. Brown (Tunbridge Wells); R. E. Abbot (Malton); G. M. Brown (Tring); G. H. Butterfield (Waltham-on-Dearne); F. Bacon (Snaresbrook); H. E. Carrington (London); E. V. D. Castiglione (Carlisle); P. R. Chanin (Taunton); *J. Batstone (Wandsworth Common); D. O. C. Beale (Tunbridge Wells); R. W. Beken (Crouch Hill, N.); F. O. Bemberon (West Hampstead, N.W.); G. Bolsover (Whitburn, Sunderland); A. W. Davson (Notting Hill, W.); G. E. Bond (Thame, Oxfordshire); A. E. Dickson (Preston);

- S. J. Dimmock (Watlington, Oxon); B. R. Mills (London); F. H. Moore (Barnet); M. Dixon (Liverpool); H. F. North (Mortimer); A. B. C. Duke (Maen, Dorchester); W. Oldham (Eton); J. B. Pascoe (Swansea); G. W. Edwards (Stoke-upon-Trent); E. G. Patching (Worthing); J. Escolme (Morecambe); F. W. Pear (Plymouth, Devon); H. F. Pegg (Woodbridge, Suffolk); G. V. Evans (West Marton, Yorkshire); P. L. Pemberton (Mortimer, S.O.); W. D. Everett (Alton, Hants); S. C. Radburn (Wandsworth Common); R. M. Ewen (Camberley); R. H. Richards (Powis Castle, Montgomery); C. A. Fentum (Upper Norwood, S.E.); A. M. Ridley (Richmond); H. O. Foster (Loughton); J. P. Risdon (Wivelston, Lincoln); P. C. Cambell (Leighton Buzzard); J. J. V. Roberts (Haunton); E. B. Gillett (Streatham, S.W.); N. P. Russell (Lordship Park, N.); H. G. F. Goddard (Taunton); J. W. Scarlett (Ramsgate); W. Griffin, jun. (Battersea, S.W.); L. Stevens (Newton); H. S. Griffiths (Putney); Abbot; T. H. Grimm (London); J. E. Stokes (Cannock); C. Gude, jun. (St. Margaret's-on-Thames); A. H. B. Talbot-Ponsonby (West Milton, Melplash, S.O.); R. F. Hankins (Finchley, N.); A. B. Taylor (Fulwood, Preston); M. M. Harrison (Aspatria); E. Taylor (St. Albans); R. O. Harrison (Carlisle); W. Tibbits (Warwick); W. A. Travers (New Brighton); W. H. Hayward (Broadstairs); R. J. Trollope (London); R. T. F. Hedley (Finchley, N.W.); R. H. Tucker (Totnes); P. C. Henderson (Clapham Common); A. S. Tyler (Walthamstow); R. T. Hower (Abingdon, Berks); G. L. Vigers (London); N. H. Hibbs (Bourne-mouth); S. M. Voy (Hammer-smith, W.); J. B. Hingley (Cradley Heath, Staffs); G. N. Warbrick (Kendal); A. H. Hopley (Cheltenham); L. H. Weaver (Kensington, W.); R. B. Holson (Hampstead, N.W.); M. F. Welsh (Heaton, Newcastle-on-Tyne); E. P. Horne (Hounslow); H. Willett (Bedford); B. E. Hornor (Norwich); W. E. Williams (Ashington-Lynde); M. M. Wilson (Woburn); F. J. Hoskins (Swansea); S. F. Wilson (Manchester); C. S. J. Howe (Leeds); F. J. Wise (Bury St. Edmunds); H. C. James (West Ham, E.); E. J. Wonnacott (Exeter); E. H. Jones (Bristol); A. F. Wood (Lea, S.E.); A. Kirk (Withington); C. R. Woodcock (Aldersburgh-on-Sea); F. H. Lloyd (London); R. B. Woodham (Frinton-on-Sea); E. Ferry (Cheshire); W. E. Woodham (Frinton-on-Sea); L. L. Loveridge (Sutton Coldfield); R. M. Woolley (Salisbury); W. S. May (Chislehurst); R. M. Wootley (Salisbury).

* Passed at head of list.

COURT OF COMMON COUNCIL.

THE Lord Mayor presided at a meeting of the Court of Common Council at the Guildhall on Thursday last week.

Bishopsgate-street.—In answer to a question, Mr. Livesidge said that the Improvements and Finance Committee had been in negotiation with the London County Council for some time past on the subject of the widening of this street, and though they had so far been unsuccessful, as the conditions of the Council were untenable, they hoped soon to come to a new arrangement by which the County Council would bear an equitable share of the cost. The improvement was too costly to be carried out by the Corporation alone.

Milan Exhibition.—A letter having been received asking the Corporation to take the lead in arranging for an exhibit of the municipal services of London at the Milan International Exhibition, 1906, Sir Thomas Brooke-Hitching gave notice of motion that some of the departments of the Corporation should be instructed by the Court to prepare such an exhibit. He thought that plans and models of the Tower Bridge and the markets would be of great interest.

Appointment of Surveyors.—Reporting on the death of Mr. H. H. Collins, the Dangerous Structures Surveyor for the eastern and southern divisions of the City, the Streets Committee recommended that Mr. Edmund Woodthorpe (the present surveyor of the northern division) should be appointed to act as surveyor for the eastern division, and Mr. Martin F. Saunders (the present surveyor for the western division) should be appointed to act as surveyor for the southern division. This was agreed to.

Heavy Motor Traffic.—On the motion of Mr. party Pearce Morrison, it was agreed to refer questions relating to the passage of heavy traffic through the City to the City Purposes committee for consideration and report.

THE ROYAL SANITARY INSTITUTE.

A public meeting was held at the Crown Court, the Gu Jhall, Bristol, on Saturday last week, the purpose of making preliminary arrangements in connexion with the Congress of the Royal Sanitary Institute, which will meet in that city in July next. The Lord Mayor (Mr. A. J. Smith) presided, and explained that the object of the meeting was to make arrangements for the reception of representatives of the Royal Sanitary Institute at the Bristol Congress, to be held from July 9 to July 16. When Mr. J. W. Wintle considered the importance of the objects of the Institute, and of the business to be transacted, he thought the citizens should do what they could to support the Institute. There is no doubt that a great deal of trouble in the city had been brought about by people not having any sanitary knowledge, and from a sanitary point of view. One of the highest objects they had in municipal matters was to cure the cleanliness of the city in which they lived. Dr. Wintle (Chairman of the Health Committee) said the meeting was a sequel to that held in August last when he had unanimously decided to invite the Royal Sanitary Institute to hold their next Congress in Bristol. That invitation had been accepted, and he was pleased to say that Sir Edward Fry had become President of the Congress.

Colonel Lane Notter, who was then asked to address the meeting, said he hoped the Lord Mayor would be pleased to accept the honour of becoming a vice-president. The annual congresses were held in provincial towns of England for the purpose of bringing forward different views and educating people both by speeches and by the exhibition of most recent appliances adapted for sanitary purposes. It was the aim of the Institute to diffuse healthy knowledge of sanitation, and try and lead people in their own interests to adopt the best measures for safeguarding their health. The Institute had been established some thirty years, and at the present time there were about 3,000 members. He could not over-estimate the valuable help it had received from municipal authorities who had thoroughly reported on the sanitary condition of their districts, and who lent their aid in the congress meetings. Another important branch was the training and examination of sanitary officers. The Institute was the first body to undertake this important duty, and there was no more important phase of sanitary work than the duty of the sanitary inspector. The work required that, such an officer had to be judicious and judicious if he was to carry on his work to the satisfaction of those over him and with that peace and harmony that should exist among his clients. This was not a metropolitan association. It was cosmopolitan, and sought to diffuse knowledge through many centres in the country. The Institute had been held in provincial towns, and they had been the means of diffusing information and helping in the elucidation of questions that had proved difficult to local officers. In addition, they had the Parkes Museum in London; he hoped at no far distant date it would be removed to a more suitable building than that at present occupied. With the aid of the people of the country the Institute might show at the exhibition the principles of sanitation adapted to all kinds of dwellings. If they could infuse a knowledge governing these things they would lengthen life, increase happiness, and make the country more prosperous.

Mr. W. Whitaker, Chairman of the Congress Committee, spoke of the usefulness of the Congress in affording the opportunity of ventilating matters of public interest. The lecturer on the occasion of the Bristol visit would be Professor Lloyd Morgan, Principal of the Bristol University College. Bailie Anderson, Chairman of the Glasgow Health Committee, would deliver the opening lecture on July 13.

Mr. H. D. Soarles Wood spoke of the exhibition, which would be one of the features of the Congress. It was a valuable object-lesson, inasmuch as matters referred to in the papers and discussions were to be seen in concrete form in the exhibition. Already they had that support of five county councils, fifteen county boroughs, and a like number of urban councils, besides school authorities, port sanitary authorities, and fifteen societies.

Mr. Moss Flower explained that at a meeting in August he told them that the provisional subscription list showed that about 150 guineas had been obtained. He also told them that he had in the name of the committee secured the option of certain public halls. Since the acceptance of Bristol's invitation he had in the name of the committee engaged the Victoria Rooms as the reception rooms and the Rifle Drill Hall.

The governors of the University College had kindly offered to place at the disposal of the committee their large hall and other rooms, and had written to say they would be pleased to help forward the meetings and make them a success. The lecture room of the Museum and the Blind Asylum Hall would be required, and thus they would be fixed up with halls within a reasonable distance of each other, so that members could easily go from one to the other.

Mr. A. P. I. Cottrell moved that a local general committee be formed to make the necessary arrangements in connexion with the Congress, the committee to consist of those who formed the Invitation Committee, together with those whose names had been read out that day, with power to add to their number.

Mr. J. Baker seconded the resolution, which was carried unanimously.

Mr. Boyd moved—"That a fund be raised for the purposes of meeting all local expenses."

Mr. Levy Langfield seconded, and the resolution was carried.

The High Sheriff moved the appointment of Dr. Colston Wintle as Chairman of the General Committee.

Mr. D. Irvine seconded the resolution, and it was carried.

The appointment of Hon. Treasurer was left to the committee, and the nomination of Dr. Wintle, seconded by Mr. Moxey, the position of Hon. Secretary was conferred upon Mr. T. J. Moss Flower.

Dr. Shingleton Smith proposed the appointment of an Executive Committee, with power to add to their number, and this was seconded by the Rev. W. B. Cooper, and agreed to.

METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of the Managers of the Metropolitan Asylums District was held on Saturday last week, at the offices of the Board, Victoria Embankment, W.C.

Lauesden Asylum.—The Asylums Committee submitted a report regarding a letter, received by the managers some two months ago from the Local Government Board, respecting a proposal to construct iron bridges between certain of the blocks of this Asylum, in the course of which the Local Government Board pointed out the costly character of the proposal. In their report the Committee stated that the estimated cost was 5,000l., and, as showing the necessity for the proposed bridges, quoted some observations of the Commissioners in Lunacy. It was agreed to send a copy of the Committee's report to the Local Government Board.

Northern Hospital.—A report was submitted by the Hospitals Committee respecting the sewage disinfecting chamber at this hospital. There is at present a formal agreement between the Managers and the Southgate authorities, by which the Managers bind themselves to disinfect all the hospital sewage by an admixture of chemicals before it is passed into the local Board's sewers. On account of the cost, and for certain other reasons set forth by the Committee, they recommended that application should be made to the Southgate Local authority to terminate the agreement and to connect the drain direct to the public sewer. This was agreed to.

Stables at Belmont.—The Works Committee reported having received plans prepared by Messrs. T. W. Aldwinckle & Son, in consultation with Professor Sims Woodhead, and Dr. Cartwright Wood, for the stables and other buildings proposed to be erected at Belmont in connexion with the preparation of anti-toxin serum. On the recommendation of the Committee the plans were approved, and it was directed that they should be forwarded to the Local Government Board for sanction. The buildings are estimated to cost 4,600l.

Among the motions down on the agenda was the following, moved by the Chairman of the Board:—

"That no plan be submitted to the Board or to any Committee for approval unless and until the same shall have been deposited for the inspection of the Managers or members of the Committee concerned, in some convenient part of the Office of the Board at least two full days before the meeting at which it is proposed that such plan shall be submitted; and that on the agenda paper for any such meeting shall appear a notice stating the plan or plans have been so deposited, and in what room."

This was agreed to unanimously, the Chairman remarking that he thought the arrangement would work very satisfactorily.

DISTRICT SURVEYORS' ASSOCIATION.—

The election of officers for 1906 has resulted as follows: Mr. Edward Dru Dry, President; Mr. Frederick Waller, Vice-President; Mr. John Clarkson, Hon. Treasurer; Mr. Henry Lovegrove, Hon. Secretary. The retiring President, Mr. Thomas H. Watson, has given careful attention to his duties during a very busy year, and his unvarying courtesy increased, if possible, the esteem in which he is held by the London District Surveyors.

YORK MASTER BUILDERS' ASSOCIATION.

The York Master Builders' and Contractors' Association and friends assembled in the Old George Hotel, Pavement, York, on the 30th ult., under the chairmanship of Mr. Geo. Sharp, President of the Association, on the occasion of the annual dinner. The loyal toast having been honoured, Mr. F. Raney proposed the toast of "The Yorkshire Federation of Building Trades." He said that one of the objects of the federation was stated to be the promotion of equitable dealings with architects and others in relation to quantities and contract agreements. Speaking as regarded architects, he felt he might say without fear of contradiction that the great majority of architects were fully in accord with the federation on this subject. As regarded quantities and contract agreements, the society with which he was identified had lately given a considerable amount of consideration to this question, and more especially to the conditions of contract which had been adopted by the Royal Institute of British Architects, and the National Federation of Master Builders. Whilst they agreed in toto to the principles laid down in that document, there was some slight difference of opinion as to the most suitable form which could be adopted for local requirements. Some of them felt that the agreements were drafted to meet the requirements of a section of the building trades who did not probably carry on their business on methods the same as was done in that locality. Locally, he and his colleagues would like to see a revision of that so as to have the conditions more adapted to local use, and he thought there should be a conference between them and representatives of the Association of Master Builders. One of the things that architects were agreed upon was that the clause for quantity should be part of the contract. If it was not out of place he would like to express the wish that all representatives of the building trades could be drawn into an association of that kind. Another object which the federation had in view was the promotion of boards of conciliation on disputes between employer and employees. That he considered a most laudable object.—Mr. P. Rhodes, in acknowledging, said he ventured to assert that anyone who looked through the agreement between the National Association of Master Builders and the Royal Institute of British Architects with reference to architects' agreements calmly and judiciously would see that it was a most equitable arrangement as between architect and builder and between the builder and his employer. In the old days the builders did not appreciate the importance of their position. "We want to remember that next to agriculture we are the largest, oldest industry in this country, and when you come to consider that 50,000,000l. of money is paid annually in wages to employees of the building trades you should feel proud to belong to a craft which is of the highest and of the utmost importance." They should not worry their minds about reducing men's wages. Let the men have a fair, good wage, and let the masters themselves be content with a fair day's work for it. They had the right to demand a good profit. During the last two or three decades the men had banded themselves into influential and powerful bodies, having a great influence in members and money. A number of years ago the masters had no federated feeling with masters in other towns, and the consequence was that when they came into contact with the men in a trade dispute they found that they had to fight not the local organisation of the men, but the whole national body. And so the Yorkshire Federation was formed, and as it grew it was connected with the North of England Federation, which was associated with the National Federation. As to the result of that alliance what better evidence was there than the institution of the conciliation rules, which were an accomplished fact?—Mr. A. W. Sinclair submitted the toast of "Success to the York Association," and said that during the last five years they had had no disputes of any moment, and the reason was that builders had become strong and powerful. There were something like 8,500 builders in the Northern Counties Federation, and when occasion arose and the cause was a just one they acted in concert for their own rights.—The Chairman, in responding, said their Association would in four months' time have been formed sixteen years. During their career they had had five strikes and only one serious lock-out.—Mr. B. Dent proposed "The Town and Trade of York," and said there were few towns which could boast of such treasures as they in York had—the walls, its bars, and the Minster—and the citizens ought to be proud of these treasures. He paid a tribute to the Dean and Chapter for the way in which they kept the Minster in repair, and hoped that they kept the Minster would be kept in good repair to last another thousand years. He regretted that trade was not better in York than it was, and that the Ouse was not made more use of.—Councillor Mansfield, in acknowledging, said he believed that in 1885 or 1886, as far as the building trade was concerned, there were more men out of work in York proportionately than there were in the

city-to-day. Mr. W. E. Biscorn proposed "The Architects and Surveyors," and Mr. E. T. Felgate and Mr. S. Neelham briefly responded, expressing themselves in sympathy with the aims of the Federation. Mr. J. W. Biscorn gave the toast of "The Visitors," and Mr. Goodwill replied.

OBITUARY.

MR. J. P. SEDDON.—We regret to announce the death at St. Thomas's Nursing Home on February 1, after an operation, of Mr. John Pellard Seddon, aged seventy-eight years, of No. 62, Albany-mansions, Albert Bridge, S.W. Mr. Seddon was elected an Associate in 1852, and in 1860 a Fellow, of the Royal Institute of British Architects; he served as member of Council, and some thirty to forty years ago he acted for a period of ten years as Honorary Secretary of the Institute, in conjunction with the late C. Forster Hayward. In 1847 he was elected one of the original members of the Architectural Association; he acted as Honorary Secretary of the Association in 1850-51, and was reinstated in membership on November 6, 1903. He attended the Jubilee Banquet of the Association in 1897. Mr. Seddon was partner of the former firms of Messrs. Prichard & Seddon, of Llandaff, and Messrs. Seddon & Carter, of Cardiff. He was born on September 19, 1827, at London House, Aldersgate, where his father Thomas Seddon, whose biography he wrote, carried on business as a cabinet-maker. Having received his earlier education at Bedford Grammar School he was articled, in 1848-51, to Professor Donaldson. He then, on returning from a professional tour upon the Continent, settled in practice in London. Having been appointed architect of an hotel at Southend-on-sea, in Glamorganshire, he made acquaintance with the late John Prichard, who was then the cathedral and diocesan architect for Llandaff, with whom he entered into partnership at Llandaff in 1852, and whom he succeeded as diocesan and cathedral architect. The partnership lasted during ten years. Mr. Seddon taking London offices at No. 6, Whitehall, and Mr. Prichard practising at Llandaff. On the dissolution of the partnership Mr. Seddon married and took up his residence and offices at No. 12, Park-street (since No. 1, Queen Anne's-gate), Westminster, and there he continued to live until 1888. Messrs. Prichard & Seddon won a premium of 200l. with their designs, after the Gothic style, for the proposed War Office, 1857; their premiated designs, and their unpremiated designs for the proposed Foreign Office with Secretary of State's official residence are illustrated in the *Builder* of August 22, 1857. In the course of their extensive practice the firm were employed as architects for the restoration of Llandaff Cathedral and for a great number of churches, parsonage-houses, schools, and other public and private buildings in the southern counties of Wales and in Monmouthshire. They were the architects of Christchurch College, Brecon; Eastington Park, near Shipston-on-Stour, Warwickshire, for Mr. E. P. Shirley; and the enlargement of Beckford Hall, near Tewkesbury. Leaving for the moment the work carried out by Messrs. Seddon & Carter, we may mention the following as being amongst Mr. Seddon's more important architectural works, denoting with an asterisk those of which plans and illustrations have been published in the *Builder*:—Lambeth Palace Chapel; the bishop's and chapter-choir stalls, Rochester Cathedral; restoration and stall-work, St. Nicholas parish church, Yarmouth; the churches of St. James, Yarmouth; St. Barnabas, Swindon, to which he added the north aisle eight years ago; St. James, Redruth; Hoarwithy, Herefordshire (July 5, 1884*); and with the prayer-desk, and (1904) designs for the five stained-glass windows in memory of the late Rev. W. Poole, vicar; designs for a People's Palace on the Savoy site, Victoria-embankment, in conjunction with the late E. W. Godwin, to whom the river-side façade was due (February 12, 1887*); design for a proposed Ecclesiastical Art Exhibition building on the Savoy site, where is now the Medical Examination Hall, he having been appointed architect to the projectors of the undertaking (August 21, 1880*); the parish-church of St. Paul, Hammersmith, 1882-89, in conjunction with Mr. H. Roumie Gough (December 2, 1882, with interior view, elevations, sections, etc.); a design for decorating the dome of St. Paul's Cathedral, based upon Sandro Botticelli's painting in the National Gallery and elaborated and drawn by Mr. H. G. Murray, artist at Messrs. Belham's, of No. 155, Buckingham Palace-road, S.W. (January 31, 1885*); his suggested arrangement upon the Commutation-row site, Liverpool, of the Cathedral of Notre Dame, Paris, as tentatively restored with its spires by Viollet-le-Duc, with an article by Mr. Seddon upon the site and building (February 14, 1885, a drawing by the late H. W. Brewer*); competitive design for the Baptist Memorial Church, Paisley (August 8, 1885, interior view*); the D. G. Rossetti memorial fountain, Choyne-walk, Chelsea, the bust by P. Madox Brown (April 17, 1886*); Christchurch Vicarage, Westminster (November 17, 1888*); the Dean Goulbourn

testimonial pulpit in the choir of Norwich Cathedral (September 5, 1891*); the Canon Edwards, of Llandaff, memorial gateway, St. David's Welsh Church, Paddington (October 29, 1904*); the restoration of the upper portion of the tower of the XIIIth century church of All Saints, Chalgrave, Bedfordshire (July 8, 1905*); country seats at Abermaide, Co. Merioneth, Rosdolan, Co. Kerry, Oxted, Surrey, Roughwood, Chalfont St. Giles, Bucks, with many others; the North and South Wales branch bank, Birkenhead; St. Peter's Orphanage and Sanitarium, Isle of Thanet, for the late Archbishop and Mr. Tait; churches at Llanbadarn, near Aberystwyth; Adforton, near Ludlow; Chigwell Row, Essex; Ayott (St. Peter's), Herts.; Ullenhall, near Hoxley-in-Ardlen; and Llandogo, Red-Brook, and Wye-sham, Co. Monmouth; St. John's, Lacey Green, Wyecombe; Holy Trinity, Fishponds, Stapleton, Gloucestershire; the restoration of many churches, comprising those of Convil, near Carnarvon; Camrose, Co. Pembroke; St. Nicholas, Great Kimble, Bucks.; St. Mary, Barfrevston, and SS. Peter and Paul, Eythron, near Dover, Kent; St. Peter, Isle of Thanet; St. Leonard, Stanningwell, near Abingdon; St. Mary, Uplawston, near St. Mary, Arminghall, near Norwich; and Holy Trinity, Ingham, near Stalham, East Norfolk. The Dean and Chapter engaged Mr. Seddon to report upon the condition of the west front of Norwich Cathedral, and fifteen years ago instructed him to advise them upon the general arrangements of the interior of the cathedral, he proposing that he was the architect of University College of Wales at Aberystwyth (first built as a hotel), and on July 29, 1886, after the fire, was appointed architect for the rebuilding on the old site, as in his report, at a cost of 17,500l. In conjunction with Mr. Murray he prepared the scheme for the decoration, after the Italian Renaissance manner, for a bay on the north side of Christ Church, Bristol (1905); he superintended the execution (1893) of the W. H. Smith memorial window, St. Margaret's, Westminster, of which the cartoons were drawn by Mr. Murray from Miss Maud Seddon's studies for the figures, and for Sir Edward and Lady Hall, of the Crucifixion window in the Teormine convent, Sicily; he prepared the designs for the organ screen, executed in teak, Llandaff Cathedral, 1903, for a new church at Walton-le-Dale, Lancashire, and the restoration, at a computed cost of from 8,000l. to 9,000l., of St. Leonard's Church, near Preston, 1902-3. Mr. Seddon presented to Llandaff Cathedral five years ago the two side-light windows of the triplet in the west front, which he had designed, being memorials to the late Dean Williams and the late Jonas Watson, of Llandaff, respectively. In our number of March 26, 1904, we illustrated, with a four-page drawing, and plan, and with Mr. E. B. Lamb's drawing of the building as from near the end of Westminster bridge, the design prepared jointly by Mr. Seddon and Mr. Edward B. Lamb for a suggested Imperial Monumental Hall at Westminster for the Heroes of the Empire. Mr. Seddon was one of the twelve architects who were nominated to compete for the Royal Court of Justice, for which he produced a very remarkable and original design. Mr. Seddon was awarded the bronze medal for Architecture, Paris International Exhibition, 1878; and made the designs for and superintended the execution of a large number of stained-glass windows, carried out by Messrs. Belham, of Piccadilly. He was the author of "Memoirs and Letters of the late Thomas Seddon, Artist," 1859; "Progress in Art and Architecture," 1852, illustrated with his own lithograph drawings; "Rambles in the Rhine Provinces," 1858; "King René's Honey-comb Cabinet," 1858; a book describing and illustrating a cabinet which he originally designed for his professional drawings, 1862, and of which Sir E. Burne-Jones, D. G. Rossetti, and Madox Brown painted the panels in oil with a series called "King René's Honeycomb"; and of "A Casket of Jewels," 1902, a work descriptive of the contents of the Royal Architectural Museum in Tufton-street, S.W. In July, 1900, Mr. Seddon was elected a Vice-President and member of Council, and in June, 1901, was re-elected a Vice-President of the Museum and the Westminster School of Art, to which he made a liberal donation. On December 11, 1902, silver bowls were presented to him and Mr. Maurice B. Adams in recognition of their services to the Museum during a period of twenty-five years and as honorary secretaries at the time of the transfer of the museum and school in 1902-3 to the Architectural Association. In November, 1901, Mr. Seddon was elected a member of the Committee of the Church Crafts League; his paper upon "Church Fittings," read to the Institute, is reported in our columns of April 19, 1890. He was one of the many honorary consulting architects to the Incorporated Society for Promoting the Enlargement, Building, and Repairation of Churches and Chapels; in April,

1904, he retired from the appointment of Surveyor for the Archdeaconry of Monmouth, twenty-one years ago. Mr. Seddon took as his partner Mr. John Coates Carter, of Cardiff, for a long time, and he was one of the few who understand architectural work in South Wales, Monmouthshire, and the neighbouring districts; the partnership was dissolved on April 12, 1904. Messrs. Seddon & Carter, of Cardiff, were employed for the reparation and restoration of Chepstow Priory Church, of which they practically rebuilt the greater portion of the fabric in 1890; the firm prepared the plans and designs of new churches and additions, in Windsor, Hove, and at Adamsdown (All Saints), with schoolroom underneath, 1902, in Cardiff; the Mission Room, Blaona, Mon., 1902; a new church, the Conservative Club (May 16, 1885*), and the enlargements of the Albert-road Board Schools, Penarth; some houses built at Penarth and Dinas Powys; improvements and additions, in Marine Hotel, Southend-on-sea, 1899; and in 1903 the restoration, with addition of a north aisle, vestry, etc., of the interesting parish church of Rogiet, Monmouthshire. In conjunction with Messrs. James & Morgan, of Cardiff, they were architects of the Dinagat Church, Newydd, Tregear, the designs being by Mr. Carter, 1893. In the early part of March 20, 1886, we illustrated Messrs. Seddon & Carter's competitive designs, being one of the three acts jointly submitted by them for the Birmingham Assize Courts. At the funeral service on the 6th inst. the Architectural Association was represented by Mr. G. H. Fellowes Pryne and Mr. D. G. Driver, the Secretary.

MR. INGLEY WOOD.—We regret to record the death, in Edinburgh, on the 30th ult., of Mr. Lindsay Ingley Wood at the early age of thirty-three. Mr. Wood was an architect by profession, but he was perhaps better known to the public on account of his resolute articles in the field of art and matters of antiquarian interest. Mr. Ingley Wood was one of the best-known and recognised authorities upon old pewter, and recently published a book of much historical and literary value dealing with the old Scottish pewter industry under the title of "Scottish Pewter Ware and Pewterers." He was a frequent contributor to *The Connoisseur* and other art journals upon old pewter and kindred subjects. One who knew him writes—"He was an artist of no mean order and his work in black and white had a striking individuality, as was shown in his sketches of Vanshising Edinburgh and Leith."

MR. WILLIAM VAUGHAN.—The death occurred on the 29th ult. at the age of fifty-five years, of Mr. William Vaughan, of Lilycroft-road, Bradford, the architect to the Bradford Education Authority, after an illness extending over several months. The eldest son of the late Rev. William Vaughan, he was articled with Mr. Samuel Jackson. Afterwards he was for ten years in the office of Messrs. Milnes & France, and in 1832 he was appointed assistant architect in the Borough Surveyor's department of the Corporation, a position he held for over nineteen years. In September, 1891, he was appointed architect to the Bradford School Board, and had held the same position since the institution of the Education Authority.

MR. HANNEN.—The death, on January 29, is announced of Mr. Benjamin Hannen, of No. 4, Penbridge-place, Bayswater, and Oselsey, Highgrave, Berks., aged seventy-six years. Mr. Hannen was a brother of the late Lord Hannen, President of the Probate, Divorce, and Admiralty Division, High Court of Justice. In 1858 Mr. Hannen joined the firm of Messrs. Holland & Hannen, builders and contractors, then of No. 17, Duke-street, Bloomsbury, and Belvedere-road, Lambeth, in whose offices he had previously served during a term of ten years. In 1883 the firm acquired the business of Messrs. Wm. Cubitt & Co., of Gray's Inn-road and Cubitt Town, Poplar, nearly all the partners of that firm having then retired, and Mr. Hannen eventually became the principal of the firm in Gray's Inn-road. At the time of the first great strike in the building trade he was member of the Council of Builders, and on the second occasion was Chairman of the Builders' Committee.

GENERAL BUILDING NEWS.

CHURCH, SWANSEA.—The Bishop of St. David's recently consecrated the new church of St. Michael and All Angels, at Manston. Mr. Bruce Vaughan is the architect. The portion of the church above is completed at a cost of 5,000l.

SCHOOLS, MISSION-GROVE, WALTHAMSTOW.—These schools, which were opened on the 31st inst., consist of a two-floor block accommodating 400 infants on the ground floor and 400 girls on the first floor, on the 9 and 10 square feet basis respectively. The site has an area of 2,900 sq. yds., and the school is completed by a breadth of 87 ft., and a depth of 33 ft. 6 in., and a frontage of 27 ft. 9 in., and the hall of the upper floor 63 ft. 10 in. by 28 ft. 6 in. Each department has eight classrooms accommodating fifty each, which are lighted from the left hand. Owing to the narrowness of the site six of the classrooms in each department are in line and over each

* At the close of the Exhibition, 1882, the South Kensington Museum authorities applied to purchase that work. Mr. Seddon, however, retained it, and in 1887 presented it as a wedding gift to his daughter, Mrs. Birch.

er at the back, and one at each end of the halls. The building is faced with "Redbank" redressed bricks, gauged arches and aprons, with Portland stone dressings. The front elevation is treated plainly in a free Renaissance character. Those of classrooms, halls, and teachers' rooms are laid with pitch-pine blocks, the galleries classrooms being formed to a slope of 1 in 10. All rooms have separate inlets and outlets for ventilation, with ridge ventilators on roof, and heating, which is on the low-pressure system, is provided by Messrs. Boyd & Sons. The lighting throughout is by electricity. The offices (with separate trapped pans) and playsheds are at the west end of playgrounds. The latter will eventually be tar-paved. The contract amounted to 9,965*l.*, and has been carried out by Messrs. Rowley Bros., of Tottenham, from plans prepared by Mr. H. Prosser, Architect to the Education Committee.

PARISH HALL, EGHAM.—The new parish hall, which has been erected in connexion with the old Trinity Church at New Etkham, was opened in the 1st inst. It will accommodate about 400 people and has been built from plans by Mr. Whistler.

ASSEMBLY HALL AND LIBRARY, IRKLEY.—The main stones have just been laid of this building, which is being erected from the designs of Mr. William Bakewell, of Leeds, which designs were selected in competition. The total estimated cost, exclusive of furnishing is 13,000*l.*

HALL, OSWESTRY.—The new Memorial Hall, erected at Oswestry, has just been opened. The building, which is used by the local friendly and trades' societies as a club-house, etc., and also by a ladies' committee as a restaurant for the use of people attending the Oswestry Smithfield, the building is situated at the corner of Smithfield-street and Smithfield-road. On the ground floor is a restaurant, 40 ft. by 18 ft., with cloak room, etc., adjoining. The main hall measures 27 ft. by 27 ft. On the second floor there are four club-rooms. The architect was Mr. Frank B. Smith, and the contractors were Messrs. Jones & Evans, of Oswestry.

NEW NORTH RIDING COUNCIL BUILDINGS, NORTHALLERTON.—We gave a brief description of these buildings last week, but we omitted to state that the asphalt of the flat roofs was carried out by Clarendon's Patent Asphaltic Company, Ltd., of Victoria Embankment, W.C.

APPOINTMENT.

SWAFFHAM RURAL DISTRICT COUNCIL.—Mr. W. V. Thwaites has been elected, out of 127 candidates, as Surveyor to the Swaffham Rural District Council.

SANITARY AND ENGINEERING NEWS.

DRAINAGE BY-LAWS.—On Monday the Public Health Committee of Paddington Borough Council reported having asked the London County Council to define by-law No. 5 of their code, relating to intercepting traps, so as to make it clear that a manhole is to be provided in connexion with every intercepting trap. In reply, it was stated that the effect of the by-law suggested, as regards intercepting traps, should be noted for consideration when any general amendment of the by-laws under section 292 of the Metropolitan Management Act, 1855, was contemplated.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Marshall & Bradley, architects, have removed their offices from 31, Old Queen-street, Westminster, to Parliament Mansions, Victoria-street, S.W.—Mr. W. A. Scott, architect, has removed his offices from 74, Holly-bank-square to 45, Mountjoy-square, Drumcondra, Dublin.

MANCHESTER INFIRMARY.—At the meeting of the Board of Management of the Manchester Royal Infirmary on the 29th ult., it was stated that, with the exception of the out-patients' block, the whole of the ground floors of the new infirmary buildings at Stanley-grove are practically completed. The granite basins and finished work on the architects' stone, and the builders are waiting for the stone to carry it round the administrative and teaching blocks. The contracts for the erection of the three-storey buildings fronting Oxford-street will be let in April next.

THE LATE ASSISTANT LIBRARIAN AT THE INSTITUTE.—Mr. Lawrence J. Gomme, assistant librarian at the Library of the Royal Institute of British Architects, has recently resigned his position in order to take up new work in Montreal. All architects who have been in the habit of frequenting the Library during the past five or six years will miss Mr. Gomme, for he made a friend of everyone with whom he came into touch, and his ready sympathy and interest were always at the service of those who sought them. His genuine desire to assist all who wished to see intelligently the splendid resources of the Library, added to his own considerable knowledge, won him immediate confidence, and he has been of

great service to students and others who were seeking information. Mr. Gomme sailed for Canada on the 25th of last month, and will, therefore, by this time have reached his destination, where we may be sure he will meet with deserved recognition and ultimate success.

GLASGOW UNIVERSITY.—The Senate will confer the honorary degree of Doctor of Laws upon Sir James Guthrie, President of the Royal Scottish Academy, and upon M. Auguste Rodin, President of the International Society of Painters, Sculptors, and Gravers, at the graduation ceremony on April 17 next.

THE TEACHING OF MATHEMATICS TO TECHNICAL STUDENTS.—A meeting of the Association of Teachers in Technical Institutes will be held at the Regent-street Polytechnic, London, on Saturday evening, February 17, commencing at 7.30 p.m., when the following papers will be read and discussed:—(1) "The Teaching of Mathematics to Engineering Students," by Mr. G. E. St. L. Carson (Head of the Mathematical Department, Battersea Polytechnic); (2) "The Teaching of Mathematics to Building Trade Students," by Mr. Harold Bustridge (Lecturer on Building, etc., London County Council Paddington Technical Institute). All teachers and others interested in mathematical teaching are cordially invited to attend and take part in the discussions.

THE BUILDERS' EXCHANGE, BIRMINGHAM.—On Thursday, the 1st inst., a large audience attended the first of the series of lectures being given at the Builders' Exchange, Birmingham. Mr. W. Sapote, President of the Advisory Council, took the chair at 6 p.m. The lecturer, Mr. H. Browning Button, took for his subject "The Underground Slate Quarries of North Wales." The lecture was illustrated by lantern slides which showed the enormous difficulties to be surmounted in obtaining slates for building purposes. Among other things slides showing the workings, milling operations, and means of transit, together with illustrations of the methods employed for examining the roofs of the huge chambers from which the slate has been extracted.

The lecturer claimed for Welsh slates their absolute superiority on geological grounds; the Welsh slates veins being in a strata of rock of considerably greater age than those of France and America. The slates from neighbouring quarries used in roofing houses in Blaenau-Festiniog 80 to 100 years ago were as good as the day they were put on. The shipment of Welsh slates from Penryn to London averages 115,000 to 120,000 tons per annum. Statistics were quoted showing the development of imports in foreign slates. The lecturer stated these were unfit for use in districts where the atmosphere is charged with chemical fumes, and buildings on which they had been used had had to be re-roofed with Welsh slates. The Chairman suggested that, in addition to the lecture, it would be of great interest if it could be arranged for a visit to be made to the slate quarries, and preparations are now being made to give effect to this suggestion.

SCULPTURE.—Before the members of the Bradford Philosophical Society at the Bradford Church Institute on the 1st inst., Mr. M. H. Spillmann lectured on "British Sculpture of To-day." The lecturer said, should primarily represent ideas, and not things. The well-accepted anything pictorial, and it was not strange that so subtle an art as sculpture was little understood in this country. Almost anyone could mould clay into the resemblance of a man, but in the result must be commonplace. Chief amongst the characteristics of the modern school was the effort towards such realism as did not detract from the dignity of conception. Until Alfred Stevens no one thought of instilling life and blood into clay and marble. He infused into his work not only life but dignity of form and movement. The lecturer proceeded to outline the chief characteristics of the work of the leading sculptors of the modern English school. The lecture was illustrated by lantern slides.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual general meeting of this Association was held at the offices, Guildhall, Small-street, Bristol, when the chair was occupied by the President, Mr. E. L. Neale. The annual report was presented and adopted, as also were the audited accounts, presented by the hon. treasurer. The annual report for the year 1905 stated that:—Not for many years past has the building trade of this city been under such a cloud of depression as during 1905.

Your committee, however, trust that the downward tendency has reached its lowest ebb. In fact, there is every indication to lead them to believe that in the near future trade will open up, and the work of the builder will be in request.

Much time and attention have been devoted to the charges made by the Bristol Water Works Company to builders for water used in constructional operations. The terms and conditions obtaining in many industrial centres were procured and tabulated, from which it appeared that the charges in Bristol were unfavourable. The directors were urged to receive a deputation from the Association, but they did not see their way to acquiesce.

Accordingly, representations were made to the Board through their secretary, and much correspondence took place, your committee strongly urging their claims for more liberal treatment. . . . Your committee granted interviews to deputations from the Masons' Society, Carpenters' Society, and the Bricklayers' Society, when very friendly discussions took place in respect to matters arising particularly out of the working rules. The societies promised to submit their cases in writing; however, only the carpenters carried out their promise, and they wrote to the effect that at the present time members of the Masters' Association were somewhat guided by the clauses which were inserted by the architects, to the effect that "certain firms shall do particular work." What their Society required was that such clauses should be deleted by the architects from their specifications, and that the whole of the work in connexion with the preparing and laying of wood block floors should be done by the builders, and that it should be considered the same as any other work, which belonged to the trade of a carpenter and joiner. The question was very fully considered, when it was resolved:—"That the members of this Association will use their best endeavours to comply with the request of the United Trade Council of Carpenters and joiners in securing the work of laying wood block floors for local men. Further, that a copy of the letter received from the Society, together with this Association's reply, be forwarded to the Architects' Society."

For some time past your committee have considered that some alterations were necessary in the winter working hours, as set forth in the existing working rules. After very mature deliberation it was decided to give notice to the various operative societies, in December next, viz.:—(1) It is proposed to substitute the following in place of rule 1, sections A and B: That from the third Monday in October to the third Saturday in March the working hours for the first five days of the week shall be from 8 a.m. until 12 noon, and from 1 p.m. until 5 a.m., and on Saturdays from 8 a.m. to 1 p.m., with the exception of the month of December, when work shall cease at 4.30 p.m. on the first five days of the week; that the working hours for the remainder of the year be as at present; (2) It is proposed to amend rule 10 to read as follows: "That any alteration of these rules shall require six months' notice from either side, such notice to expire on the first day of January in each year. During the year many questions have arisen in relation to forma of contract and tender. Without exception your committee have advised their members to adhere strictly to the rules of the Association, and it is with satisfaction they record their appreciation of the unanimity with which their recommendations have been adopted from time to time.

The report also referred to the death of Mr. John Bastow, Mr. A. E. Denby and Mr. W. Podger and Mr. H. J. Spear, their late secretary. The Chamber of Commerce having organised a testimonial fund in recognition of the services rendered by the late Mr. Spear to the trade and commerce of the city generally, the Association actively supported the scheme, and were the means of raising a sum of 150*l.* 7*s.* 6*d.*, which sum has been handed to the trustees for investment. The President moved the following resolution:—"That Mr. R. F. Ridd be elected President of the Association for the current year." This was seconded by Mr. E. Walters, supported by Mr. George Humphreys, and carried by acclamation. Mr. Ridd suitably acknowledged his election. Mr. R. F. Ridd moved, Mr. Geo. Humphreys seconded, and it was resolved unanimously:—"That the best thanks of the Association be conveyed to Mr. E. I. Neale for the large amount of time and attention he has devoted to its work, and for the able manner in which he has conducted the affairs of the Association." Mr. Neale returned thanks for the vote. Mr. R. F. Wilkins was elected as Vice-President of the Association, upon the motion of Mr. R. F. Ridd, seconded by Mr. George Downs. It was resolved upon the proposition of Mr. Neale, seconded by Mr. Downs, "That Mr. Geo. Humphreys be re-elected hon. treasurer of the Association for the coming year, and that the best thanks of the Association be tendered Mr. Humphreys for his past services." Upon a ballot, Messrs. E. I. Neale, Frank N. Cowlin, W. Foster, E. Walters, A. Dowling, J. Lovell, F. Chown, and E. A. Love were elected members of the committee for the ensuing year.

Legal.

THE WIDENING OF PICCADILLY: IMPORTANT DECISION.

In the Chancery Division on the 7th inst. Mr. Justice Buckley gave judgment in the cases of J. L. Denny & Co., Ltd. v. the Mayor, Aldermen, and Councillors of the City of Westminster, and J. C. Cording & Co. v. the same defendants.

In these cases the plaintiffs claimed injunctions to restrain the defendants from proceeding upon notices to treat whereby plaintiffs were required to treat for the sale to the defendants of certain hereditaments adjoining Piccadilly for the

purposes of widening Piccadilly, and, if necessary, a declaration that the adjudication of the Council of the defendants referred to in such notices was *ultra vires* on the ground that only a small portion of the land and premises comprised in the notices was required for such widening.

The facts of the case sufficiently appear from the following judgment.

His lordship said that on the north side of Piccadilly a short distance west of the Circus was a block of land bounded by Piccadilly, Air-street, Regent-street, and Piccadilly-place. The freehold was in the Crown. The plaintiffs in the first action, Denman & Co., Ltd., were the Crown lessees of Denman House, being Nos. 19 and 20, Piccadilly, which stood at the south-east corner of the block, with a frontage of 44 ft. and a depth of about 57 ft. to Air-street. Denman House was an important building erected by the plaintiffs two or three years ago under a building agreement with the Crown at a cost of 25,000. Their lease was dated November 9, 1903, the rent 950*l.* per annum, and the term extended to October 10, 1922. These plaintiffs occupied the shop in the western half of the house and some other parts of the premises. The plaintiffs in the second action, J. C. Cording & Co., were the under-lessees of Denman & Co., and occupied the shop in the eastern part of the house and also some portion of the basement and the whole of the mezzanine floor. They paid a rent of 1,200*l.* per annum, their tenure was thirty-nine years from October 10, 1903, as to one part of the premises, and as to the other twenty-one years from October 10, 1903. Both plaintiffs had carried on business on the site for many years, the first plaintiffs for more than fifty years and the other plaintiffs for more than thirty years. The premises were very important to them, the site being one of the best in London, and the London County Council and the defendants had in contemplation a public improvement, viz., the widening of Piccadilly by throwing into the street a strip of land which at the eastern end of Denman House would be about 27 ft. wide, and which might not be more than 25 ft. There was no question that the defendants were entitled to use their powers under Michael Angelo Taylor's Act as, and for the purpose of, acquiring such land necessary for that purpose. On June 10, 1905, the defendants served on Denman & Co., and on June 26 on the other plaintiffs, notices to treat for the whole of their interests in Denman House. The question in the case was whether these notices to treat were valid. The St. James's Hall and Restaurant occupied a large part of the block of land in question. The Piccadilly Hotel Company were desirous of erecting on the plot of land a large hotel, and they held an agreement from the Crown for a lease of the whole block subject to Denman & Co.'s existing lease. The Hotel Company were desirous of obtaining possession of Denman House, pulling it down, and extending their hotel over so much of the site as was not thrown into the widening of Piccadilly. The plaintiffs, on the other hand, were desirous of retaining so much of the property as was not required for the widening of the street.

His lordship then went through the agreements entered into between the Crown, the London County Council, and the Hotel Syndicate, dated respectively October 26, 1903, and March 4, 1904, and said that the Syndicate had acquired the ground leases of a large part of the premises upon the block which they contracted to surrender to the Crown. The Crown was not a party to any arrangement by which any part of Denman's property was to be acquired otherwise than by agreement, except so far as it was to be acquired for the purpose of the strip. As between the County Council, the defendants, and the Hotel Company the contractual rights were determined by three agreements dated respectively June 1, 1904, July 11, 1904, and June 6, 1905. His lordship said he thought these agreements intended a contract by the local authority, that they would, at the request of the Syndicate, use their statutory authority for the purpose of acquiring other and additional land for the purpose of throwing it into that which, under the bargain with the Syndicate, was to be subject to a new Crown lease in their favour for the purposes of the hotel. On April 6, 1905, the Westminster City Council passed the resolution in exactly the form submitted by the London County Council.

In his opinion they passed because they had contracted to pass it. He found no evidence that they exercised any independent judgment of their own in the matter. The local authority had no right to seek to reduce the expense to the rate-payers by straining their powers in the interest of persons who desired to acquire the adjacent land from those who were the owners of it. He went on to consider whether upon the facts of the case the house was such that the defendants, who unquestionably were entitled to take part of it, were entitled to take the whole. He came to the conclusion that upon the 30 ft. of depth which was not wanted for the widening there was no difficulty in preserving with the certain amount of re-construction so much of the building as stood on that 30 ft. Upon the facts of the case he arrived at the conclusion that the local authority were not entitled to take more than

was wanted for the widening of the street, and that the 30 ft. depth which would remain after the widening was not wanted, but was a building which could be and ought to be left as a house which the plaintiffs as the owners desired to retain and from which the defendants had no right to dispossess them for the purpose of putting the hotel company into possession. He thought that the plaintiffs were entitled to injunctions restraining the defendants from proceeding upon the notices to treat, and the defendants must pay the costs of the actions.

ACTION BY A QUANTITY SURVEYOR FOR FEES.

MR. JUSTICE SUTTON, in the King's Bench Division, on the 2nd inst., delivered a considered judgment in the case of *Elsmore v. Vallerie*, an action by the plaintiff, a quantity surveyor, to recover from the defendant, Mr. Ernest Vallerie, of Westcliffs-on-Sea, Essex, 1,164*l.*, charges for preparing bills of quantities for the proposed building of a hotel pursuant to the instructions of Mr. W. L. Griffiths, an architect, being 14 per cent. on the estimated cost of the building.

The defence set up was that Mr. Griffiths had no authority to pledge the defendant's credit in the matter. The defendant further said that he, Mr. Griffiths, and a solicitor named Goldring, were joint speculators who were to promote a company to carry out the erection of the proposed hotel and that they were not to receive any fees unless the promotion was successful, and as the promotion has not been successful the fees were not payable. The facts sufficiently appear from the following judgment.

His lordship said the plaintiff brought the action to recover a large sum for preparing bills of quantities on the instructions of Mr. Griffiths, an architect, for a proposed hotel at Westcliffs, which was never built. The action was brought against the defendant, and as against him the plaintiff must fail unless he could show that he (the defendant) authorised Mr. Griffiths to give the facts as given to his lordship. Mr. Griffiths said that the defendant instructed him to prepare plans and specifications for the hotel, and particularly that he was to get out bills of quantities. Plaintiff knew there was a scheme with regard to the hotel, but Mr. Griffiths said it was an independent scheme. Mr. Goldring, a solicitor, was called, and he said the scheme was a joint speculation. Then he had the evidence of the defendant, who said he never employed Mr. Griffiths as architect and never gave him any instructions as to the preparation of the bills of quantities. But his lordship had to look at other facts in the case. Defendant, in the contract for the purchase of the necessary land, appeared as the purchaser, but he did not find any part of the money, and as nominee his name appeared on the prospectus of the proposed company which was going to work the hotel. But the prospectus was never issued. Therefore the conclusion he came to was that the defendant was the mere nominee in the matter and had selected for that purpose on account of his knowledge in the management of hotels, Mr. Goldring was a partner in the scheme, and he was to give his services gratuitously unless the scheme proved a success. Mr. Goldring said that the defendant was to take the contracts in his own name as nominal owner. Mr. Griffiths, he said, was to prepare the plans and specifications of what was necessary and was not to look for payment unless the scheme succeeded. Under the scheme Mr. Griffiths was to have 5 per cent. on the contract price if it succeeded, and that would have amounted to a very large sum. Viewing all the circumstances of the case and the evidence given, his lordship came to the conclusion that the scheme was a speculation only on the part of the three gentlemen, viz., the defendant, Mr. Griffiths, and Mr. Goldring. To his mind that was clearly shown to him to be the case. He thought there must be judgment for the defendant with costs. Order accordingly.

Mr. Pyke Glasgow appeared for the plaintiff, and Mr. C. A. Russell, K.C., and Mr. Chester Jones for the defendant.

ACTION ON AN OAK FLOORING CONTRACT.

MR. JUSTICE KENNEDY, sitting in the Commercial Court last week, concluded the hearing of the case of *Johnson & Son v. The Lumber Company*, an action by the plaintiffs to recover from the defendants damages for alleged breach of contract and alternatively for breach of warranty.

It appeared that in September, 1905, plaintiffs received a large quantity of oak flooring, and it was said that defendant's agent had supplied them with 90,000 superficial feet of prime clear white oak flooring carefully grooved and tongued, etc., at 21*s.* 9*d.* per square, c.i.f. London, the lengths to be 8 ft. to 16 ft., with not over 20 per cent. of the lengths under 8 ft. finished. The plaintiffs said that in May and June, 1905, they paid to the defendants in respect of oak flooring 904*l.* 13*s.* 11*d.*, but that when it was delivered it was totally unfit for the purposes for which it was required, and

boards being twisted, warped, split, and sappy. 30,531 of the boards were red instead of white oak, and 24,229 pieces were shorter than the minimum length of 6 ft.

Mr. Montague Shearman, K.C., and Mr. Eustace Hills appeared for the plaintiffs, and Mr. Pickford, K.C., and Mr. Cautley for the defendants.

Mr. Hills said that the main points of the plaintiffs' contention were that the lengths were far shorter than the contract arranged for, and that the wood was knotty, sappy, and of the wrong colour and twisted. Every care was taken of the parcels delivered, a special building being erected to receive and store them. The timber was tested by laying down a sample floor, which proved its unsuitability. On that the plaintiffs decided they could not use it, and they had to buy other timber, for which they paid 31*s.* 6*d.* per square as against 21*s.* 9*d.*, the contract price. That amounted to 618*l.* 5*s.*, and for cartage and other expenses 180*l.* 12*s.* 10*d.*, a claim for 798*l.* 17*s.* 10*d.*, in addition to the payment of the wood rejected.

Mr. J. F. Johnson gave evidence as to inspecting the wood and its assignment. He said it was very knotty and twisted, and he quite a green state. About 50 per cent. of it was red, and the rest white oak. He laid a sample floor with the wood and it was found to be unsuitable.

Mr. Wm. Douglas Cargo, Architect to the Ecclesiastical Commissioners, gave evidence that he had examined the wood as unsuitable.

Mr. E. F. Whitford, general measurer, said he had examined and measured the contract in question. Out of 491 squares 244 were white and 247 red oak. He found 12,420 pieces under 6 ft. in length, or 251 per cent., and 23,215 pieces over 6 ft., or 471 per cent.

This being the plaintiffs' case, Mr. H. Brown, defendant company's general manager of the office that he inspected the goods in question on their arrival in the Victoria Dock and was satisfied with the delivery. He afterwards saw the building in a building in course of construction, and in a room where plastering and the mixing of mortar was going on, places damp and quite unfit to store it in. He did not think there was an unusual number of short pieces, and said it was an advantage to have a selection of shorts in laying flooring. He thought after a careful tally that there was about 11½ per cent. of red oak in the parcel.

Other evidence was given that the wood was of good quality, but was inadequately protected from wet and not properly piled.

In the result his lordship, in giving judgment, said he felt sure from the evidence that a cargo which ought never to have been tendered was tendered. Part of it was red oak, it was not of prime quality, and it fell short of the specification in many respects. Something like half of it was red oak and not white oak, and there were short lengths, though that was one of the least important points of the claim. He was also quite clear that a good deal was very badly prepared, badly sawn, and not jointed and grooved. He did not fix the damages on the basis claimed by the plaintiffs, but on a basis of 6*s.* per square, which worked out at 270*l.*, for which amount he gave judgment for the plaintiffs with costs. Order accordingly.

ACTION AGAINST A BUILDER.

MR. JUSTICE FARWELL, sitting as an additional judge of the King's Bench Division, on the 7th inst., heard the case of *Pennington v. Drake*, an action by the plaintiff, an estate agent, of Richmond, against Mr. C. A. Drake, a builder and contractor, of Teddington, claiming commission on 7,800*l.*, being the purchase money of twelve houses on the Udney Park Estate, Teddington.

Mr. Heber Hart appeared for the plaintiff; and Mr. Dickens, K.C., and Mr. Mears for the defendant.

The plaintiff's case was that he entered into a bargain with the defendant to introduce a purchaser for the twelve houses, and that he did so, but that it turned out that there was something wrong with the title, and the purchase was not completed. It was contended on behalf of the plaintiff that if a sale did not come off through the title, in the title, which the owner did not disclose to the agent at the time of his employment, the right of the agent to his commission was not affected thereby.

On behalf of the defendant it was submitted that, in trying to extract from a series of letters a contract, plaintiff could not stop at a particular point and say "there is a contract final and conclusive," but the correspondence must be looked at as a whole, and it would be found that a contract, whatever the terms of a preceding agreement might be, there was no ultimate agreement. It was said that the defendant employed the plaintiff to procure a purchaser who was ready and willing to enter into a contract to buy on such terms as the defendant was prepared to sell, and commission was to be payable in the event of such a sale. But the defendant and the

...the purchaser were never at one, and the plaintiff could only recover if it were shown that he had procured a purchaser and bound that purchaser so that in the event of any action against the vendor the vendor would have succeeded...

to the roof. A notice of irregularity was served upon the defendant. Nothing had been done in regard to seven of the houses, and with respect to the other the District Surveyor was not satisfied with what had been done.

NOTICE BY THE UNITED BUILDERS' LABOURERS' UNION.

The case of the United Builders' Labourers' Union v. Stevenson came before Mr. Justice Russell sitting as an additional judge of the King's Bench Division on the 6th inst.

Mr. Justice Russell appeared for the plaintiffs; and the defendant in person. Mr. Disturnal, in opening the case, said that the defendant up to October, 1904, was General Secretary of the plaintiff Union, and the action was brought to recover from him £771, odd, which various branches of the Union collected from its members, some of which was utilised for expenses and the remainder was sent to the General Secretary in London for the general funds of the Union.

The defendant addressed his lordship. He admitted that he had been guilty of the charge made against him, but would not have contested the action. For some time past he had been obliged, owing to the refusal of the members of the Union to allow him proper assistance, to keep the books in a manner unsatisfactory to him.

His lordship, in giving judgment, said he was not trying a charge of criminality. It was obvious from the defendant's own accounts that there was an answer to the claim and there must be judgment for the plaintiffs for the amount claimed with costs.

Order accordingly.

THE LONDON BUILDING ACT.

At Lambeth Police Court recently, Mr. W. Goddard, a builder, of Ellindale-road, Herne Hill, was summoned for failing to comply with a notice of irregularity served upon him under the provisions of the London Building Act.

Mr. W. C. Williams, who supported the summons, said it was issued at the instance of Mr. Ellis Marsland, the District Surveyor, under sect. 61, sub-sect. 2 of the London Building Act of 1894, which provides that wholly or in part as a dwelling-house there should be provided proper means of access to the roof.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

1,105 of 1905.—A. SAYERS: Kitchen Ranges. This relates to a kitchen range comprising in combination a fire grate provided with movable fire bars which can be raised or lowered as desired, means arranged below the grate for regulating the admission of air thereto, and a deep boiler which is arranged in a downwardly projecting flue in such manner that the hot gases first pass down in front of the boiler and then up at the back thereof.

29,551 of 1905.—G. C. MARKS (V. J. KERHUEL): Flying Bridges, Traversing Bridges, and the like.

This invention relates to flying bridges, traversing bridges, and the like, the object being to adapt a flying bridge or traversing bridge so that at certain intervals it may be used for continuous traffic. This is accomplished by providing, in addition to the traversing car, two platforms or large cars arranged to be moved away from each other when the bridge is used for its normal purpose, but towards each other at other times so as to provide, in conjunction with the traversing car, a continuous track for pedestrian, ordinary vehicular, or railway traffic to the purpose required.

7,247 of 1905.—C. A. JONES: Folding Framework Suitable for Tents or Screens, with or without Roofs, or for other such purposes.

This relates to folding framework suitable for tents or screens, with or without roofs, or for other purposes, and consists in the use of supports which connect the horizontal rails at three points, and thus control the entire action automatically and symmetrically in all positions.

7,471 of 1905.—A. G. GRICE: Cranes of Tubular Construction or otherwise.

This relates to cranes of tubular construction, and consists in the arrangement of parts whereby the axes of the jib barrel and of the heaving harrel are in line with the axis of the jib—that is to say, with the plane in which the jib can vibrate.

18,730 of 1905.—J. NISBET: Supports for Concrete or Composite Blocks for Fireproof Floors, Ceilings, Columns, Walls, or Foundations.

This relates to supports for concrete or composite blocks of fire-proof floors, ceilings, columns, walls, or foundations, said supports being composed of lengths of light metal corrugated and grouped together.

22,797 of 1905.—BAKER & CROCKETT, LTD., and E. BENNETT: Stock or Plate Locks, in Part Applicable also to other Locks.

This relates to a stock or plate lock, and consists of a plate which carries the mechanism and is let into a cavity, preferably circular in shape, formed in from the back of the stock and surrounded by the material of the stock, the said plate being bedded against the back of the cavity.

23,516 of 1905.—D. DOYEN: Suspension Support for Sliding Gates, Doors, or the like.

This relates to a suspension support for sliding gates, and consists in supporting the gate by its upper part by means of a horizontal bar upon which there slides a tube provided at each end with a stuffing box upon which the gate or door operates, this arrangement enabling a person to obtain a sliding guide for the motion longer than the width of the door or gate and in suspending the same upon stuffing boxes in which can be placed materials of any kind, which facilitates the guide sliding softly and without noise and which do not require attention.

23,808 of 1905.—J. SWARTZ: Apparatus for Automatic Closing of Doors and the like.

This relates to an apparatus for automatic closing doors and the like, and consists in the combination of one or more springs between the door and the door post, friction blocks secured to the door and the door post, and hook-shaped projections on the said friction blocks.

21,095 of 1905.—H. AEM: Method for the Production of Hollow Poles of Concrete with a Metal Insertion forming an Inter-connected Framework for Electric Conductors and the like.

This relates to a method for the production of hollow poles of concrete with a metal insertion forming an inter-connected framework for electric conductors and the like, and consists in placing

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

the metal framework, with a suitable interval, on a conical-core, and pressing same together with the core into a horizontal jacket forming a semi-cone of the same length as the pole, and containing concrete mortar, thereupon applying concrete mortar also to the metal framework of the upper frame half, striking off said mortar with the aid of templates and striking board according to the outer shape of the pole, and after setting of the mortar, finally withdrawing the cores.

5,516 of 1905.—J. G. McPHAIL, M. A. McPHAIL, AND R. SHEANE: Fire Grates.

This relates to a rotatable grate, and consists in the combination with a cage rotatably mounted in standards and provided with a door for the introduction of the fuel, and means for securing the said door, of a handle attached to said standards whereby the grate may be transported by hand.

PUBLISHER'S NOTICES.

Nat. Tel., 612, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE PAGE) for VOLUME LXXIX. (July to December, 1905) was given as a supplement with the issue of January 13th. CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also BRADING CASES (Gilt), with Strips, price 5d. each. THE EIGHTY-NINTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence. SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 2s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROCEEDINGS OF PUBLIC COMPANIES, SALES BY TENDRE, LEGAL ANNOUNCEMENTS, &c., &c. Six lines or under 6s. 0d. Each additional line 1s. 0d. SITUATIONS WANTED, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS. Six lines (about fifty words) or under 4s. 6d. Each additional line (about ten words) 0s. 6d. Terms for series of Trade advertisements, and for front page and other special positions, on application to the Publisher. SITUATIONS WANTED (Single-handed-Labour only). Four lines (about thirty words) or under 2s. 6d. Each additional line (about ten words) 0s. 6d. PREPAYMENT IS ABSOLUTELY NECESSARY.

* Stamps must not be sent, but all forms should be remitted by Postal Order, payable to J. MORRIS, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on the same day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

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

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements and strictly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have Replies addressed to the Office, Catherine Street, Covent Garden, W.C., free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unanswered queries are returned to advertisers the week after publication. N.B.—The Reply Boxes are not intended for trade lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

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

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

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing property sales with columns for location, date, and price. Includes entries for Charlton, Middlesbrough, Lambeth, Hackney, Norwood, Holloway, Belvedere, and Stroud Green.

By NOYS & HOWES.
 Sydenham—Taylor's ls., freehold stabling and coach-house. p. 4205

By RUTLEY, SON, & VINE.
 Islington.—63, and 65, Fribourg-st., u.t. 21 yrs., gr. 181. 18s., yr. 1104. 620
 Camden Town.—1, 2, and 3, Pleasant-row, f, wr. 1501. 1,080
 4 and 5, Pleasant-row, u.t. 32 yrs., gr. 156, wr. 541. 12s. 1,600
 Walthamstow.—169, High-st. (s.), l, yr. 501. 1,000
 January 31.—By MARR LIEB & SON.
 Mile End.—44 St. Peter's-rd., u.t. 241 yrs., gr. 31. 8s., yr. 322. 240
 Bow.—24, Mostyn-rd. (s.), u.t. 304 yrs., gr. 51, yr. 322. 250
 153, Finsbury-rd., u.t. 304 yrs., gr. 71, yr. 601. 790

By VENTON, BULL, & COOPER.
 Hackney.—108, Fitchard's-rd. (s.), l, yr. 651. 480

By C. P. WHITLEY.
 Mitcham, Surrey.—Upper Green, freehold shop and premises, yr. 401. 1,120

By DOUGLAS YOUNG & CO.
 Kensington.—25, Milson-rd. (s.), u.t. 70 yrs., gr. 104, yr. 52. 620
 South Lambeth rd.—No. 282, f., gr. 82. 610
 Dalston.—49, Lansdowne-rd., n.t. 38 yrs., gr. 41. 10s., gr. 351. 280

February 1.—By HEATS, SON, & REVE.
 Limehouse.—163 and 165, Salmon-la. (s.), f, wr. 541. 12s. 505
 218, Rhodewell-l, f, wr. 311. 16. 265
 West Ham.—Albert-rd., l.g. rents 61, reversion in 54 yrs. 160

February 2.—By WALTER HALL.
 Hamstead.—1 to 4, Parliament Bill-rd., f, gr. 2701. 2,100

Horsely.—Falkland-rd., fg. rents 391, reversion in 89 yrs. 1,015
 Greenwich.—Foyles-rd., a free building plot. 135

By PERCYAL HODSON.
 Elmers End.—53 to 61 (odd), Croydon-rd., f, wr. 1041. 1,115
 1 to 15 (odd), Eden-rd., l, wr. 122. 108. 1,060
 17 and 19, Eden-rd., l, wr. 371. 14s. 440

New Southgate.—Beaconsfield-rd., "Crofton Lodge," u.t. 731 yrs., gr. 106. 10s., yr. 301. 2 to 12 to 21, Ivy-rd., u.t. 73 yrs., gr. 721, wr. 3511. 1,525

By MERVIN & ADAMS.
 Clapton.—12, Beechme-rd., u.t. 641 yrs., gr. 61. 8s., wr. 411. 218. 200

MEETINGS.

FRIDAY, FEBRUARY 9.
 Royal Institution.—Mr. H. F. Newall, M.A., F.R.S., on "Eclipse Problems and Observations." 9 p.m.
 Architectural Association.—Rev. G. H. West, A.R.I.B.A., on "Differences between English and French Gothic Art." 7.30 p.m.
 Institution of Civil Engineers (Students' Meeting).—Mr. R. H. Macdonald on "Electric Driving at the Locomotive works of the North London Railway." 8 p.m.

SATURDAY, FEBRUARY 10.
 Junior Institution of Engineers.—Twenty-second Anniversary Dinner at the Hotel Cecil, 6.30 for 7 p.m. The President, Mr. Dugald Clerk, M.Inst.C.E., F.C.S., in the Chair.
 Architectural Association.—Second spring visit, to Messrs. Waring & Gillow's new premises, Oxford-street. 2 p.m.
 MONDAY, FEBRUARY 12.
 Surveyors' Institution.—Discussion on Mr. Marshall's paper on "The Valuation of Machinery for Rating Purposes." 8 p.m.
 Institution of Mechanical Engineers (Graduates' Lecture).—Professor W. Cawthorne Lutin, F.R.S., on "The Niagara Power-Station." 8 p.m.

TUESDAY, FEBRUARY 13.
 Institute of Sanitary Engineers (Students' Lecture).—Mr. F. Aldous on "Ventilation of Buildings." 7 p.m.

WEDNESDAY, FEBRUARY 14.
 Architectural Association Discussion Section.—Mr. Stanley Hamp on "Modern Hotels and Restaurants." 7.30 p.m.
 Royal Sanitary Institute.—A discussion, "Is the Intercepting Trap a Failure?" to be opened by Mr. R. Read, City Surveyor, Gloucester, and Dr. W. Butler. 8 p.m.
 Society of Arts.—Mr. Claude Johnson on "The Horseless Carriage," 1885-1905. 8 p.m.
 Association of Engineers in Charge.—Mr. H. C. H. Shenton on "Small Water Supplies." Mr. J. Patten Barber, M.Inst.C.E. (President), will preside. 8 p.m.
 Northern Architectural Association.—Mr. J. B. Mitchell-Withey on "Early XVIIIth Century Architecture," with lantern illustrations. 7.30 p.m.
 Edinburgh Architectural Association.—Hallie W. Fraser Dobie on "The Aesthetic Duty of a Corporation to a City." 8 p.m.

THURSDAY, FEBRUARY 15.
 Junior Institution of Engineers.—Mr. H. Heathcote Statham on "Architectural Design and Expression." 8 p.m.
 The London Master Builders' Association.—Dinner at the Whitehall Rooms, Hotel Metropole, Charing Cross. 6.30 p.m.
 Carpenters' Company, London Wall (Lectures on Matters Connected with Building).—The Rev. W. Marshall, M.A., F.S.A., on "Some Points of Architectural Interest in our Parish Churches." 8 p.m.
 Builders' Exchange, Birmingham (Exchange Hall).—Mr. F. G. Whitall on "The Housing Problem," illustrated by lantern slides. 8 p.m.
 Society of Arts (Indian Section).—Mr. R. B. Buckley on "The Navigable Waterways of India." 4.30 p.m.

FRIDAY, FEBRUARY 10.
 Royal Institution.—Mr. W. C. Dampier Whitham, M.A., on "The Passage of Electricity through Liquids." 9 p.m.
 Institution of Mechanical Engineers.—Fifty-ninth Annual General Meeting, when the annual report of the Council will be presented, and the results of the ballot for the annual election of the President, Vice-Presidents, and Members of Council will be announced. A paper on the following subject will be read and discussed: "Large Locomotive Boilers," by Mr. G. J. Churchward. 8 p.m.

SATURDAY, FEBRUARY 17.
 Royal Institution.—Mr. M. H. Spielmann, F.S.A., on "George Frederick Watts, as a Portrait Painter." 1.3 p.m.

TERMS OF SUBSCRIPTION.
 "THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 9s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 28s. per annum.
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PRICES CURRENT OF MATERIALS.
 * * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.	
Hard Stocks	1 7 0 per 1000 alongside, in river.
Bough Stocks and Grizzles	1 4 0 " " " "
Facing Stocks	1 16 0 " " " "
Shippers	2 0 0 " " " "
Piletons	1 5 6 " " at railway depôt.
Red Wire Cuts	1 11 0 " " " "
Best Firebricks	3 12 0 " " " "
Best Red Pressed	" " " " " "
Ruabon Facing	5 0 0 " " " "
Best Blue Pressed	" " " " " "
Stoneware	4 1 0 " " " "
Do. Bullnose	4 6 6 " " " "
Best Stourbridge Fire Bricks	3 15 6 " " " "
Grass Bricks	" " " " " "
Best White and Ivory Glazed Stretchers	12 0 0 " " " "
Quoins, Bullnose, and Flats	16 0 0 " " " "
Double Stretchers	19 0 0 " " " "
Double Headers	16 0 0 " " " "
One Side and two Ends	19 0 0 " " " "
Two Sides and one End	20 0 0 " " " "
Splays, Chamfered, Squints	20 0 0 " " " "
Best Dipped Salt Glazed Stretchers, and Flats	14 0 0 " " " "
Double Headers	15 0 0 " " " "
One Side and two Ends	15 0 0 " " " "
Two Sides and one End	15 0 0 " " " "
Splays, Chamfered, Squints	14 0 0 " " " "
Second Quality White and Dipped Salt Glazed	2 0 0 " " less than best.
Thames and Pit Sand	6 9 per yard, delivered.
Thames Ballast	5 3 " " " "
Best Portland Cement	26 0 per ton, " "
Best Ground Blue Lime	19 0 " " " "
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.	
Grey Stone Lime	11s. 0d. per ton, delivered.
Stourbridge Fireclay in sacks	37s. 6d. per ton at ry. dpt.

STONE (continued).	
HATH STONE—delivered on road wag s. d.	
Do. do. delivered on road waggons,	
Nine Elms Depôt	1 8½ " " "
FORKLAND STONE (20 ft. average) —	
Brown Washed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Fimlico Wharf.	2 1 " " "
White Washed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Fimlico Wharf.	2 2½ " " "
s. d.	
Ancaster in blocks	1 10 per ft. cube, del. d. rly. depôt.
Greenhill	" 1 10 " " " "
Darley Dale in blocks	" 2 4 " " " "
Red Curschill	" 2 2 " " " "
Closetown Red Freestone	" 0 " " " "
Red Mansfield	" 2 4 " " " "
YORK STONE—Robin Hood Quality.	
Scrapped random blocks	2 10 " " " "
6 in. sawn two sides land- ings to sizes (under 4 ft. super.)	2 3 per ft. super., " "
6 in. rubbed two sides land- ditto, ditto	" 2 6 " " " "
3 in. sawn two sides slabs (random sizes)	0 11½ " " " "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½ " " " "
1½ in. to 2 in. ditto, ditto	0 7 " " " "

HARD YORK— s. d.	
Scrapped random blocks	3 0 per ft. cube, del. d. rly. depôt.
6 in. sawn two sides land- ings to sizes (under 4 ft. super.)	2 8 per ft. super., " "
6 in. rubbed two sides ditto	13 17 6 " " " "
3 in. sawn two sides slabs (random sizes)	1 2 " " " "
2 in. self-faced random slabs	0 5 " " " "
s. d.	
Hopton Wood (Hard Bed) in blocks	2 0 per ft. cube, del. d. rly. depôt.
" " " " 6 in. sawn both sides landings	2 7 per ft. super. del. d. rly. depôt.
" " " " 3 in. sawn both sides random slabs	" 1 0 " " " "
" " " " 2 in. do.	0 8½ " " " "

SLATES.	
In. In.	s. d.
20x10 best blue Bangor	13 2 6 per 1000 of 1200 at r. d.
Hip and Valley tiles	3 7 per doz. " "
Best Brunsey tiles	50 0 per 1000 " "
Do. Ornamental tiles	52 6 " " " "
Hip and Valley tiles	4 0 per doz. " "
Best Brunson red, brown or brindled do. (Edwards)	57 6 per 1000 " "
Do. Ornamental do.	60 0 " " " "
Hip tiles	4 0 per doz. " "
Valley tiles	3 0 " " " "
Best Red or Mottled Staffordshire do. (Peakes)	51 9 per 1000 " "
Do. Ornamental do.	54 6 " " " "
Hip tiles	4 1 per doz. " "
Valley tiles	3 8 " " " "
Best Rosemary brand plain tiles	48 0 per 1000 " "
Best Ornamental tiles	50 0 " " " "
Hip tiles	4 0 per doz. " "
Valley tiles	3 8 " " " "
Best Hartshill brand plain tiles, sand-faced	50 0 per 1000 " "
Do. pressed	47 6 " " " "
Do. Ornamental do.	56 0 " " " "
Hip tiles	4 0 per doz. " "
Valley tiles	3 6 " " " "

TILES	
Best plain red roofing tiles	42 0 per 1000 at rly. depôt.
Hip and Valley tiles	3 7 per doz. " "
Best Brunsey tiles	50 0 per 1000 " "
Do. Ornamental tiles	52 6 " " " "
Hip and Valley tiles	4 0 per doz. " "
Best Brunson red, brown or brindled do. (Edwards)	57 6 per 1000 " "
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Do. pressed	47 6 " " " "
Do. Ornamental do.	56 0 " " " "
Hip tiles	4 0 per doz. " "
Valley tiles	3 6 " " " "

WOOD.	
At per standard.	
Deals: best 3 in. by 11 in. and 4 in. 4 s. d.	
by 9 in. and 11 in.	13 10 " " 4 s. d.
Deals: best 3 by 9	13 0 " " 14 0 0
Battens: best 24 in. by 7 in. and 8 in. and 4 in. by 7 in. and 8 in.	11 0 0 " 12 0 0
Battens: best 24 by 6 and 3 by 6.	0 10 0 " less than 7 in. and 8 in.
Deals: seconds	1 0 0 " 11 0 0 less than best.
Battens: seconds	1 0 0 " 10 0 0
2 in. by 4 in. and 2 in. by 6 in.	9 0 0 " 10 0 0
Do. by 44 in. and 2 in. by 5 in.	8 10 0 " 9 10 0
Foreign Seven Boards	5 0 0 " " "
1 in. and 1½ in. by 7 in.	0 10 0 " more than battens.
3 in.	1 0 0 " " "
First timber: best middling Danish or Memel (average specification)	4 10 0 " 5 0 0
Seconds	4 0 0 " 4 10 0
Small timber (8 in. to 10 in.)	3 12 6 " 3 15 0
Small timber (8 in. to 8 in.)	3 0 0 " 3 10 0
Swedish balsa	2 10 0 " 3 0 0
Pitch pine timber (30 ft. average)	3 5 0 " 3 15 0

JOINERS' WOOD.	
White Sea: first yellow deals,	
3 in. by 11 in.	24 0 0 " 25 0 0
3 in. by 9 in.	22 0 0 " 23 0 0
Battens, 24 in. and 3 in. by 7 in.	16 10 0 " 18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0 " 20 0 0
" " " " 3 in. by 9 in.	17 10 0 " 19 0 0
Battens, 24 in. and 3 in. by 7 in.	13 10 0 " 15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0 " 15 0 0
Battens, 24 in. and 3 in. by 7 in.	11 0 0 " 12 0 0
Petersburg: first first yellow deals,	
3 in. by 11 in.	21 0 0 " 22 10 0
Do. 3 in. by 9 in.	15 0 0 " 16 10 0
Battens	13 10 0 " 15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0 " 17 0 0
Do. 3 in. by 9 in.	14 0 0 " 15 0 0
Battens	11 0 0 " 12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0 " 14 0 0
Do. 3 in. by 9 in.	12 10 0 " 14 0 0
Battens	10 0 0 " 11 0 0
White Sea and Petersburg—	
First white deals, 3 in. by 11 in.	14 0 0 " 15 10 0
3 in. by 9 in.	13 10 0 " 14 0 0
Battens	11 0 0 " 12 0 0
Second white deals, 3 in. by 11 in.	13 10 0 " 14 10 0
3 in. by 9 in.	12 10 0 " 13 10 0
Battens	10 0 0 " 11 0 0
Pitch pine: deals	16 10 0 " 20 0 0
Under 2 in. thick extra	0 10 0 " 1 0 0

WOOD (continued).

Table listing various wood types and their prices per standard unit. Includes items like Yellow Pine, Fir, Spruce, and Mahogany.

JOISTS, GIRDERS, &c.

Table listing prices for joists and girders, including Rolled Steel Joists and Steel Compound Stanchions.

METALS.

Table listing prices for various metals and sheet materials, such as Iron, Steel, and Lead.

LEAD, &c.

Table listing prices for lead and other materials, including Sheet Lead and Zinc.

ENGLISH SHEET GLASS IN CRATES.

Table listing prices for English sheet glass in various crate sizes and thicknesses.

OLLS, &c.

Table listing prices for oils and varnishes, including Linseed Oil and Turpentine.

VARNISHES, &c.

Table listing prices for various varnishes and finishing products.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications...

TENDERS.

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

ACTON TREVILLE.—For erecting temporary stables at Badminton Hotel. Mr. F. W. Willis, architect, 8, St. Stephen-street, Bristol. S. Chibbens... £3,321 15 0. P. Chiek... £1,125 0 0. J. Bowling 1,400 0 0. E. Preece... 1,117 0 0. J. Perkins & Son... 1,400 0 0. R. F. Reid... 1,329 0 0. A. E. Denby & Co.... 1,098 0 0. Ltd.... 1,314 0 0. H. W. & E. I. L... 1,297 0 0. Neale... 1,095 0 0. W. J. Orchard 1,265 0 0. E. Walters & M. Durnford 1,250 0 0. Son... 1,024 0 0. E. Love... 1,189 0 0. F. Smith & J. McManus... 1,187 0 0. Co., Ltd.... 1,020 0 0. E. Clark & Son 1,185 0 0. T. Pearce... 969 5 6. T. Broad & Sons... 1,160 0 0. W. & A. Edsell 939 10 0. F. Chown... 1,136 0 0. Co., Bristol* 875 0 0.

CASILESDIE (Durham).—For erecting a villa, for Mr. J. A. Bingley. Mr. J. J. Eltringham, architect and surveyor, Deaen-street, Blackhill. T. Oallicher... £580 0 0. W. Ayton & Sons, Eltringham, Ltd... 575 0 0. D. A. rham road, Blackhill... £510

CLACTON-ON-SEA.—For erecting shops and houses, Pier-avenue, for Mr. H. Bromley. Messrs. Baker & Wrightson, architects, Clacton-on-Sea, and 21, Liverpool-street, E. C. G. R. J. Wright... £9,399 0 0. B. Burch... £6,238 0 0. R. N. Marrable... 6,870 0 0. Scales & Rohms... 6,166 0 0. Potter & Son... 6,800 0 0. J. Lizzell... 6,099 0 0. Dehson & Son... 6,688 0 0. W. Chubbiers... 5,989 0 0. C. Roper... 6,500 0 0. H. Smith... 5,987 0 0. Cabitt & Gotts... 6,870 0 0. J. McKay, Clacton* 5,989 0 0. Everett & Son... 6,270 0 0. (Architects' estimate £6,166).

CLEY-NEXT-THE-SEA.—For alterations and additions to schools, for Norfolk Education Committee. Quantities by the Committee's Building Inspector: W. S. Larner, East Dereham... £290 14 11 (Sixteen tenders were received.)

DORCHESTER.—For alterations to No. 40, South-street, for the Governors of the Grammar School. Mr. F. T. Matby, C.E., architect and surveyor, Dorchester. C. E. Slade... £460 0 0. Watta Bros., J. Salby... 420 0 0. Dorchester*... £406 17 5. J. W. & H. Childs 414 5 1

FALKIRK.—For the extension of the Post Office, for the Commissioners of H.M. Works and Public Buildings. Mr. W. T. Oldrieve, architect, Edinburgh. Credit. Old materials.

Table listing prices for materials used in the Falkirk project, including various types of stone and brick.

GUILDFORD.—For boundary walling, etc., at the Workhouse, for the Guardians. Mr. E. L. Lunn, architect and surveyor, 36, High-street, Guildford. R. o & e & Co., Marlborough Wells, & Peppitt... £617 3 0. Co.... £410 13 6. A. Johnson... 491 0 0. S. Ellis... 404 0 0. Swayne & Son... 429 0 0. R. Smith... 396 0 0. Tribe & Robinson 424 0 0. H. J. & S. & Co. A. & F. Osmond 418 0 0. Hammond... 378 0 0. Higgs & Outhwaite... 417 0 0. E. C. Hughes, S. Bayers... 414 14 0. Wokingham* 355 15 6

GUILDSBOROUGH.—For additions and alterations to a house, for Mr. C. Rowan. Messrs. Brown & Mayor, architects and surveyors, 80, Abington-street, Northampton. Quantities by the architects: E. D. Sharman & Son... £1,330 0 0. F. Weston... £1,180 0 0. A. Martin... 1,329 0 0. T. Higgs... 1,150 0 0. W. Higgins... 1,239 0 0. W. Webster, S. Hardwick... 1,233 15 0. A. Clarke... 1,139 0 0. Northampton* 1,120 0 0. T. Millar... 1,190 0 0

HALSTEAD.—For alterations to the Corn Exchange, for Halstead Advisory Committee, Essex Education Committee. Mr. F. Whitmore, Architect: G. Grimwood & Son 2,448 0 0. Sudley & Co., G. Sharp... 419 15 0. Halstead*... £355 0 0. W. Sudbury, sen. 405 10 0

HARPFORD (Devonshire).—For erecting a house at Bencham, Harpford, near Newton Poppleford. Mr. J. Archibald Lucas, architect, Ouldshill-chambers, Exeter. F. Jolley... £3,105 0 0. Ellis & Son... £2,658 0 0. G. Herbert... 3,087 0 0. Woodman & Son... 2,625 0 0. Northcott... 3,056 0 0. H. Ould... 2,625 0 0. W. G. Abbott, Anslyn & Oranger... 2,454 0 0. White... 3,037 0 0. E. Mudge... 2,454 0 0. Tremlett... 2,930 0 0. E. S. Setter, 46, Cooper... 2,672 0 0. Beth-rd... 2,325 0 0. Petrich Bros... 2,855 0 0. H. S. ym & Co. O. Setter... 2,814 0 0. Exmouth*... 2,290 0 0. Pratt... 2,740 0 0

IPSWICH.—For erecting the Ranelagh-road Council School, for the Education Committee. Mr. J. A. Scheuermann, architect, 23, High-street, Ipswich. Oak Building Co., Ltd... £13,280 9 0. S. A. Kenney... £11,380 0 0. V. A. Marriot... 11,800 0 0. C. Roper... 11,760 0 0. G. Greenwood... 11,491 0 0. J. J. & Gower... 12,570 0 0. S. Sons... 11,491 0 0. F. C. Smith... 12,345 0 0. Spencer Santo & Co.... 11,490 0 0. J. C. Thurman 12,298 8 0. Co.... 11,340 0 0. A. Seidler... 12,200 0 0. C. A. Green... 11,250 0 0. F. Parlington & Son... 12,095 0 0. C. Borrett... 11,210 0 0. M. Death... 11,943 0 0. E. Catchpole... 11,210 0 0. H. J. Linnell... 11,948 0 0. Prices, Ltd., Kettleige & Shaw 11,881 0 0. Sones-street, Ipswich*... 11,850 0 0. J. M. Kay... 11,850 0 0. Ipswich*... 10,983 0 0

KINSALE (Ireland).—For building a dwelling house, for Mr. D. O'Sullivan. M.B. Mr. M. A. Hennessy, architect, 74, South-mall, Cork. D. Murphy... £2,000 0 0. J. Jones... £1,700 0 0. J. S. Kelly... 1,697 0 0. Kelly Bros., Kin-dugan... 1,800 0 0. sale*... 1,663 0 0

MAIDSTONE.—For sewage disposal works, Allington and Aylesford, for the Corporation. Mr. O. R. Strachan, engineer, 9, Victoria-street, Westminster, London: John Mowlem & Co., Ltd... £61,699 3 0. Tilbury Contracting and Dredging Co., Ltd... 58,193 16 3. J. Riley... 57,947 8 1. F. W. Moss & Sons, Ltd... 57,280 3 0. A. E. Nunn... 57,031 3 9. F. W. Trimm... 56,192 0 6. Kemp Bros... 55,751 8 9. F. Lock, Andrews, & Phipps... 55,578 10 2. S. W. Harrison & Co... 59,998 0 0. R. C. Crawford... 53,008 6 7. Johnson & Langley... 52,092 1 8. J. & T. Bions... 50,950 1 6. H. E. Buckley... 50,744 10 10. Muirhead, Oring & Matthews... 49,829 9 6. E. & E. Hes... 49,713 0 0. R. H. B. Neal, Ltd... 49,537 0 0. Smith & Co... 48,809 0 0. Kellata, Ltd... 48,400 0 0. G. E. Wallis & Sons, Ltd... 47,471 19 7. D. T. Jackson... 47,363 0 0. Davies, Bell, & Co... 47,263 0 0. A. Jackson... 47,213 15 3. A. Braithwaite & Co... 46,577 18 8. J. Moran & Sons, Ltd... 45,709 17 0. F. W. Dean, Ltd... 45,212 14 2. Underwood Bros... 44,310 18 0. F. Osenton... 42,063 0 0. O. Wright & Co., S. Wigston, Leicester*... 41,482 5 6

W. S. Larner, East Dereham... £290 14 11 (Sixteen tenders were received.)

TENDERS.—Continued on page 157.

List of Contracts, etc.

COMPETITIONS.

Nature of Work.	By whom Required.	Premises.	Designs to be delivered
*DESIGNS FOR PUBLIC LIBRARY	Southwark E.C.	502, 304, and 201.	April 2.
*DESIGNS FOR COLLEGE BUILDINGS	University College of N. Wales	Not stated	No date.

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Additions to Corf House, Garmouth.	Musselburgh Town Council.	C. C. Doig, Architect, Elgin	Feb. 13
Infectious Diseases Hospital.	Leeds Education Committee	Burch Surveyor, Musselburgh, N.B.	do.
Repairs to Schools	Southern Mahratta Ry. Co.	Architect's Department, Education Office, Gov. Dublin	do.
3,000 gallons of Turpentine	do.	E. Z. Thornton, Sec., 46, Queen Anne's Gate, S.W.	do.
39 tons Red and White Lead	Mountain Ash U.D.C.	do.	do.
Private Street Works, Abercynon.	Blaby R.D.C.	Surveyor, Town Hall, Mountain Ash	do.
Scavenging, etc.	Dublin Corporation	B. A. Sires, Alliance-chambers, Leicester	do.
Stores	Rathdown Co. T. R.D.C.	Spencer Hart, Borough Surveyor, City Hall, Dublin	Feb. 14
Four Laborers' Cottages	West Ham Guardians	P. Cunniam, Clerly, Loughtinstown	do.
Alterations, etc., to Kitchen at Forest House Workhouse, N.E.	Wordley R.D.C.	Clerk's Office, Workhouses, James-street, Leytunstone, N.E.	do.
Stoneware Pipe Sewer, Oughy-bridge	Renfrew County Council	G. E. Beaumont, Surveyor, Grenoside	do.
Road Material, Gortals and Paisley Divisions	Esrick R.D.C.	W. H. Hill, 104, Ingram-street, Glasgow	do.
Whinstone, Slag, and Granite	Reigate R.D.C.	F. A. Camiller, 3, Stonegate, York	do.
Stores	Glasgow and S.W. Ry. Co.	A. J. Head, Surveyor, 51, High-street, Reigate	do.
Wire Fencing	do.	R. F. Harrison, Stores Superintendent, Kilmarnock	do.
Cast-iron Plates and Jaws	East Indian Railway Co.	C. W. Young, Sec., Nicholas-street, London, E.C.	do.
Washing Machine, Hydro Extractor, etc.	Warrington Health Committee	Borough Surveyor, Town Hall, Warrington	do.
Mission Hall, Upper Armlay, Leeds	Hyde Gas Co.	B. A. Sires, Architects, 2, Basinghall-square, Leeds	do.
Tank Foundation, Contract No. 1, Hyde	Wilmshlow, etc., Gas Co.	W. Sevens, Engineer, Gasworks, Wilmshlow	do.
Fireclay Goods	Thames Conservancy	Thomas Conservancy Office, Victoria Embankment, E.C.	do.
LICENCES TO WORK SIX STEAM DREDGERS	Præmar Royal Highland Soc.	Jenkins & Marr, C.E., 16, Bridge-street, Aberdeen	Feb. 15
New Games Ground.	Kinross School Board Corporation	Borough Surveyor's Office, Town Hall, Ipswich	do.
School, Kinross	Mr. T. Gregory	Garth Engineering Works, Caerphilly	do.
Redecorating Council Chamber, Town Hall, Ipswich	Bombay, etc., Ry. Co.	T. W. Wood, Sec., Gloucester-st., Bishopsgate-st., W. London, E.C.	do.
Roads, Lanes, and Sewers, Caerphilly	Salford Gas Committee	W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	do.
Fifty-six Houses, Bedwas-road, Caerphilly	Stockport H.ways, etc., Com.	do.	do.
Granite	Mutford, etc., R.D.C.	S. G. Bloy, Surveyor, Oulton Broad, Lowestoft	do.
One Two-phase Turbo-generator	Manchester Corporation	C. Nickson, Gas Department, Town Hall, Manchester	do.
One 500 K.W. Motor Generator	Sutton U.D.C.	C. Smith, Surveyor, Municipal Offices, Sutton, Surrey	do.
Switchgear	Handsforth Educ. Comm.	Wood & Kendrick, Architects, West Bromwich	do.
Partial Installation of Electric Light	Hardingstone R.D.C.	J. R. Phillips, 2, St. Giles-square, Northampton	Feb. 18
Three Filter Beds, etc., Gagle	West Ham Corporation	A. H. Seabrook, Bor. Elect. Engr., Tucker-st., Canning Town	do.
Materials and Repairs	Salop Infirmary	J. Jenks, Secretary, Board-room, Shrewsbury	do.
Team Labour	Dundee Water Commissioners	G. Baxter, Engineer, 93, Commercial-street, Dundee	do.
Taking Down Part of Refectory House, etc., Gaythorn	Boothle Corporation	Borough Engineer's Office, Town Hall, Boothle	do.
Electricity Stores	Manchester Corporation	do.	do.
Stores	Rathmines & Rathgar U.D.C.	C. Nickson, Gas Department, Town Hall, Manchester	do.
Leahead Fever Hospital, Extension	do.	Electrical Engineer's Office, Rathmines, Co. Dublin	Feb. 17
Materials	Lasswade Comm., Midlothian	F. P. Fawcett, Clerk, Town Hall, Rathmines, Co. Dublin	do.
Material and Haulage, Aberdare, Llandaf, etc.	Salford Electric Dept.	C. S. S. Johnston, Architect, 65, Hanover-street, Edinburgh	do.
Oak Fencing Posts for Cemetery	Glamorgan County Council	Surveyor, Town Hall, West Didsbury, Manchester	do.
Alterations to Heating Apparatus, Grant Lodge	Aberthillery U.D.C.	Borough Electrical Engineer, Frederick-road, Pendleton	do.
Sewers in Ward-road, Elgin	Darlington Corporation	T. Lloyd Edwards, County Surveyor, Town Hall, Bridgand	do.
Annual Contracts	Penge U.D.C.	J. M'Bean, Surveyor, 1, King-street, Aberthillery	do.
Heating Apparatus, Stonefield Council School	Riston Education Committee	G. Winter, Borough Surveyor, Town Hall, Darlington	do.
Materials	Burton-upon-Trent Corp.	A. A. Purdie, Burgh Surveyor, Elgin	do.
Road Material and Cartage	Berfordshire County Council	H. W. Longdin, Town Hall, Ankerly, S.E.	do.
Whinstone	Selby U.D.C.	G. T. Lyman, Borough Engr., Town Hall, Burton-upon-Trent	do.
Rebuilding Bridge over Barracks Brook, Huntingdon	Hunts County Council	County Surveyor, Sire Hall, Bedford	do.
Materials and Cartage	Cheshunt U.D.C.	Ernie McE. Gray, Engineer, Town Hall, Selby	do.
Kerbing and Paving Footpaths, Fivesville, St. Albans	Richtfordshire County Council	H. Lees, County Surveyor, 36, High-street, Huntingdon	do.
Stores	Richmond Town Council	R. H. Jeffes, Engineer, Manor House, Cheshunt	Feb. 18
Works and Materials	Sheffield Corporation	County Surveyor's Office, Hatfield	do.
Flint	Surbiton U.D.C.	J. H. Brierley, Boro. Surveyor, Town Hall, Richmond, Surrey	Feb. 19
Materials and Cartage	do.	Offices of Council, Ewell-road, Surbiton	do.
Painting, etc., Interior of Infirmary Annex, Macclesfield	Cheshunt U.D.C.	R. H. Jeffes, Engineer, Manor House, Cheshunt	do.
Materials and Labour	Committee of Visitors	Parkside Asylum, Macclesfield	do.
Extension of the Building of Cradley Heath Boys' School	Rawtenstall Corporation	Borough Surveyor, Municipal Offices, Rawtenstall	do.
Stone for Roads	Romley Regis U.D.C.	Pritchard & Pritchard, Architects, High-st., Cradley Heath	do.
Road Material	Beverly Highway Comm.	F. E. Priest, Engineer, 13, Harrington-street, Liverpool	do.
Road Material	Wisbech R.D.C.	A. G. Catling, 4, Post Office-lane, Wisbech	do.
Street Improvement Works, Cospennance	Cockfield R.D.C.	A. Macarthur, Surveyor, Council Offices, Haywards' Heath	do.
Street Improvements, Grays, Pontypriid	Pontypriid U.D.C.	P. R. A. Wlloughby, Engineer, Council Offices, Pontypriid	do.
Painting and Repairs, Premises in Old Gasworks-yard	do.	do.	do.
Painting and Repairs, Public Abattoirs, Tram Road	do.	do.	do.
House, Seacroft-road, Grimsby	do.	do.	do.
*ADDITIONS TO THE SCHOOL, ST. ALBANS	Herts County Council	E. Goodland, Architect, Osborne-chambers, Grimsby	do.
*LOCOMOTIVE SHED	Coventry Gas Committee	County Surveyor, Hatfield	do.
Sewage Disposal Works	Hemsworth R.D.C.	Engineer, Gasworks, Coventry	do.
Quarrying and Carting Road Materials	Midlothian County Council	T. H. Richardson, Surveyor, Hemsworth	Feb. 20
Sewage Purification Works, Clatterbridge Workhouse	Wirral Guardians	Road Office, County Buildings, Wirral	do.
Rolling Stock (100 Covered Steel Goods Wagons, etc.)	S. Indian Railway Co.	F. E. Priest, Engineer, 13, Harrington-street, Liverpool	do.
210 pairs of Wheels and Axles	do.	H. W. Notman, 55, Gracechurch-street, London, E.C.	do.
Laminated Bearing Springs, No. 420	do.	do.	do.
Sewage Disposal Works, Hemsworth	Hemworth R.D.C.	T. H. Richardson, Surveyor, Hemsworth	do.
Mortuary, Tibury	Orsett E.D.C.	S. A. Hill-Willis, Surv., Council Offices, 2, Orsett-rd., Gray's	do.
Sewers, etc., Tibury Dock	do.	T. H. Richardson, Surveyor, Council Offices, 2, Orsett-rd., Gray's	do.
Annual Contracts	Acton U.D.C.	D. J. Ebbetts, Surveyor, 57, High-street, Acton, W.	do.
*STONE PAVING WORKS	Corporation of London	Engineer, Guildhall, E.C.	do.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be delivered. Includes entries for Labour, Materials, and various construction projects.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Lists positions like Assistant in Estates Department and Director of Industrial Arts Classes.

AUCTION SALES.

Table with 4 columns: Nature and Place of Sale, By whom Offered, Date of Sale, and other details. Lists various property sales including surplus stock and building sites.

* Those with an asterisk are advertised in this number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xvi.; Auction Sales, xx. xxviii.

TENDERS.—Continued from page 155.

Table listing tenders for dredging and removing silt, and for making up the carriageway of Langborne-street.

Table listing tenders for sewerage works for the Urban District Council, Mr. A. W. Barnard, C.E.

Table listing tenders for alterations and additions to schools for the Norfolk Education Committee.

Table listing tenders for erecting a mixed school for 250 children, for the Merthyr Tydfil Education Committee.

Table listing tenders for a shop and residence at Pool, Cornwall.

Table listing tenders for extension of pier for the directors of the Southsea Clarence Esplanade Pier Co. Mr. A. H. Bone, engineer, 148, High-street, Portsmouth.

Table listing tenders for a mixed school for 250 children, for the Merthyr Tydfil Education Committee.

ROCHESTER.—For the erection of the new Technical Institute, for Estates and General Purposes Committee. Messrs. Russell & Cooper, architects:—

	Foundations.		Superstructure.		Substitution of Ancaster Stone for Bath Stone	
	£	s. d.	£	s. d.	£	s. d.
T. D. Grady	1,059	0 0	8,440	0 0	340	0 0
J. H. Durran	1,183	0 0	10,305	0 0	145	0 0
G. Grav.	1,037	0 0	8,497	0 0	235	0 0
S. E. Moss	1,009	0 0	8,744	0 0	500	0 0
S. F. Halliday	993	0 0	8,648	0 0	120	0 0
Miskin, Ltd.	1,082	2 10	8,434	5 5	300	0 0
C. E. Skinner	1,073	0 0	8,315	0 0	400	0 0
H. E. Phillips	1,070	0 0	8,760	0 0	490	0 0
Wells & Sons	850	0 0	7,900	0 0	309	0 0
Arnold & Son	1,199	0 0	8,705	0 0	101	0 0
Gann & Co.	804	0 0	8,207	0 0	290	0 0
Johnson & Son	1,057	0 0	8,468	0 0	295	0 0
Archer & Son	921	0 0	8,393	0 0	290	0 0
G. Browning	998	0 0	8,498	0 0	500	0 0
T. Cornelius & Son	951	0 0	8,109	0 0	274	0 0
A. G. Webb	832	0 0	8,132	0 0	343	0 0
G. Gates, Frindsbury, Rochester	825	0 0	8,163	0 0	50	0 0
West Bros.	975	0 0	7,950	0 0	273	0 0
A. G. Webb	1,030	17 10	9,675	10 8	290	0 0
Armitage & Hodgson	1,070	0 0	8,237	0 0	300	0 0
Stephens, Bastow & Co.	1,069	0 0	8,747	0 0	194	0 0
J. & M. Patrick	990	0 0	8,500	0 0	376	0 0

REDRUTH.—For premises, Fore-street, for Messrs. R. L. Williams & Co. Mr. Sampson Hill, architect, Green-lane, Redruth:—
W. C. Lodge

SOUTHWICK.—For new municipal buildings, Lower Shoreham-road, for the Urban District Council. Mr. G. W. Warr, Surveyor, Council Offices, Southwick. Quantities by Surveyor:—
Barnes & Son £1,776 0 0
Hawkins & Sons

STRATTON ST. MARGARET.—For stormwater bed at outfall works, for Highworth Rural District Council. Messrs. Beesley, Son, & Nichols, engineers, 11, Victoria-street, Westminster, S.W.:—
Streeter & Co., Godalming

UXBRIDGE.—For workhouse extensions, Hillingdon East, for the Guardians. Messrs. W. L. Eves & J. Frecknair Stow, architects, Uxbridge:—
Pethick Bros.
W. Irwin

SWANSEA.—For erecting fifteen houses in De-la-Rocher-road, Sketty, near Swansea, Glam., for the De-la-Rocher Building Club. Mr. C. T. Rathven, architect, Bank-chambers, Heathfield-street, Swansea. Quantities by the architect:—

T. Richards	£9,439 0 0	Lloyd Bros.	£6,000 0 0
T. Davies	8,711 18 0	C. Marles	6,825 0 0
J. & D. Jones	8,709 0 0	J. Marles & Son, Swansea	5,400 0 0
T. D. Jones	8,225 0 0	sea*	6,710 0 0
E. Lacey	7,065 0 0		

TROEDRYHIV.—For erecting boundary walls and formation of playground, etc., for the Merthyr Tydfil Education Committee. Mr. J. Lewdell Smith, architect, Central-chambers, Merthyr Tydfil:—
D. Jones, Dowlais

WARMINGSTEAD.—For erecting two villas at Upper Marsh-road, for the Rev. T. Guy Morris and Miss Stuart. Mr. A. F. Long, architect, 53, Market-place, Warmingstead:—
E. Curtis & Son

J. J. ETRIDGE, JR.
SLATE MERCHANT,
SLATER & TILER.

Penrhyn-Bangor, Oakeley-Portmadoc, and every other description of Slates, except American, ready for immediate delivery to any railway station.
Red Sandfaced Nibbed Roofing Tiles always in Stock.
Applications for Prices, etc., to
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For all the Proved Kinds of
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FLUATE, for Hardening, Waterproofing, Preserving Building Materials.
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Excavation.



EVERY few forms of constructional work can be executed without rendering necessary the excavation and removal of earth or rock. In large engineering contracts, excavation frequently forms the most considerable item of the total cost, and demands the adoption of extensive plant for the accomplishment of the work within the prescribed limits of time and expense. Even in operations such as some within the jurisdiction of the architect, the excavation of material for the formation of foundations, the construction of subways, drains, and other conduits, sometimes assumes a sufficiently formidable character.

In many cases no difficulty occurs in detaching the material from its natural bed; in others considerable trouble is experienced, and adequate knowledge of the most economical methods becomes especially desirable. We may add that in either event the architect ought to make himself acquainted with the nature of the strata immediately below the surface. This is necessary so that he may adequately protect the interests of his client, for contractors occasionally profit by the free acquisition of most valuable building material in a totally unexpected manner. As an illustration of this we may mention that in connexion with a city improvement scheme of some magnitude

in the North of England the contractors, who were also builders, obtained a gratuitous supply of building stone which resulted in a net gain to them of several thousand pounds, and conversely an equivalent loss to the proprietors. Similarly, the contractor ought, if possible, to obtain some information as to what there is below the surface, or it may be his turn to suffer. An example of the kind was furnished during the building of a public institution in the city to which reference has been made, where the contractors who had tendered on the assumption that the subsoil would be easy to deal with, were put to considerable unforeseen expense in breaking up and removing a portion of the foundations of an ancient and most substantially-built city wall. We have reason to know that the firm in question considered that the knowledge gained concerning the cohesion of early masonry was somewhat dearly purchased.

On large engineering works, involving the excavation of earth and rock in huge quantities, it is still more important that the engineer and the contractor should ascertain, as far as possible, the character of the material to be dealt with. At the same time most careful estimates have to be made of the quantities, although it must be pointed out that there is no absolutely accurate method of calculating earthwork. In many situations little difficulty is experienced in forming a reliable opinion as to the nature of the strata underlying the surface; in other places trial borings may be necessary, and the results, considered in connexion

with local geological data, may enable the engineer to obtain a very good notion of the prevailing conditions.

Earthwork in general includes two operations—the cutting down of material projecting above the level of the proposed surface level, and the filling of depressions lying below the same level, these two operations being shortly described as cutting and filling. The first duty of the engineer is to prepare plans and sections representing the area and depth of excavation in all parts of the intended works, the next is to compute the total volume of material to be dealt with by cuts and fills, and, if need be, to analyse this total so that the cost may be separately calculated for the different kinds of earth or rock shown to exist on the site.

The mensuration of earthwork is fully discussed in several well-known standard works, and numerous earthwork tables have been published for the purpose of facilitating calculations. The most recent contribution on the subject is to be found in the introductory chapters of a treatise on the subject of excavation* by Mr. Charles Prelini, who is widely known as the author of a classical work on "Tunnelling." These chapters contain a brief review of some methods practised by European and American engineers, and although the references are by no means complete they indicate the superiority of the methods adopted in the old world. As an instance, we may refer to the author's admission that while British, French, German, and

* "Earth and Rock Excavation." By Charles Prelini, C.E. New York: D. Van Nostrand Company; London: Crosby Lockwood & Son, 1905.

Italian engineers carefully determine the distribution of the volume of earth along the profile of the work by algebraical or by graphical methods, in the United States no attention is paid to such distribution, either in public or in private works. "As a consequence," the author adds, "the mean distance of haul is not known, and earthwork is never calculated on scientific principles in the United States." In view of this criticism British engineers need not expect to learn much that is useful from the examples of American practice quoted by Mr. Prelini. The mention of Continental practice ought to be accompanied by specific references to the source whence the information was obtained, and, considering the claim of the author that he has produced the only book in the English language covering the field chosen, it is strange that English methods of computation should have been overlooked. So far as the preliminary portion of the treatise is concerned, we cannot avoid the impression that the author has not done full justice either to himself or the important details discussed.

While excavation includes the breaking up and removal of earth or rock from its natural bed, excavation proper may be defined as the breaking up of material in readiness for removal. Loosely compacted earths, such as gravel and clay, can easily be separated by means of a spade; others, such as agglomerated sand and hard clay, have to be broken up by a pick, and the excavation of rock requires the use of crowbars and wedges, or of blasting agents, according to the formation and hardness of the mineral. Of course, the simple tools here mentioned are frequently replaced by powerful machinery in which their essential functions are represented, and it is often the case that comparatively soft rock is broken up by blasting as an economical substitute for mechanical appliances.

The tools and machines used in the excavation of rock and earth constitute a most interesting series, and some of them combine the performance of operations belonging to the transport of excavated material. Among elementary tools for dealing with rock, the pick, the crowbar, and the wedge differ little from those used in the earliest ages. A useful modern appliance mentioned by Mr. Prelini for the mechanical excavation of rock is a channelling machine consisting of a track travelling on rails and carrying a vertical boiler and engine, the latter imparting a reciprocating motion to the cutting bar. Machines of this type are capable of cutting slots from 1 ft. 6 in. to 10 ft. deep, the most satisfactory depth of cut being from 6 ft. to 10 ft., but for separation of the rock in horizontal planes, wedges must be used. The capacity of the channelling machine depends upon the character of the rock to be worked. It is said that on the Chicago Drainage Canal the length of channel ranged from 50 ft. to 500 ft. daily. According to the *Engineering News* the cost of operating the machine on that canal was about 42s. a day. Other figures quoted by the author as to the performance of the Ingersoll-Sergeant channeller employed on the same works seem to show that, including all charges, the cost of channelling amounted to

about 1½d. per cubic yard of material excavated.

Blasting constitutes the more general method of separating rock in the execution of engineering works. The process involves the use of various tools for drilling holes into which the explosive is afterwards inserted. In the present day machine drilling has almost entirely displaced handwork. Power drills are made in considerable variety, those employed as auxiliaries to excavation being usually of the percussion type operated by steam, compressed air, or by electric motors communicating power through flexible shafting. Two specific types of such machines are noticed by Mr. Prelini, who gives full particulars as to rotary drills, which are rarely used by engineers and contractors except in trial borings. The only form of the rotary drill that has been employed on an extensive scale for excavation is Brandt's hydraulic drilling machine, but this has found application in tunnelling rather than in work of the kind described in the author's treatise.

The introduction of blasting by gunpowder in the XVIIth century effected a complete revolution in methods of rock excavation. Gunpowder continues to be used to the present day, although to a smaller extent than the different combinations of nitro-glycerine constituting dynamite and known under various fancy names.

If we may judge by the author's work, the engineers of the United States are not usually able to ascertain the composition of the explosives supplied by manufacturers. In this respect British engineers have an advantage over their American *compères*, for the composition of all explosives in the permitted list of the Explosives in Coal Mines Order is clearly specified, and any departure therefrom involves the penalty of removal from the list. Readers in this country need not expect to gain information of practical utility from American sources with regard to the transport and storage of explosives, but they will find in Mr. Prelini's book a few useful notes on the manner in which gunpowder and dynamite are applied in blasting operations.

Turning now to the excavation of earth, and passing over the use of such tools as the spade, pick, and wedge, there remain four distinct methods of work. The first is by blasting, an operation only suitable in open country for breaking away and disintegrating large masses or hillocks of earth. The second is that of hydraulic excavation, which Mr. Prelini says has been much employed on the Pacific Coast in mining and railway work, water under pressure being applied through a hose to break down the soil and wash it away along open conduits of timber. A third method is rendered possible by the pneumatic dredger, which can be utilised with much advantage in the excavation or deepening of dock basins without exposing the walls to risk of failure. The fourth method is to excavate by the aid of the numerous types of mechanical appliances for ploughing, digging and scooping up the earth to be removed. Machines of this class are of much importance in civil engineering work, and the chapters which

Mr. Prelini has devoted to their description form a useful contribution to existing records of apparatus for the mechanical handling of materials.

Apart from one or two appliances which attack the earth in thin layers, most excavating machines operate against the earth in banks, digging downwards from an upper level, or against the face of a bank from the level of the proposed excavation. In Great Britain the usual type of digging machine is that commonly described as the steam navy, but machines provided with heavy gears also receive a fair share of attention. It seems rather strange that so little favour should be shown in this country to continuous excavating machines of the Continental type—we mean those having an endless chain with buckets on the principle of a dredger.

One very useful type of continuous digging machine made in the United States is the Austin trench excavator, forming trenches in which pipes and drains are intended to be laid. This machine somewhat resembles a traction engine having combined cutters at the scoops upon an endless chain belt. The trench need only be cut to the actual width required for pipe-laying, the disturbance of road and other surfaces kept down to a minimum, and another meritorious feature is the rapidity with which work can be executed. The description given by Mr. Prelini is taken from the American technical press, and as an indication of the economy and rapidity with which the excavator performs its work it is mentioned that at Glencoe, Ill., where some 6,000 ft. of trenching was dug by its aid in hard clay, as much as 500 ft. run from 13 ft. to 15 ft. deep has been excavated in working day of ten hours. By employing a sufficient number of men to lay pipe as fast as the machine prepares the way the work of completing a pipe line can be got through with wonderful celerity. The introduction of such an appliance would be greatly appreciated by those in this country who suffer so much from the dilatory methods adopted by municipal and other authorities when laying drains, water and gas pipes, and electric cables.

An instructive portion of Mr. Prelini's book is that wherein appliances for hauling, hoisting, and transporting excavated material are described and illustrated. The bulk of the matter may justly be characterised as a really welcome addition to a branch of literature which has been somewhat neglected, and the information conveyed appears quite as much to constructive work as to the destructive process of excavation. In a previous article on "The Mechanical Handling of Materials,"* we have already discussed in general terms some of the apparatus described in detail by the author. Therefore it is not necessary to add more than one or two brief remarks. In the first place we may point out that the scope of the chapters now in question includes the consideration of horse-drawn vehicles for use on ordinary roads, contractors' railways and rolling stock, mechanism for haulage along inclines, belt conveyors, cranes of different types, aerial cableways and by

* *The Builder*, Vol. LXXIX., p. 433.

electric telpherage systems, and some practical notes on chains, ropes, buckets, and motive power. The valuable assistance offered by traction engines and beam and petrol waggons has entirely escaped the attention of the author, his inference being that mechanically-propelled vehicles of these types have not yet made much headway in the United States. On the other hand, the complete particulars given of the telpherage system deserve full commendation.

In conclusion we must point out that the direction of excavation work on a large scale is a matter which always vests to a very considerable extent, if not entirely, in the contractor. Upon his appreciation of the distinctive characteristics of the work to be undertaken, and upon his capacity for scenting probable difficulties, the commercial success of his operations depends very largely. Moreover, it is essential that the most appropriate types of machinery and plant should be selected for the kind of work to be performed, and, above all, that the controlling mind should have a genius for administration. These things cannot be learned from any book, nor even by experience in the absence of the requisite mental capacity. Nevertheless, books are helpful in their way, and the hints given by Mr. Prelini near the end of his treatise deserve the careful attention of young engineers who may be called upon to take part in the conduct of works such as those contemplated by the author.

Although earthwork upon a scale of great magnitude occurs chiefly in the construction of canals and docks, where the most perfect machinery and organisation are absolutely essential, the building contractor is frequently called upon to carry out works that are as important to him as are more extensive operations to the millionaire engineering contractor. For this reason the study of the most modern appliances and of the best methods of procedure ought by no means to be neglected.

NOTES.

LAST week under this heading we commented upon a case where a sale having been

made under an order of Court the purchaser was discharged from his contract, where there had been a misdescription of the property, and allowed costs other than those defined in the contract for sale. In *re Jackson and Hadens Contract* the Court of Appeal have now decided a case where the purchase of a dwelling-house was being effected by private contract. The contract contained no reservation of mines and minerals, but when the abstract was delivered it appeared the vendors could give no title to the mines and minerals. The purchaser, therefore, offered either to purchase without the mines and minerals at a reduced price, or to permit the contract to be rescinded on payment of damages. The vendors then claimed to rescind the contract, but on repayment only of the deposit. They relied on article 13 of the conditions of sale, which provided that where the purchaser insists on any objection or

requisition which the vendors should be unable to comply with, the contract may be rescinded on repayment of the deposit. The Court, however, held that there having been a misdescription, article 14 applied, which provided that any error, misstatement or omission should not annul the sale, but should form the subject of compensation. The lesson to be learnt from these cases is that vendors cannot be too careful in giving accurate particulars in matters that affect title, since in the event of misdescription the contract will be construed strictly against them.

House Property and Street Widening.

THE case of *Denman & Co., Ltd. v. Mayor, etc., of Westminster*, already reported in our columns, turned upon Michael Angelo Taylor's Act, which we have had occasion to comment on in recent issues. In our comment on the case of *Pescod v. Mayor, etc., of Westminster* (August 19, 1905) and *Thompson and Jackson v. Hammersmith Corporation* (January 6, 1906) we have drawn attention to the law on this subject. In the present case the Court held that the Westminster Corporation had allowed other considerations to weigh with them, and had not come to a judicial consideration or conclusion under section 80 of the Act that the whole property was necessary for the statutory purpose in the street widening, and therefore the Court itself considered the facts, and applying the test—can the portion required be taken away, leaving the house capable of being enjoyed as a house?—came to the conclusion that the house standing on the remaining 30 ft. could easily be retained as a house, and that the defendants were only entitled to acquire the necessary strip to be thrown into the street. The judgment contains some very important observations on how far the wishes of the owner are to be regarded in connexion with property so acquired; his wishes are by no means disregarded, they can in certain cases be disregarded, and the whole property be acquired. The real question in each case is, will the house cease to be capable of retaining its character as a house? but the fact that the owner is willing to make it good as an effectual house will also be taken into consideration. The question where interests in the freehold are divided still remains in abeyance.

London Building Act and Party Walls.

A QUESTION of considerable importance under the London Building Act, 1894, has been decided in the case of *Lewis and Salone v. Charing Cross, Euston, and Hampstead Railway Company*. The railway company, in pursuance of their powers, which incorporated certain sections of the Lands Clauses Consolidation Act, 1845, had acquired 21, Cranbourne-street, and were pulling down the house in order to erect a station upon the site. The plaintiffs were the lessees of the adjoining house, and they alleged that the railway company had affected a party wall without giving the notice required by the London Building Act. The defendants contended that they were exempt from giving the party wall notice by virtue of a clause in their Act which provides that any buildings acquired for extraordinary purposes under

the Lands Clauses Consolidation Act, sect. 45 (as the house in question had been), "except such buildings or parts of buildings as may be used for the purposes of a station," shall be subject to the provisions of the Acts relating to buildings in the Metropolis. The Court construed this provision as being directed to remove the exemption contained in sect. 201 of the London Building Act of structures erected upon the railway or within the railway or station premises from Parts 6 and 7 of the Act, but as in no way affecting Part 8 of the Act which refers to interference with party structures. In such circumstances, therefore, the party wall notice is necessary, the company being in the position of an ordinary "owner" desirous of doing work affecting "a party wall or structure." In this case the Court came to the conclusion that in fact the wall had not been affected, and the plaintiffs therefore failed in their action, but the decision on the question of law is an important one.

The Rating of Land Values.

IT is probable that in the next, or at any rate in an early, session the question of the rating of land values will take a prominent place. There can be no objection to the rating of actually valuable pieces of land at their true value; the difficulty is to arrive at it. Lord Balfour's local Taxation Commission considered this subject, and the Chairman, Lord Kinross, Sir E. W. Hamilton, Sir G. H. Murray, and Mr. Stuart agreed that it was possible to make a valuation of sites, as distinguished from buildings. The other commissioners came to the conclusion "that although it cannot be said that it would be impossible to assign separate values to site and structure . . . such a system would certainly be attended with considerable uncertainty, complication and expense." The subject is a technical and troublesome one, and the recent publication of the reports of the commissioners, together with notes on the proposals to levy rates in respect of site values under the title, "The Rating of Land Values," by Mr. Wilson Fox, C.B., Secretary to the Commission (London: P. S. King & Sons) is very opportune, and will enable the point of the approaching discussion to be kept clear.

Publishers' Liabilities.

THE case of *Bullen v. The Swan Electric Engraving Company* is one of general interest to publishers and literary and artistic men. The plaintiff had entrusted certain plates from original paintings to the defendants for the production of book illustrations. After the illustrations had been produced the plates remained in the defendants' keeping. Subsequently, when the plates were required for other editions they could not be found, and the plaintiff sued the defendants for their return or for damages. The plates were left in the custody of the defendants for the convenience of both parties. No evidence was forthcoming as to what had become of the plates, but the defendants proved that they could not be found and assumed they must have been stolen. The defendants, however, gave evidence as to

the care taken in the custody of the plates, and on this evidence the Court held that, as gratuitous bailees they had satisfied their obligation, and, though with some hesitation on account of some conflict in the reported cases, the Court gave judgment for the defendants. In this case it is to be observed that the plaintiff was unable to give evidence of negligence, whilst the defendants were unable to prove the cause of the loss, and the decision turns upon the fact that they took proper and reasonable care of the property, such as could be expected from a careful owner in the custody of his own goods.

Concrete in Building Construction. VARIOUS phases of concrete construction were considered by the speakers in a discussion on "Reinforced Concrete in Building Construction" at a meeting of the Franklin Institute, and reported in the current issue of the journal of the same institution. The first speaker, Mr. E. G. Perrot, presented what was really a paper on concrete-steel, and although recapitulating a good deal that is already well known, this communication contains some practical data which deserve examination, notably the results of load tests made on full-size beams having a clear span of 20 ft. between supports. These tests confirm the substantial accuracy of the assumptions and formulae stated by Mr. Perrot, the latter being based upon the formula employed by M. Paul Christophe, the eminent French expert on reinforced concrete. Mr. W. L. Webb devoted attention chiefly to the design of dams, a type of construction which affords opportunity for one of the most remarkable applications of concrete steel. The special advantages of a dam built of this material are that it is designed with a comparatively flat up-stream surface, so that there is no tendency for it to overturn; that the method of hollow construction can be adopted with great saving of labour and materials; and that a work of the kind can be made absolutely watertight at the start and so to remain. A deviation from the subject indicated by the title of the discussion was made by Mr. F. P. Cowell, who brought forward some notes on the use of hollow concrete building blocks. This speaker argued with some reason that this form of concrete was more suitable than mass concrete for architectural construction, and he gave as an appendix to his remarks the rules and regulations drawn up by the city authorities of Philadelphia governing the manufacture, and use of hollow concrete building blocks.

The Soudan Railway. A GRATIFYING circumstance in connexion with the recent completion of the new railway from the Nile to the Red Sea is that the line has been built within the short period of sixteen months. That this is by no means an insignificant achievement is made clear by the fact that the route—312 miles in length—traverses country of a most unfavourable kind, consisting of a sandy desert, diversified by numerous hills and hollows. In summer time the heat was particularly trying to the English engineers

in charge of the works, and in the autumn and winter months floods frequently swept away bridges and portions of the permanent way. The arduous nature of the task was further increased by the necessity for importing the bulk of the material from this country and for its transportation across the desert to the required points. At the Red Sea end the new line divides into two branches, one terminating at Suakim and the other at Port Soudan, formerly the fishing village known as Sheikh-el-Bargût. The superiority of the harbour at this place over that of Suakim was so evident to the Technical Commission, appointed in 1904 by the Egyptian Government, that it was decided to bring the new railway to the port and to commence the construction of harbour works and Government buildings without delay. By the opening of the railway and the development of a new port on the Red Sea a considerable impetus will be given to the agricultural development of the Soudan, and for the moment it is certain that the facilities in question are of greater value than the irrigation works in contemplation for the benefit of the same region.

Electric Measuring Instruments. THE paper read by Mr. K. Edgcombe on "Some Recent Electrical Measuring Instruments" to the Junior Institution of Engineers is of general interest to all users of electric light and power. The extending use of the electric motor has given rise to a demand for a cheap and accurate gauge for measuring the current taken by the motor. In an instrument of this type made by the author the scale is calibrated directly in horse power, and this will be appreciated by the average attendant, who is, as a rule, ignorant of the meaning of the electrical units. A novel form of street photometer invented by Mr. H. T. Harrison is also described. It is exceedingly compact, and should prove useful in helping gas and electric lighting engineers to agree as to the relative values of the "illumination" produced by their street lamps. The question, however, of the quality of the light emitted is still left untouched. The author points out that one effect of the stringent Board of Trade lighting and tramway regulations has been to encourage the perfecting of recording instruments for pressure and current. In other countries recording instruments are only to be seen in well-equipped laboratories, but in this country there are several in every electric lighting station. The author describes an ingenious form of "inkless" recorder which he has invented. It eliminates the difficulties due to the ink in the ordinary recording pen and the friction of the pen on the paper. In conclusion various forms of frequency indicator are described. The paper would be more interesting if some hint had been given as to the percentage accuracy of the various instruments described.

Crane Motors and Controllers. MUCH useful information is contained in the paper by Mr. C. W. Hill on "Crane Motors and Controllers," which was read to the Institution of Electrical Engineers

last week. The proper rating of a motor for intermittent use is a problem of considerable complexity, and some of the tables and diagrams given will be helpful in obtaining a solution. It is usually specified that the temperature rise of any part of the machine in ordinary working must not exceed the temperature of surrounding objects by more than 75 deg. Fahr. Unfortunately the testing of a motor of this type is both troublesome and expensive. The author has, therefore, carried out a series of tests to see the degree of accuracy obtainable by the ordinary formulae. We had occasion last year, when commenting on Mr. Goldschmidt's paper, to refer to the limitations in the formulae used. Newton's law of cooling on which they are based only applies very roughly when the temperature of the machine is 50 or 60 degrees hotter than its surroundings, and so in those experiments where the calculated and observed values are almost the same, other causes, not taken into account in the calculations, must have produced an appreciable effect. Several of Mr. Hill's results prove that in many cases the rough engineering formulae are quite useless. The tables given of tests made on a shunt motor devised by the author for use on an overhead travelling crane are very instructive, and will well repay study. The use of the phrase "power factor," however, in a new sense, is objectionable. We should like to know the author's justification for giving 0.38 as the specific heat of cotton insulation, and also what he took as the specific gravity of this insulation material in constructing Fig. 3.

Site of the Institute's New Premises, and Langham House. THE freehold site which it is proposed to purchase at the price of 19,500l. for the new premises of the Institute, lies between Nos. 11 and 13, on the west side, south end, of Portland-place. The land has, we believe, never been built upon; it forms part of the grounds of (old) Foley House, which should not be confused with the present Foley House, No. 8, on the opposite side of the street. When Nash prepared his plans for laying out the upper end of Regent-street (Langham-place) and for opening out a road northwards to Regent's Park, the southern end of Portland-place was quite blocked by (old) Foley House, of which the north garden-wall extended along a line drawn from No. 68, now No. 13, to No. 1, now No. 20, Portland-place, the garden extending southwards to the rear of the houses on the north side of Mortimer-street (west), since re-named Cavendish-place, Foley House, where is now the Langham Hotel (1863-5), had been built by S. Leadbeater, or Leadbetter, in or about 1740 for Thomas, second Lord Foley. Nash acquired the property for 70,000l.; on a portion of the north garden, along its west side, he built Langham House for Sir James Langham, Bart., and some adjoining houses to the south. Langham House gave way some years ago to a block of residential flats, No. 11, but the garden-ground in part has remained, whilst another piece of it still exists in front of the later Foley House which James

built in or about 1786 for his own occupation.

At Messrs. Agnew & Sons' gallery is an exhibition under the title, "Some Examples of Independent Art of To-day." What is independent art? In too many cases means art which is independent of her beauty or finish; and some of this sort of independence finds place here, such as Mr. Wilson Steer's painting of a pasty-faced lady on a garden-seat, presenting "Summer," and devoid of charm either of colour, design, or expression; and Mr. McTaggart's "Emigrants Leaving the Hebrides," which it is difficult to make out either as emigrants or anything else. But as a whole it is an interesting exhibition, more especially in the further examples given us of Mr. Strang's new and unexpected development as a colourist. His painting of "The Bathers," a kind of pendant to his picture at the New Gallery, quite Titianesque in colour; his larger painting, "Supper Time," though too large for the slightness of its subject, a masterly work both in design and colour; such works place this Mr. Strang, hitherto known mainly as an engraver, in an entirely new category among contemporary artists. The tendency of "independent art" to indulge in what are really sketches on a large scale of rather trivial subjects is shown in Mr. Mackie's "Musical Moments," a large sketch of a family gathering, never enough, but this kind of thing is really worth doing on a small scale as a cabinet picture; there is a total want of proportion between the subject and the scale of the work. To a lesser extent the same might be said of Mr. R. Burns's "The Window," a life-size figure of a lady seen against the light of a window through which we look out on a river; this is a production of really pictorial quality, but its interest is evanescent; we can hardly imagine any one making room in a permanent collection for a mere study of lighting on so large a scale. At the other end of the room, to emphasize this, is a really complete work of art in Mr. Lavery's very fine portrait under the title "Violet and Gold." Though, at first sight, the two girls in the foreground of Mr. Tonks's picture, "The Lost Path," look like bundles of logs, at a safe distance it resolves itself into a landscape composition of fine and open effect; and Professor Brown, in "On the Wye," has got a real effect of sunlight. Among other things Mr. Hos. Hunt's "A Galloway Pastoral" is a beautiful little bit of landscape composition; Mr. Hone, in "Coast of County Clare," has made a powerful composition out of black rocks, surf, and stormy sky; and Mr. James Paterson's "An East Lothian Village" is a perfectly admirable example of a landscape in which buildings are predominant and are made to blend with the whole without losing their texture and structural quality. Too often, in modern paintings of this class of subject, we find the buildings reduced to a structureless and pulpy appearance in order to blend (as is supposed) with the landscape. This is the fault of Mr. Anneson's "Eglise St. Vulfran, Abbeville," where the effect of the dark tower

seen against a sky mottled with white clouds is fine, but the architecture is sacrificed to it in a manner quite unnecessary; the general effect would have been just as good, and the picture more truthful if the details of the tower (which fills the greater part of the picture) had been better drawn and expressed.

The Fine Art Society.

At the gallery of the Fine Art Society is an exhibition of watercolours by Dutch artists of the present day. Two of these, "Ostend" (10) by A. Le Comte, and "A Quiet Corner" by Bernard Schregel, caught our eye the moment of entering the room, as two works each showing in its way a remarkable individuality; and these two artists are, we found, two of the best represented. Herr Le Comte is an admirable painter of sea and harbour pictures, with a way of his own of treating the sea; and Herr Schregel has a faculty of his own of representing sunlight flickering through trees on to white buildings, which becomes a little mannered by repetition, but is always effective and in a style of handling completely his own. His charmingly composed little landscape, "The Last Rays of the Sun" (15), and also "A Creek in the Dunes" (22), show however that he has powers beyond those exhibited in his favourite scheme. Herr Gruppé's large drawing, "Clearing up the Wood" (12), is an admirable study of a wood in winter, with the bare trunks of trees forming the principal incident; it is in a pure watercolour style, which indeed may be said of the majority of the works exhibited. Herr Gruppé's "Pasture" (4) is also a beautiful small landscape, delicate without losing breadth. The figure studies do not interest us so much; the most artistic is Herr Haverman's "Mother and Child" (7), a woman in a yellow dress with her back to the spectator; one or two others of his are good but rather sloppy in execution, and in "After the Bath" (13) the aspect of the infant certainly suggests that it ought to be "Before the Bath." The landscapes are the best part of the exhibition, and they are very interesting. The collection of bronze statuettes of peasants by Herr Van Wyk, who seems to be a kind of Dutch Constantin Meunier (in intention at least) are too ragged in style and treatment to quite merit the title of sculpture.

The Carfax Gallery.

WE cannot feel much enthusiasm over the pictures of Mr. Graham Robertson exhibited at the Carfax Gallery. He has a manner of his own in the treatment of figures by thin painting of surfaces without elaboration of texture effect, and a feeling for colour harmony, which produces its effect in the half length portrait of a girl under the title "Daisy" (1), and in one or two others, such as the portrait entitled "Grey and Black" (14); but a good many of the other figure pictures are very crude and flat in effect, and the landscapes have the appearance of being cut out in flat pieces and put together like a puzzle-map. The black and white drawings in line for book illustrations for "Old English Songs and Dances" and "French Songs of Old Canada" are very

good in their way, and show the artist as a master of this kind of work, and the child figures in the drawings for "A Year of Songs for a Baby in a Garden" are charming. Mr. Robertson shows also some experiments in colour prints "in search of the lost manner of William Blake," some of them treating designs of Blake's, which are of some interest.

The Goupil Gallery.

At the Goupil Gallery there is a second exhibition of landscapes by Mr. Leon Little, whose first exhibition we noticed three years ago, and who has progressed further in developing his feeling for the poetry of composition and colour in landscape. "The Close of a Day" (13), a scene looking up a small river or canal between trees, is a beautiful work; some of the smaller studies—"Setting Sun" (8), "Sunny Afternoon" (9), and "Rainy Day" (12) are noteworthy for truth and poetry of effect; and the large painting "The Thaw" (39) is a most powerful picture of desolation in landscape. "Twilight" (13), a little reminding one of Corot, and "The Brook" (47) are two others worth special mention. "Pond at Moonlight" (19), though a fine little picture, shows (as is often the case in this class of subject) too much light for moonlight. But the whole collection is full of interest and talent.

WE have before referred to the Marble Arch, a proposal by Mr. Speaight to have a crescent-shaped place formed in the rear of the Marble Arch, leaving the arch standing alone in the centre of the semi-circle. As a convenience to traffic it may be worth doing, but it is hardly to be recommended in an architectural sense. The arch now stands as a gate to the park, though one not generally used; in Mr. Speaight's scheme it would lose that appearance entirely, and would merely be an erection standing apart, without any meaning. Mr. Speaight says he took the idea from the position of the Arc de l'Etoile at Paris, but unfortunately the Marble Arch is not a grand structure like the Arc de l'Etoile, and in the second place the great Paris arch actually stands over the centre of the main line of avenue, and although the traffic is made to circle round it, it stands on the axis of a long vista of road, and is, or might be, used as a state entrance to Paris from the west. The Marble Arch is no such monumental work; it is a small and rather insignificant specimen of a triumphal arch, originally meant as the gateway to Buckingham Palace, and now standing as one gateway to Hyde Park. It looks reasonable in that position, but it is not adequate for a central position in an open space, and would only look absurd.

THE KING'S SANATORIUM, MIDHURST.—The designs of Messrs. Heal & Son, of Tottenham Court-road, have been selected in competition for the furnishing of King Edward's Sanatorium. GREY'S MONUMENT, NEWCASTLE.—This monument, which stands on a site at the junction of Grey-street, Grainger-street, and Blackett-street, and was erected in 1838 to commemorate the life and services rendered to the cause of parliamentary reform by the great Earl Grey, has recently been renovated. The work was carried out under the supervision of Mr. C. H. Neuper, sculptor, of Newcastle.

ROYAL ACADEMY LECTURES.

In his second lecture on "Reason in Architecture," delivered on Thursday the 8th, Mr. Jackson, after briefly recapitulating the argument of the first lecture (see page 141 *ante*), observed that the whole change from Romanesque to Gothic architecture arose out of practical circumstances, and even was influenced by the social life of the times and the character of the men who built. This had been followed out in the last lecture in reference to one detail, the capital, which as an illustration of development on a small scale was taken first; they would now carry out the same analysis on a larger scale. If they stood under one of the great cavernous portals of a French cathedral, such as Bourges or Amiens—portals far finer and more impressive than anything of the kind in English cathedrals, for the English cathedral builders had never attempted to make the most of the possibilities of an entrance porch—they would see, if they looked carefully at the array of sculpture which decorated the deeply recessed arch, that it was arranged on a system of receding planes; differing in this respect essentially from the Classic arch, which was built in one plane. How did this come about? Did anyone invent it? No: like all other architectural features, it was the result of a slow development; and the characteristics of this great cavernous sculptured portal, strange as it might seem, were traceable in the first instance to the influence of poverty and a desire to economise material and labour. Going back to Roman times, the Romans built with large stones, which could only be obtained and handed by people possessing wealth and the best engineering appliances. But those who attempted to build on a large scale in the IXth and Xth centuries possessed neither wealth nor engineering appliances except of the simplest kind. They could neither have obtained and transported the large blocks by the Romans, nor raised them into their places if they had them. They were compelled to build with small stones. Instead therefore of attempting an arch in one order for a thick wall, they commenced with a sub-arch in smaller stones, and a second arch above it in similar stones projecting on each side of the first arch, the space between these second courses being filled in with small stones in the middle, and the label or archivolt moulding over the arch could again be formed of quite small stones projecting beyond the face of the second arch. Thus was started the idea of an arch in successive "orders," one recessed within the other. The stones might even be of quite irregular sizes; all that was necessary was to have efficient bonding. Another economy obtained in this way was in the temporary centering for building the arch on. Even the Romans had found the centering for their large arches a very heavy charge on a building; but with the system of recessed arches the first or lower arch only required a small and light centering, and the arch itself formed the centering for building the next order on. But this arrangement of receding arches affected the plan of the pier also. The Roman pier might be a simple square (a), but with two recessed arches it was obvious that the square plan did not fit the section of the arch above it.



there was a waste of material at the angles of the pier; accordingly the early Romanesque pier took the form (b), in which, as they could see at St. Albans, the section of the arch was carried down to the ground. This simple change of the arch into one of recessed orders was momentous to architecture; it came to play a part in every feature of design. The attempt was soon made to render it decorative by inserting shafts in the angles of the pier; and the introduction of a third order in the arch suggested the further modification of the pier by a half round column on each face, as at c. This kind of treatment of the pier was necessary to make it correspond sufficiently with the section of the arch, unless in the cases where

the members of the arch were intercepted by a square capital carried by a cylindrical pier. One result of this treatment of the pier at c was, as they would see, that the main outline of the pier was no longer a square, parallel with the main line of the arcade, but assumed a diamond shape diagonal to it; and this general shape the plan of the pier was maintained throughout the whole course of Gothic architecture. Then followed the device of giving more effect and expression to the orders of the arch by mouldings and by the introduction of carved ornament, but the distinction of receding orders was still preserved, as was shown in an illustration of a Norman archway from Durham Cathedral, which was very richly decorated, but the effect of receding in successive planes was perfectly obvious. Each of the orders of the arch had its own shaft in the pier below, the capitals with diversified ornament, some of them of the convex Byzantine type, some with leafage carving; but a point worth notice was that the shafts were no longer part of the pier; they were detached: and this change led to the frequent practice of making the shafts of a different material, such as Purbeck marble, the best material of the kind which this country afforded; for the English builders seldom attempted the importation of the more fine and costly foreign marbles. The section of the arch, with the multiplication of orders, was, like the plan of the pier, changed from the square flat section of the Roman arch to a diamond-shaped section, as was very obvious in an illustration of an arch from the south-west transept of Ely Cathedral. Among other examples shown were the portal of Vézelay; that of Rochester, in which there seemed to be something of French influence in the employment of sculptured figures in the place of shafts in the jambs; and the Prior's door at Ely, in which there was only one sub-order, but which was characteristic as showing very clearly the retention of the general square section of the receding, in spite of the mouldings and enrichments. And here it was to be observed that, in spite of the multiplication of mouldings in later Gothic, the recollection of the original square form of the recessed arch orders was never lost sight of, except occasionally in very late Gothic; the mouldings, as was shown on some typical sections, were still cut out of the square forms of the original arch rings, and fell into groups distinct for each order of the arch; even where the plan of the caps was circular, as at All Saints, Stamford, the square form of arch order was retained over them; and if they looked at the view of the interior of Worcester nave, they would see arches with a great elaboration of mouldings, which might seem at first glance to be without rule, but if they were examined carefully it could be found that they fell into groups, each referable to the original square section of the arch ring. This elaboration and variety of mouldings was peculiar to English Gothic; the French mouldings were poor and monotonous in comparison; but in all this multiplicity the order was preserved, and each group of mouldings threw its own shadow. Coming now to an illustration of the great west doorway at Amiens, the richness and profusion of which was almost overpowering, those who had followed out his argument would be able to recognise that the whole of this ornament followed constructive lines. The sculpture on each order of the arch was probably carved first, before being placed in position. The statues in the jambs of the doorway, which replaced the shafts often found in that position, were not spaced at random, but each occupied the precise position which a shaft would have occupied, beneath the arch-order which belonged to it. The west portal of Notre-Dame at Paris, a little later and somewhat more severe in character, showed the same characteristics. Thus these examples justified the apparent paradox with which the lecturer had started, that all this richness of detail developed in the great building adopted on account of poverty and on grounds of economy. The early mediæval builders, whose desire was to imitate Roman work, failed to do that—it was beyond their resources; but they had ended by doing something better. For fitness was a prime condition of architecture. An artistic people would have got no suggestions out of

the practical difficulties that had been referred to; the mediæval builders accepted and made the best of the position, and thus developed a true architecture on the lines of reasonableness.

If this reasonable characteristic of architecture were better and more generally understood, people would derive a new pleasure from the study of the subject. There was no great mystery about it; the general constructional problems, the only ones about which amateurs need trouble themselves, were really simple enough. The elementary principles of construction were obvious to all, people were in the habit of judging by them almost without knowing it. Slight thin walls, for instance, pleased nobody; but a plain wall solidly built was satisfactory to the eye; when buttresses had to be added to strengthen it there was an additional interest. The constructive test was what we really judged by. Many large engineering structures—railway bridges, aqueducts, as long as engineers abstained from treating them (as they thought) "architecturally," were very interesting objects; King's Cross Station was the best and most expressive railway station front in London, simply because it expressed the actual construction of the station, and it was worth note that the effectiveness of the large arches was derived from the very detail they had been considering in mediæval work—the employment of the recessed orders of arches. Even Charing Cross railway bridge, though one would hardly call it beautiful, was satisfactory to the eye in its way; it was a piece of plain practical structure suited to its special purpose. There were many worse bridges than that between Charing Cross and London Bridge. So the Kew and Putney bridges, solid masonry structures with little ornament, were satisfactory; and London Bridge, the plainest of all, was still more so. As an example in another form, of the satisfactory effect of simple and suitable construction, was shown an illustration of the old timber-built Market Hall at Ledbury, an unornamented structure in which the whole effect depends upon the suitable employment of timber in a constructive manner. Even the over-sailing of the upper story, which was the most picturesque incident in the building, arose, it was pointed out, from practical considerations; the ground floor was necessarily restricted in space from the conditions of the site, but these did not operate at the higher level, so the joists were carried out beyond the lower wall line to give a more rooey floor above. After this was shown the interior of a large mediæval barn, a large piece of plain timber construction based on a three-aisled arrangement of supports, and forming a most picturesque interior; there was not a feature in it of what was generally called architecture, yet it was in the true sense architecture. Forms of simple construction sufficed in themselves to give pleasure; construction in its broader sense was intelligible to all persons of intelligence; more elaborate forms, like those of the mediæval portals which they had been considering, no doubt required explanation, but they were not to be fully enjoyed without some knowledge of construction. Architects, no doubt, had to study more difficult problems of construction in order to learn how best to create works of beauty; but the unprofessional spectator was not concerned with these more special and complicated studies; all that need be asked of him was that he should endeavour to look a little below the surface of things. Then he would have a reason for his preference in architecture; whereas too often people knew only that they "liked" this and "disliked" that, with no reason for either feeling; or they liked what they were told they ought to like. Enjoyment to be worth anything must be sincere and must be reasonable; yet they were told sometimes that to dwell on the constructive quality of architecture was to make it "uninteresting" to the amateur. Did some knowledge of astronomy or of botany render the stars or the flowers less interesting? They only asked of the man outside the profession that he should endeavour to understand how the forms of architecture were based on laws and principles. Construction was not a dull subject; it only needed to be understood to be found full of interest. The Forth Bridge was interesting as a piece of mere construction. It was the

ness of architecture to carry things a step further than mere construction; but other in the nave of a Gothic cathedral, the dome of St. Paul's, the effect was not on construction, and the constructional effect was in fact felt by the spectator even if not fully understood. Why should a pier be built with a slightly diminishing line, either by lessening the buttresses or setting the successive stages slightly? Experience taught us that otherwise we tended to look larger at the top than at the base. And why should we object to a tall object to be steady and to look steady it must be somewhat widened at the base. Columns were diminished upward for the same reason, and entasis was given to them, as it often was to mediæval broach spires, because it was found that otherwise they tended to look hollow in line, and a hollow line in such an object tended to give an appearance of weakness, and to do away with the character of stability. In Classic architecture, such as Wren's, where the buttresses in themselves were vertical, this fulcrum of the line of sight was obtained by the production of such decorative additions as astragals and vases at the different stages, filling up the gaps to the eye, and giving a general convex outline which the eye desired. The design of the western towers of St. Paul's was a notable instance of this; its weakness or hollowness of the general line there would have seemed doubly weak in contrast with the prominent convex outline of the dome in the rear. The stronger line was preferred by common sense, and it meant that we instinctively felt its constructional character. Why did people admire the "crown" termination to a steeple as at Newcastle; St. Giles, Edinburgh; and other examples? Because, even by those who did not know exactly how it was done, it was felt to be a piece of rather daring architecture. Amateur lovers of architecture might not therefore be satisfied with the mere outward forms of things; they should link of the construction; there was no mystery about it; it was only what they had seen practically applying, in one way or another, all their lives. When this point was rightly understood, there would be more understanding of and more demand for good architecture on the part of the public. It is as important they should have that demand, or in art supply and demand stood in a constant balance; as Leighton observed, "what the public want in art, that they will have."

That an interest in art had become fashionable—that there was an increasing number who were interested in it—that was something; what was wanted in regard to architecture was that the public should be more enlightened in regard to its constructive basis, and to the students whom he was addressing this recognition of the constructive basis was still more essential. He would exhort them to consider the construction as the basis and support of all their design, just as the skeleton was the basis and support of the outward human form. Let them settle the underlying constructional motive of a building, and build up their design round it. Good architecture was the expression of good construction.

In his third lecture, given on Monday last, Mr. Jackson followed on the influence of construction on design as illustrated in the instance of the vaulted roof. The mediæval builders had always desired to have stone vaults to their buildings; they had the remains of the great Roman vaulted structures before them, and such buildings as the Pantheon. The Roman tradition of the dome was carried on in the Eastern Roman Empire, where the invention of the pendentive revolutionised dome architecture; but in Western Europe the skill to carry out such works was wanting, and Charlemagne's tomb at Aix-la-chapelle, which was an obvious copy of San Vitale at Ravenna, was built by Eastern workmen sent for the purpose. The Western builders, however, would have vaults; they could not afford to build them in the Roman way, but they found their own way. What was the difference? Compare the plans of the octagonal temple at Spalato with that of the chapter house at York: two buildings nearly the same size, but the one showed a huge mass of walling; the other, though

rather the larger building and also covered with a stone roof, seemed to have very little wall, and what it had was arranged in quite a different manner. The Romans were content to meet the thrust of the arch by an immense dead weight of thick wall; what might be called passive resistance; the Gothic builders met it by an opposition of pressures, and only by many failures did they find the means of so using these pressures or thrusts as to neutralise each other. They commenced with wagon vaults, at first of semi-circular section; subsequently a pointed section was adopted both because it exercised less thrust and because it agreed better with the exterior line of the stone roof, and left a smaller mass of material, and therefore less weight at the apex. They could see these solid stone barrel-vaulted roofs in some of the Channel churches of South Wales and the Channel Islands, and also in some minor portions of English churches, such as porches, they could still see barrel-vaulted roofs of solid stone. With side aisles, however, there was no room for the amount of buttressing required, except by the employment of successive barrel vaults over the aisles, from pier to pier, at right angles to the line of the nave. This made, however, a heavy and dark interior, and was succeeded by the employment of cross-vaulting in the aisles, which occupied less material and let more light into the church; but with this was lost the requisite abutment to the nave vault, which accordingly was for the time abandoned and the nave roofed with timber, as we still saw it at Peterborough. One of the difficulties when the attempt was first made to vault the nave was, that though the aisle bays of vaulting were built over a square, the nave, being wider than the aisles, fell into oblong compartments. The Roman vault, with its mere edge groins, did well enough over the square bays of the aisle, but with a nave wider than the length of the bays, as they could see at Vézelay, the two semi-circular arches would not work out in the same way, and they had the coal-scuttle (sometimes called the Welsh) vault, the narrower transverse vault only cutting into the haunches of the longitudinal vault. The employment of the pointed arch, which was introduced purely for constructional reasons (for the round arch was often retained afterwards in merely decorative arches), made it possible to adapt the lines of the groins to the different heights and widths required, and this being perceived, there followed the system in which the groins were built first, as an independent construction with their curves set out to the heights and widths required, and the surfaces were filled in between them; instead of the groins showing twisted lines from the meeting of unequal arches as in the Roman system, the groins made the design, and any inevitable twisting or accommodation was made in the surface filling, where it was not noticeable. Most of the difficulties of the vault itself were got over now; what remained was to fortify it sufficiently at the points where it abutted on the wall. But for the side aisles it would have been easy, but they stood in the way of the necessary buttresses. Hence arose the idea of building massive buttresses outside of the aisles, and carrying the thrust of the nave vault across by flying buttresses. Here they saw the real principle of Gothic building; the balance of thrusts one against another. Without the flying buttresses the nave vault would push the walls out; but without the nave vault the flying buttresses would thrust the walls in. Between the two the thrust of the vault was resolved into a dead weight pressing vertically on the walls. Thus in a cathedral they were surrounded by mighty unseen forces struggling for the mastery. The massive exterior buttress was the only passive portion of the construction. The section of Westminster Abbey was shown as an illustration of this, and attention called to the double system of flying buttresses adopted to carry the thrust over the cloister walk on the south side.

These were the main causes that had shaped the Gothic style as a whole. Thus reason again had led up to the architectural result. In the treatment of the eastern termination of the cathedral they could trace again the influence of reason. Aboard, the favourite termination eastwards was on the plan of the apse, which the Normans had

brought over to England, most of our cathedrals having been built in their first form with an apsidal termination to the choir, though this was abandoned later in favour of the square termination which was preferred in England, and which gave opportunity for what was one of the great glories of the English cathedrals and churches—the large traceried east window. Now the cross-vault was not easy of application to an apsidal plan. At Autun the choir was barrel-vaulted, with a semi-dome over the apse; and at Leon also they found the same arrangement. One defect inherent in this was that the windows had to be kept low; they could not be carried above the line of springing of the semi-dome. At Vézelay, where cross-vaulting was introduced and the plan took the peculiarly French form known as the *chevet*, they could see how the effect was improved by the ability to carry the windows up beyond the springing of the vault. At Beauvais this effect was pushed to its utmost limit; the choir became a kind of lantern with the spaces between the piers entirely pierced by windows; even the triforium was pierced on the exterior and glazed. Theoretically, at all events, all this wall-veil and window might be removed without affecting structural stability. Yet even for these effects the Gothic builders only reluctantly abandoned the round arch. It was found persisting in buildings where all the structural portions were built with pointed arches; in Italy especially, where the Classic tradition was naturally the strongest; in Dalmatia the round arch persisted even up to the time of its revival at the Renaissance. This fact was an indication that the increase in the height and verticality of effect in the later Gothic buildings was not really due, as was often popularly supposed, to a religious sentiment of aspiration; it was simply a matter of the most convenient way of building; and it was noticeable that this increase of loftiness arose just at the time when, in the XIIIth century, the work of church building passed out of the hands of the clergy into those of lay corporations. The increase in height was in fact inevitable with the pointed arch. The aisles had to be lofty in order to obtain light enough from the aisle windows; and the upper line of the aisle roof fixed the sill of the clearstory windows, and from these again it was desired to get as much light as possible. The effect of aspiration was produced; but reason, not religion, was the motive power.*

BRITISH SCHOOL AT ROME.

THE second open meeting of the British School at Rome for the present season was held in the library of the School on Friday, February 2. Mr. Thomas Ashby, jun., Assistant-Director of the School, read a paper on "Excavations at Caerwent, Monmouthshire," in the supervision of which he has taken a considerable part. The village occupies the site of the Romano-British city of Venta Silurum, and excavations have been in progress there since 1892. The city walls have always been in evidence, but they have been carefully studied; the inside of the north gate has been cleared, and the south gate discovered. Both gates have been blocked up in ancient times—no doubt in the later days of the city. Within the city wall, which was a revêtement wall, have been found the traces of an earlier mound, to which perhaps belonged the ditch which runs along the outside of the wall.

Of the houses which have been discovered within the city, three are of a type hardly found elsewhere in England, having rooms on all four sides of the central courtyard. This, the normal arrangement in Italy, was, as a rule, abandoned in northern climes, the south side being left open to the sun, and one large house found in 1904 followed the usual Romano-British plan, a fact which may have been due to its proximity to the south wall.

In some of these buildings mosaic pavements of elaborate design, though somewhat inferior in execution, have been found, and a considerable quantity of painted plaster

* We quite agree that the popular idea about religious aspiration is a mistake, but it may be suggested that a kind of building ambition—the desire to show how high one could go safely, and to out-do other builders, had some influence in increasing the height of cathedrals, as in such a case as Beauvais; and at Beauvais, as we know, "vaulting ambition overreached itself."—Ed.

from the walls—sometimes *in situ*—has been discovered.

Two inscriptions of considerable importance have also come to light, one of them a dedication to a former Commander of the Second Legion, and Governor successively of Gallia, Narbonensis, and Lugdunensis—possibly *Fiberius Claudius Paulinus*, who was Governor of Britain in the time of *Elegabalus*, and who was also at one time Governor of Gallia and Lugdunensis. The other inscription is upon the base of a statue of Mars, attended by a web-footed bird—either a swan or a goose—though only the feet of the figure are preserved, which was dedicated by one *Nonius Romanus* on August 23, 152 A.D.

Reports of the work are regularly presented to the Society of Antiquaries, and published in *Archæologia*.

Mr. A. J. B. Wace, Librarian of the School, read the next paper, on "A Historical Relief in the Palazzo Sacchetti." This relief, which has not received the attention it deserves, dates by its style from the time of *Septimius Severus*. On the right is the *suggestus*, on which sits the Emperor—headless—surrounded by four standing figures. Before him are eleven senators, one of whom is beardless. The background is formed by a Corinthian portico, and on the extreme left a triumphal archway. It is uncertain what buildings are here represented. Nor is it known where the relief was found, or what building it decorated; it must, however, have been at a considerable height, since the upper parts of the figures are rather roughly washed. Of the figures round the Emperor, one, whose head is still preserved, is almost certainly *Caracalla*, since it has great likeness to his busts. The relief probably shows the Emperor presenting his son to the Senate in 197 after the defeat of *Clodius Albinus*, when he proclaimed him *Imperator destinatus*. Two other points are noticeable about the relief. It shows that in the reign of *Severus* the group style, and not only the birdseye perspective style, was used. Also the front of the *suggestus* has three small knobs. These either point to a platform of wood, or to a more solid construction retaining some of the peculiarities of woodwork. Similar knobs occur also in some of the Aurelian panels in the arch of *Constantine* representing incidents at the front and in Rome. They are also visible on a relief in the Villa Albani commemorating the foundation of the *pulla Faustianæ*. But they do not occur in the *Trajanic* plaques in the Forum on the base, which *Comm. Boni* believes shows the tribunal he has recently excavated. Therefore the base is probably a statue base, and not a *suggestus*.

A third paper was also read by Mr. Wace on "Greek Patterns in Italian Embroidery, Drawn-Thread, and Tambour Work." The usual patterns in Greek work is a frieze consisting of trees of life, sirens, cocks, and double-headed eagles. Of these elements, all or only some may occur. They will degenerate gradually and become conventional. The tree of life becomes a vase with flowers. The siren appears as a castle, with birds perched on the towers. The cock turns into a deer, a lion, a horse with or without a rider. The double-headed eagle—under the influence of the tree of life—becomes a vase with flowers, with birds perched on them, and also a mannikin. As the patterns degenerate they lose their Greek geometrical style, and become natural, free, and Italian. In their degeneration the usual result appears to be that what is an animal produces animals. A *primæ facie* case has been made out that these patterns are Greek in origin; but further information and research is badly needed to help to solve this interesting problem.

There were present at the meeting, which was very well attended by foreign scholars and British residents, Sir E. H. Egerton, British Ambassador; Baron de Bildt, Swedish Minister; and Professors Körte and Hulsén, of the German Institute.

COMBINED DRAINS.—The Islington Borough Council are to ask the President of the Local Government Board to introduce a Bill to provide that the cost of repairing or reconstructing combined drains in the Metropolis shall be borne by the owners of property using such means of drainage.

GREENWICH BRANCH LIBRARY COMPETITION.

THE competition for the new Branch Library for West Greenwich, promoted by the Greenwich Public Libraries Committee, resulted in the sending in of 172 sets of designs.

Mr. A. W. S. Cross was the assessor, and in his report he states that after carefully weighing the merits and demerits of each design with regard (a) to its plan, (b) to its architecture, and (c) to its probable cost of construction, he picked out the designs numbered 11, 14, 17, 19, 22, 26, 43, 45, 55, 95, 103, 106, 112, 138, 140, and 147 as being those from which the final selection must be made.

It was suggested in the conditions that the lending library should be placed between the reading-room and the reference library, entailing the arrangement of the staff and work-rooms in juxtaposition with the lending library. As the site was a very narrow one, with practically no right of lighting on either of its long sides, but only at the back and front, this arrangement of the principal rooms inevitably made the suitability of all the plans submitted turn upon the question of how best to make these staff-rooms conveniently accessible without spoiling any of the principal rooms.

The set numbered 140, by Messrs Wills & Anderson, which receives the first premium, is clearly the best all-round design sent in. The plan is simple and most compact, and offers in one important respect from nearly all the others in that there is no corridor divided off from the reading-room and leading to the lending and reference libraries. The access to these rooms is directly through the reading-room, along one side—an arrangement which is quite justified under the circumstances.

The committee-room is placed on the first floor over the front portion of the site and has separate entrance and staircase direct from the street.

The three principal rooms are to be covered with concrete flats, asphalted, with large central domes for lighting purposes. These domes each stand upon four columns, which are worked in so as not to interfere with the tables and other fittings. The internal effect of this treatment will no doubt be quite satisfactory. The elevation to London street shows a quiet and pleasing Georgian design, to be executed in Portland stone and brick, with Westmorland slates on the roof; there are two low wings and a pedimented central portion. The transoms to the two doors are rather clumsy, and will no doubt be modified in execution.

The estimated cost of this design is reckoned at the rate of 9d. per foot cube. The second premiated design, No. 14, is the work of Mr. Henry Goldsmith, of Manchester.

The plan is one of the best submitted, well-arranged, and economical. A corridor is provided to give access to the lending and reference libraries without passing through the reading-room, thus losing the effect of spaciousness so apparent in the first premiated design. The entrance lobby is cramped, and the elevation is rather dull. No. 11, the third premiated design, by Mr. Henry A. Crouch, has a compact plan, and an attempt has been made to get some kind of architectural effect from the planning and arrangement of the entrance and corridor: the counter is not recessed, making the space for borrowers rather small.

The elevation is a little ambitious. The stone bay, with plasters carried up on two floors and a somewhat elaborate entrance feature, would prove expensive.

In none of these three designs is any special provision made in the reference library for book accommodation beyond wall shelving, nor are there any internal areas. Design No. 95 was specially mentioned by the assessor for the general excellence of the plan.

It is impossible to take more than the most cursory view of the unsuccessful designs, the bulk of which show a lamentable mediocrity, both in planning and elevation. No. 26 has a sensible, yet original, elevation; the plan is also better than the average, though there is a large and wasteful hall nearly the whole width of the front. No. 22 has a large area to light the lending library, and in some respects is a sensible

(though rather expensive plan. Similar in plan is No. 27, with an elevation which would probably look well, circular windows occurring on the first floor.

A quiet and interesting elevation is shown in design No. 51, but the plan has the reference room on the first floor—a fatal defect. A corridor, about 123 ft. long, is a feature of No. 68; the whole scheme, too, could not possibly be done for the money; this is a pity as the elevation is good. No. 84 is a very well-drawn set; so is No. 99, but its plan is much too cut up. The elevation is imposing—long panels with shields at their tops, swags, drops, and complicated architraves, all in the most correct "municipal" style. Other designs noticeable are Nos. 60 (one of the best elevations), 103, 106, 115, and 142. No. 155 has a borrower's space which is also a passage to the reading and reference rooms, and is only 6 ft. 6 in. wide!

The results of this competition are not very inspiring, as far as the designs as a whole are concerned, but the assessing has been done well. Though but a draughtsman's point, it is worthy of note that in all the 172 designs there is not one on which a really good style of printing has been employed.

THE VISIT OF THE LONDON COUNTY COUNCIL TO PARIS.

(FROM OUR PARIS CORRESPONDENT.)

The members of the London County Council arrived at the Gare du Nord on Monday, 5th inst., at a quarter to five. They were warmly received, the people plainly showing that they were happy once more to celebrate the "entente cordiale" between two nations, who though separated by the sea, are yet united in many interests and tastes.

That evening the eighty-eight members (who were lodged in the Grand Hotel) attended a banquet given by the Municipality in the Salle des Fêtes, in the Hôtel de Ville; after which there was a reception, when several of the principal singers and actors from the Paris theatres were heard.

The next morning a visit was paid to the Halles Centrales, which were decorated with English and French flags, and triumphal arches. The representatives of several branches of what may be called the "Alimentation de Paris," in their picturesque costumes, were grouped along the road through which the visitors' carriages passed, escorted by mounted guards. After they had gone through the large iron galleries, the work of the late M. Baltard, they arrived at the Bourse du Commerce, built by M. Blondel. The central Rotunda is ornamented with allegorical paintings by MM. Lucas Clairin, Luminais, Langée, and Mazerolle. From there a visit was paid to the Palais de Justice, the Sainte Chapelle, and the Mint, where some commemorative medals were then struck—after which a Déjeuner was held at the Palmarium in the Jardin d'Acclimatation. The afternoon was given up to visiting the Hôpital Boucicaud, Rue de la Conception, the Hôtel des Invalides, and attending a reception at the English Embassy.

In the evening there was a gala representation at the opera of "Samson and Dalila," and "Le Ballet du Cid."

On Wednesday morning the visitors, in spite of a thick fog, drove in motor-cars to Sèvres to see the manufactory, after which the drive was continued to Versailles, where they had déjeuner at the Hôtel des Réservoirs. They then saw the Palace, the park, and the two Triansons. On their return to Paris they were received by the President of the Republic at the Palais de l'Élysée, and then by M. Rouvier, the Minister of Foreign Affairs. A ball was given at the Hôtel de Ville in the evening, for which 1,500 invitations had been sent out.

On Thursday a visit was paid to the Ecole Professionnelle Jacquart, Rue Bouret, where girls are taught to make dresses, corsets, embroideries, lace, and artificial flowers. From there the visitors were taken to the cattle markets, and abattoirs of the La Villette. Déjeuner was partaken of at the Gare de Lyon, the artistic decoration of which the *Builder* has already mentioned; after which visits were paid to the Museum d'Histoire Naturelle, the Manufacture des Gobelins, the Asile Clinique Sainte Anne, the Panthéon,

and the Sorbonne. In the evening a large reception was held at the Ministère de l'Intérieur, Place Bureaux.

The last day's sightseeing began by a visit to the Gymnase Municipal Voltaire, where 1,000 school children, conducted by the principal instructor of singing, M. Chapuis, organist of St. Roch, sang with much spirit "God Save the King," and several other songs. The visitors then went on to the Ecole "Professionnelle d'Aménagement de l'habitation," Rue de Reuilly. In the afternoon visits were paid to the Ecole Supérieure de jeunes Filles Edgar Quinet, Rue des Martyrs; the Ecole Maternelle; the Collège Municipal d'habitation; the Ecole Primaire de la Rue Fontroy, also to the fire station in the Rue Carpeaux, where some fire drill was exhibited, and finally to the Ecole des Epinettes.

An evening at the Alhambra and a supper at the Grand Hotel ended the day, and on Saturday the members of the London municipality left Paris, accompanied by the same enthusiastic ovations as had followed them everywhere during their stay in Paris. All classes of the community have shown their sympathy with the visitors, and have a very pleasant memory of this past week.

MAGAZINES AND REVIEWS.

THE *Quarterly Review* contains an important article by Mr. H. Stuart Jones on "Art Under the Roman Empire," being ostensibly a review of various recent works, more especially Wickhoffs "Die Wiener Genesis" and Messrs. Richter and Cameron's "The Golden Age of Classic Christian Art." The article sums up our present knowledge of the art of the Empire period, which is very different, and leads to very different conclusions, from those generally entertained ten years ago. In the first century a.c., we are told, the Greek genius, which served the Roman connoisseur, though it had spent its creative force, had acquired a wonderful mastery of technique, especially in silver work; the silver plate found in the Bosco Reale Villa, near Pompeii, contains masterpieces of technical perfection and grace of form; and the author urges that there is no reason to suppose that we have here accidentally stumbled on an exceptional work. There are some fine illustrations of portrait sculpture of the Flavian period, remarkable for its power of realism. We have not space to follow out the argument of the article, which touches on many different subjects, but we may mention two points connected with architecture which are of interest. One of these is the change in the latter part of the Augustan age in regard to interior decoration of buildings, the flat treatment by slabs of marble giving way to a treatment by perspective illusion, the dominating idea of the decorator being "an indefinite extension of the horizon by an illusory system of perspectives." There is no worse form of art, to our thinking; but the reviewer does not seem to think it worth while to reprobate it. Certainly, it is not a convenient fact to bring forward in an article the main object of which is to show that Roman art was better than we had been accustomed to think it. A remark at the end of the article, in regard to Roman architecture, has something in it, "So long as Hellenism was dominant," it is observed, "architects had no feeling for internal spaces. The building was a mass to be regarded externally; and its claim to beauty rested on the harmony of its stereometric proportions. Roman builders were the first, as Riegl has acutely remarked, to treat space as a material, with what consummate effect the interior of the Pantheon would suffice to show." This is a true remark, and accentuates the distinction between the architectural spirit of Greece and Rome.

In the *Burlington Magazine* Mr. Claude Phillips writes on "Dramatic Portraiture," his aim being to draw attention to instances in which portraiture has gone beyond mere likeness-making and has achieved something like a record of the most dramatic element of the life and character of the sitter. The article is far too long for us to follow out in its argument here; but we agree entirely with it in its main lines, and recommend it to the attention of young portrait painters. Mr. Herbert Cook contributes an account of "Some Venetian Portraits in English

Possession," with illustrations; and "The Picture-Windows at New College" are the subject of an article by Mr. H. J. Powell. In a review of Mr. Holman Hunt's work we observe that there is an attempt to make out that his and Sir E. Poynter's denunciation of the ultra-Impressionists represent only the same kind of violent prejudice which was formerly directed against the early works of Hunt himself and of Millais, and that this kind of history repeats itself; and we do not think the cases are parallel; and, as we have already said, there was more reason in the objection to Millais' "Christ in the House of His Parents" to his rendering of the subject, than is—than is quite realised now.

The most interesting article in the *Art Journal* is that on "Art Handiwork" (a continuation), on account of the numerous illustrations of interesting work which accompany it. Among these some of the work representing "Russian Peasant Industries" (of which there was an exhibition in London lately) is unusual in style, and the specimens of lace-work are charming. The frontispiece is a fine etching of Cheapside and Bow Church, by Mr. W. Monk. "Portraits of the Henleys" hardly seems to us an important enough subject for treatment in an art magazine, and is probably only included because one of these portraits is a bust by Rodin.

The *Magazine of Fine Arts* opens with an article by Mr. Frederick Wedmore on "The Norwich School of Painting: Crome and Cotman," in which he at once admits the apparent incongruity of grouping these two names together. They are no doubt bracketed, in a sense, by the term "Norwich School," as they were both Norwich painters of about the same period; but here comes in the question, which we suggested the other day in regard to the so-called Liverpool School, whether painters are to be called a "School" of this or that place merely because they were natives of it. There is somewhat more excuse for it in the case of Norwich, for Stark and Vincent and Crome had some analogies, but Cotman stands out quite distinct from all the other Norwich set, in his freedom and breadth of style and his power of colour. Mr. Wedmore groups them as being the two chiefs of the Norwich set, standing above all the others, as they undoubtedly do; but the two do not belong to the same school; Crome, as Mr. Wedmore says, was a simple realist; Cotman was a poet in landscape. The illustrations of Cotman come out remarkably well in black and white; a coloured print from his "Bishopsgate Bridge" does not seem so successful, though one cannot judge very well without comparing it with the original. The number has a successful piece of chromolithography as a frontispiece; a reproduction of Van der Meer's "Lady at a Spinnet," the precise and clear-cut style of the Dutch painters of this period lends itself rather well to colour-printing. M. Arsène Alexandre contributes an article (translated probably) on "The Pantomime and Expression in the Paintings of Poussin," wishing to show—as he does to some extent—that there is more dramatic element in Poussin than is generally recognised. In England our judgment of Poussin is perhaps unconsciously influenced by the rather pointless classicism of his two pictures in the National Gallery; but he was capable of more human expression and character than are indicated in these performances. Mr. Walter Crane contributes an article on "Early Italian Gesso Work."

The *Architectural Record*, New York, has a long article by Mr. Montgomery Schuyler on "The New York House," that is, the street house, of which there are a number of illustrations showing "excellent differences." There is an amusing bit of history in the illustration called "Isolating the Brown Stone House"; there was a sad time when the brown stone house in New York was the be-all and the end-all of street architecture; here two new houses in a brighter and more attractive style are pushed out in front of it on each side (what about building line legislation?) to leave it out of notice as much as possible. There is a good deal of humour in the titles appended to the various elevations—"Late of Paris," "Late of London," "Going back to Grandma's," etc., etc. Mr. Russell Sturgis contributes an article on "Parisian Doorways of the

Eighteenth Century," which looks rather like a suggestion from our old friend M. Daly's monumental book on the subject.

The *Berliner-Architektur-Welt* contains illustrations of the "Königliche Oper" at Berlin, by Herr Biberfeld, the ground plan and arrangement being by MM. Lachmann and Zauber. The building contains a great deal of curious sculptured detail in a rather bizarre style; the principal centre feature over the entrance forms the subject of a special drawing as a frontispiece to the number. The trail of "Art Nouveau" is over it all, but it is not uninteresting. The Kohn warehouse at Berlin, by MM. Hoffmann and Kolo, of Vienna, is a very clever piece of treatment for a commercial building in which the object is to have as much window as possible.

In the *Nineteenth Century* Mrs. Arthur Strong, in a good and earnestly written article on the preservation of and acquisition by this country of great works of art, instead of letting them be sent abroad, proposes "An Official Registration of Private Art Collections," so that the public and the Government may know what are the treasures of art existing in this country (which is still immensely rich in them), and be on the watch to secure any which are likely to be offered for sale. It would also, we may observe, have the advantage of enabling those who wish to study any particular work to know where it is to be found, and would perhaps encourage some owners of private galleries to make better provision for allowing the inspection of works by students with a serious object in view. Many owners are already very liberal and obliging in this way, but there are others who are not. We do not think any objection would be raised by owners to the compiling of such an official list, which would be useful in many ways. We cannot agree, by the way, with Mrs. Strong's remark that it is a "strange prudery" to leave the "Leda," by or after Michelangelo relegated to the basement of the National Gallery. We confess that we had forgotten that it was there; but it is most certainly not a picture to exhibit in a public gallery, and there would be a not unjustifiable outcry if it were.

In the *Monthly Review* an article by Mr. Reginald Hughes, "A Pilgrimage to Canossa," though occupied rather with the historical than with the archaeological associations of the place, gives an interesting account, in very picturesque language, of a place little visited but full of memories. The *Pall Mall Magazine* contains a good short article by Mr. Kempfert on "The Life of a Star," and the possible (or probable) relation between spiral nebulae and the development of stars and planetary systems. As a short article putting the subject in a popular manner it is very well done.

To *Harper* Professor Henders Petrie contributes a short article on "The Egyptians in Sinai; an account of recent discoveries."

Public Works includes an article by Mr. C. E. Eldred on the Admiralty works at Devonport—"A Naval Dockyard in the Making"—and one by Mr. Arthur H. Diamant, assistant engineer to the Aqueduct Commissioners of New York, on "Pneumatic Pumping Plant at the Harlem River, New York."

The *Art-Worker's Quarterly* includes an article by Mr. G. W. Eve on the interesting subject of "The Lion in Heraldry."

The *Antiquary* contains an article on "The Egyptian Hall, Piccadilly, 1813-1873," a building with a curious and chequered history, which was quite worth recording and preserving in the pages of a magazine dedicated to the past. Dr. W. E. Ball continues his article on "Old Heraldic Glass in Brasted School."

School contains an article by Mr. Sydney F. Walker on "The Engineering of School Buildings," an introduction to a series of articles on this important subject, to which we shall give further attention as they appear; the opening article is only a general summary of the subject.

The *Purple Patch* has put in another appearance, and contains some very good things; notably the offers of some foreign correspondents to act as translators to the International Congress; a mediæval account of the jerry builder, with a delightful mock-mediæval head-piece; and a learned disquisition on the reasons for crooked buildings.

which have resulted from a shifting of the earth's centre of gravity, as shown in a learned diagram, and it is suggested that "Mustard Good o' ye" and the *Builder* are therefore both wrong. Very likely; 'tis a puzzling world!

THE ARCHITECTURAL ASSOCIATION.

An ordinary general meeting of the Architectural Association was held on Friday last week at No. 18, Tufton-street, Westminster, S.W., the President, Mr. E. Guy Dawber, in the chair.

The minutes and nominations having been read, the following gentlemen were elected members of the Association, i.e.:—Messrs. E. Dickens, D. W. Rowntree, H. R. Levy, P. M. Stratton, F. W. Edge, G. Robb, J. Dovaston, R. S. B. Wylde, G. S. H. Bradford, E. S. Petch, J. G. Alder, B. J. Boothroyd, C. P. Wade, G. Fitzgerald, F. E. Harris, and E. Petre.

Building Fund.

The Chairman said he had pleasure in announcing the following further donations to the Building Fund:—Messrs. Charles Morrison, 50*l.*; Ernest George & Yeates (second donation), 10*l.* 10*s.*; Leslie W. Green (second donation), 3*l.* 0*s.*; H. L. Anderson (second donation), 2*l.* 2*s.*; A. Durst (double subscription), 1*l.* 1*s.*; Maurice E. Webb (double subscription), 1*l.* 1*s.*; A. Crow (double subscription), 10*s.* 6*d.*; C. W. Ferrier (double subscription), 10*s.* 6*d.*; W. Curtis Green, 10*s.* 6*d.*; F. T. W. Millar, 10*s.* 6*d.*; John Murray (double subscription), 10*s.* 6*d.*

The Late Mr. Seddon.

The Chairman said he had to propose that a vote of condolence be sent from the members of the Association to Mrs. Seddon and the family of the late Mr. Seddon, who died last week. Mr. Seddon was one of the oldest and most valued members of the Architectural Association, having joined as far back as 1847. He was hon. secretary in 1850-51, and for many years he was hon. secretary of the Royal Architectural Museum, with Mr. Maurice B. Adams. Mr. Seddon always took a deep interest in the Association, and especially in the Royal Architectural Museum, and he attended the Jubilee Dinner of the Association in 1897. At the funeral they were represented by Mr. G. H. Fellowes-Pryne, a former President, and Mr. D. G. Driver, the secretary.

The motion was agreed to in silence. Mr. Tanner, jun., hon. secretary, announced that the third spring visit, to the Ritz Hotel, Piccadilly, by kind permission of the architects, Messrs. Mewes & Davis, would take place on Saturday, February 24. Members to meet at the building at 2 p.m.

He also announced the following lectures, commencing:—February 20, "Ventilation, Lighting, and Heating" (lecturer, Mr. F. J. O. Smith); February 21, "Perspective" (instructor, Mr. W. G. B. Lewis).

It was announced that the Camera and Cycling Club would meet on February 20, when the subject would be "A Chat on Renaissance Architecture," by Mr. J. A. Goth, 7.30 p.m.

The Differences between English and French Gothic Art.

The Rev. G. H. West, D.D., A.R.I.B.A., then read the following paper on "The Differences Between English and French Gothic Art":—

"The manifestations of art, like all other manifestations of creative energy, physical or mental, human or divine, seem subject to a periodic law, and show themselves in outbursts, separated by times of comparative calm or stagnation. And in the case of art these outbursts seem chiefly to arise either under the impulse of a strong single personality, or amongst a community so small and so uniform in the conditions and ideals of its existence as to almost possess an individual personality in its capacity for being moved by a single impulse or a strong emotion. Thus some of the greatest developments of art are to be found under despotic dynasties, like the Pharaohs, the Cæsars, the Arab Kings of Spain and India, or under a Solomon, an Attalus of Pergamum, a Louis XIV., or else in societies such as those of Athens, Rome, and Florence, which, having just passed through a great national crisis, have entrusted their destinies and the artistic

expression of their ideals to a single representative, a Pericles, an Augustus, or a Lorenzo de Medici.

There are, of course, infinite differences in the capacity of various races for expressing themselves in art, but, as a rule, when a mixed race is in process of being kneaded together, or when it is beginning to disintegrate, we shall find its art fragmentary or illogical and superficial, for in the one case the individuals have not as yet found any single expression of their common aspirations, and in the other, the stream is either spreading abroad into the marshes of decay or has been drained off into countless channels to irrigate each man's separate plot and produce there whatever harvest seems best to him.

Nowhere is the working of these laws more clearly seen than in the history of mediæval art, its origins, progress, and decay, from its rise in the Royal Domain of France in the XIth century, when the people, having been welded together by their resistance to the Normans, found in the communes the expression of their newly-attained national life, or in England when Norman and Saxon had just become one under the firm rule of Henry II.; and later in the rise of the peculiarly English Perpendicular style after the great war with France—a proof of national vigour which finds no echo in the distracted misery of her vanquished foe. Again, no art so clearly as French Gothic shows artistic genius running to waste during the splitting up of the great guilds into the runnels of the separate branches of architectural art, when each worker, instead of joyfully co-operating in the beauty of the whole, became anxious only to show his own individual skill in the technical perfection of his own work—his stone cutting, his lead work, or his storied glass.

Of the four great divisions of architecture—religious, military, civil, and domestic—each during the Middle Ages comes to perfection in succession, each represents a separate period and state of society, and each generally possesses a distinctive style. But of these four, time will not suffice to speak of more than religious architecture, the one which, having its roots planted furthest back in the past, is the first to attain anything like maturity.

When the Roman empire began to fall into decay a special officer had to be appointed to protect the poorer classes against the intolerable exactions of the bankrupt municipalities impoverished by reckless expenditure on unprofitable public works, a state of things not altogether unknown in later times and countries nearer us. When the empire became Christian, the Bishop was generally selected as this "Defensor Populi," and gradually, as the last links with the Imperial Government were broken, he succeeded to the position and palace of the Prætor, whose judgment-hall or basilica became his cathedral. In all cities, therefore, of Roman origin—and they were the great majority in France—the cathedral was not merely a place of worship, but the immemorial abode and symbol of justice and liberty for the poor and oppressed.

And in the north, where the Kings of France had already formed the kernel of the nation by driving back the Normans, when in the early XIIth century the rise of the Communes bound the people finally into one, their joy and enthusiasm found visible expression in rebuilding their ancient basilica. The King was delighted to use this new vigour of popular life against his too powerful vassals, while the Bishop seized the opportunity to win back to himself and his cathedral the religious fervour of the people, which during the two preceding centuries had been somewhat turned away towards the great outlying Benedictine monasteries by their peaceful energy and active goodness. Thus at Amiens in 1115 we find the Bishop preaching a crusade against the Sire de Coucy, the King bringing an army of his own men, and the citizens turning out *en masse*, even with their wives, eighty of whom were wounded in an assault on de Coucy's stronghold of Castillon. And by the end of the century we find in every city of the royal domain, which was also a free Comté, the rise of a Bishop's seat, a new cathedral being built by the various guilds of lay workmen, and rising amidst the wildest enthusiasm; men, women, and

children harnessing themselves to the carts to bring materials for those wonderful shrines—Noyon, Soissons, Laon, Chartres, Paris, Rheims, and Amiens.

The French cathedral, then, like the Parthenon, is the material expression of a new-born national life. It proclaims the reliance of the people on their King as the dispenser of justice to all, their trust in their Bishop as the administrator of the sacraments of God, their confidence in themselves as the inheritors of the past; and, rising from the very midst of the crowded dwellings, and appealing with countless raised fingers from earth to heaven, it proclaims itself the palladium of the city's loyalty, of her faith, her love of liberty.

The plans also of these buildings, while deriving from that of the basilica, show that they are not meant only for the common worship; but they are also great assembly-halls, open to all from end to end, with generally a comparatively small choir, and no solid screen between clergy and people.

Now in England our cathedrals tell a very different tale. From quite early Saxon times the great Benedictine monasteries of the Continent had founded missionary daughter-houses in our land, and even when after the conquest great churches and cathedrals sprang up in every direction they were all monasteries or in the hands of monks, generally Benedictines, so that, as a rule, the Bishop was abbot of the monastery whose church became his cathedral. Our cathedrals, therefore, generally stand apart from the cities to which they belong, nestled amidst the elms of their quiet close side by side with the chapter-house, where the monks transacted their business during life, and with the peaceful cloister where they slept at last, two buildings hardly ever found now in connexion with a French cathedral; for though so-called cloisters did exist in some cases in France, yet they were the dwellings of the secular clergy of the church, and very early became a tangled mass of tortuous streets surrounded by a wall, not a cloister in the usual sense, and if any of them had still existed—there are remains of something of the sort at Rouen—they would only have marked still more the contrast between the people's cathedrals of the French and ours, which were missionary churches, houses of prayer, telling no story of past popular struggle, no tale of bloodshed, save at Canterbury. Such contrasted views as those of Chartres and Lichfield, Wells and Rouen, sum up completely the stories of the two national churches, and anyone who can remember Rouen as it used to be, with the old houses built against its walls, will be able to realise how completely the French cathedral is the centre of the life of the city. There can indeed be no more telling contrast than the view of Rouen, with the fortified palace of the archbishop adjoining the cathedral, in the very centre of the town, and that of Exeter from the quiet Bishop's garden, with the large windowed Elizabethan house. Perhaps the only thing like it in France is St. Owen, which was a monastery, not a cathedral.

The same story is told by the plans as by the views, perhaps even more clearly. Instead of the great assembly-hall of the French cathedral we find in early Norman times the purely basilican plan, single or triple apsed, very slightly modified.

But when the churches become cathedrals also, and cease to be merely abbey, they have to serve a double purpose—the Norman apse gives way to an enormously extended choir, which, with the eastern transept and chapels, formed the church of the monks, with a special approach from the cloister; while the western transept, with its chapels and the inner nave, were the cathedral and parish church, cut off from the monks' church by a heavy stone screen, almost an iconostasis, which carried the roof, as at Gloucester and York. This monkish plan is well shown at Lincoln, which when first built by the Benedictine St. Hugh was an almost exact copy of that of the great mother church of Cluny, while later the apse was removed and the eastern portions added.

We shall also find that, whereas the great lay guilds built the French cathedrals and handed down as craft secrets their learning and traditions, so that the constructional development of French Gothic is the result of the severest logical reasoning from first

o last, the English cathedrals were frequently built under the direction of the monks, if not actually with their own hands, as at Gloucester, and there is consequently a comparative absence of scientific tradition, much less coherence in purpose and expression, but more individuality and local originality, and while French traditions grow stronger and more binding as the art falls more and more into the hands of a small professional class, and becomes less and less the expression of popular feeling, till it dies stifled by the swathing bands of invariable formulae, English architecture, less popular at first, but freer in its efforts and expression, comes always more and more into touch with the national sentiment, and finally develops an entirely new form, which never really died, but, adapting itself to the social evolution of the nation, gradually ceased to be chiefly ecclesiastical, and, deserting the cathedral and the monastery for the village church and the crenellated manor, at last, under the Tudors, gave rise to the domestic architecture of that sturdy middle class which has always been the backbone of the English nation; so that while France was rearing Renaissance châteaux for her wealthy nobles, the English squire and his tenants, still side by side as at Crecy, were going on building their country houses and farms on the old lines, adding a new aisle to the parish church, raising a grammar school in the village street, or providing a new college at Oxford or Cambridge to receive its boys.

Thus much as to the influence of the history of the two nations on their art. Let us now turn to its constructional development in each case, beginning with France.

From the time when Christian art began to revive after the fall of the Roman empire the efforts of all builders in the ancient imperial provinces of Western Europe had been centred in the attempt to do with small materials and a limited supply of unskilled labour what the Romans themselves had never even attempted with building resources such as the world has never seen before or since—to cover the three-aisled basilica, which by long use had become the recognised form for the Christian church, with the stone or concrete vault of the great halls of the Roman baths. The intersecting vault could be managed over the small square compartments of the aisles, but was quite beyond the power of these early builders for the high vault of the nave, while the continuous thrust of a barrel-vault, unless the three aisles were kept of equal height as at Champdeniers, brought all to ruin before long.

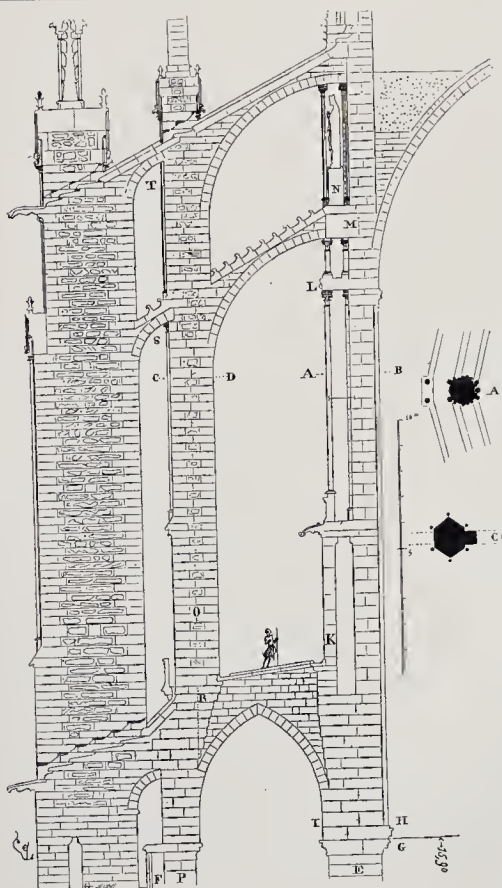
By the beginning of the XIIIth century it had become obvious that if the problem was to be solved some means must be found for concentrating the thrust upon certain points, preferably upon the corners of a square, either, as at Perigueux, by a series of domes on pendentives, or, as at Vezelay, by the regular Roman intersecting vault. This was the form which ultimately prevailed, for it was a fairly obvious step to work from centrings placed under the angles of the intersecting cylinders, and to get over the difficulty, insurmountable to these early builders, of getting the proper ellipse given by the intersection of two semicircular vaults in one of three ways—either by making the intersecting centrings semicircular and then building a dome round them, as in Aquitaine; or by piling earth on the top till the vaults themselves also became nearly semicircular, though still domical, as at Vezelay; or, as at Durham, by making the centrings segmental. It was at Durham, in England, and a little later at St. Denis, in France, that the great step was made which gave birth to Gothic of making these centrings of stone and leaving them as a permanent support to the vaulting panels, and letting each panel be separately supported by the centrings or ribs. But undoubtedly this intuition was in the air when Flambard and Suger used it, just as printing was when Gutenberg began to work, the steam engine when Watt and Stephenson took up the ideas of Newcomen and Trevithick, as the electric light and the telephone were in our own day. In it lies the key to the history of all later medieval architecture. After St. Denis all French churches exist by and for the vault, the plan of which is in the mind of the builder from the moment when the first stone is laid. It took some time for it to be found out how

great the thrust is even of this form of vault, but that abutments are needed only at the springers. This abutment was given at first in the simplest way, as at Durham, by a complete arch over the triforium carrying its roof, and later by a quarter arch butting against the springing, as at Gloucester and the Abbaye aux Hommes at Caen. But it was soon found that these arches should abut higher, and when the triforium became a mere passage they were left outside the roofs and became continually more complex, passing from the simple forms of Chartres to the extremely elaborate and beautiful ones of Amiens and St. Owen. The principle once admitted of allowing all the constructional parts of a building to be exposed to the weather, nothing can be more perfectly thought-out than the French cathedral, where the walls have formed "fours deep" and the thrust of the great vault is carried down to the main buttress by an arch. All the intermediate spaces are mere screens of storied glass, and nothing can be more perfect in its beauty. But, as always in human work, only for a moment did these stern reasoners and perfect artists rest on the summit, and Beauvais is a literal example of that "vaulting ambition which o'erleaps itself." The chiefly passive rôle of the buttresses of Amiens in transmitting the vault thrust must needs be exchanged for an active one, which shall enable the main buttresses to be smaller and the whole building lighter, though even higher, than Amiens. Let us examine this supreme but splendid folly of Beauvais. In the section,* E are the piers; on G, their capitals, stand the vaulting shafts; K is the buttress of the

triforium, corbelled out somewhat towards the aisle, but leaving the aisle vault quite free; A are two colonnettes, replacing the single one of Amiens, carrying a lintel L, on which are two more short colonnettes, increasing the size and weight of the *tas de charge* or horizontally-coursed springer of the vault, and carrying the head of the flying buttress, which butts against a huge stone, M, heavily weighted by a cornice, pedestal, and enormous statue, in front of which are two more columns carrying the great pinnacle above the upper buttress, which charges its head. The more settlement there is towards the interior, where the chief settlement always takes place, the more will these long, stiff columns push up the heads of the lintels L and M and resist the thrust of the vault, provided the columns are strong enough not to break under the strain. To add to this passive counter thrust the architect of Beauvais boldly—too boldly—added an active resistance. The intermediate buttress pier O carried by the aisle pier P is corbelled out half its thickness towards the interior, so that, if it were not for the two flying buttresses above, it would fall against the cathedral wall, and it is finally stiffened by the two small buttresses S and T joining it to the main buttress pier. But the colonnettes cracked, the lintel L gave, and the blocks M pressing against the flying buttress made it buckle, and nearly the whole had to be rebuilt differently.

Such is the extreme expression of French XIIIth century Gothic, but while the vault thus dictated the exterior forms of the building, it affected the interior hardly less. The monocylindrical columns, with great voluted capitals derived from Classic times, were soon felt to be unsuitable, as so much of

* F. Viollet-le-Duc. Dict. Art. Construction.



The Buttresses of Beauvais. From Viollet-le-Duc.

their upper surface was left unused and the arrangement illogical. So in the later columns of Notre-Dame the pier arches have their own column, with a capital of one course, and the main vaulting shaft is the continuation of another column rising from the ground, and having its capital at the vault, and the original main column, with a capital of two courses, appears behind these. We thus have the principle of continuity distinctly formulated—that every arch must have its own column, that every column must have its base on the ground and its capital at the springing of its arch. Soon it was felt that every colonnette should have members corresponding to the mouldings of its arch, and so by a gradual transition, which may be well traced at N. D. de l'Épine and St. Ouen, it came to be felt that the capitals had lost their meaning, and that all mouldings of all arches should run down to a common base without a break, sometimes dying into one another on the way, as at St. Maclou, but reappearing below, even if their reappearance was marked only by the corners of their imaginary bases supposed to exist inside that of the main pier, but to have been turned round so that their corners project from the faces. Though often ugly and wearisome in its latest examples, the better specimens of this last French style are many of them singularly beautiful, as is St. Wulfram, at Abbeville, and the smaller details of these churches are often exquisite, like the organ staircase of St. Maclou and its wonderful porch.

To turn now to English architecture. We have already seen how different its history is from that of the French, and its aim and final results are not less different. The two follow divergent paths except during a portion of the XIIth century, when French influence here was considerable, though not easy to define. First of all is to be noticed in the plan the tendency to bold, square projections and the square east end, both of which may safely be attributed to the persistence of Saxon traditions. We have several stone Saxon churches left, but the great majority were undoubtedly of wood, and in a wooden building, especially if large timber was used, as was sure to be the case in a land so covered with primeval forest as England then was, the projections would naturally be much bolder than in a stone one. Such a church as Borgunds, though itself of late date, doubtless represents older buildings, which, to judge from the Bayeux tapestry, must have been very similar in England. For a time this Saxon tradition was obscured by the Lombardic or Basilican plan, with three parallel apses or one single one, used by the Normans in Italy, and possibly derived by them from the remains of the Roman building guilds, such as that at Como. English tradition, however, soon reasserted itself, and was finally fixed by the great influx of Cistercians in the XIIth century, whose churches invariably had square east ends. One other peculiarity of the English plan, the great length of the nave, is probably due to the narthex of Cluny, the influence of whose plan we noted at Lincoln, being taken into the church. We have only one instance—Ely—of its persisting in its original form, the Galilee of Durham being hardly a case in point.

It may be well to notice here some other points in which the Saxon love for wooden construction persists, such as the cushion capital, which probably had its origin in squaring off the four sides of a tree-trunk where it is mortised into another timber; and the extreme fondness for arcaded and panelled decoration, much more natural in wood than in stone. There is also this to remember. When the Normans came to England they had already learned to build in stone probably from their Italian masters, but their predecessors, the Scandinavian invaders of the eastern counties, were, like the ancient Greeks, essentially a ship-building race, accustomed to the use of large timbers and of plankings on curved surfaces. In the eastern counties, therefore, we find in several cases, as at York and Ely, stone vaulting imitated in wood, and very elaborate open timber roofs made of large timbers, an original development to which there is nothing corresponding in France. They are almost confined to the eastern counties. Of the thirty-five examples in Brandon, only

one belongs to Gloucestershire and four to the Midlands. While in the French roof the tie-beam is a mere light tie often suspended from the main trusses by braces, as at St. Ouen, these shipbuilders use a heavy tie-beam carrying the king post, and when it sagged took to bringing forward the sole piece into the church and connecting it by long, curved struts like ship ribs with the rest of the roof, and so developed the hammer beam roof.

But with the Norman conquest a most energetic impulse was given to stone construction. The Normans had by that time become far the greatest builders in Europe, and English mediæval art never even attempted to escape from the influence of the great churches which were founded or rebuilt at the Conquest. The English cathedral is always the Norman abbey church modified or imitated. The three nearly equal, sharply marked horizontal divisions of the Norman design, with little or no expression of vertical continuity, persist almost to the end; the vaulting shafts seldom run down to the ground, but end sometimes on the abacus as at Lincoln, or just above it as at Exeter and Ely, halfway up, as at Salisbury; at the clearstory, as at Wells; the clustered columns are arranged and designed not in various groups and sizes, as at Bayeux or Coutances, so as to mark distinctly their various purposes, the arches, mouldings, or ribs which they represent or carry, but so as to bring in the greatest number of detached or semi-detached shafts, some of which may even have nothing to carry, as at Durham and Lincoln, and, since these were whenever possible made of Purbeck marble, which could only be got in short lengths, circular bands had to be introduced, and the abacus also became circular and uniform. That the pier should indicate and lead the eye up to the vault was the French ideal; that it should be beautiful in itself, the English one—so much so that, as in the very beautiful example of Exeter, the arch mouldings are even adapted to the pier, instead of the pier to the arch. The arch mouldings themselves soon become less grouped, smaller, and much more deeply cut than in France, more like mouldings in wood, more in keeping by their strong contrasts with the black and white of the columns, well suited to our grey climate, and at their best, as at Lincoln and Durham, exquisitely beautiful. But as the use of marble in the piers ceases the mouldings become shallower and more arrangements in grey, frequently worked on the chanfer, in striking contrast to those of late French work, which become deeper cut and more wire-drawn in order more clearly to distinguish the different ribs as they run down, and make the verticality even more marked. On the other hand, the English mark the horizontal division even more by the introduction of the hood-mould over the pier arches, an outside feature by rights, a sort of bolection moulding in stone marking off the arch with a sharp dark line. Again in contrast with the French, the wall, which disappears with them, till the incessant vertical lines give a sense of irritating restlessness to their later styles, is in English work everywhere visible, and its restful suggestion of strength and quiet repose most grateful, while the long drawn-out perspectives of aisles and arcades give the special character to the whole which in France is found in the soaring elevation of each separate vaulting bay.

But the real glory of our English art is to be found in its latest form, due to the way in which the English mason when left to himself, and deprived during the Hundred Years' War of all French influence and help, reasserted his own originality and worked out a completely new system of vaulting, which gives to our Perpendicular a stately life and vigour almost lacking in late French Flamboyant. The early French vaults were so largely influenced by the domical vaults of South-west France, such as that of Poitiers, that the builders hardly got rid of the idea that each vaulting bay ought to be a separate entity, by preference a square, as in hexapartite vaulting, and at least domical, if not a dome.

This feeling never influenced the Normans, but from the very first, as at Durham, they tried to keep the ridge level, using segmental ribs and stilted wall arches. But these level-crowned vaults are weaker as a whole than

the domical ones, and each panel in itself is weaker in construction, because in the French vault the half wall arch or half transverse arch, as the case may be, is divided into the same number of parts as the half diagonal rib, which, of course, is the longer, and each row of stones is laid as an arch from one to the other on a movable sliding centring or "cerce," and as each course becomes of necessity broader towards the diagonal than whole panel rises with a twisted or plough-share curved surface, as at Amiens, to straight-arched joint joining the top of the wall arch or transverse arch to the intersection of the diagonals. But if the mason is unskilful and does not distribute the difference in length between the ribs evenly over his courses he gets some of them wedge-shaped and ends with a joggle instead of a straight joint along the crown. This may be well seen in several bays of Westminster cloisters. To the Englishman, accustomed to curved planking on his ships, it seemed much simpler to treat the courses like planks of the same width all along, and dividing, therefore, the half diagonal and half arch into an unequal number of equal parts, instead of, like the Frenchman, into an equal number of unequal ones, he got, not a straight joint, but a dovetail along the ridge, and his vaulting panel ceased to be curved and self-supporting and became flat and weak. So an interstitial rib, or lierne, was inserted to strengthen this, and then other ribs were passing through the stage of Lincoln, we reach such a beautiful form as Exeter. But a difficulty arose with these liernes. They varied greatly in length, according to their position, and were all much shorter than the diagonals. Either, therefore, the ridge could not be kept level, or the curves of the shorter ribs must be "fudged," as at Minster. Where the curve of the lierne changed a short cross rib, or tierceron, was put, and a star or lozenge pattern obtained with the ribs, as in Worcester cloister and at Christchurch. Then bosses were put where the ribs intersected, as at Lincoln and Canterbury, and all sorts of fanciful arrangements of the ribs indulged in, till the practical result was a ribbed wagon vault with intersections, as in Winchester nave and Gloucester choir, while from the number of ribs of similar curve springing from one capital and meeting a flat ceiling arose the fan vaulting of the cloister, where the curves are simple. Then from changing the curves to make them meet a level ridge where there was no flat ceiling arose the four-centred arch, the form usually adopted in fan vaulting, and which naturally, as the pointed arch had done previously, descended through the wall arch and window heads into all the rest of the building. Having thus got the idea of this cone of spreading ribs, it was ingenious to bring it out from the wall and spring it from a pendant as centre, as at Christchurch and Oxford Cathedral, or even to bring it out so far as to quite complete the cone and let it meet another half cone springing from the wall, as in the Divinity School, Oxford, and that final masterpiece of Henry VII.'s Chapel, so easy to criticise, so impossible not to admire. The important point to notice is that in these latest vaults the true function of the multiplied ribs has entirely disappeared, and they and the intermediate parts are all cut out of large blocks of stone, and we have returned to the Roman wagon vault, with its continuous thrust, a strange result to follow from a slight alteration of the arrangement of the stones in the vaulting panels, and yet inevitable from rigidly following artistic reasoning. It is rendered all the more striking by the fact that the French, who strictly adhered to their original system, never arrived at these rich vaults. Here and there, as at Caudebec, we find a pendant taking the place of a central column, but it is a *tour de force*, and in late French vaults, as at Abbeville, pendant bosses are quite common and lierne vaults, as at St. Riquier, not uncommon; but when we meet with anything like elaboration, as at Rue, it is a piece of fanciful decoration, not a natural artistic development.

Time will not allow of our following out fully the development of window tracery in the two countries. France got ahead of us in the earlier stages, owing chiefly to our

* T. V. de D. "Construction"; also Willis, R.I.B.A.

adherence to the long, narrow lancet, a singularly beautiful form, especially in the triplet and in larger groups, as at Salisbury and York. Its origin is a little puzzling. I believe it was simply the translation into a pointed form of the triple arch of the Norman clearstory, with the centre opening higher than the others. Our specially English perpendicular seems too have sprung from reticulated tracery, itself a development and modification of our flowing decorated, our English, but much more beautiful, version of the French Flamboyant. St. Mary, Redcliff, a very striking example of our later style, shows us a reticulated and a perpendicular window almost precisely similar at the east end. It is worth while to compare this interior with that of Abbeville. On the whole I think the English example is the finer, beautiful though the other is. Although the English example is a good deal the earlier, yet they may be taken as the last word of the art of the two countries before absolute decay began. We have no church of the first rank as late as Abbeville, perhaps St. Michael's, Coventry, comes nearest.

Let us now glance back at the results of our study. In spite of some resemblance, there can hardly be a greater contrast than that between the French and English cathedral. In the exterior of the former, which is generally obviously the result of one great effort, the walls are standing in slices at right angles to the building which they support but do not enclose, towering high above it, and seeming to push and thrust with all their power to keep up its enormous height. It is very wonderful and very beautiful, but leaves a sense of constant effort to overcome difficulties, after all only partially vanquished. What a difference is there in the peace of the long, low English cathedral, with its insignificant buttresses and unambitious lines, with no traceried canopies or wealth of sculpture, and except for the upward pointing of its central spire, seeming content to remain on earth, and telling in its unequal parts and varied styles not of a mighty impulse which faltered all too soon, of a lofty enthusiasm which died down to mere mechanical dexterity, but of successive generations of commonplace yet earnest men, each bringing its little stone and saying,

"Add this to the rest."

Take it and try its worth: here dies another day."

And in the interior also the story is the same. In the English church we trace the stolid acceptance of existing facts, which preserves all that has gone before, however imperfect, and, adding here and changing there, makes up a building, humble-minded, as it were, with a wooden roof perhaps, content to suffice for the needs of the present, telling in every corner of the makeshifts of the past, with no sign of anxious, unrealised ambition for the future, incapable of perfection, because begun and ended incessantly, and always without continuous design, yet breathing out an indescribable charm of sympathy almost human in its loving reverence for the results of all past human effort. But in the other the soaring lines which guide the eye upward ever to the vault of stone poised miraculously on its walls of painted glass seem to tell of master minds of long ago, of those

"Few whom God whispers in the ear,

For whom earth had attached to Heaven, there was no more far nor near."

who, greatly daring in their implacable logic, swept ruthlessly away all that had gone before, had planned to raise a structure complete and harmonious all through, the absolute expression of one overmastering ideal of future perfection, bound to remain incomplete at the last from the weakness of all human aims and means, for they had aimed at

"The high that proved too high, the heroic for earth too hard."

Yet therein lies its undying power. While our cathedrals tell of the strong consciousness of the historical continuity of the nation which has made of the English a governing and imperial race, the mediæval architecture of France is the expression of that logical and artistic nature which has made the French through all European history the originators of the noblest social ideals, the exponents of their highest expression in art. And here it is that the French art towers far above the English. It is far

more the expression of the nation's soul. So far as building only makes use of its materials dexterously, appropriately, beautifully even, with limbs and fingers only, it falls short of the highest; so far as it lays open the soul of the man or of the race, it reaches it. The expression of closely-reasoned design in admirable construction and suitability to its purpose is perfect in such a building as Notre-Dame, or Amiens, or Rheims. No more marvellous temples for the worship of God can be imagined. Yet it is not in that that their chief glory resides, but in that artistic sense which made of the French cathedral a perfect combination of all the arts, more complete than even the Greek temple, because not only are its parts inseparable and even more perfectly coordinated, but because it is the expression of a fuller ideal as belonging to a later, more complex civilisation, the work of a race as highly struck as the Greek. This artistic expression is found most in that part of the cathedral which was the least fully worked out—the great west front. There is not one which is not open to the severest criticism as to proportion, adaptation to its purpose, disposition of lines and parts. Yet there we find the full expression of that indefinable quality, the artistic sense which all the Latin and Greek races possess, but which is lacking more or less, so far as regards the material arts, in almost every race of Teutonic origin. Just compare Notre-Dame with Wells, Amiens with Salisbury, Chartres with Peterborough, York with Abbeville. The sculpture of Wells is a work of a genius, full of life and expression and high qualities of execution, but what a poor and monotonous design, with moss-holes for doors and tall columns like scaffold-poles all up the front. Then take Notre-Dame. Its horizontal lines are too strong, and it is too much cut into squares, but what restfulness in the wall spaces, how beautifully the statues on the piers carry on the line of sculpture, what noble proportion and sense of scale! Why, the Arc de l'Étoile is exactly the same size, and looks about half, and, above all, what wealth of marvellous imagery! Then put Amiens and Rheims by the side of Salisbury, with its meaningless jumble of petty disconnected parts, or of Lincoln, with its senseless screen, or Lichfield, with its shopful of squat statues on brackets. Amiens had its towers cut in half for want of funds; Rheims was set back for the same reason. Both lack the repose of Notre-Dame, yet, with all their defects, which are many, especially the bringing forward of the door jambs at Rheims in front of the buttresses, how wonderful they are! And remember each of these fronts has a complete system of iconography, which I cannot explain to-night. The main point to note is that all French sculpture from the very earliest period shows the artistic genius of the race. Take the statues from the west front of Chartres, which date from about 1140. Their excessive elongation, which strikes us as archaic, is not entirely so, but due to a naive, artistic feeling that, placed as they are amongst columns, their lines ought to harmonise. Then if we look at the faces, they are studied from nature, and are of a thoroughly frankish type, but idealised. Indeed, they are much more individual than those of the end of the XIIIth century, when there is a tendency to adopt a definite generalised ideal. When we come to XIIIth century work, such as that of Notre-Dame, note the calm and breadth of the work, especially of the angels and the double row of heads and the wonderful figures from Rheims, all as fine as any Greek art, far more a part of the building to which they belong, and full of what Greek art in its search for perfect physical form generally lacks—the sense of living humanity and of humanity conscious of its power to rise above itself.

Then with the wild confusion, the rush and whirl of the other side. Note especially the Horsemen of the Apocalypse, Fame, and, most of all, Death. I know nothing to equal it. He who rides on the pale horse is shown here as a woman with blindfolded eyes. She has leaped in front of a man, exultant in his strength, and stabbed him with a huge knife so that his bowels are pouring out, and he has fallen backwards over the horse dead and limp, while she, clinging tightly to the

creature's neck, is making him rush on with outstretched head in an agony of terror. The whole is the most awful drama of human life and death. I might go on to compare the grand triple porch of Peterborough—and it is very impressive—with the great porches of Chartres, and we should find the same difference in artistic quality. But, leaving this work of the best period, let us take some of the latest, and even there we shall find the same. Even now, worn down as it is, there are few more exquisite things than the great porch of St. Maclon, and its tympanum of the Last Judgment is almost as fine as that of Notre-Dame. Hear what Ruskin says of it:—"The sculpture of the inferno side is carried out with a degree of power whose fearful grotesqueness I can only describe as a mingling of the minds of Orcagna and Hogarth. The demons are perhaps even more awful than Orcagna's, and in some of the expressions of debased humanity in its utmost despair the English painter is at least equalled. Not less wild is the imagination which gives fury and fear, even to the placing of the figures. An evil angel poised on the wing drives the condemned troops from before the judgment seat; with his left hand he drags behind him a cloud, which he is spreading like a winding sheet over them all; but they are urged by him so furiously that they are driven not merely to the extreme limit of that scene which the sculptor confined elsewhere within the tympanum, but out of the tympanum and into the niches of the arch; while the flames that follow them, bent by the blast, as it seems, of the angel's wings, rush into the niches also and burst up through their tracery, the three lowermost niches being represented as all on fire, while, instead of their usual vaulted and ribbed ceiling, there is a denon in the roof of each, with his wings folded over it, griming down out of the black shadow." Then put Abbeville by the side of York. The latter in its cold precision of rule and triangle and perpetual perpendicular panelling is only not dead because it has never really lived, not dumb because it never was taught to speak; while the other, though that saddest of all earthly things, an unfinished ruin, yet speaks all over with a thousand tongues. Though one of the latest buildings in France, a mass of prisms, of interlacing curves, scientific and geometrical from base to summit, it is full of an artistic feeling and poetry almost entirely absent from the other.

I do not say that either the science or the art of the Middle Ages, English or French, is a thing for us to imitate nowadays. On the contrary. But I do say that it is deserving of all our study and all our admiration. It belonged to the men of those times; it was the result of their need, the fulfilment of their history, and its expression in their lives; it tells us of the ideal at which they aimed and how they strove to reach it. It sprang from their heart, was part of their life. Can we say as much of our art of to-day?

Pardon me if before I conclude I rapidly review the main results at which we have arrived.

I have tried to bring before you not mere differences of style founded on details of moulding or tracery, things of no real importance, but to show you how English and French mediæval architecture are each of them the outcome of the character of the race, the result of the history of the nation, the expression of the people's ideal.

The same national characteristic of "drift" which is ours to-day, and which takes us muddling along with no definite aim or plan for the future, and which led Edward III. in his blundering rush across Northern France till he was brought to bay on the hillside of Crecy, led also the workmen of his time to close their vaulting panels just anyhow, provided they got them closed; the same sturdy commonsense and determination to stand shoulder to shoulder in whatever they undertook, which made the King dismount his knights and place them side by side with the peasants, row over row, on that gentle slope, and which gave to them all when thus united the power

"To turn to flight on that famed Picard field
Balaon's plume and Gebon's bow and Cesar's eagle shield."

made them also build their walls always thick enough to carry the vaults or else rest

satisfied with a wooden roof, and caused them to be content to mend and patch their heritage from the past rather than sweep it all away in the hope of replacing it by some marvel of quite unattainable perfection in the future, till in the end the gradual blending of all classes and of their aspirations made itself felt in their art, as in their social life, and the architecture of the cathedral, the monastery, and the castle found its last expression in the village church, the manor-house, and the farm. In art, as in empire, the English race has ever been the same—opportunist of ever forming an ideal much above the Here and Now of daily life, yet blundering unconsciously, in spite of themselves, into marvellous results in both art and empire.

And so with France. It was the same chivalrous devotion to an ideal which drove to death the knights at Crecy and Agincourt, which also inspired the burghers of the Communes with their wild enthusiasm for liberty and with their determination to find for their thankfulness a visible expression in their vast cathedrals. It was the same pitiless logic and thirst for an ideal which dictated the unswerving policy of Louis XI. and of Richelieu, which later made the nation sweep away all its past in a torrent of blood in the vain hope of bringing back the golden age, and which also in art inspired the reasoning and the artistic sense whereby the builders of Vezelay and of St. Denis were led on from Notre-Dame through the perfection of Amiens and the lovely folly of Beauvais and the ruins, unfinished beauty of Abbeville to the last wire-drawn skeleton of a XVth century church. Through it all, up to the very end, these builders were true artists, aiming at expressing a something higher than themselves which should draw up into sympathy with them all that was best and noblest in those around them. Which of the two nations did best? It is an old question, which each artist—each man—must answer for himself. Whether it is better to aim at a lofty ideal which, proving beyond our reach, may become a mere dream of Heaven, or to be content with a lower one within our grasp, even though it may keep us bound to Earth."

Mr. W. H. Seth-Smith said he had great pleasure in proposing a vote of thanks to Dr. West for his admirable lecture. They must all of them have been delighted with the paper, which was one of the most perfect in its combination of the artistic, the structural, and the historical that he had ever heard. Dr. West had given them a sketch of the historical reasons for the contrast between French and English work, and had gone into the structural reasons most thoroughly as well. The reason why the paper had been such a brilliant one was probably because Dr. West was thorough, trained as an architect both in England and France, and had had the special privilege of being under and associated with Viollet-le-Duc for some years, so that he had had the run of the French churches while Viollet-le-Duc was restoring them. That, added to Dr. West's literary and other qualifications, had given him special facilities for producing such a paper. He remembered reading and enjoying a paper Dr. West read on "Vaulting" before the Institute of Architects a good many years ago, and from his treatment of the present subject they saw that Dr. West had studied the question of vaulting very deeply. Perhaps the lecture that evening was of most value because of the tendency nowadays to set aside Gothic in favour of Classic study. He had such a warm sympathy for Gothic, which was his first study, that he was always pained when the Association students had the opportunity of hearing lectures like the present, which emphasised the beauty and the logical development of Gothic work, and which impressed them all once again with the enormous importance of that study, especially in their younger days, as giving greater freedom in designing and planning. It was impossible to criticise, except in the most general way, such a paper, and he would say no more, except to propose a very hearty vote of thanks to Dr. West.

Mr. Hugh Stannus said it would be consonant with the ideas, the impressions, of all of them that evening if he just seconded the

vote of thanks and then kept silence. The truest compliment to Dr. West was for them to feel and act like students sitting at his feet. He was old enough to remember when Dr. West was a pupil in London, and he remembered the great advantage Dr. West had of going to Paris and studying under Viollet-le-Duc with M. A. de Baudot—a man who had all the grand traditions of the grand old Frenchman. The paper that evening had been so perfect in its way that it was impossible for any one of them to criticise it; they could only study it and work it into their artistic education and their artistic conscience.

The Chairman then put the vote of thanks, remarking on the excellence of the paper and the many lantern views which had been shown, and expressing regret that the illustrations could not accompany the lecture when published.

The vote of thanks having been very warmly carried,

Dr. West briefly replied.

Next Meetings.

The Chairman announced that a special general meeting will be held on February 25 to add to by-laws 21 and 31 after the word "librarian" the words: "and editor of the A.A. Journal." They propose to make the editor of the Journal a member of Council.

After the special meeting, the ordinary meeting will be held, when Mr. F. T. Baggallay will read a paper on "Porches and Approaches," illustrated by lantern views.

The meeting then terminated.

ARCHAEOLOGICAL SOCIETIES.

GLASGOW ARCHAEOLOGICAL SOCIETY.—The council of the Glasgow Archaeological Society have issued their report for the past year. After reviewing the work of the session, they state that seventeen new members were enrolled, bringing the number up to nearly 300. A correspondence is given in the report as between the Society and Sir Hugh Shaw Stewart with reference to the preservation of Newark Castle. In reply to the Society's representations, Sir Hugh says that sums have been laid out periodically in keeping the roof watertight and preventing the building from falling into greater ruin than it is now. He regrets he is unable to do more without starving other buildings, which are a source of livelihood to those who occupy them as farm tenants, etc. So far from being indifferent to the value of the building from a historical and architectural point of view, he had lately refused a tempting sum for the purchase of the ground on which it stands in order that a shipbuilding yard might be erected there. If, he adds, the Society could see its way to provide funds for the thorough repair of the castle, he would place no obstacle in the way. The council further report that through the intervention of the Society the Lanarkshire County Council had given instructions, which would prevent any more injury to the prehistoric fortification or mote between the public road and the River Clyde about a mile north of Abington village. With regard to the rebuilding of Glasgow Royal Infirmary, regret is expressed that the managers seem determined to proceed with their scheme, without modification, with the result that the huge "Jubilee Block" to front Cathedral-square, will destroy the appearance of the cathedral.

Fifty Years Ago.

FROM THE *Builder* OF FEBRUARY 16, 1856.

THE CLOCK AT THE HOUSES OF PARLIAMENT. The proceedings connected with the intended clock at Westminster are not regarded complacently by some of our correspondents; all sorts of unfairness are complained of, but we are not in a position to say that the case is made out. One remarks that "the faces are so arranged (although of immense size) as to be perfectly useless for the purpose of distinguishing the time (even to a person standing in Palace-yard)," and asks "if it be true that the clock is made of cast-iron?" He further complains that the matter is now wholly in the hands of one gentleman, Mr. Demison. Another writer says all the English bellfounders have been insulted in connexion

with this clock, and is surprised they should be so quiet under it. Are we to believe that we are travelling backwards on all roads?

Illustrations.

DESIGN FOR BACON'S IDEAL PALACE.



Our readers are aware, the subject set for the Soane Medallion this year was a realisation of the Institute of Architects, described as being "quite the most learned parody of style which they had had since his brilliant colleague on the Council, Professor Pite, startled them with his ideas as to what a West-end club should be like." Entirely agreeing with this, we have thought it worth while to devote our plates this week to illustrating the whole set of these drawings. Bacon's description of the mansion which he would have liked to see built has often attracted attention and comment; and to have illustrated in a concrete form this architectural speculation of a great intellect of the Elizabethan era is an achievement of considerable interest.

We have asked the author to contribute any remarks he wished to make on his idea in working out the design, and he writes:—"The subject set being 'The Realisation of the Ideal Mansion as Described by Bacon in his Essay 'Of Building,' that essay becomes the first object for consideration, and on being carefully and thoughtfully read, though stimulating to the imagination, it is found to be in parts obscure and even seemingly contradictory, forcing one to the conclusion that Bacon did not conceive his palace as an organic whole, but allowed his imagination to expand and contract, describing in turn parts only of the large houses of the period.

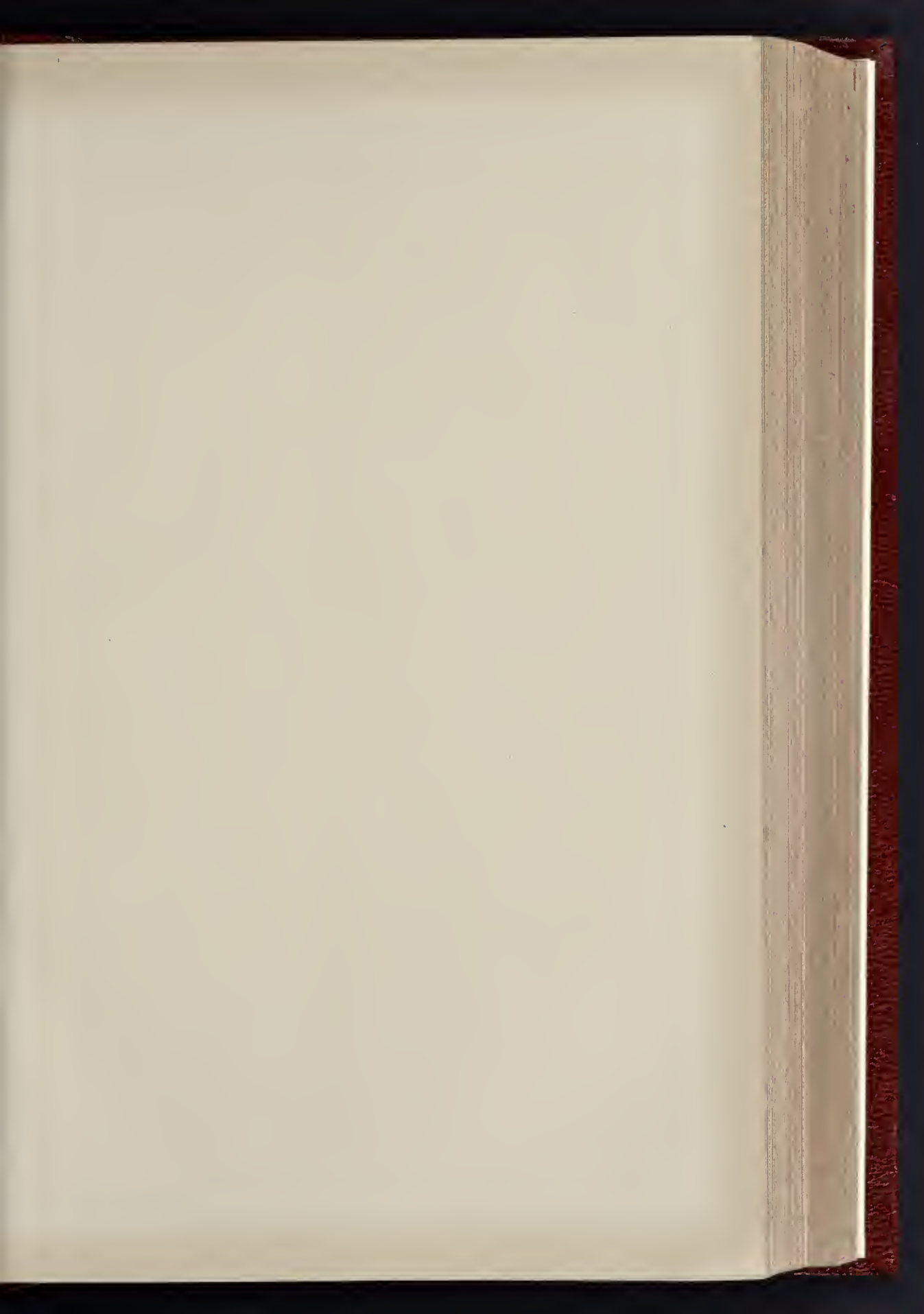
This makes it necessary to study the houses with which Bacon must have been familiar, and these, together with the large collection of Elizabethan plans in Thorpe's book, throw considerable light on the more difficult parts of the essay.

But Bacon's philosophy, having so strong a practical bias, suggests that a merely antiquarian restoration of his 'perfect palace' would be neither useful nor desirable, so an attempt has been made to combine the grandiose ideas of living which were so characteristic of the Elizabethan era with the more modern ideas of comfort and privacy.

In this particular attempt at realisation Bacon's semi-literary semi-technical description has throughout conditioned the design, but the imaginative nature of the subject seemed imperatively to demand that the design itself should possess an imaginative quality, and that the same imaginative quality should dominate its setting forth.

Although modern habits and ideas have been considered, and separate suites of rooms are provided which could readily be arranged for State functions of the largest kind, for entertainments on a smaller scale, or for the private life of the family, yet the design is by no means offered as an attempt to plan a palace as it should be, but from the first was considered as merely an unusually interesting and useful exercise."

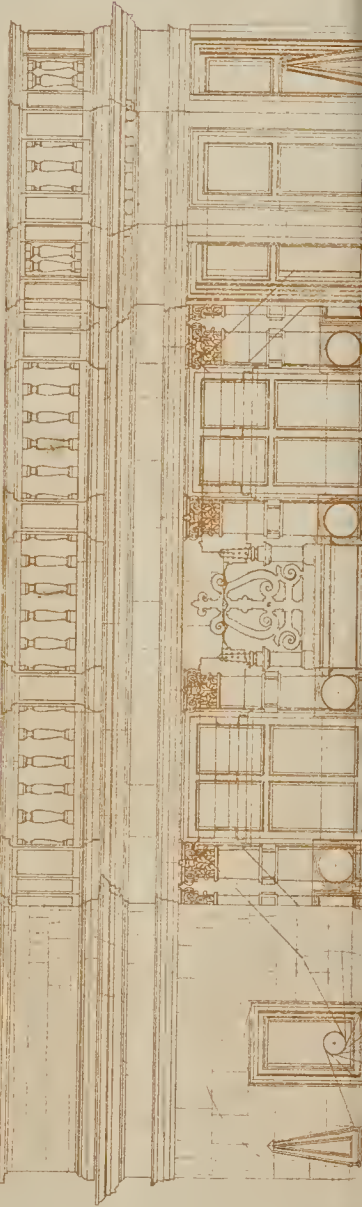
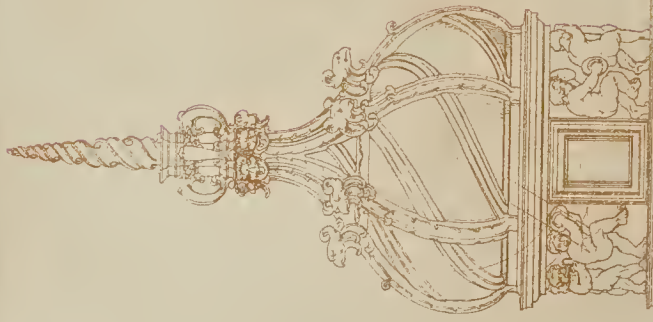
SELL'S TELEGRAPHIC ADDRESSES.—We have received from Mr. Henry Sell (165, Fleet-street, E.C.) the 1906 volume of Registered Telegraphic Addresses, which contains the names and addresses of 70,000 firms. The Directory is complete to the end of 1905, and contains every new telegraphic address or alteration registered at the Post Office up to December 31, 1905. It also contains the names of the 70,000 great firms of the United Kingdom, and a complete list of our Consuls in foreign countries classified under the towns in which they are resident. Special articles on the World's Industries, Post Office information, etc., will also be found in the book. We have found the work the present issue is the "Coming of Age" number very useful and reliable, and it deserves to be well known and used.

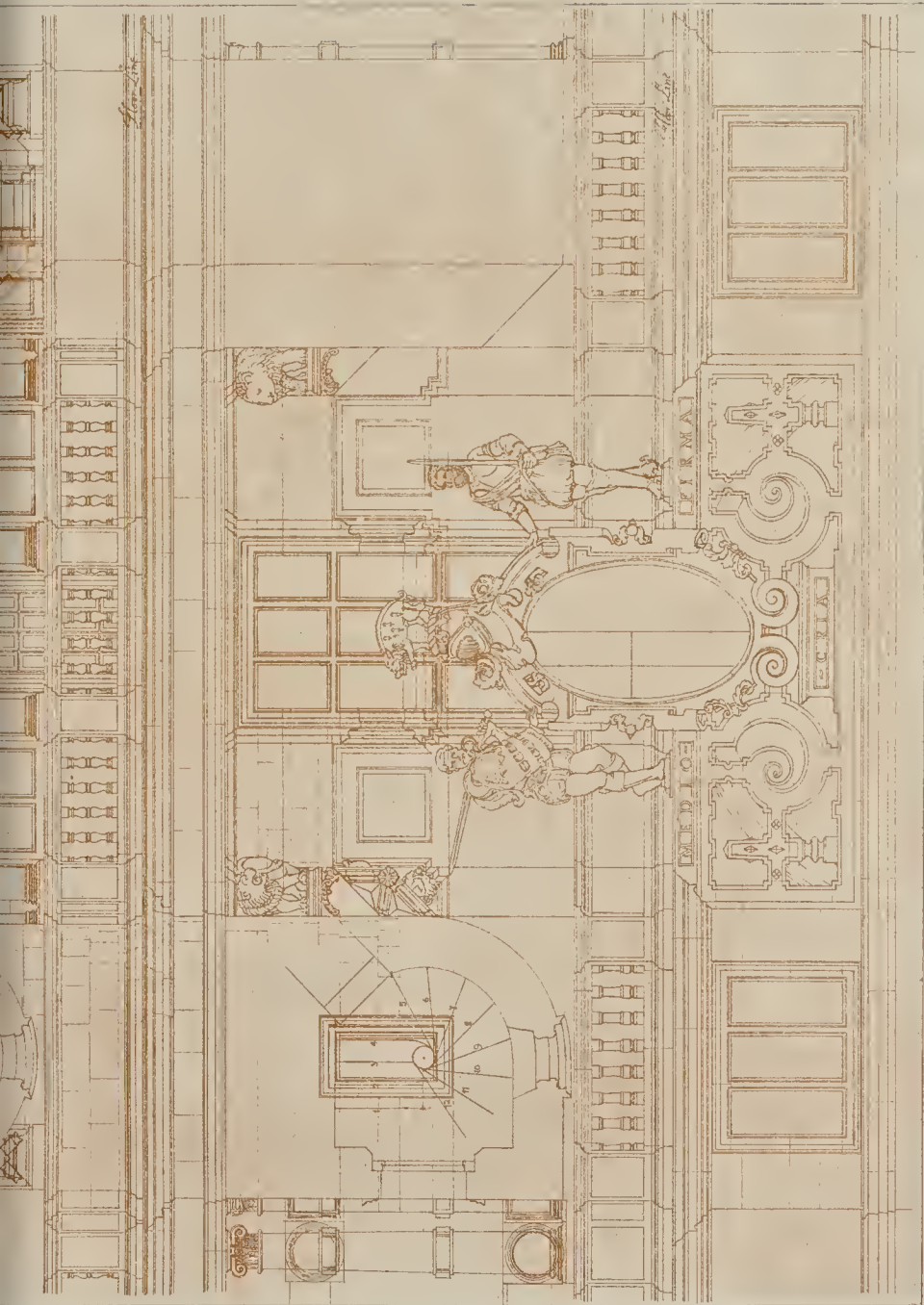


The Great and
Lower



Scala pacci.

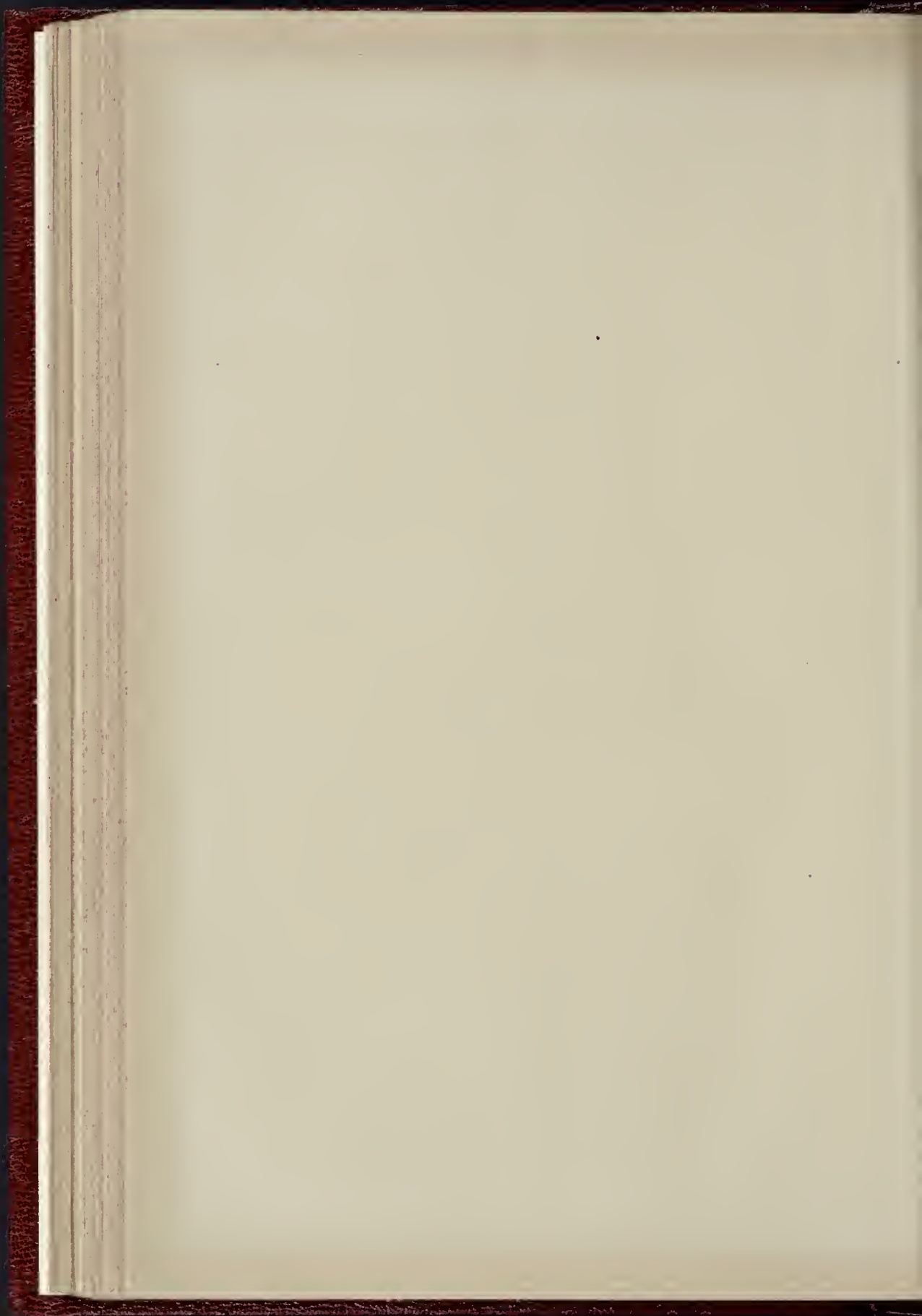


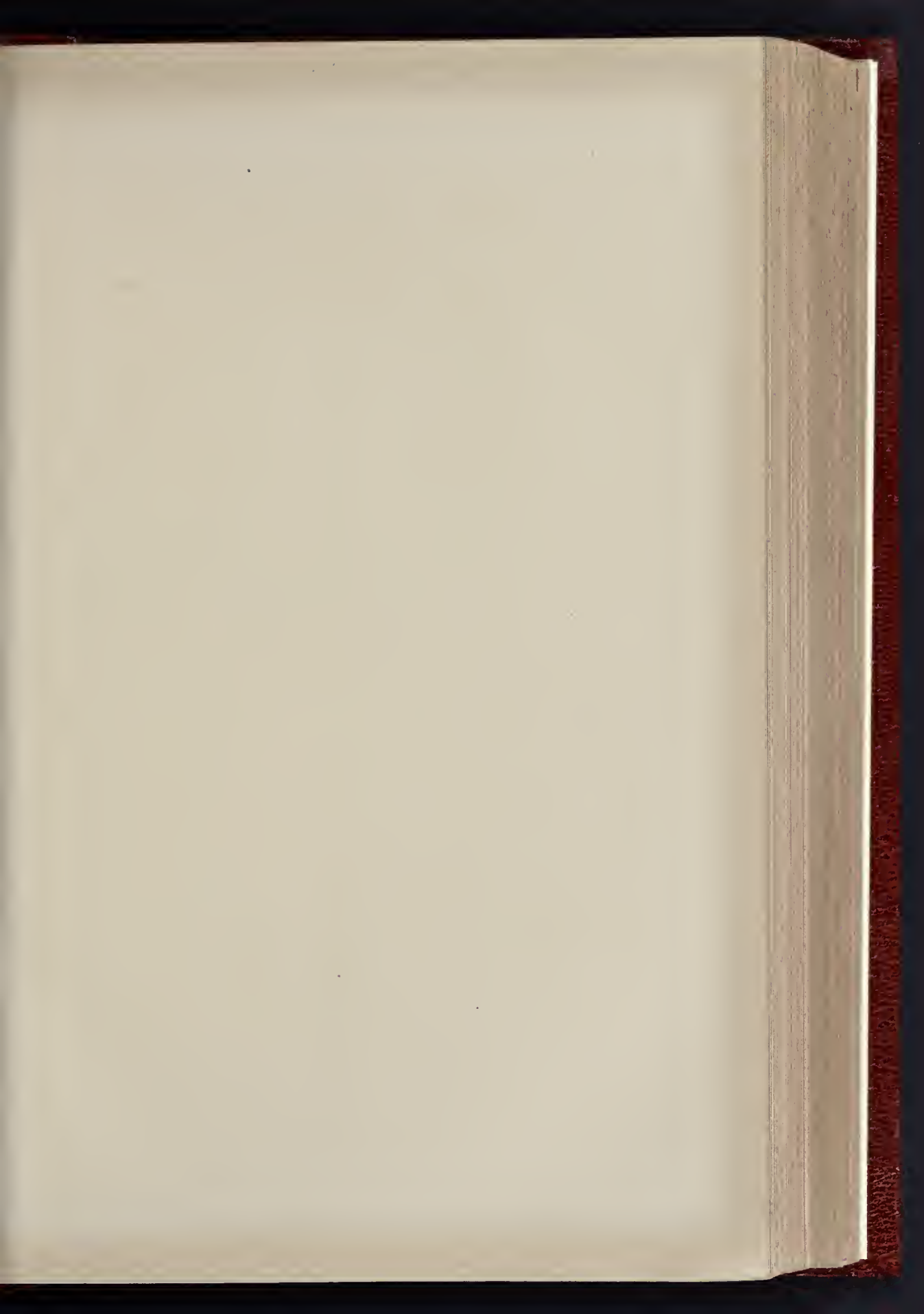


VI. PHOTO (SPRAC. C. T. 1. 4. 5. 3. EAST HODDING STREET, PETER LANE, E.C.

BACON'S IDEAL PALACE.—By MR. W. S. GEORGE
DETAIL ELEVATION.

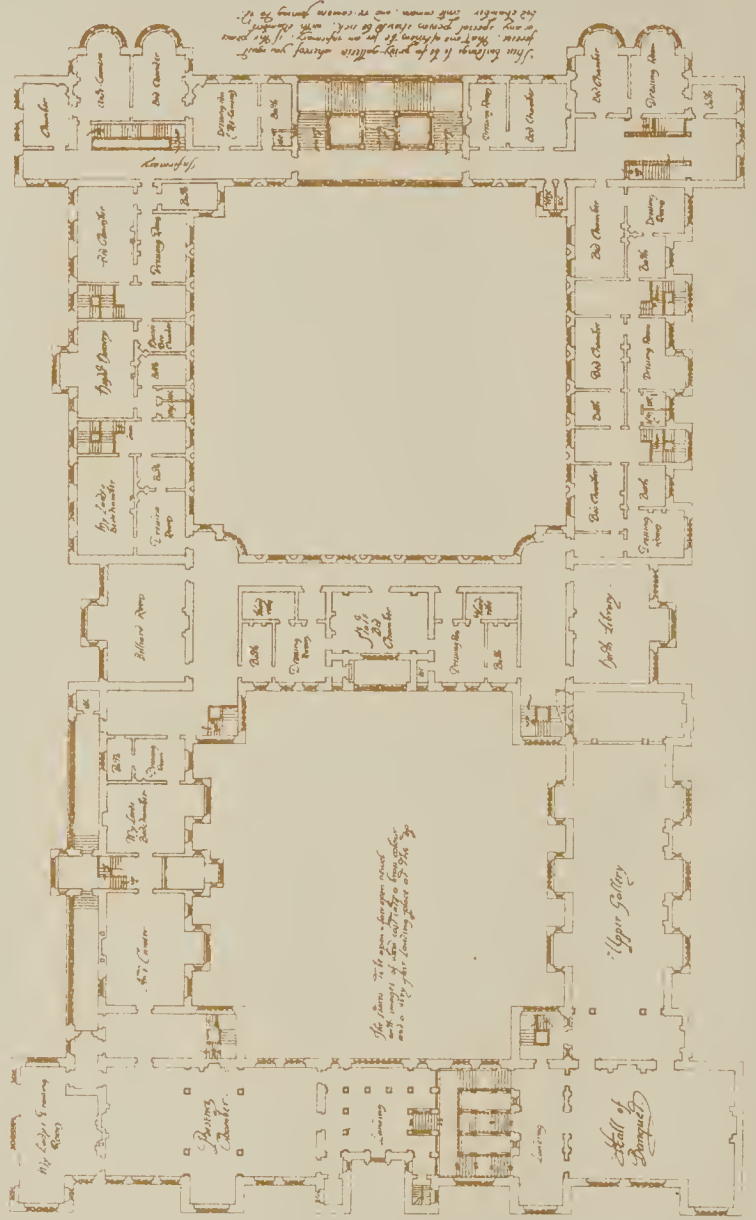
Some Medallion, R.I.B.A., 1906





THE BUILDER, FEBRUARY 17, 1906.

Plan of the Second Story



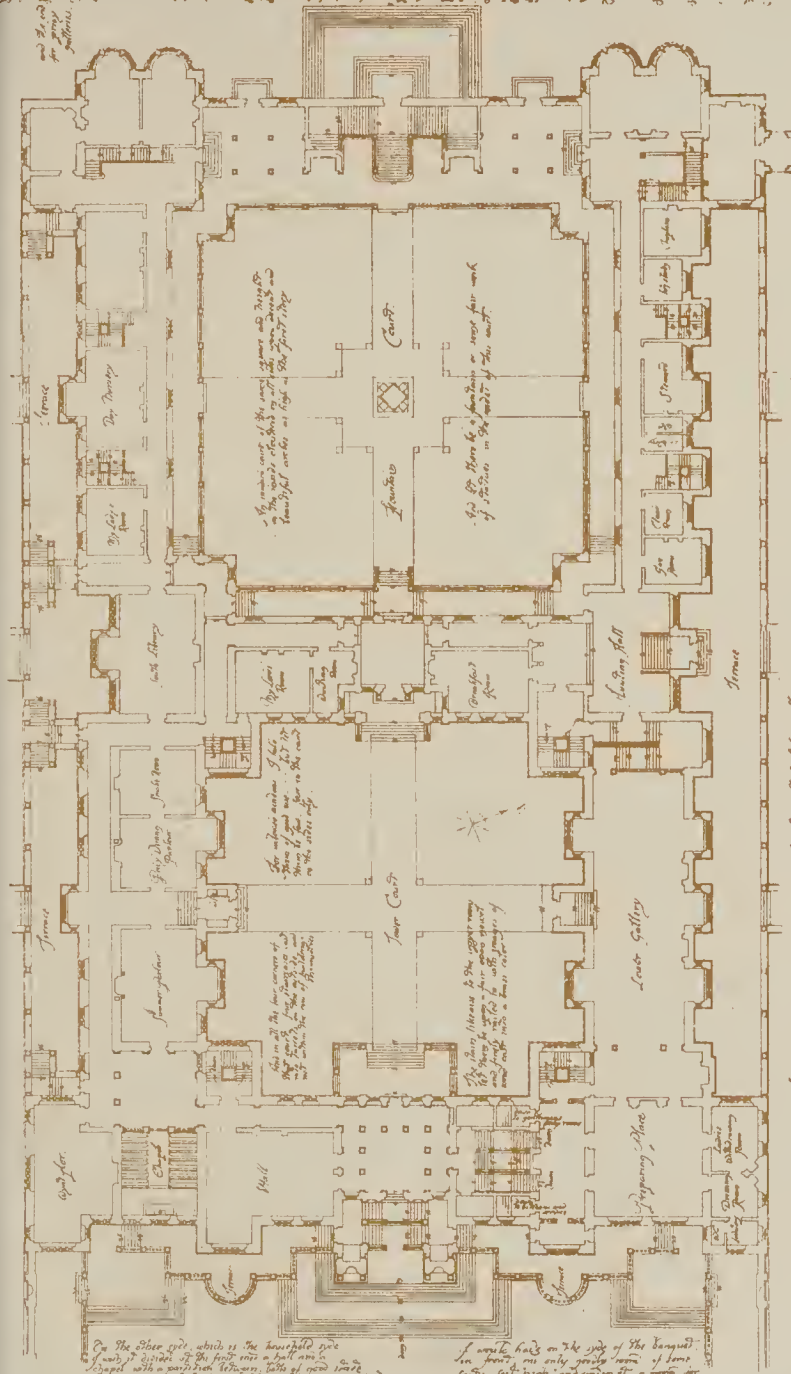
This building is to be built with a view to the fact that it is to be used as a residence for a family of some size. It is to be built with a view to the fact that it is to be used as a residence for a family of some size. It is to be built with a view to the fact that it is to be used as a residence for a family of some size.

The plan will be open to the public and a copy will be sent to the architect on a copy of the building plan to the architect.

John Sharp

1906 17/2

"The main wing measures 137 ft 8 in. broad to a grade, or plan of levels as indicated, and only such openings and windows remain as the original architect intended."



On the other side, which is the house side
of wall, is a garden, the front into a hall and a
loggia with a veranda between, side of road
and loggia, but to the left, the garden end is wider
and a summer parlour, with loggia, and under this
from the loggia, either with inner garden, and become
some garden with a veranda on the side

I would have on the side of the banquet
the "banquet" as only party room of some
size, but "high" and under the a room
a dining or a gathering place of times of triumph

The main part of the wing
is the main entrance to the
main part of the wing
of the main part of the wing

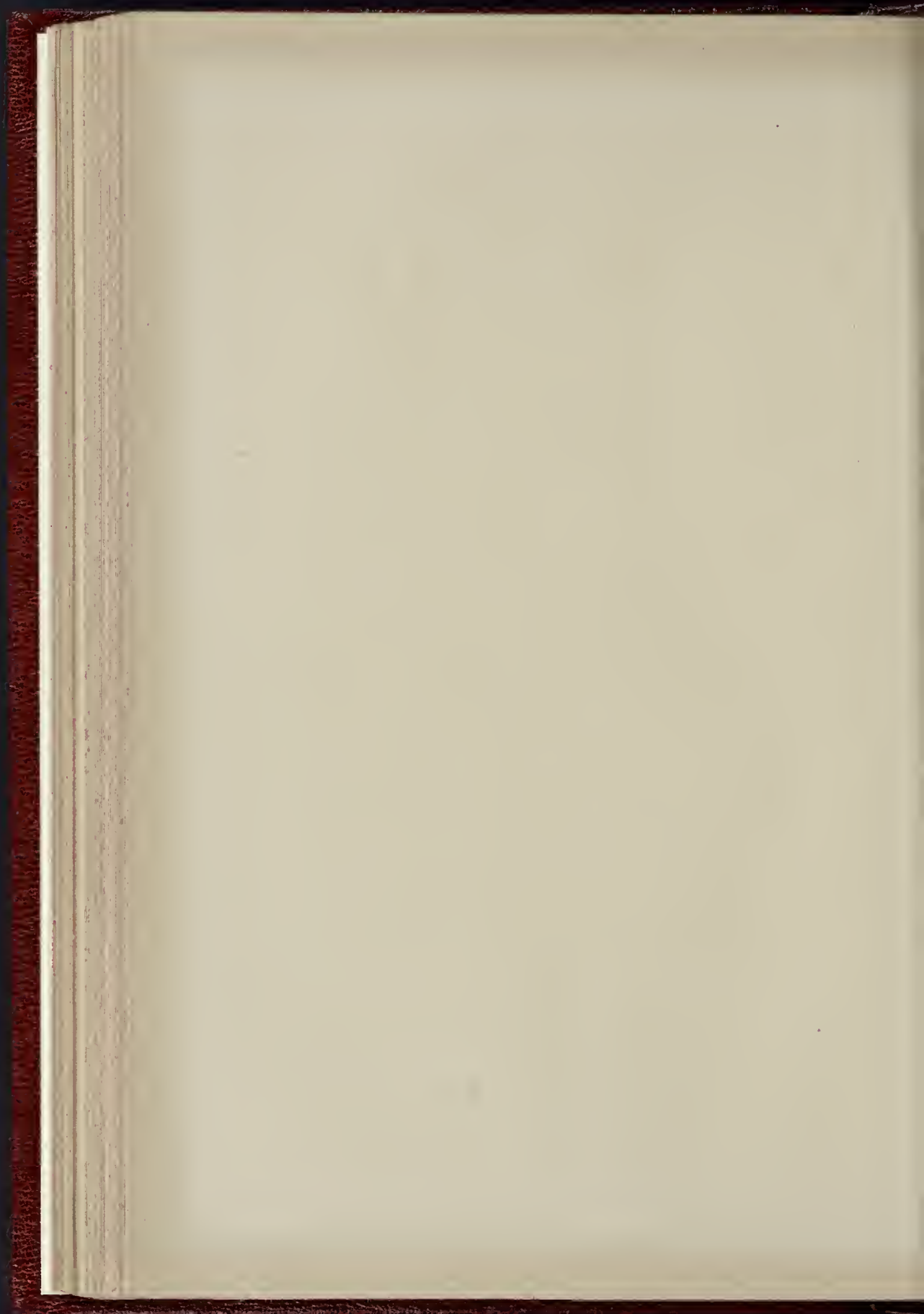
The main entrance to the wing
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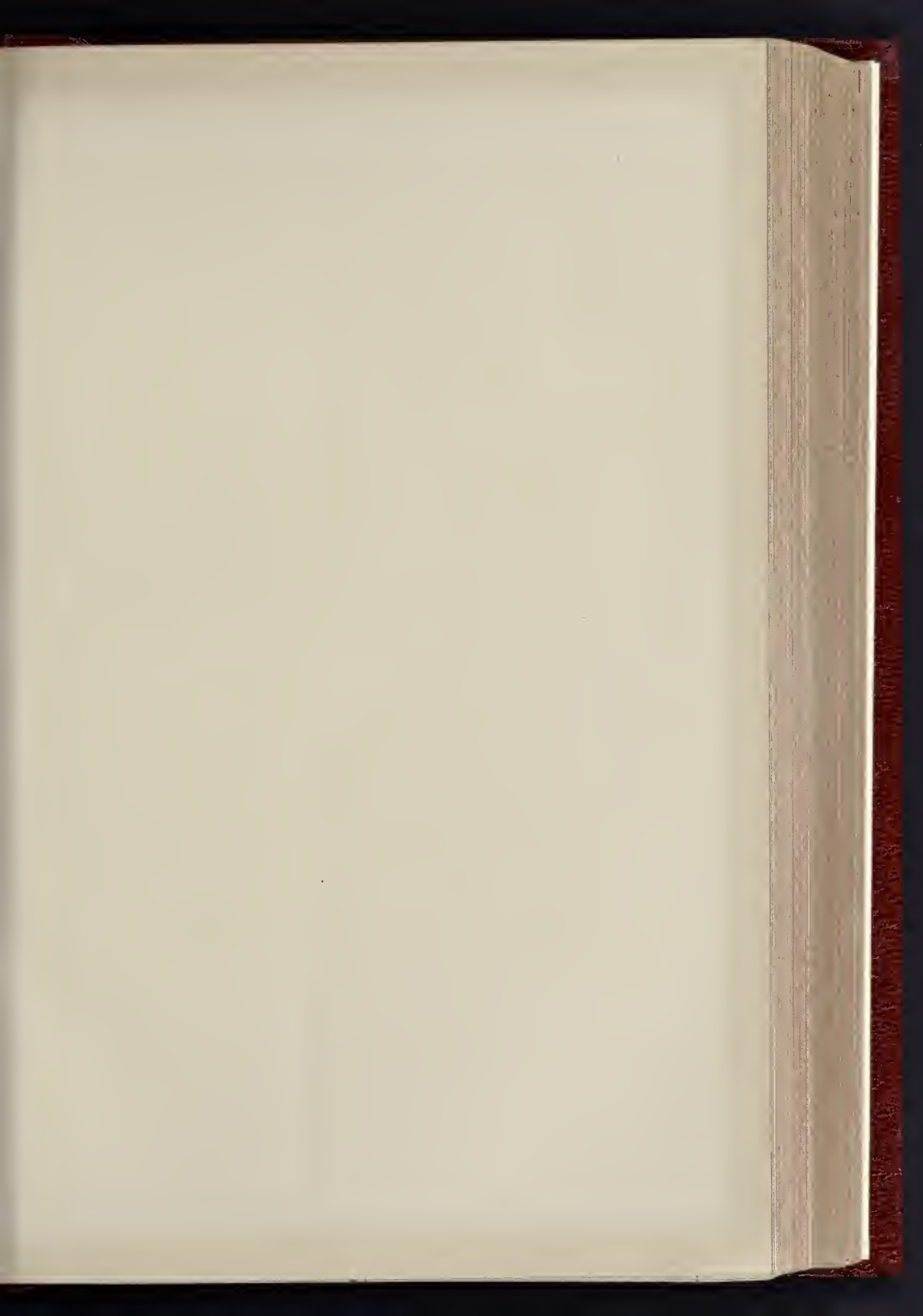
The main part of the wing
is the main entrance to the
main part of the wing
of the main part of the wing

John I. Harp

Plot of the Grand Palace

BACON'S IDEAL PALACE.—By MR. W. S. GEORGE
PLANS.





Civitas Optima Francisci



Videbitur S. Albani, Summ

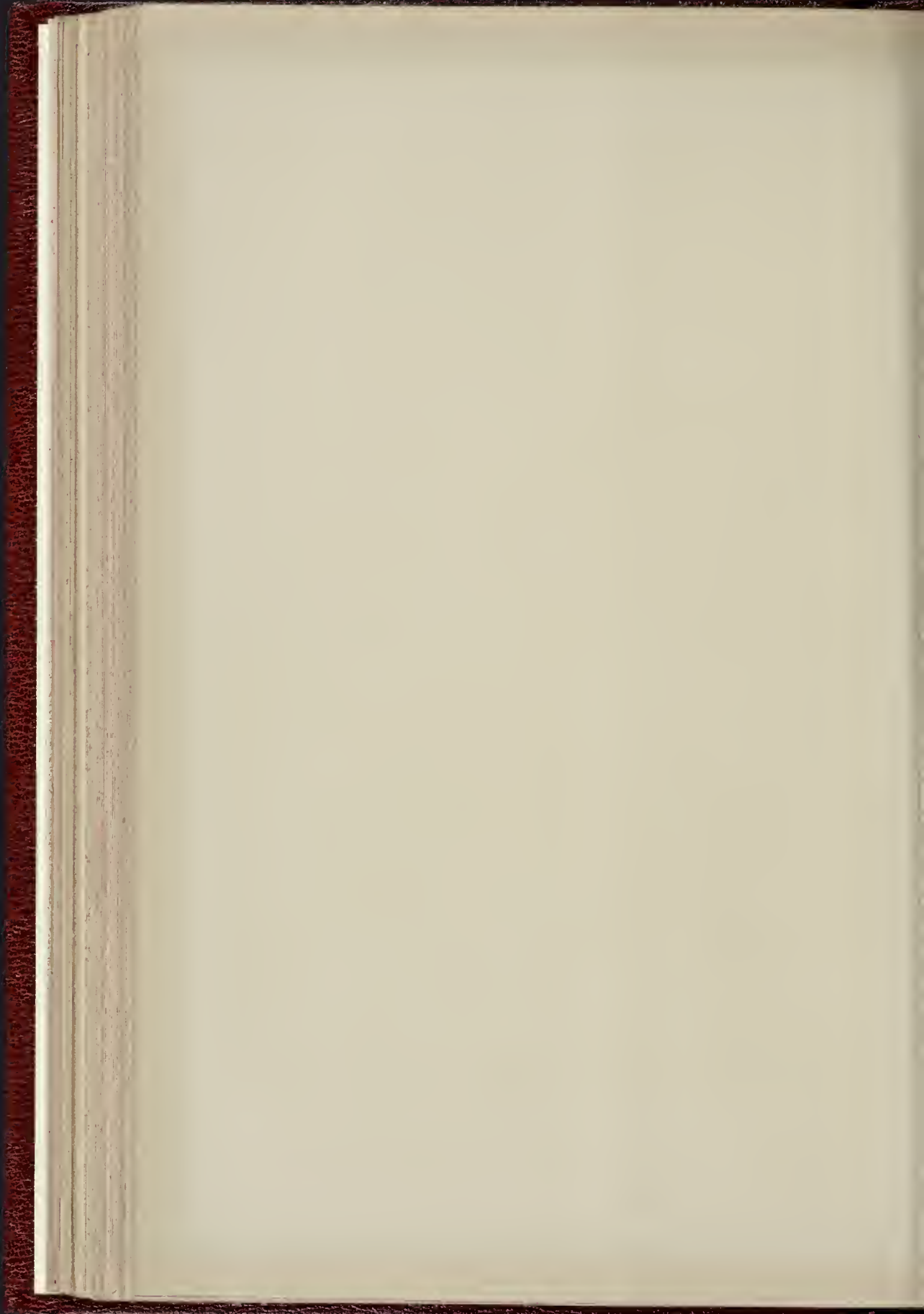
Acrid, miles, Baro: De Verulam.

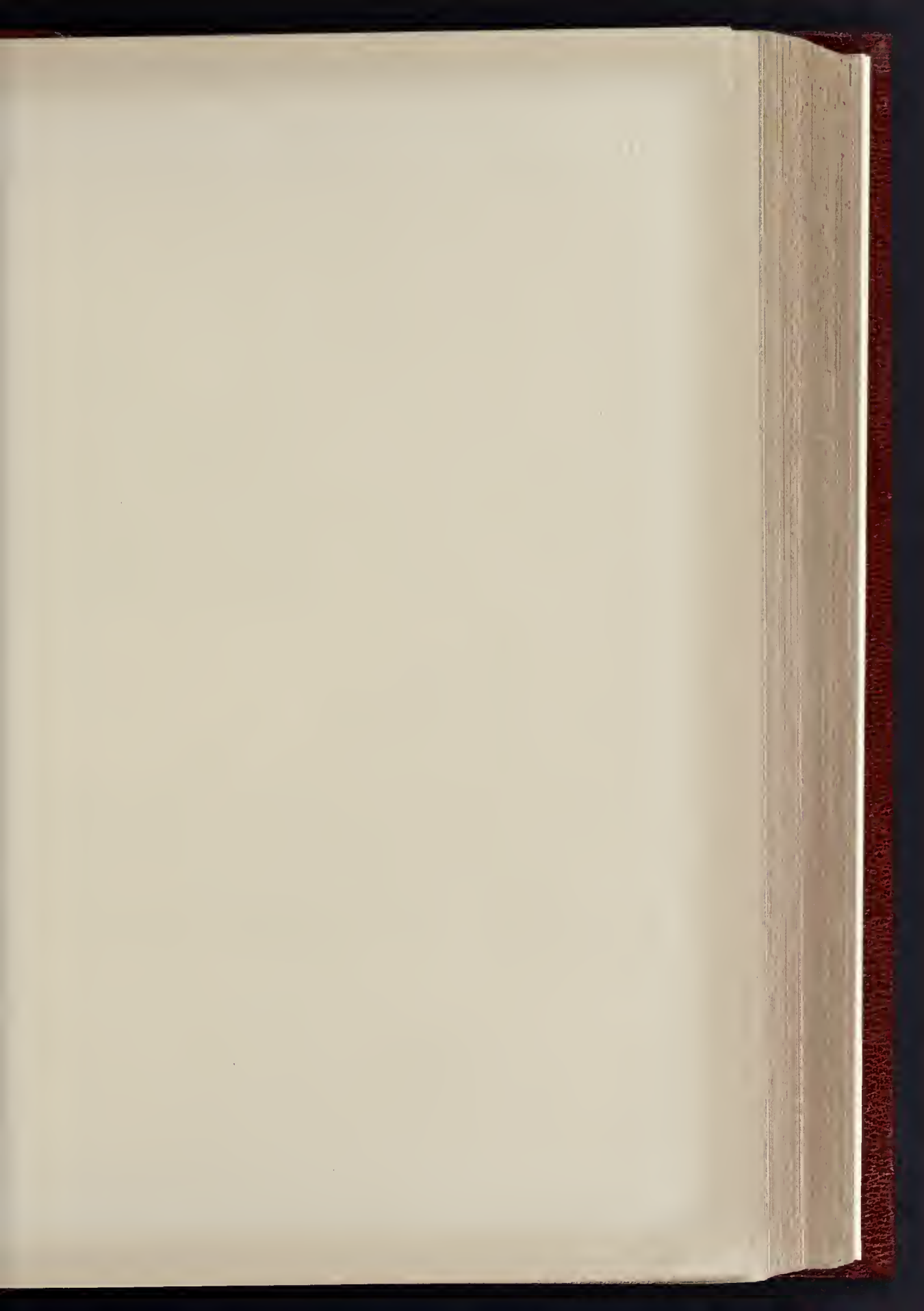


Anglia, Cune Waris.

THE PRINTING OFFICE OF THE UNIVERSITY OF CAMBRIDGE, PRINTED BY J. B. CLAY AND COMPANY, LTD., 47, KING'S HALL LANE, CAMBRIDGE.

By Mr W. S. GEORGE.
EW.





These 7 drawings that you see
 though not as I would have them be
 I hope will win the "Prize" for me
 John Thorne

I understand both these sides to be not
 only returns, but parts of the front
 and to be uniform with them, though
 severally partitioned within, and to
 be on both sides of a great and lately
 tower, in the middle of the front, that
 as it were joins them together on either
 hand.



Upright for the



Upright for the Sides

Scale



As for the tower, I would have it two stories of eighteen feet high apiece, above the two wings, and covey leaves upon the top, roiled with 170 ribs interposed.



floor. Only I understand the height of the first story to be sixteen feet, which is the height of the lower room.
16 f
floor

Base Court - Syd.

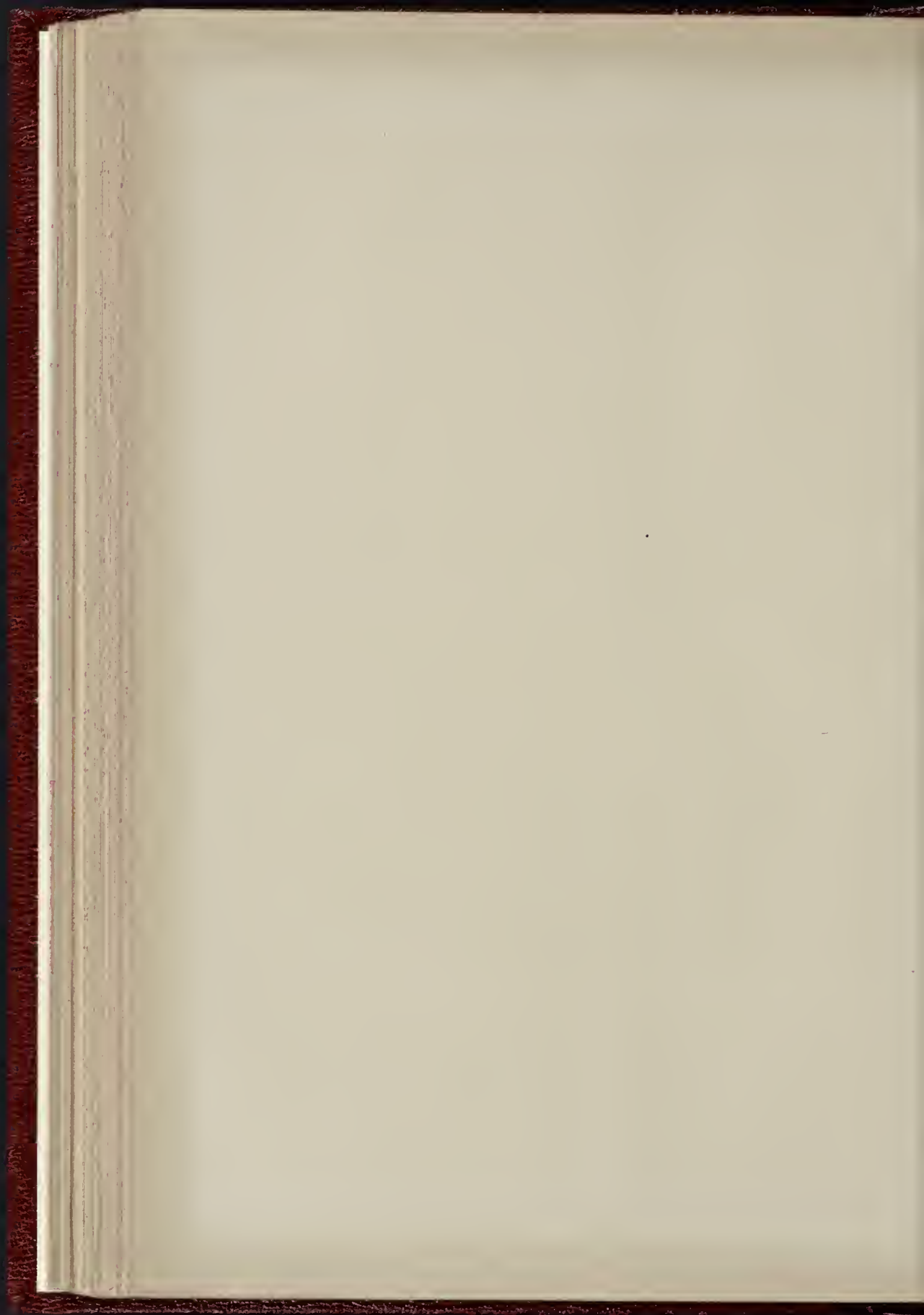
These galleries are built over the rear wall of arcade.



At both corners of the farther side, by way of return, let there be two distinct or rich cabinets, handsomely paved, richly hang'd & glazed with crystalline glass, and a rich cupole in the midst, and all other elegance that may be thought on. In the upper gallery, do I wish that there may be some few rooms running in divers places from the wall. . . . and upon the third story likewise an open gallery upon pillars, to take the prospect and freshness of the garden.

The two Inward Courts.

Beyond this court let there be an inward court of the same square and height: and in the inside cloistered on all sides upon decent and beautiful arches, as high as the first story: on the under side, towards the garden, let it be turn'd to a grove, a place of shade or retirement: and only have opening and windows towards the garden, and be level upon the floor, no whit sunk under ground, to avoid all dampness.



the water which ran down from the water-bearing stratum above. That might happen sometimes after a really good water-bearing stratum had been reached, and many wells were abandoned because the supply had been lost in that manner. It seemed rather absurd that such wells should be abandoned for that reason. It would obviously be easy enough to fill in the bottom of the well and to put in some puddled clay over the lower sand formation to hold up the water.

Speaking of the construction of wells, the lecturer said there could be no doubt that for deep wells, where it was of importance to exclude any water, and where treacherous strata had to be passed through, iron cylinders should be used for the lining, and would probably be cheapest in the end. Shafts were generally to be preferred to borings for wells in this part of the country. A shaft had a much better chance of striking a good supply of water in the chalk, upper greensand, or the Wealden beds than a boring, which might miss the fissures, or get clogged with sand, or fail to obtain a sufficient supply from sandy beds owing to the small area it touched. Well-sinking must, however, always be a matter of risk. No man could possibly tell to an exact certainty what existed in the ground 200 ft. or 300 ft. below, and the engineer could only say it was probable that a permeable water-bearing strata existed at a certain depth. There could be no absolute certainty that it existed at all. In conclusion, he urged the point that, while it was often best to go deep for a water supply, much expense and trouble might often be saved if the water ready to hand near the surface were not overlooked.

A discussion followed the paper, and the meeting terminated with a vote of thanks to Mr. Stanton, proposed by the Chairman and seconded by Mr. H. Capsey.

THE SURVEYORS' INSTITUTION.

An ordinary general meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, S.W., Mr. C. Bidwell, President, in the chair.

The minutes of last meeting having been read and confirmed, and some donations to the Library and Library Fund having been announced.

The Chairman moved that the Right Hon. Lord Justice Fletcher Moulton be elected as an Hon. Member. The Chairman said that the right hon. gentleman had been a Professional Associate of the Institution for some seven years, and they would all be glad that he had been raised to the high position of Lord Justice.

The motion was heartily agreed to.

The Secretary (Mr. A. Goddard) then read the list (printed in our last issue) of candidates who have passed the preliminary examination and have been enrolled as students.

The Rating of Machinery.

Mr. W. P. Payne then resumed the debate, opened by Messrs. E. J. Castle, K.C., G. Humphreys Davies, E. J. Harper, and E. M. Konstam, on Mr. F. Marshall's paper on "The Valuation of Machinery for Rating Purposes," an abstract of which appeared in our issue for February 3.

Mr. Payne said that Mr. Marshall's paper showed what a large amount of difficulty a surveyor had in carrying out the law in regard to the rating of machinery. What values required was that the judges should tell them what was the meaning of the words, "enhancement of value," and how to measure that enhancement. The carrying out of the rating of machinery was a great difficulty. In some parts of the country the rating was carried out in its entirety, everything being valued; but in other parts, nothing was valued at all.

Mr. W. B. Brodric said that the present state of the law on the subject had not been arrived at by what might be called natural evolution so much as from dire necessity.

The rating of machinery had been brought into prominence during the last fifteen to twenty years more particularly by the necessity which local bodies had found of increasing the yearly amounts required by them; and the assessment committees or those who instructed them had been anxious

to discover new sources of revenue so that the increased expense should not tell so heavily on the ordinary ratepayer. He ventured to question the correctness of the decisions in the House of Lords in the case of Kirby v. Assessment Committee of the Hunslet Union on December 19 last. A great deal of the machinery in Kirby's factory was personal property, and the House of Lords had decided that it was correct to rate that. It appeared to him that there was a conflict between the Act of Parliament passed by both Houses in 1840 and the decision of the House of Lords in the case of Kirby v. Hunslet. Surveyors and valuers must find themselves in a difficulty, and the only way he could see out of the chaos was for an Act to be passed—an Act such as the Machine Users' Association had promoted for the last twelve years—and that would remove many of the difficulties which exist.

Mr. E. Page, K.C., said that there was no doubt that the present condition of the law was absolutely unsatisfactory. The difficulty was not as to fixed machinery, which would go with the hereditament as part of it; the difficulty was in regard to such machinery as was not. But for legal decisions, one would have felt that such chattels would be affected by the question as to what extent was the value of the hereditament enhanced by being available for the use and erection of such machines. As to the way to deal with the matter, the only plan was to endeavour to get the law altered on the lines of the Report of the Commission of 1900, i.e., that a Bill should be passed that should enact that there should be excluded from the assessment any increase of value arising from machinery, tools, or appliances which were not fixed, or were only so fixed as that they could be removed without the removal of any part of the hereditament. On those lines the Scotch Act of 1892 was passed, which in Scotland removed the grievances of the owners of machinery. Some such Act was required in England, and until such an Act had been placed upon the Statute-book it was no good doing anything but obey the decisions of the Courts and agitators for an alteration in the law, which was very necessary if one place was to be rated in the same way as another place and if the rateable value of factories was to accord with the annual value as found by the ordinary laws of supply and demand.

Mr. D. Dimwiddy said that the subject divided itself into two heads—i.e., first, the economic question of whether machinery should be rated, and secondly, how it should be rated. No surveyor could go into a factory on behalf of the assessment committees and ignore the machinery. It was their duty so long as the law was in its present state to treat it as they found it; they could not do otherwise after the Kirby case.

Mr. G. Beken having spoken,

Mr. J. H. Sabin said he could not see why machinery, for instance, which would do the mortising for forty doors in one day should be assessed differently from a building in which forty men, with forty chisels, etc., did the work on those forty doors in one day; or a wash-house, with tubs for women, as against machinery for washing. What was wanted was the removal of restrictions on trade. Was a building increased in value, or was it not, by the use to which it was put? A house was built with the intention of its being inhabited, and could it be said that it was enhanced in value by the fact that it was going to be inhabited? A building was erected as a factory, and could it be said that its value was further increased by the fact that machines were going to be put into it? He did not feel that it was, any more than he felt that the house was increased in value because people were going to live in it; and houses would not be built if people were not going to live in them, and many factories would not be erected unless machinery was going to be put into them. The matter might be put in this way: When is a hereditament not a hereditament? And the answer was: When it was a machine. And when was a machine not a machine? And the answer was: When it is a hereditament.

Mr. Sturge, of Bristol, and Mr. A. Harston having spoken, the Chairman made

a few remarks on the subject, during which he expressed the hope that the Government would do something in the matter in the near future.

In the course of a brief reply, Mr. Marshall said he had been much struck by Mr. Sabin's illustrations. If brewers' vats were to be rated, one could not see why wash-tubs should not be. But the whole matter was in an anomalous state, and legislation was needed.

It was announced that the next meeting would be held on February 28, when a paper by the late J. Leaning on "The Assimilation of the Practice of Quantity Surveyors" would be read by Mr. H. J. Leaning.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Sir E. Cornwall, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Hackney Borough Council 2,985*l.* for paving works; St. Pancras Borough Council 1,965*l.* for street lighting; and Woolwich Borough Council 2,000*l.* for electrical fittings.

Inspection of Theatres, etc.—The following recommendations of the Theatres and Music Halls and Fire Brigade Committees were agreed to after discussion:—

(a) That as from and including April 1, 1906, the chief officer of the fire brigade be responsible to the Council for the inspection of the electric lighting installations and heating and other mechanical arrangements in theatres and the other places of public entertainment licensed by the Council.

(b) That Mr. G. Heys-Jones, an assistant in the lower section of the fire brigade, in the electric lighting, etc. section of the engineer's department, and Mr. E. S. F. Cooper, an assistant in the fire brigade, of the first class, in the mechanical section of the engineer's department, be transferred to the fire brigade as from and including April 1, 1906.

(c) That an electrical and mechanical engineer, at a salary of 400*l.* a year, and an electrical engineer, at a salary of 300*l.* a year, be appointed to the fire brigade, and that applications for the appointments be invited by public advertisement.

Exhibition of Sculpture.—A petition was presented by the Vice-Chairman from the Society of British Sculptors asking the Council to grant a temporary site and building where an exhibition of the art of sculpture can be properly seen. The petition was referred to the Improvements Committee.

Marble-hill—Adaptation of Mansion for Refreshment and Shelter Purposes.—The Parks and Open Spaces Committee recommended, and it was agreed:—

(a) That the estimate of expenditure on capital account of 1,567*l.* approved on August 1, 1905, in respect of the adaptation of the mansion at Marble-hill, be cancelled to the extent of 500*l.*; and that the resolution of that date sanctioning expenditure for the purpose be rescinded so far as it relates to expenditure exceeding 975*l.*

(b) That the offer of Messrs. Chambers Brothers to provide for 150 seats of service in the mansion at Marble-hill be accepted.

Putney School of Art.—It was agreed to accept the transference of this school to the Council.

School, Dawes-road, Fulham.—The Education Committee reported as follows in reference to the new secondary school proposed to be erected on the Dawes-road site (Fulham) for the accommodation of 316 scholars:—

In the letter accompanying these plans the attention of the Board of Education was invited to the extremely expensive character of their requirements in respect of the building and equipment of new secondary schools, and it was stated that, in the opinion of the Council, considerable economy could be effected without appreciably diminishing the efficiency of the school as a whole.

The Board on December 5, 1905, approved the plans as submitted for a total accommodation of 316 girls, and added that it had been decided to modify the regulations of the Board for the building of secondary schools, as follows:—

(1) The minimum allowance of 8 sq. ft. per scholar will be reduced to 6 sq. ft. where the Board are satisfied that the larger provision is impracticable.

(2) Classrooms: The minimum allowance of 18 sq. ft. (with the alternative provided by the existing regulations) will be reduced to 16 sq. ft., provided that the Board are satisfied with the arrangement proposed.

These important concessions on the part of the Board will enable the Council to effect considerable saving in the erection of this and other secondary schools. In view of the pressing need for secondary school accommodation in Fulham, we are of opinion that the school as planned for 316 scholars will be hardly large enough to meet the requirements of the district, and the plans have accordingly been redrawn for a school to accommodate 510 girls. The total cost of erecting the school in accordance with these amended plans, including supervision, quantities, and lithography,

equipment, etc., is estimated at 35,956*l.* The cost of the building only is estimated at 28,558*l.*, equivalent to about 56*l.* a place. It may be mentioned for information that the cost of the building as originally planned for 316 scholars was estimated at 20,000*l.*, equivalent to about 63*l.* a place. As it is the first school of this character for the Council's approval before sending them to the Board of Education. We recommend that the proposed sketch plans, submitted to the Education Committee on January 31, 1906, of the secondary school proposed to be erected on the Dawes-road site (Fulham), be approved, and that they be forwarded to the Board of Education.

Mr. Whitaker Thompson moved, and Mr. Buxton seconded, that the recommendation be referred back. The cost should not be so high as 56*l.* a place.

Mr. Barnes said it was impossible to do the work at a less cost while the present rules of the Board of Education applied.

Canon Jephson said that if they were free to carry out the work in the best way they could the cost would be very much less. The Council had to comply with rules which were as rigid as the laws of the Medes and Persians, but they endeavoured to do the work as inexpensively as possible.

Sir William Collins said that one impression more definite than any other which he had brought back from Paris was that the adequate school provision, and the natural sequence of secondary education following the primary school. He expressed the wish that the Board of Education would relax their requirements still more, but the cost of 56*l.* a place was not excessive in comparison with the cost of other similar schools erected in London and the country.

The amendment was lost, and the recommendation of the committee agreed to.

Hildrop-road Site, Islington, N.—The following recommendations of the Finance Committee were agreed to:—

(a) That the claim of Messrs. Grezar & Son, the contractors for the erection of the pupil teacher centre on the Hildrop-road site (Islington, N.), be settled at 4,832*l.* 5*s.* 2*d.* exclusive of legal expenses.

(b) That expenditure not exceeding 200*l.* be sanctioned in respect of the legal costs incurred by Messrs. Grezar & Son in connexion with their action in regard to the erection of the pupil teacher centre on the Hildrop-road site (Islington, N.); that the sum of 200*l.* be allowed to Messrs. Grezar & Son.

Lists of Contractors Selected to Tender.—The Education Committee recommended, and it was agreed:—

That the name of John Wainwright & Co., Ltd., of 173, Mark Lane, be added to the selected list of contractors for tar-paving playgrounds of Council schools.

That the name of A. E. Podmore & Co., of 33, Charles street, Hatton-garden, be added to the selected list of contractors for the provision of gas services and fittings in schools.

That the name of J. Harrison & Co., of Station Works, Denmark-road, Camberwell, be added to the selected list of contractors for supplying and erecting iron buildings, as far as small contracts are concerned.

That G. J. Lynn, formerly one of the partners of Staines & Son, builders, Gt. Great Eastern-street, who is continuing the business under the old name, be added to tender as heretofore.

List of Rates of Wages and Hours of Labour.—The Works Committee reported as follows, the recommendation being agreed to:—

"The hours of labour of plumbers inserted in the Council's list of rates of wages and hours of labour are not in accord with the provisions of the working rule agreement between the Plumbers' Association and the London Master Builders' Association. We recommend:—

That the Council's list of rates of wages and hours of labour be amended by the substitution of '50' for '47' as the hours of labour in summer of plumbers and plumbers' mates, and that the rate of pay of plumbers and plumbers' mates for overtime on week-days (except Saturdays), inserted in the list be as follows: "6 p.m. to 8 p.m., time and a quarter."

Vauxhall Bridge—Provision of Lamp Standards, etc., for Bridge.—The Bridges Committee brought up the following report:—

"We have considered what arrangements should be made for lighting the new Vauxhall Bridge, and we are of opinion that the best system of lighting will be the incandescent high pressure gas-lighting system. We have been in communication with the Gas Light and Coke Company with a view to ascertaining to what amount it would be prepared to supply and erect suitable standards with the requisite lamps, service mains, etc., and also the amount to be prepared to supply and erect the lamps, etc., for a sum of from 650*l.* to 700*l.* The exact amount will depend upon the settlement at a later date of certain details of the work. This amount would cover the cost of any lighting arrangements which may have to be made provisionally pending the completion of the permanent installation. It is proposed, however, to consider at a later date what course shall be adopted for lighting the watermen's stairs at the bridge. Sixteen

standards will be erected, twelve of which will be on the bridge itself, and four on the approaches, and two dwarf lamps and standards on the southern approach. The lamps will be of the incandescent type in use in Kingsway and Aldwych, and will each contain two burners with a combined power of 660 candles and fitted with apparatus for automatic intensification. The standards of the lamps have been designed by the architect and will be in keeping with the architectural features of the bridge. It will be necessary for an agreement to be entered into with the company for the supply and fixing of the standards etc., and for the requisite expenditure is included in the estimate of 170,000*l.*, approved on November 25, 1902, for the construction of the superstructure of the bridge.

The committee recommended accordingly, and it was agreed.

Bridges.—The Bridges Committee reported as follows:—

"We report that the work of the partial reconstruction of four bridges carrying the Albert Embankment-road over certain dock entrances, and the reconstruction of Mill Pond Bridge in Nine Elms-lane, has been completed. The work has been executed by Messrs. Faise & Son, whose tender therefor, amounting to 3,444*l.* 18*s.* 3*d.*, was accepted on August 1, 1905.

Dangers of Fire.—The Fire Brigade Committee recommended that the brigade should periodically inspect (in addition to theatres and other premises licensed for public entertainment and common lodging-houses) buildings belonging to the Council and other rate or tax supported buildings within the county of London, subject to requests for such inspection being made by the committee or authority concerned, and that the chief officer of the brigade should advise on the fire arrangements of such buildings.

After discussion the matter was referred back on the motion of Sir Melville Beachcroft.

Paris Tramways.—Mr. Allen Baker, the chairman of the Highways Committee, in reply to Mr. Waterlow, said he had noticed one or two matters regarding tramway administration on the occasion of the visit to Paris. In the first place, he noticed that trams were allowed over several of the bridges crossing the Seine, and further, that the adoption of the conduit system by the Council had been amply justified by the experience of Paris. He had also learned that the tramway companies paid to the municipality a small tax on each fare collected towards the cost of keeping up the streets through which the trams passed.

The Council shortly afterwards adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Lines of Frontage and Projections.

Deptford.—A one-story shop adjoining No. 118, Manor-road, Brockley, abutting upon Brockley-road and Manor-road (Mr. J. Webster for Mr. P. Verschooten).—Consent.

Hampstead.—An iron and glass porch in front of No. 13, Marefield-gardens, Finchley-road, Hampstead (Mr. H. Carpenter for Mr. S. Baer).—Consent.

Hammersmith.—Retention of a building to be used as a watch-box on the eastern side of Wood-lane, Hammersmith (Mr. W. Weaver for the Council of the Royal Borough of Kensington).—Consent.

Strand.—A deviation from the plans approved for the erection of a building for the United Universities Club, Suffolk-street and Pall Mall East, so far as relates to the substitution of two smaller balconies for one large balcony at the first floor level on the Pall Mall East frontage (the projecting portion of the front being also kept back to the main front of the building), and an alteration in the projection and length of the two balconies at the first floor level on the Suffolk-street frontage (Mr. R. Blomfield, A.R.A.).—Consent.

Hampstead.—Retention of a projecting clock in front of No. 118, West-end-lane, Hampstead (Mr. R. Cornish).—Consent.

Lewisham.—Bay windows above the one-story shops in front of Nos. 23, 24, 25, 26, and 27, Crofton-park-terrace, Brockley-road (Messrs. Tonkins & Connew).—Consent.

Paddington, South.—An iron and glass conservatory at the first floor level at the rear of "Keith House," Bayswater-road, Paddington (Mr. L. H. Isaacs for Sir Clifton Robinson).—Consent.

St. George, Hanover-square.—An oriel window and balconies in front of a proposed extension of the Berkeley Hotel, Berkeley-street, Piccadilly

(Mr. R. Griggs for the Berkeley Hotel Company, Ltd.).—Consent.

Lewisham.—A one-story shop in front, and at the flank, of No. 14, Brownhill-road, Catford (Mr. A. W. Osborn for Mr. B. Walker).—Consent.

Wandsworth.—An addition to a building at the rear of No. 1, Mitre-terrace, Mitcham-road, Tooting, to abut upon Vant-road (Mr. E. Bates for Messrs. Welfords Surrey Dairies, Ltd.).—Consent.

Westminster.—An alteration to a porch in front of No. 87, Victoria-street, Westminster (Messrs. Griffin & Woollard for Mr. J. B. Martin and others).—Consent.

Strand.—Two oriel windows in front of Nos. 59 and 60, Pall Mall (Mr. E. G. Dawber for the London and Lancashire Fire Insurance Company).—Consent.

Fulham.—The retention of a wood and iron motor-house at the rear of No. 219, New King's-road, Fulham, abutting on Coniger-road (Dr. F. J. Ayre).—Consent.

St. Pancras, North.—Deviation from the plan approved for the erection of a building, with a one-story portion in front, upon the site of No. 73, Highgate-road, St. Pancras, so far as relates to the construction of two skylight windows over the one-story portion next the wall of the main building, and to the erection of an iron and glass covered way over the front portion of the cartway entrance to the premises (Mr. S. P. Rees).—Consent.

Islington, East.—A building on a site abutting upon Prabh-road and St. Thomas-road, Finsbury-park (Messrs. F. Matcham & Co.).—Refused.

Hammersmith.—The retention of a wooden signboard in front of No. 47, King-street, Hammersmith (Mr. F. T. Harris for Mr. H. Samuel).—Refused.

Norwood.—An iron and glass shelter in front of No. 26, Vaughan-road, Camberwell (Mr. G. G. Rogers for Mr. F. J. Westcott).—Refused.

Rotherhithe.—Buildings on the site of No. 247, Lower-road, Deptford (Mr. J. H. Bethell for Mr. H. Bellsham).—Refused.

Width of Way.

City of London.—A building on the site of Nos. 75 and 76, Lombard-street, City (Mr. M. E. Collins for Messrs. Slazenger & Son).—Consent.

Hackney, North.—Permission to retain wooden enclosures at the rear of No. 34, Newington-green, Hackney, abutting upon Church-path (Mr. R. Manley).—Refused.

Width of Way and Lines of Frontage.

Dulwich.—Buildings on the west side of Vestry-road, Camberwell (Messrs. E. Crosse & Co. for Mr. C. Pedley).—Consent.

Camberwell, North.—A dwelling-house and a one-story shop on the west side of Harvey-road, Camberwell, southward of No. 6 (Mr. W. Smith).—Refused.

Hammersmith.—A building at the rear of No. 243, Uxbridge-road, Hammersmith, to abut upon Askew-crescent (Messrs. Prickett & Ellis for Miss Acton).—Refused.

Space at Rear.

Brixton.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of buildings on the southern side of Camberwell New-road, next Denmark-hill, with irregular spaces at the rear (Mr. R. L. Pearce for Mr. A. A. Carter).—Consent.

Southwark, West.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a two-story stable building on a site at the rear of warehouses on the south-east side of Barron's-place, Southwark (Mr. A. E. Chasemore for Mr. W. Sumpson).—Consent.

Formation of Streets.

Kennington.—That an order be issued to Mr. C. Barker sanctioning the formation or laying-out of a new street for carriage traffic to lead from Lower Kennington-lane to Denny-street, Lambeth (for the Duchy of Cornwall).—Consent.

Lewisham.—That an order be issued to Mr. E. E. Leach sanctioning the formation or laying-out of a new street for carriage traffic to lead from Perry-hill to Castlans-road, Lewisham.—Consent.

Wandsworth.—A deviation from the plans sanctioned for the formation or laying-out of new streets for carriage traffic out of the western side of Thrale-road and northern side of Nimrod-road, so far as it relates to the omission of the footpath on the northern side of the road adjoining Tooting Graveney-common (Messrs. D. Young & Co. for Messrs. A. W. Gosden & H. F. Crunden).—Consent.

Wandsworth.—That an order be issued to Mr. J. C. Radford sanctioning the formation or laying-out of new streets for carriage traffic out of the south side of Hazlewell-road and in continuation westward of Chartfield-avenue, Putney (for Lord Westbury).—Consent.

Paddington.—That at the request of Mr. A. T. Stewart the Council do permit the retention of wooden fences or barriers across Biddulph-road

and Ashworth-road, on the Paddington Estate, Sutherland-avenue, Paddington.—Agreed.

Wandsworth.—That the Council do consent to the application of Messrs. Holloway Brothers for permission to retain barriers across Ellerton-road, Wandsworth.—Agreed.

Whitechapel.—A deviation from the plans approved for the formation or laying-out of streets for foot traffic only on a site on the west side of Backchurch-lane and east side of Gower's-walk, Whitechapel, so far as relates to an alteration in the position of buildings on the western side of Backchurch-lane (Messrs. Crickmay & Heath).—Consent.

Hackney, South.—A deviation from the plan approved for the formation or laying-out of a new street to lead from Morning-lane to Chatham-place, Hackney, so far as relates to an alteration in the position of the boundaries of such street (Messrs. Hodson & Whitehead).—Consent.

Cubical Extent.

Rotherhithe.—The erection at Messrs. Peek, Frean, & Co.'s biscuit works, Drummond-road, Keeton's-road, and Storks-road, Bermondsey, of additions to Blocks B, C, L, M, N, and N1, whereby such blocks will exceed in extent 250,000 cubic feet (Messrs. Stock, Page, & Stock for Messrs. Peek, Frean, & Co., Limited).—Refused.

Deviation from Certified Plans.

Holborn.—Deviations from the plans certified by the district surveyor, under section 43 of the Act, so far as relates to the proposed erection of a building on the site of Nos. 240 and 241, High Holborn (Mr. H. T. C. Newton-Mason).—Consent.

Working-class Dwellings.

Camberwell, North.—Five intended dwellings to be inhabited by persons of the working class, and proposed to be erected on a site at the rear of dwellings in Preton-street, Camberwell (Messrs. J. A. J. Woodward & Sons for Mr. J. Dennis).—Consent.

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

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS.—At the usual monthly meeting of the Sheffield Society of Architects and Surveyors, held at the Literary and Philosophical Society's rooms, on the 8th inst., Mr. G. C. Snaith delivered a lecture on "An English Monastery in the Middle Ages." Mr. T. Winder presided in the absence of the President. Mr. Snaith said monasticism dominated the Middle Ages. The ideal life was monastic; all that made for progress up to the dawn of the Renaissance came from the monasteries. Learning survived only within their walls; education was possible in the art of the monks; schools; agriculture was the art of the monks. They cleared the forests, ploughed the fields, made barren wastes into fruitful farms. Monasteries were the refuge for the oppressed in a world where force reigned otherwise undisputed. Monastic life was not an institution peculiar to Christianity, and he instanced the surprise of the Spaniards who, in the XVth century, discovered among the Aztecs of South America convents above which glittered the gilded cross. The lecturer dealt principally with the Benedictine Order and its reformed branch, the Cistercian Order. The causes leading to the foundation of Fountains Abbey, a house of the latter order, were instanced as typical of those which led to the erection of so many of the beautiful abbeys of Yorkshire. By means of a plan and views the various parts of a monastery were illustrated, and a description was given of the daily life of the monks. The lecture was illustrated by lantern slides, and at its conclusion a vote of thanks was proposed by Mr. H. Wilson, seconded by Mr. E. M. Gibbs, and supported by Messrs. C. Pawson, C. P. Innocent, W. J. Hale, J. R. Wigfall, and the Chairman.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the 8th inst., Mr. H. Percy Adams delivered a lecture on "Sanatoria, Mr. W. H. Thorp in the chair. Mr. Adams, in dealing with the general principle of a sanatorium, remarked that such institutions should serve two purposes: the healing of patients suffering from lung diseases, and also that they should act as schools where people were systematically taught the value of fresh air and cleanly habits, so that when the patients left and were distributed among the community they should spread the knowledge so acquired as well as practise it in their homes. Therefore, such an establishment should be a model of hygienic requirements. Sanatoria might generally be divided

into two classes—the American or cottage type and the concentrated or hotel type. He expressed the opinion that for the accommodation of anything like one hundred patients the hotel type of sanatorium was a practical necessity, but for small establishments of about twenty beds the cottage type was probably the best from a purely medical point of view. No sanatorium built in England on the cottage plan had more than twenty beds, but on the Continent they sometimes had more than fifty patients. He argued that there was no economy in erecting buildings of a purely temporary character, because there was so much in common between such structures and those of a permanent character. Speaking of the Germans as having been the pioneers of these institutions, many of which had been erected by the insurance companies, Mr. Adams showed views and plans on the screen of a number of these institutions, many of which he had visited, and gave many details of their arrangements. He then proceeded to give the history of the movement which resulted in the conception of the erection of the King Edward VII. Sanatorium, of which he is the architect, and gave many details of the structural features and arrangements of the establishment now approaching completion at Midhurst. Mr. E. R. Dolby, engineer, of Westminster, who has been associated with Mr. Adams in the erection of King Edward VII. Sanatorium, described details of the heating, hot-water service, and electrical arrangements of the Midhurst Sanatorium.

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting on Tuesday, the 6th inst., Sir A. Binnie, President, in the chair, it was announced that fifteen Associate Members had been transferred to the class of Members—viz., Messrs. Robert Adam, J. W. Anderson, John Cowan, Michael Elliot, C. N. Goodall, John Halliday, W. A. Harper, C. M. Herdman, E. P. Hooley, A. J. Knowles, Albert de Linde, F. H. Lives, G. T. Lynam, P. le J. de Segrain, George Watson. It was also reported that eighteen candidates had been admitted as students. The monthly ballot resulted in the election of thirteen Members—viz., R. A. Dawbarn (Sidcup), R. M. Deeley (Derby), H. E. Gwyther (Rio de Janeiro), J. L. Harrington (Kansas), H. C. Kidd (London), W. W. Lackie (Glasgow), J. B. Lewis (Melbourne), Magnus Maclean (Glasgow), C. T. Purdy (New York), F. P. Purvis (Tokio), Frank Rigby (Alsager, Cheshire), M. D. Robinson (Indwe, Cape Colony), A. M. Sillar (London); and twenty-four Associate Members—viz., M. McC. Biddler (Bangkok), T. W. K. Clarke (London), H. S. Coppock (Wales), B. D'O. Darley (India), F. T. Ercoyd (Manchester), W. P. Gauvain (Wahai, N.Z.), C. H. George (Ashton-under-Lyne), H. S. Giles (Oswestry), John Haddin (Glasgow), William Hawthorne (Kircubbin), W. C. Houston (Edinburgh), H. O. Johnson (Ystad, Sweden), H. F. Kerr (London), R. T. McKay (New South Wales), D. R. MacLachlan (Leeds), E. E. Mann (Victoria), C. H. Mitheli (Toronto), James Muirhead (Rugby), Geoffrey Parker (Alexandria), F. B. Robinson (Skipton), W. H. Stacey (Birmingham), J. N. Stirling (Govan), Gillis Svensson (Waltham Cross), P. C. Young (Baluchistan). There were elected two Associates—viz., Julio Brandão (Brazil), C. E. Hawkins (London).

COMPETITIONS.

CARNEGIE LIBRARY COMPETITION, CROMPTON.—The assessor appointed in this competition has given his awards as follows:—First (premium of 30l.), Mr. Jesse Horsfall, F.R.I.B.A., 4, Chapel-walks, Manchester; second (premium of 20l.), Messrs. A. E. Dixon, A.R.I.B.A., & Chas. H. Potter, 65, King-street, Manchester; third (premium of 15l.), Mr. Thos. J. Hill, 55 Cross-street, Manchester; fourth (premium of 10l.), Messrs. John Eaton, Sons, & Cantrell, Stamford-street, Ashton-under-Lyne. There were forty-six designs submitted. The awards were unanimously approved by the Free Library Committee, and, on the arbitrator's recommendation, it was decided to give an additional premium (30l., 20l., 15l., and 10l.,

instead of 30l., 20l., and 10l. as originally intended).

LUTON SECONDARY SCHOOL AND TECHNICAL INSTITUTION.—The design of Messrs. Spalding & Spalding, of 15, Queen-street, Cheap-side, London, for the Luton Secondary School and Technical Institution has been selected by Mr. H. Percy Adams, the assessor. The whole of the designs submitted will be publicly exhibited at the Town Hall, Luton, on the 26th and 27th inst., between the hours of 10 a.m. and 4 p.m.

BOOK RECEIVED.

BRASS AND IRON FOUNDING. By Joseph E. Dangerfield. (Dawbarn & Ward. 6d.)

Correspondence.

R.I.B.A. FELLOWSHIP.

SIR,—I am sorry that it should again be necessary to ask your assistance on this vexed question. Is it not time that the Council settled the real function and purpose of the Fellowship? Is it (1) a means of providing money for the exchequer? or is it (2) a means of keeping in check the Associates? or is it (3) a means of recognising eminence in professional work?

The recent nomination and election of the group of really leading men might imply that (3) was the motive, and that the Institute wished to honour men of power and eminence, but many of us wish to know whether the Secretary informed these gentlemen how the members of the profession have been implored and entreated to become Fellows (not, be it noted, Associates), and what a brilliant company of colleagues in the Fellowship have been and are being provided for them.

I should like to have an opportunity of expressing the wide-spread disgust and scorn with which the action of the R.I.B.A. is regarded by all whom I meet; and as showing that this is not a merely personal expression of opinion, I may state that I hold letters from most of the leading provincial allied societies strongly endorsing the protest of the Leeds and Bradford Associates, which I was instructed to forward to you and to them.

If the Institute sees fit to flout the strongly-expressed protest of the allied societies in this way, and if the London men are content to be ignored, it will become necessary, and not for the first time, for the provinces to lead; and I think I can promise them an opportunity of voting by ballot on some of the nonentities who are rushing into what was once thought to be the more honourable class of membership.

There are, of course, other methods still possible of bringing our views before the members of the Institute; and our members here feel so strongly on the matter that we intend to make the matter a test question in voting at the forthcoming Council Election.

FREDK. MURRO.

Leeds.

* * * We print the above as it appears to express the feelings of a certain number of persons; but in our opinion the wrath expressed in it is due to persons on one side, and on the other we feel quite clear Fellowship of the Council cannot be regarded as a recognition of men of eminence merely. Every competent, well-instructed, and honourable architect who has been in practice the required number of years, though he may not be an architectural genius, has in our opinion a right to election as Fellow. Fellowship of the Institute cannot be taken as the reward of genius; it is the enrolment of a competent professional man—that is all. The men who possess exceptional talent will always make their influence felt without any question whether they are doctored as Fellows or not.—Ed.

THE LATE MR. J. P. SEDDON.

SIR,—In your obituary notice of the late Mr. J. P. Seddon in last week's *Builder* it is inadvertently stated that the deceased was joint Hon. Secretary with me at the time of the transfer of the Royal Architectural Museum to the Architectural Association. Permit me to point out that owing to my absence in the year Mr. Seddon had retired from office long before the time referred to; and after attending occasionally as a member of the Council for some while, in the interval, he was elected to the honorary position of Vice-President in recognition of his past services to the Museum. It was for this reason that the Council of the Association elected Mr. Seddon as Mr. Seddon with a silver bow on the occasion to which you allude, when I also was honoured by a similar recognition (for my twenty-six years as Hon. Secretary) before the Council dissolved. I had acted alone for many a long day, and when I contemplated the gift of the Tufton-street property to the Architectural Association, Mr. Seddon as my old valued colleague, was the first person to whom I submitted the project after having obtained the approval of our President, Sir William Emerson. Mr. Seddon at once

gave the matter his warmest support, and, notwithstanding the state of his health, immediately be heard of my proposal came over specially to my house one very cold inclement Sunday to discuss the details. Subsequently under date of May 13, 1904 (when circumstances arose which I need not mention here), he wrote to me, "I never, to my knowledge, heard of any proposal to make over the Architectural Museum to the Architectural Association till you suggested it to me, and then it came quite as a novelty."
At the funeral, Mr. W. D. Caröe and Mr. G. H. Fellows Fryant were present at the church service on behalf of the Council of the Royal Institute of British Architects, and I attended as late Hon. Sec. of the late Museum. Mr. Francis Ford, the curator, also was there, but the only representatives of the profession present at the grave side when the interment took place at Fulham were Mr. D. G. Driver, the Secretary of the Architectural Association and Royal Architectural Museum, and myself.

MAURICE B. ADAMS.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—VI.

SHORT CUTS TO MULTIPLICATION (continued).

Multiplication by Certain Numbers.

To multiply any whole number by 11.

Rule.—Write down the right-hand figure of the multiplicand, and for the other figures of the product in order from the right-hand write down in succession the sums of the first and second, the second and third, the third and fourth figures of the multiplicand, until the last figure is reached. The respective sums are to be increased by any numbers carried over from the preceding additions, and the last figure of the multiplicand is to be written down with the addition of any number carried over from the preceding sum.

Example: Multiply 46257 by 11.

46257	Ordinary Method.
11	46257
508827	46257
	46257
	508827

To multiply any whole number by any number from 12 to 19 inclusive.

Rule.—Starting from the right-hand multiply the first figure of the multiplicand by the first figure of the multiplier; multiply the second figure of the multiplier, adding in the first figure of the multiplicand; continue the process until the last figure of the multiplicand has been so dealt with. Then (1) if the last-obtained figure of the product is under 10, write to the left of it the last figure of the multiplicand; or (2) if the last multiplication and addition give a number of two figures, add to the left-hand figure of that number the last figure of the multiplicand.

Example (1): Multiply 20657 by 14.

Here the process is as follows:—
7 x 4 = 28, write down 8 and carry 2; 2 + (5 x 4) + 7 = 29, write down 9 and carry 2; 2 + (6 x 4) + 5 = 31, write down 1 and carry 3; 3 + (0 x 4) + 0 = 0, write down 0; and finally (2 x 4) + 0 = 8, which is also written down.

Thus the product so obtained is 89198, and writing to the left-hand of it the left-hand figure of the multiplicand we get 289198, which is the required product.

Example (2): Multiply 24657 by 17.
Here the process of multiplication is performed as in Example (1), giving 219198, the last-obtained number being 21. To the left-hand figure of this add 2, the last figure of the multiplicand, making the final product 419198.

To multiply by 11 any whole number of two figures whose sum does not exceed 9.

Rule.—Write down the sum of the two figures between the two figures themselves.

Example: Multiply 54 by 11.
Here 5 + 4 = 9, which placed between 5 and 4 gives the product 594.

To multiply by 11 any whole number of two figures whose sum exceeds 9.

Rule.—Write down the sum of the two figures between the two figures themselves, and increase the left-hand figure of the product by the number carried over from the addition of the two figures.

Example (1): Multiply 64 by 11.
Here 6 + 4 = 10, which placed between 6 and 4 gives 6(10)4 = 704.

Example (2): Multiply 96 by 11.
Here 9 + 6 = 15, which placed between 9 and 6 gives 9(15)6 = 1056.

To multiply by any multiple of 11 not exceeding two figures any whole number of two figures.

Rule.—Write down the sum of the two

figures after multiplication by the number representing the multiple of 11 between the two figures after similar multiplication.

Example (1): Multiply 34 by 22.
Here twice 3 and twice 4 = 6 and 8 respectively and their sum = 14, which placed between 6 and 8 gives 6(14)8 = 748.

Example (2): Find the square of 22.
Here the two outer figures of the product are evidently 4 and 4, and as the sum of these figures is 8, we get 484, which is the required square.

Example (3): Multiply 33 by 22.
In this case twice 3 and twice 3 = 10 and 6 respectively, which can be written down or mentally noted as the two outer figures of the required product. The sum of these figures = 16 gives 6 as a figure of the product, the two last figures being 69, while the first two figures will be 10 + 1 carried from 16, and the required product of 726 is thus obtained.

Example (4): Multiply 19 by 33.
Here the products of 1 and 9, multiplied by the figure representing the multiple 33, are 3 and 27 respectively, and the sum of these = 30. Therefore, we can write down or mentally note, 3, 30, and 27, giving the clue to the required product, which, commencing at the right-hand side, obviously includes:—In the first place, 7; in the second place, 2 carried over from 27; and in the third place, 3 plus the 3 carried over from the 30. Thus we get 627 as the product.

Example (5): Find the square of 33.
Here the outer figures of the product are evidently 9 and 9, and as the sum of these figures is 18 we get 9(18)9, which obviously gives 10, 8, and 9, or 1089 as the required square.

It is unnecessary to give further examples of this simple rule, which can evidently be applied with great readiness to any of the lower multiples of 11.

To multiply any whole number by 11·25, 112·5, 1125, and so on.

Rule.—Add to the multiplicand one, two, or three, or more ciphers, according as the multiplier represents tens, hundreds, thousands, and so on. To the number so obtained add one-eighth of that number, and the sum will be the required product.

Example: Multiply 1872 by 11·25.

1872
2340
21060

To multiply any whole number by 12·5, 125, 1250, and so on.

Rule.—Add as many ciphers as there are figures in the integral part of the multiplier. Then one-eighth of the number so obtained will be the required product.

Example: Multiply 1872 by 12·5.

187200
23400
210600

To multiply any whole number by 13·3, 133·3, 1333·3, and so on.

Rule.—Add to the multiplicand one, two, three, or more ciphers according as the multiplier represents tens, hundreds, thousands, and so on. To the number so obtained add one-third of that number, and the sum will be the required product.

Note.—This rule is also useful for rough approximations where the multiplier is between 13·25 and 13·5, or between higher decimal values of the same figures.

Example: Multiply 1872 by 13·3.

187200
62400
249600

To multiply any whole number by 14·2857, 142·857, 1428·57, and so on. (Approximate.)

Rule.—Add to the multiplicand as many ciphers as there are figures in the integral part of the multiplier. Then one-seventh of the number so obtained will be the required product.

Note.—This rule is also useful for rough approximations where the multiplier is between 14·25 and 14·5, or between higher decimal values of the same figures.

Example: Multiply 1872 by 14·2857.

1872000
26742857

To multiply any whole number by 15, 150, 1500, and so on.

Rule.—Add to the multiplicand one, two, three, or more ciphers, according as the multiplier represents tens, hundreds, thousands, and so on. To the number so obtained add one-half of that number, and the sum will be the required product.

Example: Multiply 1872 by 15.

187200
93600
280800

To multiply any whole number by 16·6, 166·6, 1666·6, and so on.

Rule.—Add to the multiplicand as many

ciphers as there are figures in the integral part of the multiplier. Then one-sixth of the number so obtained will be the required product.

Example: Multiply 1872 by 16·6.

6)187200
31200

To multiply any whole number by 17·5, 175, 1750, and so on.

Rule.—Add to the multiplicand one, two, three, or more ciphers according as the multiplier represents tens, hundreds, thousands, and so on. To the number so obtained add one-half and one-fourth of that number, and the sum will be the required product.

Example: Multiply 1872 by 17·5.

Adding one cipher and adding one-half and one-quarter of 18720 we get:—
18720
9360
4680
32760

To multiply any whole number by 25.

Rule.—Add two ciphers to the multiplicand; then one-fourth of the number so obtained will be the required product.

Example: Multiply 1872 by 25.

4)187200
46800

To multiply two mixed numbers each ending with the fraction 1/2 (= 0·5).

Rule.—To the product of the two integral parts add half their sum and the fractional part (= 0·25).

Example: Multiply 15 1/2 by 10 1/2 (= 15·5 x 10·5).

Then
(15 x 10) = 150 = 150
1/2(15+10) = 12 1/2 = 12·5
1/4 = 0·25
162 1/2 = 162·75

To multiply any whole number by 33·3, 333·3, 3333·3, and so on.

Rule.—Add to the multiplicand as many ciphers as there are figures in the integral part of the multiplier. Then one-third of the number so obtained will be the required product.

Example: Multiply 1872 by 33·3.

Adding two ciphers and dividing by 3, we get:—
3)187200
62400

To multiply any whole number by 35, 350, 3500, and so on.

Rule.—Add to the multiplicand as many ciphers as there are figures in the multiplier; divide the number so obtained first by 4, and then by 10. The sum of the two quotients will be the required product.

Example: Multiply 1872 by 35.

Adding two ciphers and proceeding as stated above we get:—
4)187200
46800
18720 = (187200 ÷ 10)
65520

To multiply any whole number by 75, 750, 7500, and so on.

Rule.—Add to the multiplicand as many ciphers as there are figures in the multiplier; divide the number so obtained by 2, and divide the quotient by 2. Then the sum of the two quotients will be the required product.

Example: Multiply 1872 by 75.

2)187200
93600
46800
140400

Multiplication by various other numbers can be performed in a manner similar to that embodied in the foregoing rules.

OBITUARY.

MR. BROWN.—Mr. Oswald Brown, M.Inst.C.E., who died on February 10, in his fifty-ninth year, at his residence, Silvertown, Wimbledon, was a son of the late Mr. Joseph Brown, K.C., of Avenue-road, St. John's Wood. He was elected member of the Institution of Civil Engineers in 1879. On leaving King's College, London, he entered the service of Messrs. James Simpson & Son. He then took charge of the erection of the pumping plant, Berlin waterworks, and of the waterworks at Gelatz. As hydraulic engineer to the government, South Australia, he carried out the deep drainage scheme for Adelaide. Mr. Brown enjoyed an extensive practice in London as a consulting engineer, chiefly for water supplies; and he designed the waterworks for Pernambuco. **MR. EDWARD TAYLER.**—We regret to announce the death, at the age of seventy-seven, of Mr. Edward Tayler, the well-known miniature painter.

He was born at Berne, and studied art for a short period at Nottingham, afterwards coming to London, where he paid special attention to miniature painting with great success, eventually adopting this as his profession. For over half a century his beautiful miniatures and water-colour drawings have been known to the public, and for thirty consecutive years he was an exhibitor in the Royal Academy. He was also the Honorary Treasurer and one of the Founders of the Royal Society of Miniature Painters, and in the present exhibition of the Society three of his works occupy a place of honour.

MR. PEEL.—The death, on January 28, at Reading, is announced of Mr. James Peel, aged ninety-four years, one of the oldest members of the Royal Society of British Artists. Mr. Peel was a native of Newcastle, and began his studies under the elder Dalziel. When twenty-nine years old he removed to London as a portrait-painter. He soon, however, devoted himself to landscape painting, and frequently contributed to the Royal Academy and Suffolk-street Exhibitions.

MR. CHANEY.—Mr. H. J. Chaney died on February 13. He was during many years Superintendent of the Standard (Weights and Measures) Department of the Board of Trade, Old Palace-yard, Westminster, and was lately decorated with the Imperial Service Order.

GENERAL BUILDING NEWS.

CHURCH, BURTON-ON-TRENT.—The contracts for the new church of St. Chad, Burton-on-Trent, have been let. The principal contractors are Messrs. Wilcock & Co., of Wolverhampton. The architect is Mr. C. F. Bodley, R.A., and the church will be of Hologram stone, both inside and out, and will be in the late Decorated style. The nave is to be 85 ft. long and 25 ft. wide, and the chancel will be 46 ft. by 12 ft. There will be a chapel with a length of 52 ft. and a width of 15 ft. 9 in. The church will be provided with a square tower rising to a height of 70 ft. The building will seat 750 persons.

CHURCH EXTENSION, ADEBSHOT.—A Commission appointed by the Bishop of Winchester reports that there is pressing need of increased church accommodation in the town, where the civilian population amounts to nearly 20,000 persons. The Commission recommends that the parish church should be enlarged, and that a new church should be built, at an estimated outlay of 8,000l. The scheme has been referred to Mr. T. G. Jackson, R.A., and a building fund has been opened, to which 1,400l. is already subscribed.

CHRIST CHURCH, SHAW, WILTS.—This church has been formally re-opened by the Bishop of Salisbury. Under the direction of Mr. C. E. Ponting, the architect, the west wall of the church has been removed to allow of an extension of the nave. A new apsidal sanctuary has been built in place of the shallow recess in which the altar, originally stood; pillars and arched traces and cloisters of oak have been erected to form nave and aisles, and a new oak roof has been fitted. The new church has been enclosed on three sides by oak screens, and a new oak reredos has been added, consisting of a large central panel, designed to hold the figure of the Crucified Lord, with six smaller panels on each side holding figures of the twelve Apostles. A scheme for filling the windows with stained-glass has been drawn up, and in accordance with this, one of the windows on the north side, representing St. Aldhelm, has been carried out by Mr. Horace Wilkinson, as a memorial presented by the family of the vicar.

BRIDLINGTON NEW CONGREGATIONAL CHURCH.—On the 1st inst., at Bridlington, the foundation-stone of a new Congregational church was laid on a site on the Elms estate, facing St. John-street. The new building will accommodate 240 worshippers, and a schoolroom will be attached, which on occasion may be used as an extension of the church by means of a sliding partition. The architect of the new buildings is Mr. Joseph Shepherdson, Bridlington.

ART SCHOOL, BURSELEM.—The foundation-stone has just been laid of a new school of art, Burslem, as an addition to the Wedgwood Institute. The Town Council has obtained powers to raise a loan of 8,000l. for building purposes, etc., and the building contract has been let to Messrs. W. Grant & Sons for 6,500l. The designs for the new building have been prepared by Mr. A. R. Wood, and they show that the new school will be arranged on the central hall plan.

St. HELEN'S GIRLS' SCHOOL, ABERDEEN.—The new buildings, in Shippon-road, for the school, conducted by the Wantage Sisters, have just been completed, at a cost of about 30,000l., after Mr. F. L. Pearson's plans and designs. They will accommodate forty boarders and 200 day scholars, and comprise a chapel, school-hall with gallery, laboratory, dormitories wherein each child has its own window, community and recreation rooms, and an isolated infirmary having its own kitchen. The general plan is on the central hall system.

COUNCIL SCHOOLS, BLAENAVON.—The new Hillside Council Schools at Blaenavon have just

been opened. The new buildings, which have been erected at a cost of about 7,000l., comprise a mixed school with accommodation for 250 children and an infants' school to accommodate 150 children. The buildings are heated on the low-pressure hot water system, and the schools have been built of St. Julian red bricks, with Forest of Dean stone dressing, by Mr. Charles Cooke, Hereford, from designs by Mr. J. B. Francis, architect, Abergevenny.

BYFLEET NATIONAL SCHOOL.—Since the end of November, the Byfleet National School has been closed for alteration and enlargement, and it was re-opened recently. As enlarged, the school will be recognised by the Board of Education as providing accommodation for 367 children, consisting of 239 mixed boys and girls and 128 infants. This number exceeds the original accommodation by about 140 places. Two new classrooms have been built, and the infants' schoolroom has been enlarged. A central hall, 40 ft. by 22 ft., has been provided, and new cloakrooms and lavatories for the boys and infants, while one of the old classrooms has been converted into a girls' cloakroom and lavatory. The building will be heated by open fireplaces. The alterations involved pulling down the master's house, which abutted on the old school. The sanitary arrangements have been entirely remodelled. The contract price for the work was 2,251l., and the whole of the work is being carried out by Messrs. Martin, Wells, & Co., of Aldershot, from the designs of Messrs. Jarvis & Richards, architects, London.

COUNCIL SCHOOLS, BARNSTAPLE.—The Mayor of Barnstaple recently laid the foundation-stone of the new Council schools in Ashleigh-road. The buildings are being erected by Messrs. Henry Stirling & Son, builders, from designs by Mr. Arnold Thorne, architect.

THE CAUSEWAYSIDE LADS' INSTITUTE, EDINBURGH.—New premises are to be erected for this institute on a site in Causewayside. The building has been planned and designed by Mr. de Spigarnovitch and Mr. J. McLeod, Mr. Robert R. Hogg acting as surveyor. It will contain on the ground floor a refreshment-room and kitchen, waiting-room, lavatory, etc. The first floor will consist of a gymnasium and hall, and on the second floor, which will be partly lit from the roof, there is provision made for a workroom and a games-room. The two entrances on the stair landings will form a bathroom, lavatory, etc. It is intended to heat the building with hot-water pipes. The cost of the premises complete will be about 1,500l.

CENTRAL WESLEYAN HALL, GREENWICH.—The adaptation of the Wesleyan church in London-street, Greenwich, to the purposes of a central hall for the district has now been completed. The work was carried out at a cost of 5,000l. from designs by Mr. George H. Oatley, architect.

BUSINESS PREMISES, WIGAN.—New offices have been opened by the Prudential Assurance Company in Library-street, Wigan. Mr. W. C. Ralph was the architect for the work, the contractor being Mr. W. Johnson.

BIDEFORD IMPROVEMENTS: NEW MUNICIPAL BUILDINGS, ETC.—Visitors during the present year to Charles Kingsley's beloved "little white town on the hill" will not fail to notice decided evidences of advancement in Bideford's architectural attractions. The beautiful statue of Charles Kingsley on the river bank at the Park entrance, which was unveiled by Lord Clinton on February 7, is the first monument of its kind erected in Bideford. On the same day was formally opened the new Municipal Buildings and Free Library, situated at the west end of the Long Bridge and adjoining the Fowl Hall. The new buildings are one story in height and in Elizabethan-Gothic style, and are from designs by Mr. A. J. Dunn, of Birmingham, the work being carried out by Mr. H. Glover, of Bideford, whose tender was 5,492l. In adding the new premises, some of the alterations which have been made to the old Town hall, and the seating accommodation in the Petty Sessional room has been increased, whilst the system of hot water heating installed in the new portion has been extended to the Town Hall. The new buildings occupy a frontage of 31 ft. on Bridge-street, and 108 ft. on the New-road. The stonework at the base is in grey Foresters' Dean stone, and the upper portions of the buildings are of bricks with Monk's Park freestone dressings. A loaded turret is one of the most striking portions of the exterior. The new Council Chamber is 29 ft. by 26 ft., and 24 ft. in height. Below this are rooms designed as offices. The entrance to the library and reading-room is the New-road, facing the river. The reading-room is 34 ft. long, by 23 ft. wide, and 19 ft. in the clear of the wagon-head roof.—*Western Morning News.*

EPISCOPAL RESIDENCE, SOUTHWELL.—The Bishop of Southwell laid the foundation-stone of a new episcopal residence at Southwell. The new house is the design for which is Mr. W. D. Carie, has been planned so as to incorporate the ancient hall which was restored by Bishop Trollope in 1884, as well as

the old palace now in ruins. The form of the old building will not be altered, and the new part is designed on simple lines.

PROPOSED EXTENSION OF THE DEWSBURY WORKHOUSE INFIRMARY.—Mr. G. A. Fox, architect, attended the meeting of the Dewsbury Board of Guardians on the 2nd inst. to explain the plans of the proposed extension of the Workhouse infirmary. He stated that, basing his estimate on what had been done previously, the cost would amount to 100l. per bed. There were ninety-four beds. In reply to questions, Mr. Fox said they could reasonably hope to complete the work for 10,000l. The plans were approved, and it was decided to forward them to the Local Government Board.

GRAND SURREY CANAL, CAMBERWELL.—A new foot-bridge across the canal, affording means of access between St. George's-road and Neate-street, was opened on January 29. It consists of a steel lattice girder bridge, having three spans, and with the approaches is 410 ft. long. Messrs. Henry Woodhull & Sons, of Catford, were the contractors for the entire work, upon a contract for 3,969l., and the designs were prepared by Mr. William Oxtoby, Engineer to the Camberwell Borough Council.

ROWTON HOUSE, NEWCASTLE-ON-TYNE.—A new Rowton House has just been opened at the top of Dog Bank, Lower Pilgrim-street, Newcastle, for the Northern Rowton Houses, Ltd. The building, which exteriorly is of red brick, is of three stories, containing 254 cubicles, or separate chambers. The whole of the doors and staircases are of ceramic tile, the former being covered with wood sheathing. On each landing there are three water hydrants—there being fifteen altogether in the building—with the necessary hose, so that a copious supply of water can be instantaneously at command, and there are two emergency staircases, one at either end. The entrance to the building is in the former being in Dog Bank, and leads immediately to the office, where tickets are taken. From this office the whole of the telephones and electric lighting throughout the building are controlled. Turning to the right after passing the turnstile the visitor reaches the kitchen, sculleries, cooking ranges. At this end of the building also are the crockery, blanket, linen, and other stores, a disinfecting chamber, hot-water boiler-rooms for heating purposes, the staff women's bedrooms, wash-houses, etc., and there are also lifts for sending up to all the floors the blankets, linen, etc. There are four large bath-rooms, and several ranges of hand and foot washing basins in different parts of the house, all of which are lined with white enamelled tiles. On the left of the main entrance is a recreation-room, a library, and a small writing-room. At the front of the building facing the river is a balcony, on which seats are provided. The building has been designed by Mr. J. C. Maxwell, architect, the contractor being Mr. S. F. Davidson, Newcastle.

MASONIC CLUB, NORWICH.—A new club for the Freemasons of Norwich and Norfolk has been erected at 47, St. Giles's-street, Norwich, from competition plans prepared by Mr. A. C. Havers, architect. The facade is classic in character, and is carried out in Monk's Park stone, with parts in Portland stone. The rooms for the club members are all on the ground floor, and those for the different lodges and chapters on the first floor, being approached by a staircase from the entrance hall. The kitchen, scullery, and domestic offices are on the second floor, the approach being by secondary or service staircases from the back hall adjoining the staircase hall. The service bedrooms and linen store are on the top floor in close proximity to the kitchen and domestic offices, but on a higher level. The following firms have been concerned in the work: Messrs. John Young & Co., builders; Chas. Payne & Co., electric light; Ellis Geary & Co. London, flooring; Kite & Co., London, heating and ventilation; Watson & Kirby, Norwich, paper hanging, electric bells, lavatories, and lifts; Chas. Havers & Sons, stoves, etc.; Mr. Arthur H. Norwich, Grouse plaster ornamentation; and Mr. Geo. Boston, furniture ornamentation.

MITCHELL LIBRARY, GLASGOW.—The new building for the Mitchell Library in Glasgow will occupy a site in North-street, to the east of the St. Andrew's Halls, and extending from Berkeley-street to Kent-road. The length of the building from north to south is about 189 ft., and the depth from east to west about 105 ft.; and there will remain a considerable space between the library and the halls available for extension of the library in the future. The accommodation provided includes a main reading hall, 11 ft. by 51 ft., arranged for 300 readers; students'-room for 50 readers; ladies'-room for 50 readers; magazine-room for 200 readers; and suitable apartments for the Jeffrey Reference

Library, for the Glasgow Collection, and for the Burns' Library and Scottish Poets' Corner. Provision is made for the storing of about 400,000 volumes, and for the necessary administrative offices. The estimated cost of the building as approved by the Corporation is 52,850l. The architect is Mr. William B. White, of Glasgow.

ASSOCIATED, LIVERPOOL.—In terms of the will of the late Mr. William Buckwell, of Deptford, a portion, amounting to about 15,000l., of his residuary estate will be expended upon the building and endowment of memorial almshouses at Lingfield, Surrey, for the poor of Lingfield and Deptford.

PROPOSED PAVILION, LANCASTER.—It is stated that Lord Ashton intends to present to Lancaster a structure which will be erected in the park, and, in fact, work has already begun. The structure is from designs by Mr. John Belcher, of London, who has prepared a model for the Academy. The structure will be reached by flights of steps, and is surrounded by a terrace about 70 ft. above the lower level of the park. The lower hall is 5 ft. 6 in. above the terrace level, is 42 ft. in diameter, and the same in height, with an octagonal dome. From this hall there are two staircases leading to the upper stage and also into the main domed chamber. Another staircase leads from this hall to the higher galleries, and it also provides communication with the four angle terraces. There is a third gallery above the upper colonnade, which surrounds the drum of the dome. At this level there will be four groups of stately, illustrating "Commerce," "Industry," "Science," and "Art." The sculpture work has been entrusted to Mr. Herbert Hampton. An iron staircase leads through the dome to the belvedere, 118 ft. above the level of the terrace. The total height to the vane is 220 ft. from the ground below the main stairway. At the base of the main steps, and enclosed by the two semi-circular flights, is an ornamental water, 51 ft. long by 20 ft. wide, with a niche under the landing, at present shown with a figure of Atlas. The main building is to be constructed externally of Portland stone.

STAINED GLASS AND DECORATION.

LIVERPOOL CATHEDRAL.—It is announced that Mr. S. J. Waring (of Waring & Gillow, Ltd.) and his sons will present an entire set of choir stalls—to be executed after designs by Mr. G. F. Bodley, R.A.—to commemorate the firm's long connexion with the city of Liverpool, where their business was first established. It is anticipated that the carving of the stalls will be executed in Messrs. Waring & Gillow's workshops at a cost of nearly 8,000l.

MARLBOROUGH CHURCH, NORFOLK.—A memorial window has been placed in the parish church of Marlborough, Wiltshire, in memory of Sub-Lieutenant E. Travers Flotcher, R.N., who was lost in his ship, *Submarine A3*, last summer. The window, erected by his brother officers of his rank, is emblematical of "Hope," and was executed by Messrs. James Powell & Sons, of Whitefriars, E.C.

BURTONUPON AVON, CHESHIRE.—A stained-glass window, by Mr. Edward Frampton, of Pimlico, has been set up in the chancel of St. Boniface parish church, Bunbury, near Tarporley, in memory of Dr. J. Everett Dutton, who died from fever at Kosongu, Central Africa. The design represents "Christ healing the sick."

FORDCOMBE GREEN, BRISTOL, WELLS.—Under the supervision of Mr. C. H. Fellows Prynne, architect, Messrs. Percy Bacon & Brothers have just executed and erected in this church at Fordcombe Green a large three-light stained-glass east window. The central light contains Our Lord in Majesty surmounted by an angel; at the foot are S. Gabriel and S. Michael—the side lights contain figures of the Virgin and S. John in the top portions, with S. Augustine of Canterbury and S. Mildred (founder of Minster Abbey) in the lower parts.

MEMORIAL WINDOW, BARKINGSIDE.—The Bishop of Barking recently unveiled the window which has been erected in Barking-side Church in memory of the late Mr. George Henry Ingram. The window is placed in the north wall of the church, the chief figure being Christ healing the sick. It was designed and executed by Mr. Hemmings, London.

SANITARY AND ENGINEERING NEWS.

ARMSTRONG COLLEGE, NEWCASTLE.—The Council have resolved to establish a Chair of Civil Engineering, and have voted a sum of 2,600l. towards new electrical engineering laboratories in the college. Two scholarships of 125l. per annum apiece will be offered, in competition, to the graduates, in aid of the prosecution of definite research.

COMBINED DRAINS.—The General Purposes Committee of Wandsworth Borough Council has decided to draw the attention of the Local Government Board to the unsatisfactory state of the law with regard to combined drains. It is asked that the matter may be considered with the view of

Bill being introduced next session to amend the law.

MANCHESTER SHIP CANAL.—The half-yearly report of the engineer states that twelve new cottages for the accommodation of the Company's workmen at Eastham have been completed and are in use. The lay-bye above Eastham Locks is practically complete, and the sheers alongside for removing and relaying steamers' funnels have been satisfactorily worked. The works for the extension of the wharf and lay-bye at Warrington have been completed and are in use. All the leading jetties at the locks have been completed. At Partington cooling basin the two additional hoists on the northerly and southerly sides of the canal, with the approaches thereto, have been completed and are in use. The new hydraulic power station has also been completed and is in use. Additional railway sidings at Barton and Trafford Wharf have been completed and are in use. The work required for the increase in the depth of the canal to 28 ft. from Latchford Locks to Manchester, is progressing steadily. Several of the works required in order to permit of the level of the water in the estuary section of the canal being raised so as to give a minimum depth of 28 ft., have been completed, and the others are in hand.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The practice of the late Mr. W. J. H. Glynn, architect and surveyor of 37 and 39, Essex-street, Strand (and formerly of 39, Essex-street), has been taken over by Messrs. Hukins & Mayell, architects and surveyors, of 76a, Westbourne-grove, W., who will continue the practice at the same offices as before.

ROYAL SANITARY INSTITUTE.—At an examination in sanitary science as applied to buildings a public works held at Glasgow on February 9 and 10, one candidate, Mr. David Miller (Glasgow), presented himself, and was granted a certificate.

GOLDSMITHS' COLLEGE, NEW CROSS.—The Goldsmiths' Company have agreed to contribute a further sum of 1,558l. in addition to their previous endowment of the College, in order to defray the cost of equipping the buildings in complete working order.

MEMORIAL TO THE LATE DR. W. REA, JESMOND.—There has just been erected in the old Jesmond cemetery a memorial of the late Dr. William Rea, the musician. It takes the form of a headstone, 7 ft. high, with bronze inscriptions surrounded by a wreath. The stone was designed by Mr. Rob North, architect, of Clifford's Inn, and the bronze relief by Mr. Frank Derwent Wood, sculptor.

CONFERENCE OF METROPOLITAN BOROUGH COUNCILS.—The Lambeth Borough Council have invited the various metropolitan borough councils to send delegates to a Conference which it is proposed to hold at the Lambeth Town Hall with the purpose of framing and establishing a uniform scale of trade-union rates of wages and conditions of service for the workmen employed in each department of the several borough councils.

DIARY AND HANDBOOK OF THE LONDON MASTER BUILDERS' ASSOCIATION.—The London Master Builders' Association have just issued their Diary and Handbook for 1906, and we are glad to call attention again to a well-arranged and useful little work. It contains the names of the officers and members, and a short history of the Association; a summary of working rules and agreements; a list of Conciliation Board decisions; a comparative statement showing the hours worked per week and the rates of wages per hour in various towns; a number of useful tables; some electrical notes and a glossary of electrical terms, and much official and other information which a builder or contractor is likely to want from time to time. The price of this excellent little book is 2s. 6d., and it can be obtained at Nos. 31 and 32, Bedford-street, Strand.

THE SECREPHONE.—This is a simple appliance, made by the Secrephone Company of Coleman-street, London, for securing that conversations at the telephone will not be overheard. It can be easily fitted to the transmitter or mouth-piece of any kind of telephone. By its use it is possible to carry on a conversation at a desk telephone, when other people are in the room, without being overheard. The only drawback to its use apparently is the condensation of moisture on the mouth-piece. The company therefore supply an antiseptic absorbent paper lining which can be readily fitted in and removed from the mouth-piece.

ROYAL ARTILLERY WAR MEMORIAL.—The Royal Artillery South African memorial which is to be erected at the corner of the Mall and the road leading to Storey's Gate will consist of two groups, one of a gun in action and the other of a limber with a pair of horses and one driver. The sculptor is Mr. Colton.

RUSKIN'S HOME IN VENICE.—A memorial tablet has been affixed on the front of the inn occupied by Ruskin in the interval 1877-82. The inscription states that the tablet is erected by the grateful city of Venice to his memory.

LONDON BRIDGE: OLD AND NEW.—A set of pencil drawings by E. W. Cooke, R.A., which Sir David Salomon presented to the Corporation some thirty years ago, have been hung in the corridors of the committee-rooms in the Guildhall. The drawings delineate, with much detail, the demolition of old London Bridge, and the building of its successor. They include views of the St. Thomas's crypt and Chapel pier with the derrick used for drawing the piles of the starlings; the longitudinal arch over Nonesuch lock; the ribbed middle arch, 18 ft. wide, of Long Entry lock; with the cavity of the chapel and additions made from time to time; the alternate polygonal and squared pier-heads; the Shore, Mill, Chapel, King's, Draw, St. Mary's, and others of the originally twenty locks (or arches); and old Fishmongers' Hall. They are valuable, moreover, as a record of riverside scenes, and of shipping and river traffic, under conditions which have ceased to exist. The Grace Collection contains some prints, 1827-32, after E. W. Cooke and W. Knight, of the old bridge, together with Major Yates's water-colour drawings showing the former approaches, etc.

FIRST GARDEN CITY, LTD.—At the recent second annual general meeting, presided over by Mr. Ralph Neville, K.C., the directors' report for the twelve months ended on September 30 was adopted. The report sets forth that a large number of workmen's cottages will be created during the current year, mostly by the Garden City Tenants, Ltd., and that many of the workmen employed by the Garden City Press, Ltd., Messrs. Vickers & Field, asphalt makers, and others, are arranging for the building of their own homes. The total resident population now exceeds 1,500, and houses are required at once for 100 more families. The Heatley-Gresham Engineering Co. settled on the estate in October and, when their works are removed from Bassingbourne, will employ 150 men there. A public elementary school is provided; gas-works have been erected; twelve miles of water-mains are laid; about 280 houses have been erected, representing a capital value of some 90,000l.; and covenants have been ratified for the erection of an additional 150 houses, shops, etc. The total number of workmen employed on the estate in factories, building operations, workshops, and so on is about 500.

EAST END DWELLINGS COMPANY.—From the report to be submitted to the twenty-third ordinary general meeting of the Company on the 19th inst., we learn that "Evesham Houses," the new buildings in Old Ford-road, Bethnal Green, were finished early in the summer, and, with the exception of some of the larger tenements, were rapidly taken up. There has been a marked improvement in the letting of the Company's buildings in and near Victoria Park-square and Globe-road, Bethnal Green. As cottages appear to be more popular in Bethnal Green than tenements in block buildings the directors, with the concurrence of the freeholders, decided to build cottages on some of their leasehold land in that district, and at the close of the year eleven were approaching completion. There are a number of applicants for these cottages, and it is expected that they will let at remunerative rents as soon as they are ready.

SHEFFIELD MASTER BUILDERS' ASSOCIATION.—The annual general meeting of the members of this Association was held recently at the Builders' Exchange, Cross Burgess-street. At the commencement of the proceedings, Mr. Arthur Mastin, the retiring President, occupied the chair. Mr. T. Roper was unanimously elected President for the ensuing year, and was invested with the badge of office by Mr. Mastin. Mr. G. E. Powell was elected senior Vice-President, and Mr. T. Eshelby junior Vice-President. Mr. Arthur Mastin was re-elected treasurer, and Messrs. William May and H. H. Hodkin, auditors. The following formed the committee:—Messrs. J. Longden, J. Biggin, A. J. Forsdike, J. D. Cook, A. Mastin, F. Fidler, H. H. Hodkin, F. Turner, W. Kirkham, J. Vasey, J. S. Teasby, J. Dawson, jun., Charles Roberts, Walter Shaw, J. C. Waring, W. May, G. H. Bown, and W. W. Mears. The deputy treasurer (Mr. J. D. Cook) presented the accounts for the past year, and they were approved. The annual dinner was fixed for March 8. Votes of thanks were unanimously passed to the retiring President, the auditors (Messrs. W. May and H. H. Hodkin), and the deputy treasurer.

BATH MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Bath Master Builders' Association was held at the Assembly Rooms on the 6th inst., the company numbering about 100. Mr. William Webb, the President, had on his right the Mayor (Mr. C. B. Oliver) and the Town Clerk (Mr. F. D. Wardle), and on his left his immediate predecessor (Mr. F. J. Blackmore) and the President of the Bristol Association, Mr. Alfred W. Willis proposed (after the loyal toasts had been honoured) "The Mayor and Corporation of Bath." The Mayor (Mr. Oliver), in his reply, said that one work of the Corporation which touched the building trade had not been met with the success anticipated—he referred to

the building by-laws, and he hoped some way might be found to make operations easier for architects and builders.—The Town Clerk also replied. He said that those who had anything to do with municipal work knew most positively that whoever went on to a council sacrificed time and sacrificed money, because it was an absolute fact that nobody who was on the Council could avoid losing contracts and opportunities of doing business with the body that he served on owing to the strictness of the law.—Alderman Moore proposed "The West of England and South Wales Federation," coupled with the names of Mr. E. W. Wooster, who is President of the Federation, and of Mr. W. F. Long, also of Bath, who is both solicitor and secretary to the Federation.—Mr. Wooster, in reply, acknowledged the honour which had been paid him by the Federation in placing him in the Presidential chair. He recognised that in the south-west they were not so efficiently organised as in London and the north. There were difficulties geographically, but there were hopes now that a central secretary in London had been appointed that they would improve in this matter. Mr. Wooster dealt with the advantages made associations and federations brought to the individual, and placed high among these advantages the fact that it made them known to each other. He regretted that the advantages could not be extended to lessening competition and increasing profits.—Mr. W. F. Long, also responding, described the Federation as a sort of court of appeal, and it was one of the cheapest in the land. "The object was endeavouring to bring about universally the improved principle that the quantities should form part of the contract, or should be guaranteed by the architect or quantity surveyor. The principle of conciliation was also foremost among the objects sought by the Federation."—Mr. George Hayward proposed "Kindred Associations."—Mr. J. Howard, President of the Bristol Association, in reply, referred to the happy relations which had long existed between Bath and Bristol builders. He believed that properly conducted trade unions were for the benefit of the working men, but the great evil in the building trade had to cope with was the limitation of output, and the curtailment of men's energy.—Mr. R. F. Ridd, the incoming President at Bristol, and Mr. G. H. Perrin also replied.—The Mayor briefly proposed the "Bath Master Builders' Association." Reference had been made to the subject of quantities as being a vexed one. There was no reason why quantities should not form part of the contract, but it was the builders' business and not the architects'. If the builders said they would not enter into contracts unless quantities formed part of the contract, the thing was done, and it would only be an equitable arrangement between architect, builder, and client.—The President suitably replied.—Mr. J. Howard proposed "An Immediate Past President."—Mr. Blackmore, in reply, commented on the very admirable relations which existed between members of the Association.—Mr. Erwood then proposed the toast of "The Architects, the Engineers, and Surveyors," and congratulated them upon the selection of one of their number to fill the office of Mayor, and of another to be a member of Parliament (Mr. T. B. Siccock).—Mr. H. W. Matthews and Mr. C. J. Calvert replied.—The last toast of the evening was that of "Our Honorary Members and Visitors," proposed by Mr. C. H. Long.—Mr. Cotterell, in reply, said he had listened in vain for much allusion to the state of the trade. He thought they could say truthfully that there were unmistakable signs of a revival in the building trade. Schemes which had been pigeon-holed for a long time were being brought out and examined.—Mr. H. W. Dodge also responded.

BRITISH FIRE PREVENTION COMMITTEE.—The tests arranged for next week include on Wednesday the 21st, two tests with Kinnear Roller shutter doors, the first with a double door (starting at 9 a.m.) and the second with a single door (starting at 10.30 a.m.). There will also be a test with a floor by the New Expanded Metal Company, this being a reinforced brick concrete floor supported by protected girders. This starts at 1 p.m. On Thursday, the 22nd, there will be a test with a non-proprietary system, namely, with a clinker concrete floor supported by broad flange girders, protected by coke breeze concrete. This test starts at 1 p.m. There will be a limited number of cards available to architects, engineers, and surveyors holding public appointments, and the officials of Fire Insurance Companies. Applications for these should be made in writing to the Assistant Secretary, 1, Waterloo-place, Pall Mall, S.W., by Monday, February 19th latest.

A CHURCH STRUCK BY LIGHTNING.—The parish church of St. Edith, Anwick (a village five miles from Sleaford, Lincolnshire), the spire of which was struck by lightning during the thunderstorm on Thursday last week, is a building in the Decorated period, and is, with the exception of the north doorway and arcade, the work of the XIVth century. In consequence of the condition of the church Messrs. Brewell & Baily, architects, Nottingham, were called in in 1900, and reported upon the church. The chancel was restored

under their direction, at a cost of slightly under 1,000. During the thunderstorm the spire chiefly suffered. The top finial and 5 ft. of masonry or more were lifted right off, shattered into a great number of pieces, and scattered in all directions. Having demolished the apex, the lightning formed a fissure on the north-east of the spire, which has opened up as much as eight or nine inches in some places for at least 15 ft. down. The fluid then ran down inside the spire, and made a large hole right through the masonry about 50 ft. down, continued to the lower window, the east window of the belfry, where it moved the whole of the masonry forming the main arch and disturbed the tracery. The edge of the lead roofing of the nave on the north side is disturbed, as if the fluid then travelled along the edge, and a large stone of the chancel arch has been fung several feet away, but possibly this damage was done by the masonry falling from the spire. The lead and slates are slightly damaged, the roof of the new chancel is just touched, and several bits have been knocked off the buttresses around the church.

Legal.

DISPUTE AS TO THE APPROVAL OF PLANS.

MR. HERBERT SMITH, on the 6th inst., applied *ex parte* to a Divisional Court of King's Bench composed of the Lord Chief Justice and Mr. Justice Ridley for a rule nisi for a mandamus directed to the Middlesbrough Corporation, compelling them to show cause why they refused to approve of certain plans submitted with them in connexion with the proposal of the applicant to erect certain houses in the Lothian-road. The learned counsel said that his client, a builder, proposed to erect the houses in question, and duly deposited the plans in compliance with the local by-laws. The Corporation refused, and still continued to refuse to approve the plans. What the applicant complained of was that the Corporation declined to assign any reason for their action, although it had been pointed out to them that all the statutory requirements had been complied with. The plans had been refused approval some time ago, and on Tuesday last they were again laid before the local authority and disapproved of, although his client had had no notice. On being written to asking for the reason, the reply of the official was that he had no instructions to comply with the request.

The Lord Chief Justice: Have you any authority to show that the Corporation are bound to give their reason for their refusal?

Mr. Herbert Smith said his submission was that the applicant was perfectly entitled to the mandamus to compel the Corporation to give them or to show cause why they would not. His client was willing to take the rule at his own risk.

The Lord Chief Justice said he thought they could only act on the authority of a decided case.

Mr. Herbert Smith said his case was that the Corporation were not acting *bona fide*. His client had sent in plans which it was sworn on affidavit were in accordance with the by-laws and the builder had a statutory right to get an answer.

The Lord Chief Justice, in giving judgment, said that in his opinion the rule ought not to be granted. All the affidavit said was, that the approval of the plans had been twice refused and that they were in the applicant's belief in accordance with the by-laws. In order that a rule should be granted there should be shown that the local authority were not acting properly on matters within their discretion. If that were shown, the matter might be decided otherwise.

Mr. Justice Ridley concurred, and the motion for a rule was accordingly refused.

A RAILWAY COMPANY AND THE LONDON BUILDING ACT.

THE case of Lewis & Salome v. the Charing Cross, Easton, and Hampstead Railway Company, which came before Mr. Justice Warrington in the Chancery Division on the 8th inst., raised an important point of law under the London Building Act, 1894.

The facts were as follows:—The plaintiffs were the leaseholders of No. 21, Cranbourne-street, the house adjoining No. 21. By their special Act of 1893 the defendants were authorised to construct a tube railway running up Charing Cross-road, and crossing Cranbourne-street. At the intersection of Charing Cross-road and Cranbourne-street the company were constructed No. 21, which, being out of requisition as to the deposited plans, was property which they were not entitled to take compulsorily under their special powers, but which they were entitled to acquire by agreement for their "extraordinary purposes" in accordance with sect. 45 of the Railway Clauses Act, 1845. After the defendants had acquired the property they began to pull it down, and the plaintiffs' case was that in so doing they had affected the party wall between Nos. 21 and 22, and that they were only entitled to do

that after giving notice under the London Building Act, 1894, which had not been done. The question whether the company were justified in not giving the notice turned on the construction of certain sections in the defendants' special Act of 1893. Sect. 5 of that Act provided that the company might make and maintain in the lines and according to the levels shown in the deposited plans and sections, the railways and all necessary stations, platforms, approaches, and conveniences connected therewith. By sect. 31 the company might take by agreement for the extra-ordinary purposes mentioned in the Railway Clauses Consolidation Act, 1845, any quantity of land not exceeding in the whole 5 acres, but nothing in the Act was to exonerate the company from any action of other proceeding for nuisance in the event of any nuisance being caused by them upon any lands so taken. For the purposes of the section, "extraordinary purposes" was not, without the consent of the Council, to include the erection of buildings or works for generating electricity or the provision of wharves, and loading or unloading goods or cattle. It also provided that any buildings erected on any land acquired under the section, except such buildings or parts of buildings as might be used for the purposes of a station, should be subject to the provisions of the Acts relating to buildings in the metropolis. Sect. 45 of the Railway Clauses Act, 1845, enacted that it should be lawful for the company, in addition to the lands authorised to be compulsorily taken by them under their powers, to contract with any party willing to sell the same or the purchase of any land adjoining or near the railway not exceeding in the whole the prescribed number of acres for "extraordinary purposes" for the purpose of making and providing additional stations and places for the accommodation of passengers. The company were also empowered to do such other acts as were necessary for making, maintaining, altering, or repairing and using the railway. By sect. 5, subsect. 31 of the London Building Act the expression "building owner" meant such one of the owners of adjoining land as was desirous of building, or of the owners of buildings, storage, or rooms separated from one another by a party wall or party structure as was desirous of doing a work affecting that party wall or party structure. By sect. 20 of the Act any building or structure situate upon the railway or within the railway or station premises, and used in connexion with the traffic of the railway, was deemed exempt from the operation of Parts and 5 of the Act. By the action the plaintiffs claimed an injunction to restrain the company, its contractors, etc., from continuing the demolition of No. 21, Cranbourne-street in such a way as to interfere with the party wall between the premises in question and damages for alleged wrongful interference with the plaintiffs' possession of No. 22, Cranbourne-street. On behalf of the plaintiff it was argued that the company were subject to the provisions of the London Building Act, but the contention on behalf of the defendants was that the Act had no application to them, and that the plaintiffs' only remedy, if any, was for compensation under the Railway Clauses Act.

His lordship, in giving judgment, said he agreed with the company that the pulling down of the house No. 21 was within the company's powers under the Railway Clauses Act, 1845, but the company said that with regard to the erection of buildings to be used for the purpose of a station they were exempt from the requirements of the London Building Act, 1894. The argument of the company was that they were entitled, by virtue of their special Act, and of sect. 16 of the Railway Clauses Act, 1845, to demolish the house, and if, in the course of demolition, they interfered with a party structure, and did what in the case of an ordinary owner could not be done without notice, it did not matter in their case, for they were authorised by their special Act to do it, and the adjoining owner's remedy was compensation. The fallacy of that argument was that, though the special Act authorised demolition, it said nothing about party structures, and it did not even follow that in course of demolishing a party structure need be affected—indeed the company said that nothing they had done affected the party structure. It seemed to his lordship that the company's statutory enactments could not be read so as to authorise them to deal with No. 21 so as to affect the party structure of No. 22 without the necessity of giving notice. In these circumstances the company must be treated for the purposes of the London Building Act as an ordinary owner desirous of doing a work affecting a party wall or structure within the definition of sect. 5, subsect. 31 of the Act, and that being so they must give the required notice.

On the question of whether the party structure was affected by what the defendants had done, his lordship, after having heard evidence and personally viewing the premises, found as a fact that what the defendants had done was so trivial as not to affect the stability of the party wall. He accordingly dismissed the action, but without costs.

Mr. Rowden, K.C., Mr. Cunningham Glen, and Mr. Morle appeared for the plaintiffs; and Mr. Roskill, K.C., and Mr. Austen-Cartmell for the company.

DISPUTE AS TO THE BUILDING OF THE WALDORF THEATRE.

LAST week in the Chancery Division Mr. Rose Innes moved before Mr. Justice Kekewich, on behalf of Mr. E. G. Saunders, to restrain the Waldorf Theatre Syndicate, Ltd., from paying Messrs. Waring & Gillow, Ltd., any further sums in respect to work done or material supplied, both in regard to the erection and equipment of the Waldorf Theatre and from concluding a compromise in regard thereto without the plaintiff's consent. The learned counsel said that Mr. Saunders was a gentleman who, before the opening of Alhways, entered into a contract with the Duke of Bedford to take a considerable area of land upon which the Waldorf Theatre was built. Mr. Saunders put himself into communication with Mr. John Waring, of Waring & Gillow, Ltd., and on June 12, 1903, an agreement was made between them with regard to the finding of money for the erection of the theatre. Half the share capital in the company was to be given to Mr. Saunders and one-half to Mr. John Waring. Mr. Saunders's shares were, as later appeared, issued to himself and he then became the equitable owner of the shares to the number of 8,993, but he had the right to get them back. The motion was brought because Waring & Gillow, who were contractors for building the theatre, were largely represented upon the board of the company. They had three clerks who, as directors, had been approved on one day and what they had done as clerks of Waring & Gillow on the day before. It was Mr. Saunders's contention that the bill of 71,364, was grossly excessive, and defendants admitted that certain sums should come off. Mr. Saunders's position had been untenable, because he had been outvoted by the three other directors. He thought an arbitrator should be asked to fix the exact amount of the building bill. The amount coming in as rent for the theatre was 8,900, a year.

Mr. Maughan, for the defendants, denied that Mr. Saunders was a shareholder or had ever been one. By a resolution of March 2, 1905, passed at a meeting at which plaintiffs was in the chair, it was resolved that Messrs. Waring & Gillow should be instructed to complete the building of the theatre, shops, and offices. Shares were held by Mr. John Waring, who had a private account, and it was to his interest that the bill should be reduced as low as possible.

Mr. Rose Innes thought that Mr. Saunders had sufficient interest in the shares which had been allotted to his name to come there and say that the Syndicate were not dealing fairly with the shareholders.

His lordship, in giving judgment, said the plaintiff contended that the Syndicate should not be allowed to pay the bill of Messrs. Waring & Gillow, and the matter referred to arbitration or a proper account had been taken. He thought that as the plaintiff was not a shareholder he had no right to interfere, though it seemed strange that he was a director and not a shareholder. He was a member of the Board, and the Board was the proper authority to have the control. The majority of the Board afforded no sufficient interest in the shares to suit as a minority had to submit to a majority. Therefore in his character of an alleged shareholder or in his character as a director he seemed to have no interests which would justify him in maintaining an action against the defendants. He accordingly dismissed the motion with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

2,762 of 1905.—R. MAREINICUS: *Fences or Walls*. This relates to a partition or fence consisting of armoured concrete posts or pillars formed with lateral vertical grooves in which slabs or plates also made of armoured concrete are inserted to form intermediate panels.

3,790 of 1905.—L. ZAMBONI, R. H. BOWEN, and J. WILSON: *Window Frames, Pulley Frames, Particularly Applicable for Window Sashes*.

This relates to a pulley frame, and consists in the combination with a hollow face plate, comprising primarily separate front and back members of pressed sheet metal having registered openings for a pulley, of means connecting said plate members in rigid relation, comprising inter-engaged screw sockets, flanges or press-fit metal casing having a recess and flanges on its opposite edges extending between said face plate members, a flap on one of said face plate members engaging said casing recess, a shaft in said casing, and a pulley mounted to rotate in said casing on said shaft.

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

4,485 of 1905.—M. CLARKE, C. CLARKE, and J. CLARKE: *Mountings or Bearings of Tipper and Tipper Boxes for Waste, Water-Closets, and the Like*.

This relates to mounting or bearings of tipper and tipper boxes and consists of a vertical stud, an inclined stud in combination, with an inverted angular projection having a vertical portion and an angular portion and an inner bearing surface.

5,351 of 1905.—W. D. SHEPPARD: *Gas Cooking Stoves, or the Like*.

This relates to a gas cooking stove having the boiler arranged in the bottom part of the stove above the heating burner, and a water supply cistern at a suitable height in the neighbourhood of the stove, and consists in the method of connecting the water inlet supply from the cistern to the lower part of the boiler by passing it completely under and round the lower edge of the stove and thence up into the bottom of the boiler, and by connecting the outflow pipe to the boiler, and by carrying it up from the top of the boiler inside the stove and then out through the flue or chimney of the stove, so as to avoid perforating or drilling of the sides of the stove.

7,163 of 1905.—J. WOLLENDE: *Poultry Coops and Means for Ventilating the same*.

This relates to a poultry coop, which can be made of any shape or size that may be required. The two sides and back are made weather-proof, the front is formed of a head and sill and vertical bars, the vertical bars being spaced and securely fixed on the inside of the head and sill, and all fixed together from the body of the coop. The roof is made to fall from front to back and projects over the body of the coop. The back portion of the roof is secured with hinges to the back portion of the coop, and there is also fixed a steel or iron ring under and in the centre of the projecting front portion of the roof; the whole of the roof may be raised or lowered and can be kept in position at either place by a steel or iron C-shaped hook which passes into the ring at the front portion of the roof, and which has two steel or iron bars projecting downwards forming an angle of 30 degrees, one bar being made heavier than the other, which in case of a storm acts as a lock to the roof and shutter.

8,555 of 1905.—F. C. W. TIMM: *Shaft Furnaces for Smelting, Cement Burning, and other purposes*.

This relates to a process of preserving the inner walls of blast furnaces for reducing, smelting, burning, sintering, and the like, and is characterised by the feature that in charging the furnace a casing is built up against the inner wall of said furnace either by correspondingly shaped blocks or by pressing material between a metallic template and the lining in a measure to correspond to the lowering of said casing and pierced in opposite the twyers so that the air of combustion can pass through the openings into the interior of the casing.

10,740 of 1905.—A. CURRIE: *Siphon Discharge Flushing Cisterns*.

This relates to a siphon discharge flushing cistern, consisting of a box or casing, formed with dome enlargement, a saucer-shaped valve of a diameter nearly equal to the box or casing, and working in the interior thereof in order to produce the flushing, and a siphon tube having a diameter larger at its point of connexion with the dome enlargement than at its discharge or outlet end, through which the flushing water is expelled.

3,992 of 1905.—W. ROHL: *Jointless Facing*.

This relates to a process for the production of a mass for making pavements without joints, according to which pieces of mass of magnesite, gravel, sand, and the like, which is stirred to a thick consistency, with a solution of about 45 per cent. strength of magnesium chloride, is mixed with a similar quantity of a glutinous pitch-like mass, which latter consists of a pit asphalt powder soaked with benzine.

7,340 of 1905.—R. WARMINGTON: *Connections for Joining Branch Drains to Main Sewers*.

This relates to a connexion for joining branch drains to sewers and main drains, and consists of a junction piece longitudinally divided through the central plane, comprising an upper and a lower part, the end part having sockets along each side into which sockets the upper part engages and in which the two parts are cemented together, the division extending also throughout the branch throat for the branch drain.

9,350 of 1905.—J. C. BUTTERFIELD: *Road Making*.

This relates to the binding together of the material of a road by means of a mixture of fine granite, flint, slag, or the like, and chalk, limestone, or the like, with or without asphalt or pitch, or with both in combination with petroleum or other mineral oil and nitro-benzole or other nitrated hydrocarbons.

8,101 of 1905.—L. P. FRIESTEDT: *Metal Sheet Piling and Mine Sheeting*.

This relates to a metal sheet piling and consists of a beam section provided with rib edges, square or cylindrical in cross section, which are bisected by the web of the beam and furnish a locking

shoulder on each side thereof, and a joining beam section so constructed that it is provided on one side with an integral jaw and on the other side with a companion jaw which is riveted to the beam section, said jaws engaging with the above-said locking shoulders so as to lock two sections together to form a continuous wall structure.

12,282 of 1905.—H. N. WILSON: *Cellular Steel Fireproof Building Construction*.

This relates to a cellular steel fireproof building construction, and consists of an impenetrable sheet of steel, bent or folded into triangular cells, and adjacent cells having their angles supporting contact, the exposed surfaces being channelled.

12,474 of 1905.—F. E. TAYLOR: *A Sink and Bath in Combination, both forming the Pedestal to the Sink, for use in Cottages*.

This consists in the combination of a bath and sink, both constructed for and arranged with permanent fittings, for getting rid of the waste water from the sink in a direct and sanitary manner by means of a short waste pipe from the end of the sink emptying directly into the pipe head fixed to iron waste pipe at the end of the bath, this pipe being secured to lugs formed in the recess at the end of the bath.

15,148 of 1905.—G. SMITH: *Gully Traps*.

This relates to a gully trap comprising a casing the sides of which are perforated to within a short distance of its closed bottom, and a frame fitting the open top of the said casing and having perforated pockets to contain disinfecting powder.

15,210 of 1905.—C. P. BRADY: *Devices for Testing Water Pipes*.

This relates to a device for testing pipes, and consists in the combination with a main outer casing communicating with an air pump and provided with an outlet pipe, of an inner receptacle and provided with a flaring top fitting within the top portion of the outer casing, and a closing cover for the two casings.

16,917 of 1905.—W. GABRIEL: *Means for Reinforcing Concrete*.

This relates to a composite bar for reinforcing concrete, and comprises a bar and a continuous piece of wire or metal band, said wire being secured at its ends to the ends of the bar and wound around said bar at intervals apart and alternately in opposite directions, the wire between said intervals of winding being formed into stirrups which extend upwardly and outwardly from the bar and alternately on opposite sides thereof in two planes inclined towards each other in the form of a V and intersecting each other at a point directly above the bar.

17,880 of 1905.—J. O'DOWD: *Road Gutters*.

This relates to a roof gutter, and consists of lengths of plain galvanised iron having one edge flanged to fit upon the moulded edge of the guttering and of means for securing the lengths of iron to the roof.

22,699 of 1905.—G. MEISTER and R. HERZER: *An Adjustable Device for Carrying Loads on the Shoulders*.

This relates to an adjustable load-carrying device, and is characterised by a carrying strap terminating at one end in an eye, and by a rack along which the strap can be adjusted to any desired height and which terminates at its upper end in a pad provided with a felt bolster for preventing the load resting against it from being damaged, and at its lower end in a V-shaped foot which at its free ends is provided with teeth for preventing the load resting thereon from slipping off.

21,622 of 1905.—E. G. WATROUS: *Water-closet Basins and Means for Flushing the same*.

This relates to a water-closet bowl provided with a jet arranged to direct a stream of water into a discharge passage and between the walls thereof, said discharge passage having a contracted portion which prevents a flaring mouth to the jet whereby a substantially solid column or plug of water is discharged drawing or entraining in its wake the combined solid and liquid contents of the bowl.

23,532 of 1905.—DR. A. GASPARY: *Machinery for Moulding Artificial Stone, Slabs, Tiles, Bricks, and such like*.

This relates to a machine for moulding artificial materials, which is so constructed that its compressing and smoothing tool is capable of being moved up and down as well as forwards and backwards longitudinally.

24,188 of 1905.—J. LEVICK: *Ball Floats for Gully Traps and other uses*.

This relates to a ball float for gully traps, which is provided with a float which is capable of effectually resisting the corrosive or other deleterious effects arising from their contact with sewage or other liquids containing chemicals, without its buoyancy or power of flotation being detrimentally affected; and this object is attained by jacketting a metallic or other float with lead which is applied to the exterior of a suitable spherical foundation or body part by a spinning or analogous process, by electro-deposition, or otherwise.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing property sales with columns for location, details, and price. Includes entries like 'Forest Gate—Dames-road, l.g. rents 534. 8s.', 'February 7.—By BAXTER, PAYNE, & LEPPER', and 'February 8.—By DUNCAN & KIMPTON'.

MEETINGS.

Table listing various meetings and societies. Includes 'Royal Institution.—Mr. W. C. Dampier Whetham, M.A., on "The Passage of Electricity through Liquids," 9 p.m.', 'Institution of Mechanical Engineers.—Fifty-ninth Annual General Meeting', and 'Institution of British Architects.—A Special General Meeting'.

BRICKS, &c. (continued).

Table listing brick and material prices. Includes 'Best Dipped Salt Glazed Bricks', 'Quoins, Bullnose', 'Double Stretchers', 'One Side and two Ends', 'White and Dipped Salt Glazed', 'Thames and Pit Sand', 'Best Portland Cement', 'Portland Stone (20 ft. average)', 'Ancaster in blocks', 'Greenhill', 'Darley Dale in blocks', 'Best Corehill', 'Closeburn Red Freestone', 'White Basebed', 'Harn York', 'Hopton Wood (Hard Bed) in blocks', and 'SLATES'.

PRICES CURRENT OF MATERIALS.

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

Table listing prices for various materials. Includes 'Hard Stocks', 'Grizes', 'Facing Stocks', 'Shippers', 'Pistons', 'Bed Wire Cuts', 'Best Fareham Bed', 'Best Blue Pressed Staffordshire', 'Do. Bullnose', 'Best Stourbridge', 'Fire Bricks', 'Glazed Bricks', 'Best White and Ivory Glazed Stretchers', 'Heads', 'Quoins, Bullnose, and Flats', 'Double Stretchers', 'Double Headers', 'One Side and two Ends', 'Two Sides and one End', 'Splays, Chamfered, Squinns', and 'BECKS, &c.'.

WOOD.

Table listing various wood products such as Deal, Battens, and Joists, with columns for 'At per standard' and '£ s. d.'.

JOISTS' WOOD.

Table listing Joists' Wood products like White Sea, Battens, and Second yellow deals, with columns for 'At per standard' and '£ s. d.'.

White Sea and Petersburg.

Table listing White Sea and Petersburg wood products, including First white deals and Battens, with columns for 'At per standard' and '£ s. d.'.

Fitch Pine.

Table listing Fitch Pine products like Fitch pine deals and Yellow Pine, with columns for 'At per standard' and '£ s. d.'.

Oil.

Table listing Oil products such as Raw Linseed Oil and Turpentine, with columns for 'per gallon' and '£ s. d.'.

VAENISHES, &c.

Table listing Varnishes and other products like Fine Pale Oak Varnish and Superfine Hard-drying Oak, with columns for 'Per gallon' and '£ s. d.'.

JOISTS, GIRDERS, &c.

Table listing Joists, Girders, and other products like Rolled Steel Joists and Compound Girders, with columns for 'In London, or delivered' and '£ s. d.'.

METALS.

Table listing Metals products such as Common Bars and Staffordshire Crown Bars, with columns for 'Per ton, in London' and '£ s. d.'.

METALS (continued).

Table listing Metals products like Iron, Sheet Iron, Galvanized, and Best Soft Steel Sheets, with columns for 'Per ton, in London' and '£ s. d.'.

LEAD, &c.

Table listing Lead and other products like Lead Sheet, Zinc Sheet, and Brass, with columns for 'Per ton, in London' and '£ s. d.'.

ENGLISH SHEET GLASS IN CRATES.

Table listing English Sheet Glass in Crates products like 15 oz. thirds and 2 1/2 oz. thirds, with columns for 'per ft. delivered' and '£ s. d.'.

OLLS, &c.

Table listing Oils and other products like Raw Linseed Oil and Turpentine, with columns for 'per gallon' and '£ s. d.'.

VAENISHES, &c.

Table listing Varnishes and other products like Fine Pale Oak Varnish and Superfine Hard-drying Oak, with columns for 'Per gallon' and '£ s. d.'.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications...

TERMS OF SUBSCRIPTION.

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TENDERS.

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

BEVERLEY.—For the construction of a concrete retaining wall, on piled foundations, at wharf on River Hull, Grovehill, for the Corporation. Mr. J. Gomid Smith, Borough Surveyor, Guildhall, Beverley.

BUCKFASTLEIGH.—For building stables and bullock houses, for the Co-operative Society, Ltd. Mr. Andrew Warren, architect, Fours-street, Buckfastleigh.

COWPEN (Blyth).—For additions to stable buildings belonging to Cowpen Urban District Council. Mr. R. Grievs, Surveyor to the Council.

DEVONPORT.—For road works, lane between Whittington and Amherst streets, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal-buildings, Devonport.

DEVONPORT.—For road works, lane between Alma-road and Amherst-street, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, Devonport.

DEVONPORT.—For road works, lane between Hamilton-street and Spencer-avenue, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, Devonport.

DEVONPORT.—For road works, Coldrenick-street, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, Devonport.

DEVONPORT.—For road works, Victoria-road, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, Devonport.

DEVONPORT.—For making-up Alma-road, Enfield Lock, for the Urban District Council. Mr. R. Collins, Surveyor, Public Offices, Enfield.

ELTWICK (Beds.).—For the erection of a villa residence in the avenue, Eltwick, for Mr. F. Knitell, Mr. W. B. Stonebridge, architect, Woburn Sands, B.S.O.

FOREST HILL.—For kerbing, channelling, and metalling the roadway and paving footpaths at Brockley Park, for the Lewisham Borough Council.

FRAMPTON COTTRELL.—For alterations and additions to Council School, for the Gloucestershire Education Committee. Mr. R. S. Phillips, Surveyor, Shire Hall, Gloucester.

TENDERS.—Continued on page 185.

List of Contracts, etc.

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*DESIGNS FOR COLLEGE BUILDINGS	University College of N. Wales	Not stated	No date.

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Fitting up, etc., Five Baths at Girls' School, Workhouse	Belfast Guardians	J. W. Robb, Clerk, Union Offices, Workhouse, Belfast	Feb. 20
Wheels and Axles	Sec. of State R.C.	Director General of Stores, India Office, Whitehall, S.W.	do.
Buffers for Wagons	do.	do.	do.
Bearing Springs for Wagons	do.	do.	do.
Spiral and Volute Springs for Wagons	Foleshill R.D.C.	Surveyor, Union-buildings, Foleshill	do.
Granite	Acton U.D.C.	D. J. Ebbetts, Surveyor, 57, High-street, Acton, W.	do.
Annual Contracts	Battersea Borough Council	Electrical Engineer, Lombard-road, Battersea	do.
Materials for Electricity Department	Great Western Railway Co.	G. K. Mills, Secretary, Fadington Station, London	do.
Extension of Vegetable Market (Ironfounders and Plumbers)	Boole Corporation	B. J. Wolfenden, Borough Engineer, Boole	Feb. 21
Extending Foundry at Grange Ironworks, Mytholmroyd	Bradford Corporation	City Architect, Whitaker-buildings, Brewery-street, Bradford	do.
Dwarf Wall, Stone Coping, and Gate Piers	Burntisland Town Council	W. Williamson, Architect, Kirkcaldy	do.
Extension of Boiler House, new Steam Boiler, etc.	East India Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Extension of Vegetable Market (Ironfounders and Plumbers)	Twickenham T.D.C.	F. W. Pascoe, Surveyor, Town Hall, Twickenham	do.
Public Library, High-street, Burntisland	Southwark Borough Council	J. A. Johnson, Town Clerk, Town Hall, Waterloo-road, S.E.	do.
Pig-Iron	Hammersmith Boro. Council	Borough Surveyor, Town Hall, Hammersmith	do.
Steam Wagon and Six Tipping Wagons	Rhondda U.D.C.	J. Rees, Architect, Hillside Cottage, Penrhyn	Feb. 22
Materials and Stores	Brixworth R.D.C.	do.	do.
*MAKING UP AND PAVING ROADS	Wigston Magna U.D.C.	Mr. Wykes, 5, Elysiun-terrace, Northampton	do.
Enhancement of Pontrhonda School, Llwynypia	do.	Surveyor, Station-road, Wigston Magna	do.
4,500 tons of Granite, etc.	Thame R.D.C.	W. Parker, 2, High-street, Thame	do.
Haulage	Borough Engineer's Office, Town Hall, Salford	do.	do.
Team Labour	Grays Thurock U.D.C.	Surveyor, Council Offices, Grays	do.
Broken Granite	Hackney Borough Council	Norman Scorgie, Borough Engineer, Town Hall, Hackney	do.
Removing Buildings and Erecting Tenements, Dean-road, etc.	Wimbleton Corporation	C. H. Cooper, Borough Engineer, Town Hall, Wimbleton	do.
5,000 cubic yds. of Clay	Bradford Corporation	City Architect, Whitaker Buildings, Brewery-street, Bradford	Feb. 23
Repairs, etc., of Sixty-six Water Vans and Twelve Water Carts	Dore R.D.C.	P. Gwillim, Cwm Dulais, Fountains	do.
800-ft. Run of 22-in. Cast-iron Pipes	Westminster City Council	Westminster City Hall, Charing-Cross-road, W.C.	do.
Chapel, Registrar's Lodge, etc., at Thornton Cemetery	Chipping Wycombe Corporation	T. J. Rushbrooke, Boro. Surv., 77, Easton-st., High Wycombe	do.
Heating	Forest of Dean U.D.C., East, Com.	Vale & Kingsford, Quantity Surveyors, George-st., Gloucester	do.
Works and Materials	Heaton Norris U.D.C.	F. W. Brooke, Clerk, Council Offices, Heaton Moor	do.
Stone, etc., and Carting	Taccaster R.D.C.	T. Scott, Surveyor, Aberford, Leeds	do.
*NEW SORTING OFFICE AT TOTENHAM	H.M. Office of Works	H.M. Office of Works, Storey's-gate, Westminster, S.W.	do.
Removal of Ashpit and other Refuse	Lithelstall U.D.C.	A. H. Carter, Surveyor, Public Offices, Litherland	do.
Extension Steam Heating Apparatus at School, Weston-super-Mare	Somerset County Council	H. Price & W. Jane, Architects, Weston-super-Mare	Feb. 24
Materials, West Riding Lunatic Asylums	Harrogate Corporation	Clerk to Committee, Room 30, County Hall, Wakefield	do.
3,000 tons of Portland Cement	Felling U.D.C.	E. W. Dixon, Engineer, 64, Albert-street, Harrogate	do.
Paving, etc., of a Cross Street at Felling	Ammanford U.D.C.	E. Bolam, Clerk, Council Buildings, Felling, Co. Durham	do.
Private House Connections with Water Mains	Llandaff & Dinas Powis R.D.C.	T. M. Evans, Clerk, Ammanford	do.
Tools, Castings, Oils, etc.	Warrington Water Committee	J. Holden, Surveyor, 20, Park-place, Cardiff	do.
Pipes, Castings, Valves, Hydrant Covers, etc.	do.	Water Engineer, Municipal Offices, Sankey-st., Warrington	do.
Bib, Stop, and Ball Cocks, Ferrules, etc.	do.	do.	do.
Oils	do.	do.	do.
Carting	Home Hemphost Corp.	W. R. Locke, Boro. Engineer, Town Hall, Home Hemphost	do.
Materials	Mr. W. P. Nicholas	A. O. Evans, Williams & Evans, Architects, Pontypridd	do.
Residence at Trealaw	North-Eastern Railway Co.	F. J. Valentine, Engineer, Northgate Offices, Darlington	Feb. 26
Painting Darlington Station, etc.	Leads Gas Committee	R. H. Towarsley, Gas Department Manager, East-parade, Leeds	do.
Timber for Gasworks	Bradford Corporation	F. Holland, Eng., 11, Parkinson's-clos., Hunslet-gate, Bradford	do.
Pump Room and Steam Boiler at Chimney	West Hartlepool Corporation	H. E. Friedrichs, Boro. Electrical Engineer, West Hartlepool	do.
Atmospheric Steam Heating, etc., Union Hospital, Horton-lane	Winstan Magna U.D.C.	N. G. J. Clark, Bank, Inspector, Station-rd., Wigston Magna	do.
Electric Lighting, Specification 38	Sowerby Bridge U.D.C.	A. W. Bisset, Engineer, Gasworks, Sowerby Bridge	do.
Seavenging	do.	do.	do.
Iron Roof over Two Boilers	Hampton Wick U.D.C.	H. Fawcett, Clerk, Council Offices, High-st., Hampton Wick	do.
Retorts, etc.	Freston U.D.C.	Surveyor, Council Offices, Chester Bank, Freston	do.
Seavenging	York Corporation	A. Creer, City Engineer, Guildhall, York	do.
Stores	Hinckley R.D.C.	S. Preston, Clerk, Church-street, Hinckley	do.
Annual Contracts	Hilford U.D.C.	Surveyor, Town Hall, Hilford	do.
Sewage Disposal Works, Bournemouth	Newbiggin, etc., Provident Soc.	C. F. Murphy, Architect, etc., Morpeth	do.
Timber for Gasworks	Mountain Ash U.D.C.	Surveyor, Town Hall, Mountain Ash	Feb. 27
*CHIMNEY SHAFT AT DESTROYER WORKS	Doncaster R.D.C.	W. R. Crabtree, Surveyor, Union Offices, High-st., Doncaster	do.
*DRAINAGE AND OTHER WORKS AT MORTUARY	Disch U.D.C.	W. M. Rogers, Borough Eng., East, Foundry-st., Halifax	do.
*PIPE SEWER, etc., AT CEMETERY, LITTLE ILFORD	Derby Corporation	A. Cooper, Surveyor, The Terrace, Disch	do.
14,450 yds. of Woodpaving	Commr. of H.M. Works, etc.	J. Ward, Borough Surveyor, Bunting-lane, Derby	do.
Teacher's Residence at Ballyrobin, Antrim	Baling Towe Council	Sir Henry Tanner, H.M. Office of Works, Storey's-gate, S.W.	do.
Seavenging, etc., Works	Corporation of London	Borough Engineer, Town Hall, Baling, W.	do.
Keeling and Chamelling at Cheslyn Hay	do.	Engineer, Guildhall, E.C.	do.
Lancashire Boiler and Feed Pump	Hove Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove	Feb. 28
Two Calorifiers and Hot Water Cylinder	Llandaff & Dinas Powis B.D.C.	H. A. Craig, Ballyrobin, N.S.	do.
Bridge and Concrete Work to Boiler Bed, etc.	Cannock R.D.C.	M. Warren, Clerk, 20, Park-place, Cardiff	do.
Sludge Pressing Machinery	Botherham Baths Committee	H. M. Whitehead, Engineer, Penkridge, Stafford	do.
Sewage Purification Works	do.	J. Platt, Architect, High-street, Botherham	do.
Sludge Pressing Buildings at Sewage Works	do.	do.	do.
Sewer, Sea Outfall, etc.	Horwich U.D.C.	H. L. Hinoell, Engineer, 41, Corporation-st., Manchester	do.
Road Materials	do.	do.	do.
Connecting Bridge at Salsberry-road Schools	Plymouth Corporation	W. T. Douglas, Engr., 15, Victoria-st., Westminster, London	do.
*WORKS AND MATERIALS	Brough Education Authority	Borough Road Surveyor, Town Hall, Brough	do.
*WOOD PAVING	Wood Green U.D.C.	H. J. Snel, Architect, 11, The Crescent, Plymouth	do.
*RACKS FOR STORING LIMB. STONES	Hove Corporation	Council's Surveyor, Town Hall, Wood Green, N.	do.
	Ordnance Survey	Borough Surveyor, Town Hall, Hove	do.
		Ordnance survey Office, Southampton	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Road Material, Works, etc.	Castle Ward R.D.C.	D. Hays, Surveyor, Ponteland, Newcastle-on-Tyne	Mar. 1
Remodelling Park-street School Buildings, Llanelli	Llanelli Education Committee	W. Griffiths, Architect, Llanelli	do.
Surfaces Water Drainage	Guildford Town Council	C. G. Mason, Borough Engineer, Bridge-street, Guildford	do.
Water Supply	Chatteris U.D.C.	A. Giddius, Clerk, Chatteris, Cambs.	do.
HEATING AND HOT-WATER APPARATUS	Croydon C.B.	Borough Engineer, Town Hall, Croydon	do.
Pattern Stores and Extending Foundry at Kingston	Campbell Gas Engine Co.	Jackson & Fox, Architects, 7, Rawson-street, Holford	Mar. 2
Llanadwrn Council School, Repairs	Carmarthenshire Educ. Comm.	W. D. Jenkins, County Educ. Arch., Shire Hall, Carmarthen	do.
Llangenech Council School, Repairs	do.	do.	do.
Llangenoch Council School, Ventilation and Repairs	do.	do.	do.
Penwan Council School, Repairs	do.	do.	do.
Capel Evan Council School, Repairs	do.	do.	do.
Annual Contracts	Barking Town U.D.C.	H. Hargreaves, Clerk, Public Offices, Barking, Essex	do.
COTTAGES, ETC., ERECTION OF	Sheffield Corporation	C. F. Wike, City Surveyor, Town Hall, Sheffield	do.
Reservoir	Devizes U.D.C.	Borough Surveyor, Devizes	do.
Condensing Plant, Cooling Tower, and Tank	Pontypridd U.D.C.	R. P. Wilson, 66, Victoria-street, Westminster	Mar. 3
Artesian Well	do.	do.	do.
Materials	South Shields Corporation	S. E. Burgess, Borough Engineer, Chapter-row, South Shields	do.
Road Material and Team Labour	Robbham R.D.C.	R. Bradbury, District Surveyor, 29b, High-street, Rotherham	do.
Roadworks, Longchree-road, Lewisham	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford	Mar. 5
Materials and Stores	Margate Waterworks Depart.	F. Stanley, 18, Cecil-square, Margate	do.
Cartage Work	Middlesex County Council	H. T. Waseham, County Eng., Middx. Guildhall, Westminster	Mar. 6
16,000 tons of Granite, 2,000 tons of Chipping	do.	do.	do.
Are Lamin Carbons	do.	H. Faraday Proctor, City Electrical Engineer, Bristol	do.
WOODWORK, ETC., FITTINGS, AT SOUTHERN HOSPITAL	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
Boilers, Automatic Steamers, Pipework, etc.	Bincham R.D.C.	R. H. Brammott, Clerk, Market-place, Birmingham	Mar. 7
Turbo-Alteration, Sub-Station, Machinery, etc.	Sydney (N.S.W.) Mun. Council	T. Rooke, 8, Queen Anne's-gate, Westminster, S.W.	do.
Works and Materials	Hendon R.D.C.	J. A. Webb, Surveyor, 61, St. James's	Mar. 8
LIGHTHOUSE, DWELLING, ETC., PEMBROKESHIRE	Trinity House Corporation	Trinity House, E.C.	do.
Police Station, etc., Meadow-lane and Great Wilson-street	Leeds Watch Committee	W. H. Thorp, Architect, Phoenix-chambers, South-prade, Leeds	Mar. 10
Line	Colchester Roads, etc., Comm.	H. Goodyear, Borough Engineer, Town Hall, Colchester	do.
Goods and Materials	Plomesgate R.D.C.	T. W. Keat, Clerk, Workhouse, Wickham Market, Suffolk	Mar. 12
Fruits and Kent Raglons	Aylesbury U.D.C.	W. H. Taylor, Surveyor, Town Hall, Aylesbury	Mar. 14
Materials and Stores	Irlington Guardians	W. Smith, Architect, 65, Chancery-lane, W.C.	Mar. 15
TWO BLOCKS AT ST. JOHN'S ROAD WORKHOUSE, N.	Mr. J. Houlton	W. Broadbent, Architect, Red Hall-chs., Guildford-st., Leeds	No date
ADDITIONS TO GUARDIANS' OFFICES, ST. JOHN'S RD., N.	Mr. H. F. Parkins	E. G. Davis, Architect, 7, Bridge-street, Hereford	do.
Shed through Houses, Town-street, Hereford	Salford Corporation	J. P. Earle, Architect, Norfolk-row, Sheffield	do.
A Willing Shed at Cliffe Mills, Pudsey	Univ. Coll. of South Wales, etc.	Borough Engineer's Office, Town Hall, Salford	do.
Pair of Houses, Redbrook-road, Monmouth	Bucks Education Committee	Jackson and Priestman, Surveyors, Exchange-bldgs., Bradford	do.
Church, Catcliffe	Enlargement of St. Ann's Church, Keighley	The Registrar, University College, Cardiff	do.
Roads, etc., Holingwood-lane, Great Horton	* FARMHOUSE, ESSEX	Harcourt, Lee, & Kerkham, 63, Bishopsgate Without, E.C.	do.
SUPERSTRUCTURE OF NEW COLLEGE BLDGS., CARBIFEE		W. R. Davies, 41, Mill-street, Pontypridd	do.
NEW ELEMENTARY SCHOOLS, SPON'S SYLVAFOED		E. Simpson, Arch., 12, Cunliffe-ter, Manningham, Bradford	do.
Hall, etc., Pontypridd		Clawtons, Chestnut	do.
Enlargement of St. Ann's Church, Keighley			do.
* FARMHOUSE, ESSEX			do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
* OUTDOOR ASSISTANT (SURVEYOR'S DEPARTMENT)	Finchley U.D.C.	£20, per annum	Feb. 19
* DIRECTOR OF INDUSTRIAL ARTS CLASSES	Glasgow, etc., Technical Coll.	£25, per annum	Feb. 23
* SURVEYOR'S ASSISTANT	Ruship Northwood U.D.C.	90s. per annum	do.
* CLERK OF WORKS	Durham County Council	3s. per week	Feb. 28
* ASSISTANT EXAMINERS IN PATENT OFFICE	Civil Service Commission	Not stated	April 5

AUCTION SALES.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
* DEALS, PATTERNS, ETC.—Green Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sim	Feb. 21
* FREEHOLD WHARF, GREENWICH—At the Mart	Edwin Fox & Bousfield	Feb. 22
* YARD, WORKSHOPS, ETC. PENGE—Tinkett Hotel, Anerley	Wallord & Milshin	Feb. 28
* GRANITE, ETC.—Stone Yard, Stony-street, Borough Market, S.E.	Henry Langton & Co.	Mar. 6, etc.
* SAW MILL MACHINERY AND TIMBER—Stanley Bridge Wharf, Clifton	J. T. Skelling	Mar. 29
* BUILDING SITE, HAYMARKET, S.W.	Mav & Rowden	March 30
* FREEHOLD BUILDING LAND—At the Mart	Alfred Savill & Sons	do.
* SHOPS AND BUSINESS PREMISES—At the Mart	do.	do.
* SIXTY COTTAGES—At the Mart	do.	do.

* Those with an asterisk are advertised in this number: Competitions, iv. vi. viii. x.; Public Appointments, xviii. xix.; Auction Sales, xxx.

TENDERS.—Continued from page 183.

HALE.—For making-up part of Finchley-road, for the Urban District Council. Mr. F. E. Boaz, Surveyor, Council Offices, Ashley-road, Hale:—			
R. Allen	£288 16 11	W. Woodins	£243 3 1
Mitchell & Son	294 0 0	B-thall & Son	307 13 10
J. Hamilton & Son	260 0 0	G. Reyson, Sale, Cheshire	197 3 0

HENDON.—For road works, Warner-road and Brent-street, for the Urban District Council. Mr. S. Slatyer, Engineer and Surveyor, Council Offices, Hendon, N.W.:			
J. & W. Drake	Warner-road, £1,079 11 0	Brent-street, £371 8 0	
W. Griffiths & Co.	1,087 13 4	349 0 0	
British Paving Co.	1,054 12 11	334 1 9	
Peeries, Dennis, & Co.	987 0 0	367 0 0	
G. H. Mann	1,010 1 3	328 8 0	
T. Adams	970 0 0	357 3 8	
Grinley	899 6 9	331 7 11	
F. G. Bruanell	894 13 1	335 10 6	
R. Ballard, Ltd., Child's Hill, N.W.	*861 12 6	*318 4 6	

LONDON.—For the execution of sewer works, for the Westminster City Council:—

Podrette & Co.	£10,197 9 0
W. Kennedy, Ltd.	6,129 8 10
Tilbury Contracting & Dredging Co. Ltd.	5,934 10 5
Mulheard, Greig, & Matthews	5,911 9 3
A. J. Ewart	5,527 2 7
J. Mowlan & Co., Ltd.	5,408 0 0
A. J. Neave	3,989 4 6
D. R. Paterson	3,841 0 0
W. Neave & Son	3,089 0 0
C. W. Killingsback & Co.	3,058 17 1

LONDON.—For the erection of St. Stephen's Vicarage, Southwark, S.E., and appurtenances, for the Rev. W. Dodge, Mr. John W. Rhodes, architect, Mitre Court-chambers, Mitre-court, Temple, R.C. Quantities by Messrs. Matthews & Coleman, 11, Old Queen-street, Westminster, S.W.:

F. Dickenson	£2,486	Patman & Fotheringham	£2,123
G. Gray	2,393	C. North	2,084
H. H. Hollingsworth	2,382	C. G. Bill	2,006
Harris & Warrlop	2,227	Richards & Co.	1,989
A. White & Co.	2,225	Spiers & Son	1,988

LONDON EDUCATION COMMITTEE TENDERS.

Islington, E.—Highbury Truett School (certain works and adapting precautionary measures recommended by the chief officer of the fire brigade):—

L. H. & R. Roberts	£487	J. Grover & Son	£407
E. Lawrence & Sons	480	W. Shurmer & Sons, Ltd.	387
Stevens Bros.	468	J. Stewart, 174, West Green-road, South Tottenham*	363
W. Lawrence & Son	459	C. B. Price	425

[The architect's (Education) estimate, comparable with these tenders, is £350.]

Islington, E.—Haver-street (House for School-keeper):—

W. H. Lascelles & Co.	£228	Stevens Bros.	£138
Ltd.	228	Marchant & Hirst	117
G. S. S. Williams & Son	159	G. Barker, 48 and 50, New-road, White-chapel*	98
L. H. & R. Roberts	156	J. Grover & Son	149

[The architect's (Education) estimate, comparable with these tenders, is £200.]

LONDON.—For the construction of two underground conveniences in Sutton-street, for Stepney Borough Council. Mr. M. W. Jameson, Borough Engineer, 15, Great Aile-street, E.

F. & G. Forster	£3,201 0	Rowley Bros.	£2,949 0
Davis & Bennett	2,209 0	S. Lissner	2,948 0
F. & T. Thorne	3,100 0	B. E. Nighd- gale	2,842 0
G. Barker	3,098 0	A. E. Symes	2,825 10
Spencer, Saub, & & Co., Ltd.	2,909 0	F. E. Deavesy, Ld., South- end-on-Sea	2,648 0
W. Shurmit, & Sons, Ltd.	2,997 0		

NAILSWORTH.—For alterations and additions to Nailsworth Council School, for the Gloucestershire Education Committee. Mr. R. S. Phillips, Surveyor to the Education Committee.

W. H. Drew	£712 0	A. S. Cooke, Pagan- hill, near Stroud,	
E. W. Baldwin	710 15	Glos.*	£613 19
T. Poulton & Son	676 10		
Orchard & Peer	635 0		

BOEHAMPTON.—For the erection of a house, for Mr. W. Gibson. Mr. T. Merrison Garrod, architect, Birkbeck Bank-chambers, High Holborn, W.C. Quantities by Mr. Stephen A. Batts, F.S.I., 17, Surrey-street, W.C.

G. Gray	£1,556	W. Renshaw	£1,449
J. Gibbs	1,550	W. Kelland	1,315
W. K. Williams	1,456		

STRABANE.—For the erection and completion of labourers' cottages, scheme "L" for the Strabane No. 2 District Council. Mr. J. McIntyre, architect, Letterkenny.

Glennagh Cottage.

Hood Bros.	£154 9 6	R. J. McCaffrey	
J. Galbreath	144 0 0	Lilford*	£133 10 0
P. Quigley	138 13 0		

Liskey Cottage.

R. J. McCaffrey	£148	R. Lowery, Argary,	
E. McCosker	145	Ballindrait*	£143

Mullaherry Cottage.

J. Galbreath	£143 19 11	R. J. McCaffrey	£136 10
P. Quigley	141 3	W. Gibson, Baky,	
E. McCosker	139 0	holey, Raphoe*	134 0
R. Lowery	137 0		

Letternill Cottage.

J. Galbreath	£149 0	W. Gibson*	£138 0
R. McCaffrey	138 10		

Glasnogue Cottage.

Hood Bros.	£154 9 8	G. Hepburn	£141 0 0
A. Ollphant	149 10 0	J. M'Grath	133 19 6
P. Quigley	143 0 0	R. M'Cauffrey*	132 10 0

Aradh Cottage.

J. Galbreath	£160 0	E. Broly*	£135 0
J. M'Grath	148 19	A. J. M'Cauffrey*	135 0
W. Graham	130 0		

Dromore Big.

J. Galbreath	£140 0	W. Gibson*	£131 0
R. J. McCaffrey	137 15		

Galdonagh Cottage.

J. Galbreath	£155 0	R. J. McCaffrey	£135 0
J. M'Grath	149 19	E. Broly*	107 0
W. Gibson	145 10		

Foyin Cottage.

A. Ollphant	£139 9	J. M'Grath	£137 9
G. Hepburn	139 0	R. J. McCaffrey*	134 6

Raphoe Townparks—Double Cottage.

J. Galbreath	£267 0 0	J. M'Grath	£257 10
J. Johnston	265 0 0	E. McCosker*	255 0
R. J. McCaffrey	259 7 6		

Maghellan Cottage.

J. Johnston	£180	E. McCosker	£17 8
J. Galbreath	149	R. J. McCaffrey*	135
R. Lowery	139		

Rockhill.

R. J. Fleming	£154 9 8	R. J. McCaffrey	£129 15
J. Galbreath	144 0 0	R. Lynch, St.	
W. Gibson	141 0 0	Johnstown*	129 0

Kennyally—Two Cottages.

R. J. Fleming	£154 7	E. Broly*	£128 0
J. Galbreath	144 7		128 0
R. J. McCaffrey	129 15	R. Lynch	129 0
	129 15	W. Graham	139 9

Trillick Cottage.

Hood Bros.	£154 9 8	E. Broly	£133 0 0
W. Gibson	144 10 0	R. Lynch	129 0 0
J. Galbreath	144 0 0	R. J. McCaffrey*	128 5 0

St. Johnstown Cottage.

R. J. Fleming	£152 7	E. Broly	£132 0
J. Galbreath	144 11	R. Lynch	129 0
J. M'Grath	138 11	R. J. McCaffrey*	128 5

ST. ALBANS.—For erecting a new infants' school at Sandridge New Town, for Hertfordshire County Council Education Committee. Mr. Urban A. Smith, County Surveyor, Hatfield.

W. & D. Wilkins	£2,992 5 5
F. W. Stanley	2,537 4 10
W. Tomes	2,450 0 0
Goldhawk & Son	2,337 11 11
A. W. Nash	2,370 15 3
E. Dunham	2,331 12 6
J. T. Bishell	2,314 7 6
J. Hammond & Son	2,268 3 0
E. Gough & Co.	2,272 0 0
E. Wilnot & Sons	2,245 14 0
C. W. Dampston	2,241 8 10
C. Miskin & Sons	2,169 0 0
F. & G. Foster	2,165 0 0
W. H. Hyde	2,125 0 0
Oak Building Co.	2,099 0 0
G. Darlington	2,080 0 0
G. Henson & Son	2,043 3 8
J. Wilnot & Sons, Hitchin*	1,922 0 0

SYDENHAM.—For roadworks, Earlsborough-road and Queensborough-road, for the Lewisham Borough Council.

Edmondson & Son, Sydenham £487

Earlsborough-road.

Edmondson & Son, Sydenham £309

TAUNTON.—For new branch premises, Greenway-avenue, Rowbarton, for the Co-operative Society. Mr. F. W. Roberts, architect, 2, Haunnet-street, Taunton. Quantities by the architect.

J. Chapman	£1,255 17 0	H. W. Pollard	£1,116 0 0
Westbury & Jarmam	1,170 0 0	T. Manning & Son	1,115 0 0
F. W. Rowwell	1,161 0 0	A. J. Spiller	1,098 0 0
T. H. Mogg	1,153 0 0	H. G. Smith	1,099 0 0
ridge	1,120 0 0	Taunton*	1,029 0 0
E. G. Coles	1,120 0 0		

St. Terence Houses, adjoining.

J. Chapman	£1,500 0 0	H. Mogeridge	£1,218 0
A. J. Spiller	1,380	Westbury & Jarmam	1,200 0
H. G. Smith	1,307 0	Jarmam	1,200 0
T. Manning & Son, Taunton*	1,219 10	H. W. Pollard	1,195 0

WOBURN SANDS.—For the erection of warehouses and stabling, Station-road, Woburn Sands, for Mr. Charles Featherstonehaugh. Mr. W. B. Stonebridge, architect, Woburn Sands, K.S.O.

S. Foster	£681	W. T. Sharpe	£500
T. Yirell	660	A. W. Nash, Dun-	
Corby & Sons	660	stake*	493
C. Linfield	642		

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FEBRUARY 24, 1906.

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2. Elevations and Sections.	
3. Plans.	
Church, Walton-le-Dale.....	The Late J. P. Seddon, F.R.I.B.A., Architect.

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Tradition and Invention.



THE series of lectures on architecture delivered by Mr. T. G. Jackson to the Students of the Royal Academy, the gist of which has been pretty fully reported in

our columns, has been, we think, one of the most instructive series of lectures on architecture that has been delivered there, as it is one calculated to lead the students to think for themselves about the meaning of architecture; and it was also very well illustrated, not only by pictorial representations of buildings, but by what is much more valuable on such an occasion, diagrams showing the construction and building up of architectural features, and the relation between structure and expression. It might no doubt be thought (and we were inclined to think so on first seeing the announcement of the lectures) that the object of lectures on architecture to the whole body of Royal Academy Students, only a minority of whom are architects, should be to give them accurate knowledge as to the great book of the architecture of the past; a knowledge certainly useful to painters who may have to introduce architecture in their works, and necessary to architects, for an acquaintance with the actual forms which architecture has taken must precede the attempt to analyse and understand them. The justification for Mr. Jackson's choice of subject is that the

history of architecture had been very fully gone into by a series of previous lectures; and therefore the occasion had come for an analysis of the structural causes of these historical forms. The choice of subject has been amply justified by a series of most suggestive lectures. But future lectures to future generations of Academy Students will have to resume the historical treatment of architecture; it is a branch of knowledge that cannot be neglected, but it is possible that in future lectures the history of architecture may be taught merely as a great field of knowledge and not as affording the proper precedents for design; and if this change does come about it will probably be to some extent due to the present year's course of lectures, which will no doubt leave their mark on the subject, and in which something has been said which much needed to be said.

But it will not do to forget that there is another side to the subject of tradition in architecture. While we quite agree that the modern architect should, as Mr. Jackson says, be himself and carry out his work in accordance with the practical requirements of the present day, it would be a dangerous gospel to preach that he should try to emancipate himself from all tradition. The effect of such an effort is seen in France and Germany in the vagaries of "art nouveau," in England in a tendency, among some of the younger architects who want to escape precedent and copyism, to an exaggerated and over-acted simplicity which sometimes comes near to obliterating architectural expression altogether.

On the other hand there are those, the majority perhaps of practising architects, who would adhere to precedent, some from mere indolence, but others from a feeling that ancient forms of detail are, as it were, hallowed by long association, have become a part of architecture itself, and cannot be ruthlessly torn away. The feeling is like that expressed in regard to music in "Master Hugues of Saxe Gotha"—

"Ah! but traditions, inventions
(Say we and make up a visage),
So many men with such various intentions,
Down the past ages, must know more than
this age!"

Leave we the web its dimensions."

It was in this spirit that Mr. Richard Hunt, looking over a young architect at work on a capital for a classic building, said—"Do you think you can make a better capital than the Jupiter Stator? No? Then why try?" We do not agree with Mr. Hunt's position; the Jupiter Stator model might fairly and usefully have been taken as a ground or starting-point for a new treatment, which might be as good, though different; it would at least be a more intellectual exercise than copying. But there is something to be said for traditional forms. In the first place, we cannot get rid of them unless we are to strip our modern architecture to almost the bare walling; for we cannot invent a whole school of new detail in a generation or two. Secondly, there is something in traditional forms, such as mouldings and capitals, which has gathered round it a long and dignified association of ideas, and gives a kind of continuity to architecture which is not a thing to be lightly

thrown away. The very form of column and capital, found in the Gothic shaft as well as in the Classic order, is a tradition, and one which we can hardly imagine architecture entirely deprived of.

As to invention, we have two remarks to make, arising out of Mr. Jackson's lectures. His view of the absolute domination of structure over design—that no one ever invented an architectural feature, but that it developed naturally out of construction, appears to be absolutely true in regard to mediæval architecture; is it equally true in regard to Renaissance and (still more) in regard to Greek architecture? There is one feature in Italian Renaissance architecture which, we take it, was an absolute invention—the baluster. It does not arise out of construction; and it must have been invented by someone (we shall probably never know who) who perceived that if an open railing were wanted, something different from a miniature column was required for the situation. As to the Greeks, we are inclined to believe that they had the faculty of absolute invention, of considering a detail of construction and inventing the best treatment for it. The only account we have of the origin of the Corinthian capital actually suggests an invention; it may be, probably is, mythical, but it presupposes the faculty of invention of an architectural detail as a matter of pure æsthetic taste; and this faculty we believe the Greeks had and more or less exercised, and that they were in this respect on quite a different level, intellectually, from the mediæval architects.

Secondly, when those who, of set and serious purpose, believe in and stand by tradition in architecture, as something which they think worth holding on to—when they are accused of being mere copyists, is it not open to them to turn round and say that there are other fields of invention in architectural design besides those of columns and buttresses and detail? There is surely a field for absolute invention in plan and section. The conception of plan, and its treatment in section, is really the basis of architectural thought. A building may derive all its details from classic tradition, but if it shows invention in the idea of the plan and in the sectional treatment and (we might add) the mode of lighting, it is original building; it is invention in architecture, in spite of the details being traditional. This is a side of architectural invention which should not be overlooked; and we beg to suggest that a very useful course of architectural lectures might be given on the subject of architectural design in Plan and Section.

THE REPORT OF THE TRADE COMMISSION.

THE Report of the Royal Commission on Trade Disputes and Trade Combinations states that the main subject of their inquiry may conveniently be divided into three heads, as follows:—

A. The liability of Trade Union Funds to be taken in execution for the wrongful acts of agents of the Union.

B. The Statute Law relating to picketing and other incidents of strikes.

C. The Law of Conspiracy as affecting Trade Unions.

The Commissioners were Lord Dunsin, Sir W. Lewis, Sir Godfrey Lushington, Mr. Arthur Cohen, and Mr. Sidney Webb, but the main Report is only signed by Lord Dunsin, Mr. Cohen, and Mr. Webb; Sir Godfrey Lushington and Sir W. Lewis sending minority Reports under their own names. It is observed that the Trade Unions demand a change of law in regard to each of the above subjects, and allege that the present state of the law differs from that of the past, and is due to the effect of well-known decisions of the House of Lords, of which that in what has become known as the Taft Vale case is the most important. Considering this attitude of the Trade Unions, it is somewhat remarkable that "with some trifling exceptions," they refused to give any evidence before the Commission. The Commissioners do not feel called upon to comment on this refusal, further than to remark that their duty to continue their investigations was plainly unaffected by the attitude of any Society or individual, and that it did not involve them in any difficulty as to discovering what was the nature of the objections taken by the Trade Unions to the law as it stands, as these had been conspicuously revealed to the world both by repeated speeches delivered during the deliberations of the Trade Unions, and by Bills introduced avowedly on their behalf in Parliament. This is no doubt all that the Commission could well say on the subject; but the refusal of the Unions to give evidence before such a Commission will be felt by most people to be an indication of conscious weakness.

The Taft Vale case is the first point touched upon in the Report, and it may be convenient here to quote the summary of the portion embodied in Clause 13 of the Report:—

"13. In the case of the Taft Vale Railway Company, the Amalgamated Society of Railway Servants, being a Trade Union registered under the Trade Union Act, 1871, and its officers, were sued by the Taft Vale Railway Company in tort for having conspired to induce the workmen of their company to break their contracts, and also for having conspired to interfere with the traffic of the company by picketing and other unlawful means. Mr. Justice Farwell having granted an interim injunction against all the defendants, the defendant Trade Union appealed on the legal question whether a registered Trade Union was liable to be sued in tort. The Court of Appeal reversed the decision of the Judge, but ultimately the House of Lords restored it, holding that a registered Trade Union could be sued in tort by the name in which it was registered under the Act. The grounds for the judgment were that a registered Trade Union having been invested with the statutory powers of the Act of 1871, it must be legally inferred that it was the intention of Parliament that such Trade Union should be liable to be sued in its registered name. A strong opinion was also expressed by Lord Macnaghten and Lord Lindley that, apart from the Trade Union Act, any Trade Union whether registered or not registered could under the general rules of legal procedure be sued in tort by means of a representative suit, i.e., a suit in which a few members have been selected by the plaintiff to represent all the defendants. The case then went for trial, and verdict was found for the plaintiffs. The damages were assessed (or fixed by agreement) at 23,000*l.*, which sum has since been paid out of the Union funds."

The judgment of the House of Lords, it is admitted, took many persons by surprise, and the Trade Unions' protest against it as "making a practically new law against Trade Unions." The Report however says:—

"We are satisfied that the law laid down by the House of Lords involved no new principle, and was not inconsistent with the legislation of 1871."

The argument on which this conclusion

is based is drawn out at some length and is of considerable interest. The fact that no statute had previously laid it down that a Trade Union, as such, was liable to an action "in tort," makes no alteration in the fact that the members of a Trade Union were, by the previous existing law and before they were registered liable personally to such an action. The operation was restrained only by the practical difficulty of getting at all the defendants. In the eyes of the law before 1871 a Trade Union was nothing but an aggregate of individuals, and the Courts of Common Law adopted a rigid rule that in an action to recover damages in respect of a "tort," judgment could not be recovered against any person or persons not named as defendants in the action. The liability of the funds of a Trade Union could at any time have been effectively realised in the case of a Trade Union consisting of only a small number of persons, who could have been made individually responsible. The difficulty arose only in the case of a body so numerous that it would be practically impossible to bring them all into court as defendants. In considering the Taft Vale case the House of Lords took the view that from the provisions of the Trade Union Act of 1871 it was legally inferred that the intention of Parliament was that a registered Trade Union could be sued under its registered name, with the consequence that its funds would be liable for any damages that might be awarded. No public Commission as a body has represented that they ought to be exempt; no Government has promised that they should be exempt by forthcoming legislation; and no judge has pronounced that they are exempt. On the question of abstract justice the Report speaks plainly and strongly:—

"32. It remains now to consider the question on the ground of justice and equity, and here the objections against disturbing the law as laid down in the Taft Vale case appear insurmountable. There is no rule of law so elementary, so universal, or so indispensable as the rule that a wrongdoer or so indisputable as the rule that a wrongdoer should be made to redress his wrong. If Trade Unions were exempt from this liability they would be the only exception, and it would then be right that that exception should be removed. That vast and powerful institutions should be permanently licensed to apply the funds they possess to do wrong to others, and by that wrong inflict upon them damage, perhaps to the amount of many thousand pounds, and yet not be liable to make redress out of those funds, would be a state of things opposed to the very idea of law and order and justice."

In the face of such a decisive opinion in the Report of a Royal Commission, we do not imagine that any attempt to upset the Taft Vale decision can have a chance of success. It has been shown to be not only good in equity but good in law. In regard to this point Sir Godfrey Lushington, who dissents strongly from some other conclusions of the main Report, is entirely in agreement. But he dissents from a proposal made in the main Report, that the Provident Funds of Trade Unions should, by some form of legislation which the Report only suggests in a tentative manner, be separated under law from their other funds and made free from liability. The idea with which this suggestion is made is evidently that it bears hardly on those who paid money into such a fund, to be liable to lose their savings through wrong action on the part of the Union. To us it seems a very

natural reflection—let them see that their Unions do not act wrongly. As Sir Godfrey Lushington puts it, "Thrift is a good object, but thrift comes after payment of just debts, and certainly not least, debts incurred in consequence of wrong-doing to others. The case is only made the stronger by the attempt altogether to repudiate debts of this character. That workmen should collectively do wrong, and be able to refuse to those who have suffered such wrong any reparation out of the funds they have collectively saved for their own use and benefit, is contrary to justice;" and in fact, the knowledge on the part of those who have placed their savings in the care of a Trade Union, that in the event of the Union rendering itself liable for a wrong to others their savings will be endangered, would be a very powerful influence on those members to do all they could to keep the managing Committee in the straight path; and to exempt Provident Funds from liability would be, as Sir G. Lushington shows, a totally exceptional kind of legislation, and would remove a very strong incentive to avoid illegal acts.

On the question of picketing, which, though not a term known in or defined by law, is accepted by the Commissioners as a matter of convenience, its meaning being generally understood, the main Report is not so clear or satisfactory. The Commissioners who sign the Majority Report seem to have divided between a conviction that picketing is actually a form of persecution, and a desire to allow it with the safeguard of a new clause added to the Conspiracy and Protection of Property Act (1875). That Act defines five kinds of persecution for which the culprit is liable to fine or imprisonment. One of these runs—"watches or besets the house or other place where such person resides, or works, or carries on business or happens to be, or the approach to such house or place"; with this proviso following at the end of the clause—"Attending near the house or place," etc., "in order merely to obtain or communicate information, shall not be deemed a watching or besetting within the meaning of this section"; a sentence which is almost cynical in its disregard of realities, though on the surface it may seem harmless enough. The Report quotes on the next page the proposal made in Mr. Whittaker's Bill of 1905, which may be taken to embody the wishes of the Trade Unions:—

"Clause 1.—It shall be lawful for any person or persons acting either on their own behalf or on behalf of a Trade Union or other association of individuals, registered or unregistered, in contemplation of or during the continuance of any trade dispute, to attend for any of the following purposes at or near a house or place where a person resides or works, or carries on his business, or happens to be:—

- (1) for the purpose of peacefully obtaining or communicating information;
- (2) for the purpose of peacefully persuading any person to work or abstain from working.

It had been pointed out, in a previous clause of the Report, that the effect of the 1875 Act is that "watching or besetting" was only lawful for "communicating or obtaining information"; that for the purpose of "peacefully persuading" it was an offence; and this is the limitation that Mr. Whittaker's Bill wished to get rid of. The Report expresses the opinion

that such an enactment would legalise the attendance of any number of persons for the specified purpose, although the attendance might be such as to cause a nuisance or a trespass. But the real objection, it is observed, lies deeper:—

"The evidence on this matter laid before us is on this point really overwhelming, and is evidence which the Trade Unions have made no attempt to contradict. What it comes to is this, that *watching and besetting* for the purpose of peacefully persuading is really a contradiction in terms. The truth is that picketing—however conducted—when it consists of watching or besetting the house, etc., and it is to be observed that the statute places no limit to the number of persons attending for the purpose only of obtaining or communicating information or to the length of time during which such attendance may be maintained—is always and of necessity in the nature of an annoyance to the person picketed. As such, it must savour of compulsion, and it cannot be doubted that it is because it is found to compel that Trade Unions systematically resort to it."

That is plain speaking and common sense; but unfortunately the Majority Report does not carry its common sense far enough. It goes on to say that it is admitted that the real abuse of picketing consists in illegal intimidation, in producing in the mind of a person apprehension that violence would be done to his family and his property. But as a strike is not illegal, the right to persuade others to strike is legal and should be safeguarded; and it is suggested that this could be done, and the oppressive action of picketing struck at, if the watching and besetting clause were altogether withdrawn, and another subsection inserted—"Acts in such a manner as to cause a reasonable apprehension in the mind of any person that violence will be used to him or his wife and family, or damage be done to his property." It is really impossible to read this without amusement, as one thinks of the delicate line which will be drawn, and which courts of law will be asked to draw, between the sort of picketing which may be a source of the most intense annoyance and persecution to its victim, and yet which may adroitly be just stopped short of what can be legally made out to be causing "a reasonable apprehension that violence will be used." It is like the peaceful Quaker's "Friend, thee's not wanted here," while drowning the victim all the same.

On this subject, in fact, the Report blows hot and cold with the same breath. It is a relief to turn to the special Report of Sir G. Lushington, who on this subject speaks the plain common-sense of the matter in no uncertain tone. In his opinion, even if the sole purpose were peaceful persuading, watching and besetting of a man's premises ought not to be permissible. It is a form of persecution that a workman cannot enter or leave his house without being beset and hampered by men fastening on him, often with angry and abusive expressions; to "persuade" him—should it not rather be said to bully him—into doing as they are doing. And then, as Sir G. Lushington very pertinently asks, why are Trade Unions alone, of all the world, to have the privilege of doing this?—

"The truth is that picketing is a form of industrial conscription; and, in organising it, Trade Unions act as if they represented not only their own members but the entire body of workers, and had authority to enforce regulations to which all were bound to conform. It is a system which could not be lawfully practised by any society in which membership was purely optional, and which recognised that every individual was free

to act as he pleased. In connexion with this point it must be remembered that the Statute does not apply exclusively to workmen; at the instance of Trade Unions it was made of general application, and extends to the whole community. As a fact I believe the particular enactment is not required for anybody except workmen in time of strike. Picketing exists nowhere but in connexion with Trade Unions. Is it possible, for instance, to imagine that a tradesman should picket the premises of a competitor? or that one railway company should picket the station of another railway company? or that the authorities of a church or chapel should watch and beset the approach to a rival church or chapel? or that picketing should be introduced into political warfare, and say the Conservative organisations should station pickets at the doors of the private residences of Liberal Members of Parliament, to watch them day after day coming in and going out, to communicate or to receive information or to peacefully persuade them? The very suggestion seems ludicrous; yet this is but a very faint picture indeed of what in times of strike individual workmen have actually to undergo at the hands of Trade Union pickets."

Sir G. Lushington concludes by suggesting that picketing is an abuse for which a remedy is urgently required; that the personal freedom of workmen needs not less protection than hitherto, but more; and he therefore recommends that the existing prohibition of "watching and besetting" be retained in the Conspiracy and Protection of Property Act, and that the proviso permitting it for the sole purpose of "giving and receiving information" should be repealed; and we fully agree with him. The supposed maintenance of the distinction between "peacefully persuading" and "giving and receiving information" is absurd on the face of it; it is legislating for a man's intentions, which cannot be proved one way or another. The only fact a Court can have on evidence is that the man or men were there, "watching and besetting"; but what possible evidence can discriminate as to their purpose, or who is to draw the line between "persuading" and "giving information"? We heartily wish that Sir Godfrey Lushington's trenchant remarks had appeared in the Majority Report instead of in his own Separate Report; but as it is, it may be hoped that they will not altogether fall to the ground, and that they may do something towards putting a check on the legalising of a system of petty tyranny which is a discredit to a civilised country.

NOTES.

A PRACTICAL movement is now on foot with the object of inducing the Government to introduce into Parliament a Bill confirming the responsibility of the Crown to protect the sea coast of this country and to afford assistance to local authorities in the construction and maintenance of coast protection works. The movement in question originated in the Conference recently held in Westminster, when the representatives of various municipal and other councils were present. It certainly is the statutory prerogative and the duty of the Crown to protect the land from inundation for the benefit of the commonwealth, and, as a matter of fact, no obligation rests upon anyone else. Moreover, local authorities do not appear to have power to execute protection works unless they also happen to be the owners of the threatened land. We know the difficulty of the problem is largely to be found in the small value of land along the coast

except in the vicinity of towns, but the case of those living near the sea is somewhat hard, as the cost of the necessary works is positively prohibitive in some places, and in others involves exceedingly heavy burdens in the way of taxation. The most unfortunate thing of all is the unrestricted removal of beach material, a habit in which Government departments are among the worst offenders. This suicidal practice should certainly be stopped at once, however indisposed the Government may be to fall in with larger views as to their responsibilities.

Economies in Railway Working. WITH first-class passengers travelling in their own motor-cars, electric trams and omnibuses capturing humbler individuals, and working expenses mounting steadily upwards, railway managers find it necessary to look in all directions for methods of retrenchment. Combination is, of course, no new experiment, and this is the key-note of the new departure which is being announced by the chairman of several leading lines at the half-yearly meetings of shareholders. In certain large manufacturing centres steps are being taken to establish receiving offices, organise a joint collection of goods and parcels, and generally to work in combination instead of in rivalry wherever practicable. The London and North-Western and the Midland Companies, which are in contact in many places, have already entered into an agreement to work on co-operative lines in a number of manufacturing towns; the Lancashire and Yorkshire Company have also joined in the movement, and it appears likely to spread. This amalgamation of forces will bring down town-office expenses, and render unnecessary many duplicate trains, both passenger and goods; and it is claimed that the new arrangements will be advantageous rather than prejudicial to the trading public, while being of undoubted benefit to the shareholders.

Labour Returns. THE labour returns show continued improvement in nearly all the industries with the exception of the building trade, in which stagnation continues. The Trades Union returns for January prove that more workmen are in employ than at this time last year, the figures relating to the unemployed showing that only 4.7 trades unionists were unemployed, as compared with 6.8 per cent. at the end of January last year. Despite the continued improvement in the labour returns during the past few months, more has been heard of the unemployed this year than for many years past, a fact not without significance in view of recent legislation dealing with this question.

The Port of Liverpool. NOTWITHSTANDING the remarkable expansion of traffic on the Manchester Ship Canal, Liverpool does not seem to suffer any diminution of prosperity. The annual statement of Mr. Robert Gladstone at a recent meeting of the Mersey Docks and Harbour Board confirms this fact in a remarkable manner. We have referred on a previous occasion to the activity displayed in dock construction and other harbour works in

Liverpool. At the present time the site is prepared for a scheme of dock extension to come before Parliament during the next session. The first step in this project will be the formation of two new entrances, each 135 ft. wide, into the river, the making of a vestibule dock out of which will open two others suitable for vessels 800 ft. long. These entrances are designed to serve for a still larger extension opposite Seaforth, the works being rendered necessary by great increase of trade and the increasing size of modern ships. New entrances to the basins at Tranmere are now nearly complete, the new river wall is well advanced, nearly 90 acres of land have been set apart for shipbuilding purposes, and the board propose to build a new dock with an area of 11 acres at Birkenhead. Altogether Liverpool seems likely to maintain her position as the second greatest port of the world, and possibly to surpass London, unless something practical can be done for the improvement of the metropolitan port.

Electrolytic Theory. MR. WHETIAM'S lecture at the Royal Institution last week on the "Passage of Electricity Through Liquids" will be appreciated by all who are interested in electrical theory. As one of the foremost workers in this branch of research, and as a writer who has grappled successfully with some of the most abstruse problems in connexion with it, we had expected that he would expose the fallacies of some of the old-fashioned theories. Instead, however, of doing this he gave an excellent elementary description of the main phenomena in electrolysis, and it was only occasionally by a qualifying phrase or a happily chosen analogy that one realised that the lecturer had a quite different conception of the mechanism of the electric-current to that universally adopted until a few years ago. He showed the decomposition of a solution of sulphate of copper into its constituent ions, by means of an image on the screen, and called especial attention to the concentration of the solution where the current entered the liquid, and its attenuation where it left. Faraday called the constituents, into which the electric current separated the liquid, "ions" because they move. In modern theory these ions carry the electric charges, and the actual convection of these charges constitutes the current. In the older theories the analogy used was that of water flowing from one reservoir to another, and being pumped back again. In the modern theory the analogy of a row of men carrying the water in pails between the two reservoirs is given. The lecturer showed on the screen the actual motion of the ions, and explained how their velocities were measured. These measurements have been made by Steele and others, and are found to be in practically exact agreement with the theoretical values of Kohlrausch. Hardy's experiments on the coagulation of a clear solution of albumen by the addition of certain chemical salts were shown, and the reason why the higher the valency of the ion the more efficiently it acted in "curdling" the albumen was explained. It is interesting to notice that both the chemical electrician and

the physiologist are now exploring this field of research.

The Hellenic Society. THE paper by Mr. E. Norman Gardiner read at the meeting of the Hellenic Society on Tuesday, under the title "Heracles* the Pancratiast," dealt with a rather curious subject which has some bearing on the representation of Hercules in ancient art. The "Pankration" seems to have been something like the Japanese "jujitsu" of which we are hearing so much now, and was a contest something between wrestling and boxing, the main object being, in one way or another, to tire out the adversary or put him *hors de combat*. Hercules was the patron or hero of those who were victors in this struggle; and Mr. Gardiner took it that the vase representations of the strife of Hercules and Antæus and of Hercules and the Nemean lion were a kind of typical representation of the Pankration, showing Hercules in the act of lifting Antæus from the ground, throwing the lion over his shoulder, etc. The series of slides shown were very curious and interesting, and the conclusion deduced from them by the lecturer was that the later (and now the popular) idea of Hercules as a kind of giant of over-developed muscle was not in accordance with the original Greek conception, in which Hercules represented rather youthful vigour and resource in athletics. In all the representations that had been shown of his combats the impression was given that the victory was one of science over brute force.

The Leicester Galleries. THE exhibition of paintings and water-colours by Mr. Charles Sims, at the Leicester Galleries, throws rather a new light on the possibilities of this clever painter; in fact, until we caught sight of "The Moth Catchers" (54), an obvious first study for a recent Academy Picture, we felt some doubt whether it was the same Mr. Sims whose work we knew at the Academy. From the variety of the subjects of the small pictures here, and of their treatment, it seems evident that this artist has much more within his powers than his Academy pictures have yet shown. Sketches as many of the works are, there is much both of fine colour and fine suggestion in composition. In this latter respect the sketches numbered 15 and 24 may be particularly noticed; they are very slight but they have the making of pictures in them. Among the larger works "Beech Boughs" (14) and "Washing Day" (26) are good, the latter is a very carefully studied interior both as to figures and accessories. "Bacchus and Ariadne" (34), which seems to have been painted under the influence of Watts, is unsatisfactory in respect of the plump and rather stumpy figure of Ariadne; but the vigorous movement of the figure of Bacchus is finely given, and the whole is a striking symphony in colour. The best thing in the whole collection, and the most complete in itself, is "Sunshine and Wind" (50), showing the figures of a woman and child drifting across a bleak common on a

*The Hellenists are not always very logical in their Anglicising of Greek names. "Heracles" is of course the Roman form, popularised in English by long use; but if "Heracles" does not satisfy them, why do they not adopt "Herakles," the genuine Greek name, instead of "Heracles," which is neither one thing nor another?

stormy day. If this has not been worked up into a large and complete picture (we do not recollect it as such), we hope it will be. In the adjoining room is a miscellaneous collection of oil-paintings, a good many of them by the Norwich artists, among whom James Stark comes out very well, and there are two fine Cromes (19 and 42) of rather unusual subjects for this artist; "Cattle at a Pool" by Vincent (30); "A Gipsy Encampment" by Stothard (46), weak in the figures as usual, but exceedingly powerful in its landscape effect; and a "Wooded Landscape" (33) assigned in the catalogue to "Colkett and Bristow," whose joint production has a great resemblance to that of Stark, and Stark at his best. There is also a very fine painting of a stormy coast scene, "Mouth of a Sussex River" (7), by "Jock" Wilson, whose name we confess to having forgotten, but who is worth remembering if this is a typical example of his powers. Among the few portraits in the collection it is interesting to see a fine example of the work of Reynolds's pupil and follower Northcote—a half-length of a lady, the colour and quality of which raises one's respect for an old R.A. whose repute has rather suffered, probably, by the satirical portrait of him in Haydon's Autobiography, and perhaps by the literary celebrity of Hazlitt's "Conversations with Northcote," which have created a kind of impression that the latter was chiefly occupied in talking about art. Evidently he could paint as well as talk.

Dudley Gallery Art Society. THIS Society, which retains the name derived from its old exhibition room, holds its exhibition this year in the large room of the Alpine Club, where the light at all events is admirable. The exhibition, amid a certain proportion of mediocre work, contains more really interesting drawings than usual; drawings which have character and individuality, and not merely competent execution. There are more, indeed, than we have space to mention. Among those that we have noted as especially good are Mr. Joseph Powell's "Rye from the Marshes" (20); Mr. S. G. W. Roscoe's "Autumn Morning on the Exe" (54); Mr. James T. Watts's small landscape, "Rain on the Moor" (69); and Mr. David Green's "On Gouthland Moor." The landscapes by Mr. R. A. K. Marshall are beautifully finished and very delicate in their distant effects, but too minutely picked out for breadth of effect. Miss Jex Blake and Miss Margaret Bernard show their usual power in a very opposite school of water-colour art, that of broad effects of composition and colour, with no breaking up into small detail. Mrs. Jardine's snow scene, "Zuoz, Engadine" (91), with its effective contrast between the pure white of the snow and the dirty white of the village houses, is fine and truthful. Among the few pictures in which figures are prominent Mr. Innes Fripp has made a good scene out of the "Merchant of Venice" (66); his group of Elizabethan men on the seashore in "Treasure Trove" (181) reminds one pleasantly of Kingsley's "Westward Ho!" and is well composed and carefully worked out; and Miss Janet Fisher in "Bluebells" (160), where a young girl kneels in a wood

to collect the flowers, appeals to a sense of something more than mere execution. Among others we may mention Mr. Duassut's "Essex Lane in Winter" (19); Mr. Roscoe's "The Landslip, Beer" (51); Mr. Newton Benett's "Buscot, Thames" (274), and Mr. Geo. Marks's beautiful little landscape, "Gorse" (209), which is quite perfect.

From the Alps to the Apennines. THE water-colour drawings by Mr. E. Whyley, exhibited under this title at the Fine Art Society's Gallery, belong to some extent to the order of topographical drawings, which are looked at as much for what they represent as for their artistic style; but these are very good work of their kind, and in those in which architecture is the prominent subject, such as "South Porch, Bergamo" (18), "Doorway of San Rufino, Assisi" (61), and "West Door, Verona" (65), the architecture is very well treated—precise in definition without being hard. "Nightfall, San Gimignano" (16) is an interesting sketch, showing the celebrated towers as silhouettes in the twilight. Among those which deal with more extended landscape effect may be mentioned "Morning Mists" (7); "On the Road to Sale Marasino" (12), where the colour treatment of the hills in the background, just a shimmer of green through a hazy atmosphere, is very delicate; and "Flush of Sunrise, Montreux" (49), a successful indication of an effect very difficult to realise, even in water-colour, a better medium for this type of effect than oil.

Etchings after Corot. At Messrs. Dowdeswell's Gallery there is on view a collection of very fine etchings after the landscapes of Corot, by MM. Brunet-Debaines, Krostewitz, Huet, Monnier, and others. As etchings, and as translations of Corot into black and white, there is not much to choose between them; all are good, and Corot's style, which is not dependent on strong colour so much as on composition and aerial perspective, is peculiarly suitable for representation by etching, in which the evanescent character of the great painter's effects can be better represented than in the more pronounced and precise lines which are inseparable from engraving. If we were to select any as particularly successful they would be Monnier's etching of "L'Etang" (10) and Brunet-Debaines' "Pastorale" (3).

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

An ordinary general meeting of the Royal Institute of British Architects was held on Monday at the rooms of the Institute, No. 9 Conduit-street, W. Mr. Leonard Stokes, Vice-President, occupied the chair in the absence through indisposition of Mr. John Belcher.

Furniture.

The minutes having been taken as read, Mr. E. Guy Dawber read a paper on "Furniture," of which the following is an abstract:—

Tracing the development of furniture in England, the author said that nearly all the examples shown in MS. illustrations down to the middle of the XVth century were of an ecclesiastical character. Throughout each successive period the style of the furniture had followed that of the architecture, and if any special piece was required, the same craftsman who built the church, monastery, or castle, made it, or at any rate had such control, that in character and detail it

assimilated with the building. Household furniture in the XVth and XVIth centuries was characterised by simplicity and stability of construction, and, as much of it had to be shifted from one castle to another when any great personage moved, its supply was necessarily limited, and rooms were consequently sparingly furnished. The influx of foreign workmen from Italy and the Netherlands had hindered the development of a distinctive and national taste, and up to the close of the XVIIth century there was hardly a definite and decided tradition. After the design of furniture began to break through its ecclesiastical environment, when the Renaissance in Italy had developed in England, then we find a real national style gradually being evolved. Perhaps the most constructively perfect period of English furniture was the end of the XVth and first half of the XVIIth centuries, and though its design was based almost entirely on classical influences and detail, and the outlines may suggest extraneous origin, it retained a character essentially English, and soon lost any trace of foreign influence. The workmanship was of the best, the construction admirable, and framed in a manner calculated to withstand the roughest usage. During the reign of Charles I. and for many years previous, velvets, brocades, satins, and stuffs had been imported from Venice and abroad, and much furniture from Italy as well as the Netherlands. The Restoration, in 1660, caused a further influx of furniture and workmen from Holland, Flanders, Spain, and France; and to this we owe a great deal of the mixed character and diversity of style so prevalent in the latter half of the XVIIth century.

Marquetry was one of the distinguishing characteristics of late Dutch XVIIIth century furniture, and when treated in a quiet and simple manner was very pleasing; but although it became the fashion for some years in this country, and chairs, cabinets, clock cases, and indeed all surfaces, offered opportunities for the new style of decoration, it never took a firm root, and after a few years died out. Carving—at the beginning of the XVIIIth century—was sparingly used, the tendency being towards greater lightness and grace of line in furniture. In the XVIIIth century many schools of craftsmen and cabinet-makers based their designs almost exclusively on the models of the leading architects of the day. Sir Christopher Wren had gathered around him a school of designers and carvers whose influence upon furniture-makers was very marked. It was the age of constructive joinery and beautiful carving, and whether in oak or deal one single style and tradition permeated the whole country. The architect was the chief director in all matters of style, proportion, and arrangement, and a great deal of the actual furniture was designed by him. It is not too much to claim that the classic spirit so predominant throughout the furniture of the XVIIIth century, is mainly attributable to the influence of architects. Chippendale's first book was published in 1754. In reading it we cannot help admiring the power he possessed of combining the seeming incongruities of the so-called French, Gothic, and Chinese styles which were then so fashionable, and in making out of them pleasing and harmonious pieces of furniture, and imparting to them such symmetry and dignity. We see in his work how all his effect was obtained from outline and carving only, for though inlay, veneer, and painting had long been in use, he discarded them altogether, and worked in the solid mahogany. But he did not originate a style; he only carried on the existing traditions of the day and clothed them in fresh detail of his own, or borrowed from other sources. Whatever we may think of the general design of Chippendale and his fellow-workers, there is no doubt that these famous cabinet-makers thoroughly appreciated the proper limits within which carving, as applied to furniture, should be confined. Lowness of relief, adaptation to the structural lines, the employment of a maximum of plain surface with a minimum of carving, are all strongly-marked characteristics of the work of this period. The author went on to deal with the work and influence of other eminent furniture designers—Shearer, Heppelwhite, the brothers Adam, Sheraton, etc. Two

facts, he said, mainly contribute to the charm and interest of the furniture of by-gone days: the first, that its form and detail were so admirably adapted to the material it was made of; the second, that it was always so singularly suitable to its environment.

Towards the close of the XVIIIth century, though the design of furniture was still influenced by the architectural features and character of the houses it adorned, it began to show that the necessity for the two being absolutely in harmony was not considered essential, for a great school of specialists in furniture-making had arisen, and the association between the architect and cabinet-maker was beginning to weaken, until it ceased to exist. About half a century ago, when perhaps domestic architecture in England was at its lowest ebb, things reached such a pass that the fashion in furniture became absolutely regardless of architectural principles or fitness, and only the idea of comfort and luxury prevailed, until the inevitable reaction set in, and people, finding they could no longer get new furniture which was not an eyesore, reverted to the opposite extreme—viz., the older styles of former days. Then came the difficulty which still exists—which particular style amongst those of the past to select. All, perhaps, are equally incongruous in modern houses, yet all appeal to people in different ways; and now that in the mind of the general public architecture and furniture have been definitely divorced from one another, it is the fashion to pick up pieces of furniture, quite indiscriminately, because they happen to be beautiful, quaint, or old, and people fill their houses, utterly indifferent to the effect produced. All this brings us back to one thing worth noticing—that throughout the periods when architecture flourished and was a living art, furniture was the same, and very beautiful work was the result; but when there ceased to be any real tradition in architecture, at the same moment furniture died out. The two are inseparable—they always have been and always will be; and just as to-day we have a real living common-sense style of domestic architecture, so also, with its development, will a real style of furniture arise. There is undoubtedly a great effort being made at the present time amongst many of our ablest designers and craftsmen to remedy this by producing designs for furniture original and artistic in treatment. There is still, however, too much inclination, in aiming at simplicity of form, to neglect the beauties of form altogether. Because mouldings have been excessively or wrongly employed, there is a tendency to abjure them altogether, so losing one of the main factors in creating beauty and interest. Of course, to class the whole of the modern furniture produced to-day in such a category would be absurd, for we have designers and craftsmen who, if only given the opportunity, can design and make furniture which can rival the productions of past ages. But until there is some settled standard of thought and tradition permeating the whole country, any efforts at design in furniture must be but isolated and individual. The author said he did not suggest that an architect should design furniture; but he should have in his mind the house he is building, finished and furnished complete, just as a painter has a mental impression of the last state of a picture he may only be beginning to put on canvas. That impression may be modified and improved in detail as the work proceeds, but the general scheme, the broad idea, will remain. For the architect, however, who is more thorough in his work, and is not content with constructing the mere shell of his house, there is much scope for excellent effects, by planning permanent fittings, such as bookcases, cupboards, side-board recesses, and so on. The reproach that the British is an inartistic nation is being removed. People have either become artistic themselves or have attained to the wisdom of Socrates in admitting that they know nothing, and are content to leave the work to those whose business in life it is to show them what is artistically right and in good taste. With the improvement in domestic architecture, which is so marked, the author felt sure that it would only be a matter of time before the public realised that good, sensible, modern furniture could be equally well obtained at a reasonable cost; and this result would be

greatly helped if architects generally gave more thought and care than they do at present to the finishings and furniture of the houses they design. An architect's training and sense of proportion should enable him to exercise a very helpful power in controlling and directing the taste of the public.

Mr. Percy Maquoid, in proposing a vote of thanks to the reader of the paper, said it was difficult to say anything fresh after the excellent paper which dealt with a very large subject in a simple way, and had brought almost all the types of furniture known to them into a small compass. Mr. Dawber had shown them how one period melted into another, and they had seen from the illustrations the different links, and that, to his mind, was the great interest in furniture. It was the periods of transition which taught the most. He would have liked to have seen a little more of the Elizabethan furniture, but it was extremely difficult to find genuine examples. The court cupboard, for instance, was a very important piece of furniture, and really comprised every necessity for the family. The court cupboard given in the illustration was from the Victoria and Albert Museum, and in connection with this piece of furniture he would like to tell a story. Some time ago a gentleman living in the West sent him some photographs of two chairs of the same date and type of this court cupboard, and asked him to come and look at his furniture. They could imagine his horror when he found the hall filled with furniture made by the same hand, and he had to tell his friend that there was not a single piece of furniture genuine. He asked how the furniture was obtained, and his friend told him he had been getting it piece by piece for the last fifteen or twenty years, and that it came from a family in the North who were greatly reduced in circumstances, and who said the furniture was all made by the carpenters of the family in the reign of James I. This gentleman had spent large sums of money in getting oak furniture, but he was glad to say that he obtained the money back, and the furniture was returned to the "carpenters of the reign of James I." One of the most beautiful specimens in oak that Mr. Dawber had shown was the Charterhouse table, which was especially interesting because it showed the strong influence of the French style of Henri II. of about 1656, and he did not suppose there was any other specimen of English oak furniture that quite represented the style as perfectly as that table. There was one subject on which Mr. Dawber said little. He mentioned the fact that walnut was used, and no doubt very extensively, and some specimens entirely constructed of walnut were before the beginning of the Civil War, and so great an impression had this walnut made on the people that they planted a great many walnut-trees. Walnut was evidently looked on as a rather precious thing, because they never found an inferior piece of furniture made in walnut in Elizabethan or Jacobean times. The date of the Yorkshire chairs given by Mr. Dawber as 1620 seemed a little early, because the applied split baluster which occurred was, he fancied, a little later in date. If they did not put these chairs a little later they would practically find they had no chairs to sit on, because then there would have been no chairs made between the Restoration chairs and these very distinctly made in 1625, and he could not imagine that a local variety would have sprung up so early as 1620 bearing the split baluster. It must have come from Holland, through Suffolk, and got to the north. Also, one missed the very rare specimens of gilded furniture beginning at about 1710 and going on to about 1725 or 1730, the taste for which, he would imagine, came in with the Guelphs. It was very showy, and bore on the knees of the chairs and sofas an ornamentation that he was at a loss to account for. He meant the lions' and the eagles' heads at the end of the arms. There must have been something symbolical about that, for they found it only in that period and very extensively produced. There was also an extremely objectionable fad used which doubtless represented someone at the time, and he would like to know who it was. He agreed with Mr. Dawber about Chippendale,

who was a very able man, but did very little that was really original except to refine and make lighter certain forms which existed before him, and to make these forms more practical and suitable to the costume and appearance of those people who used the chairs. They would remember that in Chippendale's time costumes lightened. The costumes of the first George and Anne were far more clumsy, and the furniture made then was more suitable to the rather dull, clumsy people who used it. Chippendale's time was far brighter and a more intellectual and gay period, and consequently they found a rather lively characteristic introduced into the furniture. Mr. Dawber had shown them some very beautiful specimens of Adam furniture, and he felt that in referring to the merits of Shearer, Heppelwhite, and Chippendale they were inclined to neglect Adam. Where they found Adam in possession of a house designed by him, and with the furniture in its original place, the effect was most beautiful. There was one very beautiful Adam house, where the furniture was also designed by the architect, and that was Lord Jersey's house at Osterley. What had been said with regard to modern furniture was most interesting, and he had no doubt when they found the public would pay as much as their ancestors paid they would get something respectable produced. At present it seemed to him that the wood was rather flat and the mouldings were flat, and there were a great many uprights which suggested that clothes should be hung upon them, and the hinges were much larger than was wanted, and there was a sense of affectation of bareness which did not attract. As to the Nouveau Art, he thought it was the result of a person who was living entirely by himself, neglected by society, and who, when he sat down to design furniture, dined on red herrings and absinthe, and then tried to produce something extraordinary, in which he thoroughly succeeded.

Mr. J. D. Crace, in seconding the vote of thanks, said he felt some interest in being there, because it was now forty-nine years ago that his father read the first paper on the same subject in that room, and it was particularly fixed on his mind because he had a large hand in preparing the diagrams for the paper. The many things which Mr. Dawber touched upon were all interesting, but he thought he made somewhat light of the aid that might be got in tracing the history of furniture from old manuscripts. The illustrations to be found in many of the old manuscripts were by no means exclusively ecclesiastical. Many of the dedication pages in old books showed the domestic surroundings of the person to whom the book was presented, and in that way they often got extremely interesting details. Then there were many interesting specimens of furniture scattered about the country in many old houses of pre-Elizabethan times. He recollected seeing a distinctly original bedstead at Lord Mount-Edgumbe's house, Cotheloe, which had certainly never left the house since the time of Henry VII. He was sorry also that Mr. Dawber did not give a little space to the inlaid work done in Elizabethan times. Elizabethan furniture was often extensively inlaid. They found inlay in the round done in the most charming way at Hardwicke Hall, and done apparently in view of the visit of Elizabeth there, for a sort of complimentary message had been let in on top of the table. There was the Royal device and Cavendish arms, with supporters, two stags, and twining round them were roses and the words:—

"The redolent smell of exultation
We stags exalt to the divine."

There was also an immense amount of furniture of the time of William III. in the same house. Knowle House was also most interesting in the way of furniture. He thought perhaps that Mr. Dawber went rather far in saying that design was altogether given up in the middle of last century, because it was then reviving. It began to revive before the Great Exhibition. In fact, the Exhibition was the outcome of the sense in a number of people of the great want of making design in the articles of life better understood. But there was a great deal of admirable work provided between 1850 up to the end of the century. In fact, they had only to look back to the horrors which

appeared in the shops when he was a young man to look now at an ordinary shop in Tottenham-court-road and congratulate themselves. A great deal of the furniture produced by the ordinary furniture-makers to-day might not be of a very high quality or of a high quality of design, but at any rate it had the right intention. It had the right general notion of what design should be, and did not include the horrors of the early half of the XIXth century. He thought architects would do well to show some interest in the designs of the furniture to be used in the houses they built, because they were very greatly interested in the effect of the total result of a house, and that would always depend to some extent on the accessories.

Mr. Maurice B. Adams said if modern work in this regard was referred to at all there was one period of architecture and furniture which Mr. Dawber had not alluded to but which always struck him as extremely interesting—he meant when Burges, Mr. Street, Mr. Eastlake, and Sir Arthur Blomfield interested themselves in designing furniture, some of the designs so produced being extremely good, and which in the history of furniture certainly ought to claim adequate recognition if they were to consider the work now generally associated with the Arts and Craft School. If they remembered Burges's house at Kensington he thought they would agree with him that it was one of the most remarkable buildings of its kind in this country, and one which he would like to see acquired as a national monument—it really was a most wonderful piece of work, thoroughly worked out from beginning to end by one of the most distinguished architects of the XIXth century. In that house and in his office at Buckingham-street, Burges carried out the idea which William Morris, Rossetti, and Burne Jones also realised—that they could have perfectly plain furniture and then paint it most beautifully inside as well as out, and make it extremely interesting and a supreme work of art. Burges, in his house, acting on the lines of the painted mediæval armour at Bayeux, painted a series of bookcases in his library beginning "A was an architect, B was a builder," and so on all round the room, and then he employed in doing this Marks and Sir E. Poynter, while inside the furniture were painted most lovely representations of plant life, all part and parcel of the story, and to his mind carrying furniture to a much higher plane than the exquisite cabinet-work of Chippendale and others which had been presented. In reading Burne-Jones's life he would find that his idea was to design something exquisitely beautiful in itself, well proportioned, and all that, but the object of the thing mainly was to produce a surface on which most beautiful painting could be placed. Whether or not it was desirable to paint chairs and such-like articles was another matter, but he did think that, in a history of furniture up to the present time, it would be a pity if they left out all mention of such work as that belonging to that much-abused period of the Gothic revival. There was some very nice modern work at that time by Bruce Lambert, and Brydon followed much in the same way. They were friends and Scotchmen, and they did some exceedingly nice work which would bear criticism from the modern standpoint. There was very much more intelligence and thought in it than there was in the semi-barbaric rabbit-hutches which they saw with huge iron hinges and with interiors hard to get at, and which were of little use. It was a subject which he had taken a great deal of interest in all his life. Some years ago when his friend, Mr. Aldam Heaton, read a paper on "Furnishing" it was rather disparaged by one or two members of the Institute as being a subject which practical architects could not turn their attention to. He thought that was a great mistake, and when they went into some of the modern houses which architects were building all over the country they found that where the architects had been allowed to have a voice in the furnishing of the house the result was exceedingly satisfactory, whereas, on the other hand, they found in some houses a mass of the most trashy furniture which could be introduced. But in designing furniture for a house they must remember that the persons who used them

must not appear incongruous, and the present unfortunate system of rapid changes in the fashion of dress made it extremely difficult to design anything which would exactly accord with living modes and manners. Mr. Macquoid had done well to insist that it was not only the architecture of the period which influenced the furniture, but also the costume and style of the people who used it. He had known Mr. Dawber for a great many years, and he believed the first time he came across him was when he was making some sketches of furniture in East Anglia in ancient buildings. He was not surprised to find that Mr. Dawber was still interested in furniture.

Mr. H. D. Searles-Wood said he would like to throw out the suggestion that at the Congress a visit to Burges's house and perhaps some other houses might be arranged.

Mr. A. Penty said it always struck him that little of the old furniture was wholly satisfactory. They saw a chair, for instance, of which the legs were beautiful, while the back was the reverse of beautiful. In some cases they got a real feeling of vigour, but with this vigour there was a lack of refinement, and then, again, in other work they got refinement but the vigour was gone. He could not but feel that somehow or other there never seemed to have been the same standard of design maintained in furniture as in architecture. He did not know the reason for that, but so it always seemed to him.

Miss E. Rowe said that Mr. Macquoid had alluded to the spindle ornamentation being too early for 1620, and she would like to ask Mr. Dawber whether in his observations he had noted that in Nasb's "Mansions of England" there was a drawing of the Moncaunte room showing the interior porch, and that was, she believed, about 1580. He would see that the spindle ornament was given in that.

The vote of thanks was heartily agreed to. Mr. Dawber said that when he undertook to read a paper on "Furniture" he realised that the subject was an immense one, and covered an enormous amount of ground. The speakers, with one exception, had been kind enough to tell him of his shortcomings, and to a certain extent he knew them. It was quite impossible to say everything, or even to trace properly the history of furniture, in the time he had at his disposal. He knew Hardwick Hall very well indeed, and had sketched the furniture. He could not quite agree with Mr. Macquoid as to what he said about the split baluster of the Yorkshire chairs. He had two Derbyshire chairs which were better examples than those he had shown, and they had the split balusters, and he put them down at 1610 to 1615, and all the researches he had made led him to the belief that that was the real date. At the same time he admitted that it was with besitation that he ventured to express his opinion before such an authority as Mr. Macquoid.

The New Premises.

The Chairman said that a meeting had been called for the following evening to consider the question of acquiring new premises for the Institute, but, as Mr. Belcher was indisposed and one or two little troubles had arisen, the Council felt that all they could honestly do would be to postpone the meeting. They would have to meet, because the meeting had been advertised, but the only business which would be transacted would be the adjournment of the meeting. On Monday, March 5, a special general meeting would be held for the election of the Gold Medallist, to be followed by a business meeting for the election of members. Mr. Saxon Snell had given notice that he would call attention to the Henry Saxon Snell Bequest and as to what steps had been taken by the Council to formulate a scheme for the proposed scholarship or prizes, and also that he would move a resolution.

COUNCIL SCHOOL, TEVERSAL, NOTTS.—A new council school has just been opened at Teversal. It affords accommodation for seventy-five children, and the main room can be divided by a partition. There are also cloakrooms, and the school itself is surrounded by a playground. The cost has been 1,700l. Mr. J. Sander, the County Architect, prepared the plans for the work.

ROYAL ACADEMY LECTURES.

At his fourth and concluding lecture on "Reason in Architecture," delivered on Thursday last week, Mr. Jackson said that it might be objected to the argument of his preceding lectures—if all architecture was based merely on the fit expression of structure, what room was left for art? That was a vital question to which in fact the previous lectures were intended to lead up. Sound building was not everything; and though architecture must rest on a reasonable basis and not on caprice, it did not follow that no room was left for art. Everything depended on the spirit in which the suggestions and opportunities of structure were received; and that depended on whether the artistic spirit was or was not present in the builders. The suggestions of structure might be treated gracefully or ungracefully; some ages were artistic, others utilitarian and commonplace. To a dull mind the use of recessed orders of arches would have suggested nothing but economy of material; the artistic mind found in it the suggestion for mouldings and the grouping of pier-shafts; and the practical difficulties of vaulting, which led to the introduction of the built-up vaulting-rib, were by the artistic mind etherealised into the roof of King's College Chapel. In like manner the weighting of buttresses practically required nothing but a mass of stonework, but it was treated as a pinnacle, and became a feature of beauty; and so with the flying buttress. The gradual approach to each other of the original small narrow windows of the Romanesque builders, left between them a thin shaft of stonework till there was but a led to the blending of the lights into one window, and to the introduction of tracery to support the leaded glass—a feature as unexpected as it was admirable. But for the artistic spirit the development of the capital might have stopped at the Byzantine cushion form. A recent writer on architecture in the *Edinburgh Review*, he noticed, had maintained that the new development in architecture after the fall of the Roman Empire was owing to the ideas of the new races who had supplanted the Romans; that they must have had the idea of this architecture in their minds before they built it; and so on. That, he could only say, was putting the cart before the horse. At the root of each fresh departure in architecture was a reason founded on convenience and quite outside of aesthetics, and a reason which refused to be lost sight of; when it was lost sight of, the style decayed and fell. Construction to the architect, in fact, was like natural form to the painter; as long as it was correctly expressed, there was room for development beyond the structural basis. The solution of the problem would be different with different people, and that solution demanded to be expressed as much as the constructional basis itself. The marble quarries of Greece suggested trabeated structure and fine mouldings; the Romans, who used the arch, erected in their aqueducts splendid arched structures; their weakness was the retention (in other erections) of trabeated forms where they had no constructive meaning. There was something in personal character and social conditions which influenced architectural development. During the Xth and XIth centuries clerical influence induced a certain conservatism, but after the XIIIth century, when the lay influence came into building, the development was wonderfully rapid. The next generation after the Norman nave at Peterborough saw the west front built, and after that a whole succession of original styles was developed in three and a half centuries. Contrast this with the case of the Roman arch, which was just as good a suggestion in architecture, but was not developed into anything further. The Roman Empire, like the Roman architecture, bore the stamp of Rome everywhere, and every colonial city was but a miniature of Rome; and so the central type governed everything in Roman architecture, which hence became monotonous. The time of jarring nationalities succeeded, to whom the monotony of Roman architecture was unsuitable; architecture must in any case have taken a new direction, Gothic architecture was the style of individualism; it could take almost any shape and yet remain the same style, and was therefore exactly suited to the social instincts of the period; but the influence of construction was behind all this.

No new style was ever invented; it came about unconsciously, and to parade what was called "Art Nouveau" as a new style was to ignore all the teaching of history. All the revivals of modern times were of outside appearances only; sash windows were Classic, it was understood, mullioned windows were gothic; precedents were wanted for everything from Palladio to Pugin; chimneys were no part of original Classic architecture; they were therefore to be disguised as vases or obelisks. This idea of architecture had been accepted by the public, and rules for carrying it out had been formulated by the authorities who had control over our art schools. In lesser arts the same principles applied; forms should be founded on utility, in which sense the humblest utensil might have interest; the forms of old pottery, and of the bronze vessels found at Pompeii, which were generally admirable to the eye, were founded on convenience and utility. The same principle should hold good in what was called "Applied Art." Why were we to see floorcloth looking like squares of tiles, and brooches made in imitation of horseshoes, or a diamond brooch in the shape of a pig? That was not design, it was the unintelligent imitation of form. To return to architecture, how did our modern practice accord with the fact that new materials were coming into use? There were plenty of constructional suggestions in these days, but we still stuck to our old architectural forms. There was a demand for glass shop fronts, and they had to be supplied; yet we still continued to build above these glass fronts as if there were no glass below. We should face the facts; show the girder and the iron column which carried it, and not conceal the girder and stanchions behind a mask. And it was inconsistent that the upper portion of a building should ignore the construction of the lower portion. Projecting oriels and domes and other such features were impertinences in a building of which the real construction was iron. Why not treat iron in some such way as wood used to be treated in half-timber work? Iron construction really resembled carpentry a good deal; why not make the superstructure of a shop a visible iron framing, with the iron exposed to view as the wood was in the street buildings of Chester? Of course we could not tell how long iron was going to last; and apart from any special demand being made for it, he thought an architect who wished to go down to posterity would be wise to keep iron out of his buildings as much as possible. But to see miles of streets resting on concealed girders was a lesson to us, at all events, that we had thrown away an opportunity.* The recollection of constructional basis might also act against the common mistake of crowding buildings with ornament, so that the eye in vain seeks for repose in any plain spaces. Terra-cotta had had a bad influence in this respect, a fine material in an artist's hands, it had encouraged the use of cheap repetition of ornament. Self-restraint in ornament was one of the lessons much needed in this day; the sense that in this respect, often, the half was more than the whole. One temptation to pretentiousness in ornament was that it was popular; and moreover it saved thinking; it was easy to cram on ornament. If all architectural design were referred to the test of construction, ornament would take its right place, which should be like that of the drapery to a statue. Ornament should have structural meaning too; as applied to a capital it should have an upward and supporting tendency; in friezes and cappers it should have a flatter character. Doorways invited decorative treatment, and in the earlier Gothic doorways of France the tympanum was sometimes decorated with sculpture which was thought of sufficient

* It is possible that another way out of this may be found, by persuading the better class of shopkeepers to believe that in the long run a good architectural treatment of a front may be a better advertisement than the whole sheet of plate glass. We can give one instance in point, of recent occurrence. An architect was desirous to carry the upper part of the front over a shop on a genuine elliptical arch over the ground floor window, instead of inserting a girder and filling the whole space with plate glass. He showed the client that the architectural effect was much better and more complete in that way, and asked him if it was worth while to spoil the whole front for the sake of getting in two triangular bits of plate glass which were not really necessary. The argument was accepted.—Ed.

value to be preserved and reset in a later building. Windows also were opportunities for decoration in a typical Venetian palace the decoration was nearly all concentrated on the windows. That was an example of ornament rationally applied to emphasise important and permanent features. Good ornament was too precious to be wasted where it was not wanted; and when ornament made us forget what it decorated, it was an excess. All architecture should be brought to the bar of reason, not of precedent. The latter was easier to follow, no doubt, but it only led us round and round in a circle. Unfortunately it was the element most generally understood, and an architect who deserted precedent would be likely to find himself unpopular. But there was already a movement in favour of greater liberty. The search after character was to be recognised now as an object, though it was sometimes carried too far, leading to an exaggerated simplicity or a forced effort at originality; the latter a great mistake; the dull proprieties of the old school were preferable to that; originality must have an obvious reason. The real value of the study of old architecture was to form ideas of style. The letter of old work was dead, though the spirit survived. But there were still many people who looked on imitation as the test of architecture, and would gravely ask you where such and such a feature "was taken from." Ancient architecture should be to the modern architect what ancient art was to the sculptor and painter—a subject for study, not for imitation. Imitation had only the same kind of value in architecture as "Elegant Extracts" or dictionaries of quotations in literature. The modern architect should go straight on his own way and be himself, and bring his art into accordance with modern requirements. If he was required to use iron construction, let him treat it accordingly, and quit brick and stone forms. Each one who followed this principle would do something towards putting modern architecture on its proper basis—that of reason.

On Monday Mr. Colton gave the first of two lectures on Sculpture, to be followed by one from Mr. Goscombe John; but we defer a report of the first to next week, when a brief résumé of the three lectures will be given.

MICHELANGELO'S WORK AT SAN LORENZO AND IN THE SISTINE CHAPEL.

It would, of course, be an impudent and profitless proceeding to attempt to deal in one short paper with the personality and work of so revolutionary a figure as Michelangelo proved himself alike in all the arts, but, having had occasion for another purpose to have some slides sent from Italy of the Sistine Chapel roof, and being able to add to these a few of the master's own sketches for his work at San Lorenzo, it seemed to me that it might be possible briefly to consider some of his methods, and find, at any rate in his architecture, a moral for our own times.

For his times and ours are not so dissimilar as they may at first sight appear. In both we find the same struggle going on—the struggle of the romantic spirit to assimilate classic forms. In the work of Brunelleschi, Alberti, and the earlier Renaissance architects we see them employing classic detail, as a decorative adjunct only, to buildings in plan, substance and idea romantic and picturesque; and the result is always graceful and charming, like the Italian temperament itself. Just as they played with Gothic architecture, producing, without any real appreciation of its relentless logic, things of refinement and exquisite beauty, like the façades of Siena and Orvieto, so they now played with their

* We can give one amusing and typical instance of this. When the National Portrait Gallery was in progress, we received a letter from a correspondent (if we remember right, he was an architect) complaining that the late Mr. Christian, in carrying out this building, which is a kind of annex to the National Gallery, was not repeating the capitals of the National Gallery correctly, but was introducing a modified classic capital different from them, and urging us to make a public protest against this nefarious proceeding.—Ed.

† A paper read before the Liverpool Architectural Society on Monday, February 5, by Professor C. H. Reilly, M.A., A.R.I.B.A.

Classic orders and entablatures, encrusting them with the graceful arabesques of their fancy or the delicate grotesques of their humour.

But while this was happening the scholars were at work on their own revival of learning, and most unfortunately, as it seems to us now, they hit upon the writings of that pedantic old Roman, Marcus Vitruvius Pollio. From that moment they began to invade the domain of architecture, much as in church work the country parsons, with knowledge culled from Rickman's styles and Parker's glossary, do to-day, and then, as now, only too many architects were ready to follow their directions. Instead, therefore, of applying to the ample Roman remains about them their senses and emotions, and trying to get at the real significance of the work, they accepted the authority of this Roman architect, whose writings they partially understood, as the final and ultimate test of all good building. They did not even stop to inquire whether what was good in the 1st century under the Roman Empire still remained perfect in the XVIth century under the Christian Church, any more than our own cathedral committee seem to have considered whether work of the XIIIth century adequately expresses the thoughts and ambitions of the XXth. This, then, was the state of affairs when Michelangelo first turned his attention to architecture.

And, to digress for one moment in order that the moral may be more clearly pointed, I think we have reached to a not very dissimilar state ourselves. When the Romantic spirit swept over Europe in the early XIXth century its strongest manifestation was in the revival of Gothic architecture. Of this revival we are still feeling the effects, even in those of our buildings which purport to be classic.

It shows itself in our love of picturesque detail; in the tower, without which no modern municipal building seems complete; in the accidental manner in which we attach to classic façades such non-classic features as turrets, high-pitched gables, steep and semicircular pediments. In fact, we are reaching a stage of so-called classic design so free from the dignity and repose which are of the essence of the classic spirit, that many who love that spirit, which our own XVIIIth century architects—our Chambers and Gibbs, made so essentially English when all the world was given over to rococo licence and barbarism—many advocate now the practical renunciation of all self-consciously designed detail at all, and bid us to rely for beauty on the abstract, bald form our construction leads us to, together with such added beauty as may be attained by judicious choice of material and surface. This is, indeed, a hopeless attitude—one which, if adhered to, may not, indeed, prevent us from producing satisfactory domestic architecture on a small scale, but will for centuries prevent us, until new forms have grown up with all the present significance of the old classic ones, from interpreting in our architecture the pride and grandeur of our national or even of our civic life. No; the real danger, I think, lies in the possibility, owing to the intervention of the Gothic revival and the break which it has caused with our own English classic tradition, that some genius like Michelangelo, only half endowed with the classic spirit, but strong enough, like him, to impose his fashion upon us, may arrive, and by combining the old detail into new forms, as he did, send us still further on the road of this free and freer Classic, till we produce in the XXth century the very rococo mannerisms we refused to admire in the XVIIth and XVIIIth.

For this was the well-known result of Michelangelo's work at San Lorenzo.

He was commissioned to add a new sacristy as a monument to the Medici on the northern side of the church to balance Brunelleschi's sacristy on the southern side. He was also commissioned later to build on the western side of the cloisters a room for the famous Laurentian Library—the collection of books and manuscripts made by various members of the Medici family. Both these commissions came from Clement VII., a Medici Pope. Another Medici Pope, Leo X., had, earlier, as the result of an open competition, commissioned him to erect a new façade to the church. To this day, however, this has not been built, though Michelangelo

wasted several years of his life quarrying marble for it. The blocks are still to be seen, I believe, at Carrara. Till he commenced the sacristy, this—the proposed façade—was his only architectural work as far as we know, and the model for it, which can be seen at Florence, shows what a jejune and spiritless thing it was—a mere frame for sculpture.

But, coming to the sacristy itself, which, when forty-seven years old, and protesting that architecture was not his trade, he was compelled to undertake, we find it to be in plan a simple square compartment of 40 ft. either way, exactly similar to Brunelleschi's old sacristy across the chancel. In the centre of one side is a square recess of 16 ft. covered with a semicircular dome on pendentives. The main chamber is of very lofty proportions. It consists first of a cube of 40 ft. to the top of the attic cornice. The square on plan is then reduced to a circle by means of large pendentives at a height of 62 ft. above the ground, above which, again, is a semi-circular dome carrying the lantern. In each of the four walls above the attic, and under the circular arches dividing the pendentives, are four windows, from which the interior receives its light, and for the purpose of lighting the monuments below the light could not be better distributed. The acoustic properties of the building are, however, the very reverse of this, but for these it was not designed. Like most Italian buildings, the structure was complete in brick first, and then overlaid with its marble and plaster covering. The main scheme of this covering consists in a lofty Corinthian order and attic in dark ash grey ("pietra serena," with the interstices filled with white plaster or white marble. So far it is very simple and very satisfactory, the dark cornices, pilasters, and archivolts, although, as we shall see of Michelangelo's "improved" profiles, nobly outline the shape of the interior. But when this was done the architect set about to design a scheme of doorways, niches, and subsidiary pilasters, which have no organic connexion either with the uses or structure of the building, or the idea of a mausoleum. At the end of each wall is a square-headed doorway with a curved pedimented niche above it, so that there are to this one compartment eight apparent entrances. The detail of this door and niche, combined into one feature, is unlike anything preceding it in architectural history. It is a highly complex design executed, like the monuments themselves, in polished white marble of exquisite finish, but it is not till you see the mouldings plotted that you realise to the full all the deliberately designed variations which have been introduced. It must not, therefore, be considered that, because Michelangelo was loth to undertake this work, he did not, when he had once set his hand to it, make the architecture as intensely personal as the sculpture. Like it, it is overlaid with thought, and serious effort. It is, and it was meant to be, part of one whole with the sculpture. His sketches show this very clearly, and no doubt it is difficult for us nowadays to form a correct estimate of the architecture when only two out of the fourteen niches are filled.

On either side between the main black pilasters containing the doors are the monuments themselves. They each consist of a lofty basement, in front of which is the curved sarcophagus, with its reclining figures, and a main story divided into three niches by four coupled pilasters. The centre niche in each case contains the seated figure of the duke or captain, and is square-headed. The two outer niches, which are shallower, and, curiously, have no outer pilasters to contain them, are finished with curved pediments. These pediments, together with the curved sarcophagus, form an interesting triangular composition. This part of the work, as may be seen by comparing the mouldings with those of the library, is twenty years later than the preceding, which was finished in 1529. The enriched mouldings, than which no more exquisite ones exist, vary in either monument, as do the capitals of the pilasters, and, like them, have been thought to be part of some subtle allegorical scheme. Whether this is so or not, they certainly form an admirable foil to the broad surfaces of the figures.

But, considering this architectural

background as a whole, and allowing for the pilasters being finished with candelabra or similar ornaments on the curious pedestals above the cornice, it must be admitted, even when we have accepted the artificiality of the scheme, that the scale is trivial. Perhaps it was purposely reduced in an attempt to enhance that of the sculpture, but, if so, it is only another proof of amateurishness.

Considering these things, it is interesting to note what in a critical age, when artists and men of taste abounded, was the effect of this architecture on Michelangelo's contemporaries. Vasari, himself an architect with no small practice, says: "Michelangelo wished to build the new sacristy upon the same lines as the older one of Brunelleschi, but at the same time to clothe the edifice with a different style of decoration. Accordingly he invented"—mark the word—"for the interior a composite adornment in the newest and most varied manner, which the antique and modern masters joined together could have used. The novelty of his style consisted in those lovely cornices, capitals, basements, doors, niches, and sepulchres, which transcended all that earlier builders working by measurements, distribution of parts, and rule had previously effected, while, following Vitruvius and the ancient relics, such men were afraid to supplement tradition with original invention. The licence he introduced gave great courage to those who studied his methods, and emboldened them to follow his path. Since that time new freaks of fancy have been seen, resembling the style of arabesque and grotesque more than was consistent with tradition. For this emancipation of the art all craftsmen owe him an infinite and ever-enduring debt of gratitude, since he at one blow broke down the bands and chains which barred the path they trod in common." Knowing where this path led his successors to, we may devoutly hope no one with a similar influence will point the way for us.

Of the figures themselves it is perhaps presumptuous to speak. The first sight of them, particularly of the seated figure of Lorenzo, as Rogers has well said, "fascinates and is intolerable." Unlike Greek sculpture, they have a tragic force, a sense of brooding and destiny, making them, while intensely personal, sublime and remote in their austerity. The two dukes sit, the one easily, gracefully above the immovable forms commonly called Night and Day, and the other, generally styled Lorenzo, with hand to chin, rapt in intense thought, above the half-stirring figures of Dawn and Twilight. The dukes do not pretend to be portraits, and are in their contrasting attitude and bearing part of the larger allegory of time and destiny contained in the figures below. These latter, awkwardly poised as they are on the elliptical surface of the sarcophagi, are so full of power and thought that, like the figures on the Sistine roof, they seem elemental forms, beside which the architectural and decorative feature, the very building itself, in a little while, sinks into insignificance. "It is easy," as Symonds says, "to remark that their strained postures and written limbs have perverted the taste of lesser craftsmen. Yet if Michelangelo was called upon to carve Medicean statues after the sack of Rome and the fall of Florence—if he was obliged in sober sadness to make sculpture a fit language for his sorrow-laden heart, how could he have wrought more truthfully than this?" To imitate him in both sculpture and architecture without sharing his thoughts was the real decadence. That this was something of his meaning is shown from four lines of verse he sent in reply to a friend who tried to compliment him on the lifelikeness of his figure of Night. Night is speaking—

"Dear is my sleep, but more to be mere stone,
So long as ruin and dishonour reign.
To hear nought, to feel nought, is my great gain,
Then wake me not; speak in an undertone."

Concerning the actual technique of the carving, whether the figures are finished or not, there has been ample controversy. To me it seems clear, as has often been suggested, that parts have been left with roughened surface purposely to hold the eye, while other parts have been finished to the glossiest polish so that the eye may glance freely from them. On the figure of Day, for instance, the planes are all broad and flat and the surface slightly rough, so that the

eye can study the figure carefully and take time the while, whereas Night is finished to highest polish, and can only be seen, as it were, in flashes. If this was Michelangelo's intention, we have the beginning of that method of suggestion in stone which Rodin has carried to such remarkable lengths. But it must be remembered that in all Renaissance sculpture there is an attempt to express individuality, which is quite foreign to Greek work. Michelangelo, particularly, with his passionate love of the human figure, while contenting himself with a type for the face, strove to make the body suggest every thought and emotion the human mind might seek after; and, feeling that this was the highest limit of art, as in painting he would have nothing to do with landscape, so in his architecture he would not permit any but the most conventional of wreaths and enrichments beside his sculptured forms.

The other and purely architectural undertaking at San Lorenzo was the construction of the Laurentian Library over the western cloister and the vestibule with staircase leading to it. If Michelangelo had been an architect by instinct and training, rather than by compulsion, he would not in this case any more than in the sacristy, have adopted the plan suggested to him by his clients. But, having once conformed to it, in both cases his architecture was reduced for him to little more than a system of panelling. The chief interest of the library, then, which is a long, narrow compartment some 110 ft. by 30 ft., and of the vestibule adjoining, some 30 ft. square and nearly a double cube in height, is the further development they show of his distinctive style and the numberless pitfalls he was preparing for his followers. As others have pointed out, this vestibule suggests rather an exterior than an interior. The tall Doric columns, if such they can be called, set back in pairs in rectangular recesses in the wall, serve no purpose that pilasters would not more effectively do, and at the same time preserve the continuity of the wall surface.

It is amusing to note what Vasari, who completed the building for Michelangelo, and may have been responsible for some of its eccentricities, says: "In the library of St. Lorenzo Michelangelo afterwards made a plainer demonstration of his intention by the splendid distribution of the windows, the arrangement of the upper chamber, and the marvellous entrance-hall into that enclosed building. The grace and charm of art were never seen more perfectly displayed in the whole or in the parts of any edifice than here. I may refer in particular to the corbels, the recesses for statues, and the cornices. The staircase, too, deserves attention for its convenience with the eccentric breakage of its flight of steps, the whole construction being so altered from the common usage of architects as to excite astonishment in all who see it." This passage shows well the mastery which Michelangelo's false architecture achieved even in his lifetime, for when eccentricity is praised and astonishment made an aim, Art the coy maiden is likely to make way for the bolder creature, Artifice. And, indeed, this is what happened, for the gigantic internal orders unrelated to the structure, the superimposed pediments, the baluster architraves, here first used, became a fashion for the next two centuries in most parts of Europe, and so entirely was the restraint of precedent discarded that anyone who could put a classic feature to a new and strange use was sure of fame. But in his own work, and even in the additions by Vasari, we find all these features in themselves so well proportioned, so delicately moulded and refined, that, though nothing can remove the sense of unreality that always attaches to these rooms, after you have been in them awhile you forget that any other kind of detail exists outside. It was his followers, to whom, as Vasari said, he had opened a path hitherto barred to them, who took these new features and applied them everywhere and in every scale and proportion, in much the same way as the White Star cable end is used nowadays on every Free Library, who produced the decadence.

Of his work in the Sistine Chapel we shall be better able to judge from the photographs. It is a long, narrow room, 132 ft. by 44 ft., and 68 ft. high. It is vaulted with a single tunnel vault in plaster, with cross vaults to

the windows. When Michelangelo was called upon by Julius II. to decorate this vault in 1508—that is, when he was thirty-four years of age—the room was perfectly bare, except for a dado of primitive frescoes and a row of twenty-eight Popes by Botticelli. Over the altar, where his "Last Judgment" now hangs, were three small frescoes by Perugino. In this building Michelangelo locked himself up, dispensed with the scaffold Bramante had somewhat clumsily provided, constructed a new one of his own, and in less than four years covered the whole roof with the portentous vision of prophets, sibyls, nude figures, and episodes in Old Testament history we think of whenever the Sistine Chapel is mentioned. I do not mean to dwell on this marvellous creation, except to point out that, just as at St. Lorenzo he treated architecture as a scenic addition to his sculpture, so now, discarding all the ordinary canons of decoration, and caring nought for the building he was called upon to enrich, he produced, not a painter's or an architect's conception of a painted ceiling, but a sculptor's dream of 343 mostly nude figures in every conceivable attitude and combination. For this he had certainly two very good excuses—the first, that, as architecture at St. Lorenzo, so painting here, he protested, was not his trade; and the second, that the building itself was a barn-like structure, with no architectural features to command respect.

The result is that on looking up the real roof seems to have been removed and a new hypothetical one of his own imagination constructed in its place. This rises in great arches from pedestals between the windows. Through these arches is to be seen the sky, and in the sky are visions of the Creation, the Deluge, and the Fall. On the pedestals from which the arches spring are seated youthful geni, and below them, with attendant children, crouch the prophets and sibyls—colossal figures some 12 ft. high in sitting posture, and, painted as they are on the quicker curve of the vault, they represent in drawing perhaps the greatest technical achievement of man.

Most of us are familiar, at any rate from illustrations, with this thunderous vault, its angry titans, and its visions of perfect human beauty as in the form of Adam receiving life from the Creator. We know it, but we never think of it as pertaining to a building, as part of a surface decorated. Indeed, with such work on such grounds it would be absurd to criticise. Starting from them, it has risen to another plane, even to another sphere, and the result is a thing apart, divided by the impassable gulf of Michelangelo's genius from the rest of the world. So that the painters who followed him, like the architects, but for a different reason, were bound to fail. Michelangelo could only succeed on the path he took by creating a new heaven and a new earth, and that is not given to all men to do.

PROPOSED NATIONAL COLLECTION OF DRAWINGS OF ANCIENT ARCHITECTURE.

Two or three weeks ago we published a note stating that the Spiers Testimonial Committee had handed over to Mr. R. Phené Spiers the sum of 79l., being the balance in hand of the fund after paying the costs of the medallion, presentation of books, dinner to Mr. Spiers, and publication of his volume of essays, "Architecture East and West." We now understand that Mr. Spiers proposes to hand over this sum to a small committee, consisting of himself, Professor Lethaby, and Mr. R. Weir Schultz, to deal with as the nucleus of a fund, to be added to by subscription or otherwise, for the purpose of forming a collection of drawings of ancient architecture in continuation of the work of the Spiers Testimonial Committee, such drawings to be deposited at the South Kensington Art Library or at the British Museum, and to be available for access by students of every kind. The committee now invite architects and others who possess such drawings to place them at their disposal for this purpose.

They will also be glad to receive any information from architects or others interested in the proposal as to the existence of such drawings, or of sketch-books or other material of a similar kind. Photographs of

buildings which no longer exist or which have been materially altered will also be received for the collection.

It has long been felt that in the past there has been a great loss of valuable records owing to the want of suitable means of collecting and preserving the same when such have no longer any particular use or value to the owners.

The committee have reason to believe that such a collection would be very much appreciated for purposes of reference, and arrangements would be made for preserving and cataloguing the same in the names of the authors and donors.

The committee will be glad to receive notification of available drawings, and will make arrangements for the collection of these. Communications to be addressed to Mr. R. Phené Spiers, 21, Bernard-street, Russell-square, London, W.C.

Mr. Spiers himself, Mr. E. F. Knight, Professor Lethaby, Mr. Schultz, Mr. Sidney Barnsley, Mr. A. H. Christie, Mr. E. W. Gimson, Mr. F. W. Troup, Mr. Cecil Brewer, and others have already promised drawings.

Sir Aston Webb and the other members of the testimonial committee have expressed their cordial approval of the proposal.

Sir Aston Webb writes—"I need hardly say I entirely sympathise with the proposal to collect reliable records of our fast vanishing ancient buildings, and shall be pleased to place any records I have at the disposal of the committee, or to join in contributing to the necessary funds. I think Mr. Spiers' desire to place the balance of the testimonial fund as the nucleus of a fund for this object is a most generous one, which I am sure all will appreciate."

We need hardly say that we are entirely in sympathy with the scheme; adding also our appreciation of the generosity of Mr. Spiers in thus turning the surplus of the testimonial fund to account for the general good of the profession.

THE ROYAL SANITARY INSTITUTE.

A SESSIONAL meeting of this Institute was held on Wednesday last week at the Parkes Museum, Margaret-street, W., the chair being taken by Mr. O. Claude Robson, Engineer to the Willesden District Council.

The Intercepting Trap.

The subject for discussion was: "Is the Intercepting Trap a Failure?" and the Chairman, in calling upon Dr. W. Butler, Medical Officer of Health, Willesden, to open the discussion, said that physically and materially the subject was a small one, but it affected a very large principle indeed. It affected not only the comfort and health, but the actual life of the community at large, as doctors would no doubt tell them. The interceptor was an old friend, but they had not been favoured as much as they would have liked with full discussions of the matter, and he believed that the present discussion would prove of much value, not only to sanitarians but to the public at large.

Dr. Butler first considered the purpose of the interceptor in a modern system of drainage, after which he said that he should endeavour to show that the conception of a drainage scheme in which the drain was disconnected from the sewer was wrong in principle, and that in practice it was as mischievous as in theory it was faulty. It was based on the assumption that it was safe to have a condition of things in the public sewers that it was unsafe to have in the house drains which communicate with the sewers, and that they might recognise the existence of a danger zone on one side of a trap against which the other was assumed to be safely secured by a seal of sewage. It must, of course, be conceded that the inside of a sewer could never be regarded as a sanitary situation, but from this to the assumption that its gaseous contents might be contemplated as so potentially charged with danger that they might not even be admitted to a gas-tight system of tubes having no unsealed opening save to the outer air above the houseposts, was a most serious confession of sanitary failure. The truth was that accumulations of considerable volumes of sewer gas were dangerous and insidious, whether they be permitted to stagnate in the sewers or in the house drains. If the sewers were efficiently ventilated, as unques-

tionably they should be, there was no ground to suppose that the atmosphere of the sewer was more harmful than that of the house drain, and the disconnection of one from the other was not only harmful, but irrational also. For it presupposed what sanitarily could not be presupposed—namely, a dangerous atmosphere in the sewers; and it was an attempted defence, by means of a trap, against this danger, which in its very adoption cast doubt upon the efficiency of the means, since the same were used in the defence of the house against the still dangerously regarded atmosphere of the house drain.

Perhaps the most universally objectionable feature of the siphon was that it prevented the efficient ventilation of the sewers. That the public sewers were inefficiently ventilated in those cases where their communication with the soil-pipe ventilators of the house drains was intercepted, was shown in many ways. It was a common experience with municipal officers that daily complaints were received, during the summer months, of the offensive smells proceeding from the openings to the sewers in the crown of the roadway, placed there originally with the intention of acting as fresh-air inlets to the sewers, and now in many districts being sealed off because they were found to act as vents for the foul gases of an insufficiently ventilated sewer. Visual demonstration of this fact might be had during frosty weather, when a stream of condensed vapour might be observed proceeding from these openings into the sewers. It might also be shown with regard to most sewers that the number of upcast shafts which it had been possible to erect were quite insufficient to cause such a negative pressure in the sewers as should result in anything like continuous aspiration of air into the sewers through the road openings. But, short of effecting this, the road grids became a nuisance owing to escape from them of the gaseous contents of the sewer at the street level, and under conditions, owing to inadequate sewer ventilation, in which these gaseous contents were apt to contain a large admixture of sewer gas. He thought it would not be disputed that what was most urgently needed in respect of most public sewers, was an increased number of exit ventilators intentionally so acting. And could these be provided in sufficient numbers—as practically at present they could not be—the problem of sewer ventilation would be solved, and the atmosphere of the sewers would then be rendered as innocuous as rapid change in the aerial contents of the sewers could render it. Such sufficient numbers of upcast ventilating shafts would be provided where each house drain and soil ventilating pipe in direct aerial communication with the sewers. The aspirating effect of so many outlet ventilators to the sewer, up which the lighter air of the sewer would tend constantly to ascend, would be a rapidly inflowing current of fresh air to the sewers at all lower openings; and thus at one and the same time both the sewers and the house drains would be effectively ventilated and any accumulation of gases of decomposition, either in the sewers or the drains or their escape in improper situations rendered impossible.

The interception of the drains from the sewers, however, had deprived the sewers of what should be their natural outlet and on occasion inlet ventilators. It had necessitated the provision on each house drain of an untrapped opening, situated in a large portion of cases in immediate proximity to the doors or windows of the house, and acting, if not as often as not, at least with a frequency un contemplated in the theory of its advocates, as an outlet ventilator to the drain. Further, to provide access to the segment of the drain between the interceptor and the sewer another complication in the shape of a raking arm with a readily removable stopper had had to be added. An inspection chamber was a proper equipment of every drain, but the interceptor, necessarily placed as near to the sewer as practicable, had necessitated the placing of the manhole where the drain was deepest, and where, apart from the consequently increased cost, it necessarily formed a capacious reservoir for the storage of gases at the very site where they were most likely to accumulate owing to the couple of gallons or so of stagnating sewage contained in the

trap at the bottom. Everyone of these complications introduced into drainage systems to meet the exigencies of the interceptor were extremely apt to go wrong and produce nuisance. The interceptor itself was essentially insanitary. It retained within the precincts of the house premises between two and three gallons of sewage which was of that aggravated character which resulted from the undue retention of solids, and thus breaks with the primal principles of domestic sewage disposal. The plating down of the street gratings to prevent the offensive smells from the sewers, which the introduction of the interceptors had occasioned, would, especially where shafts had not been erected in their place, make this forcing of the trap a more frequent occurrence than was contemplated. Where no facilities whatever even for inadequate ventilation of the sewers were provided, the daily recurring increases of pressure of the imprisoned gases must necessarily force them through the yielding traps into the house drains. And this contingency to which every house drain disconnected from the sewer by a trap was subject was a greater danger than was incurred when sewers and house drains were the channels for the constant flow of continuously renewed currents of air. This was a breakdown of the interceptor in its intention, the frequency of which it was impossible to estimate. But it failed in other directions which were not contemplated. A straight pipe with a proper fall showed little tendency to choke, but if in the course of such a pipe an acute kink or bend be introduced, especially if it be of such a character as to remain filled with floating solids, the tendency to become choked at this point would have increased enormously. During last year he had a systematic inspection made of all the readily accessible manholes in his district. These amounted to some 6,745, and comprised the inspection chambers of about a third of the houses in Willesden. In no single instance was a drain found to be choked but at the interceptor, but no fewer than 288, or $\frac{4}{10}$ per cent. of all the drains inspected, were discovered to be stopped at this point. In 118 of these cases the manholes were filled with fetid sewage, emitting its foul vapours through the drain inlet ventilator in close proximity to the doors and windows of the houses, into which they were duly aspirated. In the 170 remaining cases where the drain was blocked, the manhole remained free of sewage, because of another accident of the system—namely, the unstopping of the raking arm, which permitted of the escape of the drain contents to the sewer, and incidentally of the sewer gas into the drain. In 654 cases this accident was observed to have occurred. That was to say, in nearly 10 per cent. of all the drains examined the interceptor, apart from its incidental drawbacks, failed absolutely of its object, the drains in these cases being in direct communication with the sewers. But for the drains to be accidentally in direct communication with the sewers in only 10 per cent. of the houses was much more serious than for 100 per cent. of the drains to be intentionally directly connected with the sewers. In the one case the sewer was adequately ventilated, in the other the sewer air was presumably ten times more concentrated than where all the house drains ventilated the sewer. In the one case, moreover, the sewer air, diluted and comparatively innocuous, found vent above the roofs, and away from all openings to the houses; in the other a concentrated sewer air was laid on at the ground-level at the very threshold of the houses. The untrapped opening to the drain, intended as an inlet ventilator, became in these cases at least a serious danger to health. But to such an extent was the inlet ventilator recognised as a common cause of nuisance owing to its waywardness of acting upon occasion as a vent for foul gases, that it had become common practice to fit it with a mica flap to prevent reflux currents from the still suspiciously regarded drain. In 3,193 cases of those he investigated, however, the fresh-air inlet was wholly unprotected by any properly acting appliance. This might appear a trivial matter, since at its inception no valve was considered necessary. But it must be remembered that admission to the house of air from the interior of the drain was still, and properly, he thought, regarded

as dangerous. Most people who would remain unmoved at the forcing of the intercepting siphon would feel alarm at the unsealing of the yard gully, and a crack in a drain pipe covered with two or three feet of clay was regarded as a most serious insanitary condition by people who were undisturbed at an unprotected gaping opening to their drains a couple of feet below their open window.

It might be thought that the result of the inspection of nearly 7,000 manholes yielded exceptional results due to accumulation of stoppages long unrecognised. It was true that in many of the stoppages there was evidence of antiquity in the insanitary condition discovered, but in many parts of the district there had been previous systematic inspections which yielded results quite as bad, though in lesser numbers, owing to the more limited area of investigation. Nuisances of the character discovered were, moreover, constantly being abated, being, as they were, the natural occasion of prompt complaint. He had, however, had a re-inspection made of about 500 manholes with a view to seeing whether the results yielded by the first inspection were confirmed. The re-inspection was made within eight months of the first survey, and included 216 manholes where originally no defects were discovered and 288 where defects originally found had been made good. In nearly 15 per cent. of the manholes re-examined, the most serious defects were discovered. Both in these and in those primarily discovered the defects were traceable to the interceptor, and the modifications which it entailed. In an examination of over 7,000 manholes it was found that in 95 per cent. the interceptor failed of its object of disconnecting the drain from aerial continuity with the sewer. It failed not only of this, its essential purpose, but was directly responsible for a high percentage of blocked drains, and manholes converted into leaking cesspools. The untrapped drain-opening in the forecourt which it necessitated, normally served as an outlet for the emanations of the drain, and set at ridicule all insistence on the need for effectual trapping of yard gullies and the elaborate precautions taken to secure a gas-tight drain.

In the very frequent abnormal conditions where the drain was choked, and the raking arm patent to the sewer, it was an unmitigated nuisance. It was for these reasons that he was bound to answer the question they were discussing in the affirmative. Dr. Butler concluded by giving what he considered the essential principles of sanitary drainage.

Mr. R. Read, City Surveyor, Gloucester, said that his answer to the question was "Yes." The intercepting trap was patented by Mr. W. P. Buchan, of Glasgow, about 1875, and, without any special investigation, was adopted by the Local Government Board, and introduced into their model by-laws in 1877. Ever since then this official recognition had caused it to be taken for granted by large numbers of people, and had deterred many from investigating the question for themselves. The trap used up the fall required by four or six ordinary pipes, it was inserted at the lower end of the underground portion of the house drain, forming an obstruction therein nearly 8 in. deep to the flow of the sewage, it caused the sewage to deposit from 25 per cent. to 35 per cent. of its solid matter in the trap after each discharge in dry weather, and paralysed the flow of the sewage through the whole length of the underground portion of the house drain. During dry weather the contents of the trap were always more or less putrid, and contaminated both the drain and the sewer to which it was connected. The intercepting trap necessitated in the front of the house, near the front door or windows, the so-called fresh-air inlet, which acted alternately as an outlet and an inlet with every discharge from the drain. A mica or aluminium flap valve was generally fixed to these inlets in order to prevent them acting as outlets, but the constant flapping action accompanying every discharge from the drain very soon damaged this, to such an extent that it became quite useless, and the result was that in most cases the householders promptly stopped up the opening to get rid of the nuisance which ensued. The trap was liable to frequent stoppage, and was provided with an inspection chamber,

or manhole, to facilitate its clearance; but these inspection chambers were, as a rule, only opened when a serious stoppage occurred, which caused the sewage to show above ground. The great majority of stoppages in modern drains occurred at the intercepting trap, and many of these occurred unknown to the householder, because they cleared themselves by the accumulation of sewage in the inspection chamber and drain, until a sufficient head of sewage was produced to force the obstruction through the trap; the result of these temporary stoppages being that the brickwork of the inspection chamber, amounting to about 4 sq. yds. or 6 sq. yds. area, and a considerable length of the drain became plastered with a slimy deposit of decomposing sewage. When the pressure of the head of sewage was not sufficient to force the obstruction, of course the sewage showed at the yard gully, and men had then to be sent for to open and clear the drain. The trap was introduced into the lower end of the house drain, on the erroneous assumption that it was a safeguard to the house, but it was no protection to the house at all; on the contrary, it was a useless and dangerous obstruction, which provided at every man's front door the very conditions and dangers which it was the object of modern sanitation to prevent. These traps now formed part of many thousands of existing drains, and while they absolutely prevented the adoption of a proper system of ventilation, they also provided a reservoir of putrid sewage on every house drain to contaminate everything passing through it, and thus caused noxious gases and smells to be generated in the drains and sewers, which could not be got rid of by any amount of flushing of the sewers alone, and the more numerous the traps the greater the nuisance. The trap necessitated the use of at least 50 per cent. more water in the flushing cisterns to the water-closets, and even a three-gallon flush was not sufficient to prevent stoppages, as had been shown by experiments carried out by the Institute. More recently the experiments of Dr. Porter on an actual 6-in. drain in connexion with a factory proved that the intercepting trap could only be entirely cleared out by a six-gallon flush. The great object of a system of drains and sewers was to discharge the sewage at the outfall in the shortest possible time. Why, therefore, should we put an obstruction into every drain to defeat this object? The intercepting trap was wrong in principle, and was no remedy for either a badly-constructed drain or sewer; it could not protect the house from the action of a defective drain, and it was liable to be forced at any moment: the true safeguard to the house and its inhabitants being a sound drain laid with a good fall, gas-tight joints, and properly ventilated, the full size above the roof of the house. On such a drain the intercepting trap was a useless and dangerous obstruction, but its absence allowed the drain to be laid with a better fall, to remove the sewage quickly while in a fresh state, and to keep itself clean.

Mr. W. F. Loveday (Borough Surveyor, Stoke Newington) said he had consistently held the views put forward by Dr. Butler and Mr. Read. There was one little criticism he had to make as to what Dr. Butler said about the faulty interceptor. If they had an interceptor with the cap off, it did not follow that the interceptor was to be condemned as an interceptor; but the bogey of sewer gas and house gas having been considerably exploded in recent years, and bacteriologists being unable to find any germs at all in the gas, the necessity for the interceptor no longer existed. When sewers were properly ventilated the necessity for the interceptor ceased altogether.

Mr. Roehching said that in our imperfect state of knowledge, when we could not assign to every effect its true cause, we could not afford to give up the belief that prevention is better than cure. The escape of sewer gas into the street was less of an evil than its escape into the houses. He did not think the term "intercepting trap" so appropriate as that of "disconnecting trap." Those who wished to urge upon them the abandonment of the disconnecting trap must first prove that sewer gas was beneficial to health, or that the air in our public sewers was always as good as the air in our

house drains, and that every disconnecting trap was an unmitigated nuisance. We were bound to exclude from the house anything which might be harmful to health, but, if it could be proved that sewer gas was beneficial to health, then the necessity for the disconnecting trap was done away with. It was the unexpected which happened, and we must make sure that the air in our house drains would not get polluted by sewer air, seeing that it was impossible to say what the air in our public sewers would be like from time to time. In the case of a private drain, well made and maintained, we could be reasonably sure that the air would be sweet and free from smell, but we could never be sure of the air in a public sewer, and if by any chance the air of the house drain was at fault, then the faults must be corrected. He looked upon the disconnecting trap as a useful tell-tale. They had had the disconnecting trap for twenty-five years, and it had been put down and was being put down every day in large numbers, both in this country and abroad, and there were many millions in use; that being so, was it thinkable that, had the trap been an unmitigated nuisance, it would have been used to this day? It would have been abandoned long ago. Where it had failed, carelessness was generally the cause. There was no such thing as an absolute apparatus, and yet, even according to Dr. Butler's investigations, the trap was efficient in 90 per cent. of cases; just why it failed in 10 per cent. of cases he could not explain. Granting, however, for the moment, that the disconnecting trap was a failure, was Dr. Butler's method a perfect one? He did not think it was. It was well known that pipes were forced by siphonage, or pressure of air. They could not be sure that the flow of air was always constant. From experiments with houses where there was no disconnecting trap, they found that there was no such thing as a constant flow from the street to the house—first it was from the street to the house, then from the house to the street. It was impossible to say that, if houses had no disconnecting traps, the public sewers could be ventilated through them; at one time they might be, but not generally. Owners and tenants of houses looked to the employment of disconnecting traps for the ventilation of their own houses, and they left it to the public authorities to see to the ventilation of the public sewers without recourse to the house drains. As an engineer, he would like to point out that, in works of engineering, they allowed for a strain four or five times more than was necessary, in order to guard against contingencies over which they had no control. Why should that factor of safety be omitted in the carrying out of sanitary works? The interceptor was a convenient and cheap factor of safety which he hoped would not be abandoned. An Englishman's house was his castle, and they ought not to let it be invaded by sewer gas any more than by anything else.

Dr. C. Sanders (West Ham) supported Dr. Butler and Mr. Read. He represented a town where the drains, which had been relied on modern principles, did not contain pure air. The modern system of drainage provided a sink-hole, and the only remedy at present possible was the one very largely adopted—i.e., the occupiers covered up the inlet ventilator. He should like someone to tell him the difference between sewer air and drain air. Personally, he did not know any difference. He hoped that the bogey of sewer air percolating into the house would, if the methods of Dr. Butler and Mr. Read were adopted, disappear after this discussion.

Mr. C. Chambers Smith (Engineer and Surveyor, Sutton) said he could not agree with Dr. Butler and Mr. Read, and, after Mr. Roehling's remarks, he thought it would be agreed that the bottom had been knocked out of their case. Dr. Butler's main objection to the trap was that it got blocked up, but the apparatus which was perfect and never required attention had yet to be discovered. An intercepting trap was as necessary as a gully trap, and who would say that, because the gully trap got blocked up, it should be abolished? It would be interesting to know the number of gully traps which got blocked in Willesden, and whether Dr. Butler would condemn them, and for the same reason? The point that the

fresh-air inlet might be directly under the window of a house was not a strong one, for the objection could be met by carrying the inlet above the eaves of the house roof. Another point was, that the necessity for ventilating sewers had not been proved. Who said they must ventilate them? [Dr. Sanders: The public.] The public did not know anything about the matter, and only wanted the nuisance from sewer grids abolished. There were many towns where the sewers were absolutely unventilated.

Mr. F. Wood (Borough Engineer and Surveyor, Fulham) said that, if used properly and judiciously, the intercepting trap was not a failure; when it was a failure, it was because its application was at fault. The water-closet was a trap, but no one would suggest that this be dispensed with, and the pan left freely open to the main sewer. The trap intercepted the gas from the sewer, and he believed it did it effectually, and if that were the object, then the trap was not a failure. Still, the whole system of house drainage was wrong, and the more one examined it, the more one was convinced of the fact.

Mr. W. Green (Finchley) said that, in his opinion, the intercepting trap was the greatest mistake in sanitation that was ever made, and he hoped that it would be abolished as a nuisance. He had been wondering why in cities where there were no intercepting traps the people persisted in living. Were water-closets always trapped? If not, where was the harm in letting the sewer ventilate through the house drain? He had known drains stink as badly as sewers, and, in his experience, the air of sewers could be kept as fresh as the air of drains. They could get circulation, not only through the drains, but also through the sewers if they adopted the right principle—i.e., to have a ventilating pipe from every house drain, without an interceptor.

A member said he thought the case against the intercepting trap had been a little forced; but no doubt ventilation would be improved if the trap were abolished. As sewer air was so bad, they must protect themselves against it. The trap was not a perfect appliance, and, if drains were properly ventilated, there would be no need for the trap.

Mr. A. Martin (Westminster) said that the subject was very important, and he suggested that it might be practicable to invite written expressions of opinion with regard to it.

The Chairman then proposed a vote of thanks to Dr. Butler and Mr. Read. He considered that the 10 per cent. of stopped drains referred to by Dr. Butler, showing masses of festering filth therein, was ample evidence in favour of their views. Indeed, after Dr. Butler's figures, he thought that even Dr. Buchan might have changed his views. He did not think that the intercepting trap should be considered as part of the house drain pure and simple. Where did the house drain end, and where did it leave off? If two houses drained into one drain, that drain became a sewer. The interceptor should be considered in conjunction with the general system of sewage, and, if that be so, they must remember that one of the first principles in designing any water-carriage system was to remove from all houses or inhabited areas all dirt or noxious matter as speedily as possible. In designing a scheme of drainage, one's object was to see that there was no obstacle or obstruction to retard the rapid flow of sewage to its ultimate outlet. If that be so in the main sewers, why should they in the smaller have these miniature cesspools? The advocates for the interceptor say they are necessary to prevent sewer gas entering our houses, whilst the opponents suggest its passage by the house drains and the upcast shafts connected therewith. They were told that the upcast shaft was a source of danger; in his district he had many hundreds of them attached to houses, and, as far as he could recollect, there had not been more than two or three complaints with regard to nuisances arising from them, and he believed that these were sentimental complaints. The Chairman then proceeded to sum up the discussion.

Mr. Roehling seconded the vote of thanks, which was heartily agreed to.

Mr. Read, in reply, said that the intercept-

ing trap was the cause, to a great extent, of the sewer gas in the sewer. The interceptor caused an obstruction, and the water in the drain dribbled in on one side and out at the other. There was no rust, but stagnation in both drain and sewer, and, as long as that condition prevailed, they would always have sewer gas. If they let the sewage run through clean, they had a sewer with a good velocity, giving no trouble, and they got good ventilation. With the trap in its present position they would never secure proper ventilation, for in order thoroughly to ventilate a sewer one must have the outlets largely in excess of the inlets.

Dr. Butler also replied, and said that, after hearing the discussion, he was more convinced than ever of the utter futility and danger of the trap—it required only a discussion such as they had had to clinch one's opinions on the matter. He was brought up in the orthodox faith as to the value of the trap, and he held to that faith until the force of circumstances drove him from it. There was little to be said for the interceptor on theoretical grounds, and on practical grounds everything was to be said for the abolition of it. He agreed with Mr. Roehling that we must try to keep the sewer air out of our houses, but what he said was that the intercepting trap not only failed to keep the sewer gas out, but was responsible for letting it in. Mr. Roehling advocated the use of the trap because it was a tell-tale. He (the speaker) objected to it because it was not a tell-tale—except on the numerous occasions on which it went wrong.

A vote of thanks to the Chairman brought the proceedings to a close.

CARPENTERS' HALL LECTURES: SOME POINTS OF ARCHITECTURAL INTEREST IN OUR PARISH CHURCHES.

ON Thursday last week the first of the usual spring series of lectures at Carpenters' Hall, London-wall, on matters connected with building was given by the Rev. Walter Marshall, M.A., F.S.A., the title being "Some Points of Architectural Interest in our Parish Churches," the Dean of Chichester presiding.

Mr. Marshall stated that he proposed dealing particularly with wooden roofs and screens, and, having described in detail the various members of a roof and the use of each, he said that, of the beauties that medieval architecture presented to the architectural student, there were few more striking than the open-timber roofs which adorned so many of our churches and halls, and testified to the constructive skill and artistic feeling displayed by the carpenters of that age. The effect of these roofs with their bold receding arches, massive, richly moulded and carved timbers, spandrels fitted with intricate tracery, profusely ornamented cornices and exquisitely-carved bosses, should rivet the attention of every spectator. When they added to this the blaze of rich colouring, of which most of the roofs showed traces, the result attained would be a degree of splendour which it was difficult to imagine in these days of more sombre treatment. Yet these roofs were hardly noticed by the average spectator. There was an absence of open-timber roofs in the early period of Gothic architecture which appeared very unaccountable at first, because one would naturally suppose that, as timber roofs of a necessity preceded stone vaulting, the most beautiful and elaborate forms of roofs would also occur prior to the magnificent examples of groined vaults in stone which still remained in all our cathedrals and many parish churches. The reason for this deviation from the usual course of events was not far to seek when we remembered the serious fires that destroyed Canterbury and other cathedrals about that time; the builders, finding that it was possible to use stone for roofing purposes, soon became so proficient in the use of that material that the mason seemed to have excluded the carpenter almost altogether, both from constructional and ornamental work.

The best examples of timber roofs occurred in our parish churches and a few old palaces and halls. They were, as a rule, somewhat acute in their pitch, but not invariably so, and the timber used was nearly always oak or chestnut. The scantlings were of stouter

proportion than those generally in present use and gave a feeling of robustness and security to the roof, as well as providing an insurance against the ravages of time which seemed to have left very little impression upon the enduring oak or chestnut. Most of the damage was the result of neglect or of the ruthless vandalism of the Reformation, and, later times, in defacing and removing the carved work, though, in this respect, the roofs, owing to their inaccessibility and the fear of consequences if the structure were meddled with, had fortunately come off lightly. But there was nothing to hinder the abundant use of that most effective weapon and safe cure in the hands of a fanatic or ignoramus—the whitewash brush!

Roofs might be best divided into five classes:—(1) Tie-beam roofs; (2) trussed-rafter (or single frame) roofs; (3) hammer-beam roofs; (4) collar-braced roofs; (5) aisle roofs. In many instances these classes became combined in one roof.

Tie-beam roofs occurred at all periods. In Norman times they were the only description of roof in use, but very few examples remained—in fact, he did not know of one. Restoration had swept them all away. In Old Shoreham Church was what might be a portion of a late Norman roof of the tie-beam type; this tie-beam had the characteristic billet moulding of the square form. It might be that the rest of this original roof was in existence, but at present the plaster hid it if it was there.

The "trussed-rafter" form of roof was probably chosen for the purposes of gaining head-room, or because of the difficulty in placing a wooden roof over a stone vault. Its superiority over the tie-beam, both constructionally and in point of beauty, necessarily led to its being preferred and generally used. These roofs were frequently lined and often covered with lath and plaster, although it might be doubted whether their beauty was increased by either process, certainly not by the latter. The form of the arch in this roof was often perfected by the addition of braces, curved or straight, the underside of the rafters, and the roof was generally formed in panels by ribs running horizontally with carved bosses at the intersection. The roof at Minster Lovell (Oxon) showed this treatment with straight braces admirably, because the open and panelled portions of the roof were side by side. The most striking class of roofs was those constructed with hammer-beams. The origin of these roofs was often supposed to be that of the tie-beam which had been cut off, merely leaving the ends supported by braces; but, perhaps, the more likely theory was that derived from the mode of securing the feet of trussed-rafters. The collar-beam was retained in some cases, but not in others; but, instead of cross-timbers, thin curved braces were used connecting the collar, principals, and struts together, forming an arch which was not only important as binding the roof together, but greatly enhanced its beauty. Many buildings had double ranges of hammer-beams, of which there was a magnificent example at March. So far as these roofs were concerned, England stood unrivalled amongst all other countries, and whatever superiority they might claim in other respects there were few churches, he believed, in Europe which could boast of such specimens of timber roofs as were to be met with in almost every county of our land.

The other type of roof was known as "collar-braced," and was a simplification of the "hammer-beam," where sometimes the strut and collar were omitted. It was going only one step further to leave out the hammer-beam itself. It was found this could be done, and we had the collar-braced roof as the result.

Aisle roofs were generally of the lean-to order. The earliest examples were simply a continuation of the rafters of the nave, but the introduction of clearstories necessitated a distinct roof, generally of a flat pitch, in order to leave as much space as possible in the aisle wall for the windows. Aisles very rarely had gabled roofs, and then only of low pitch if clearstories existed. A very fine example was to be seen to the north aisle of Wymondham, where the spaces between the trusses were boarded under the common rafters and formed into panels with richly-cusped tracery and elaborately-carved bosses

at the intersection of the moulded ribs. Another example of an aisle roof, but not gabled, was Mildenhall; in that case the bold and vigorous carving of dragons and grotesques was most remarkable. But the feature of that church was its incomparable nave roof, in which the alternating arrangement of the trusses was most happy, as the appearance of crowding, so noticeable in some of those elaborate roofs where the trusses were not far distant from each other, and everyone a repetition of its neighbour, was here entirely absent.

Colour played an important part in the decorative splendour of mediæval roofs, but the general practice was only to tint the mouldings and the carvings. These bright touches of colour did much to light up the sombre effect of the woodwork, and thus greatly enhance its charm.

Proceeding with that portion of his lecture devoted to screens, Mr. Marshall said that, although in our churches there are to be found screens of various kinds, when he spoke of screens generally our thoughts always turned to the rood-screens, and he was sure they must have derived much pleasure from visiting a church where the rood screen still remained, and must have felt how very much they added to the sense of completeness of the internal effect of a building. But, in considering rood-screens, they must be careful to make a clear distinction between those in a cathedral or collegiate church and a parish church. In the cathedral or collegiate church the screen—almost invariably of stone—was of a much more solid construction than in the parish church. In both types of buildings it answered the purpose—one amongst several—of dividing the nave from the choir. But in the cathedral this division was, of necessity, far more marked than in the parish church, because the choir was reserved for the use of the clergy, provision for the laity being made in the nave. They might, therefore, consider the choir of a collegiate church before the Reformation as a church within a church, and thus that choir was not only cut off from the nave by the solid screen, as at Tattershall (Lincs.), but also when there were aisles to the choir they were also shut off by screens, but not generally of so solid a character as the rood-screen.

Almost all parish churches before the Reformation were provided with a chancel screen, and a rood loft placed upon it; however, the screen seemed to have been used first without the loft, because the earliest examples of screens did not seem to have carried any loft, as, for instance, the beautiful screen at Stanton Harcourt (Oxon), which must be of late XIIIth century or early XIVth century date, and is probably the earliest example of a chancel screen existing in England. It seemed impossible to say the precise period when those rood-screens were introduced. He was inclined to think about the XIIIth century, because, frequently in Norman and Transition Norman churches there was distinct evidence that the jambs of the chancel had been cut away for the fixing of the screen, and also, in some cases, for the insertion of the rood loft staircase. The fine church at Walsoken showed this very clearly. They must have noticed that the tops of most rood-screens to-day presented an unfinished appearance, which was owing to the destruction of the rood loft in accordance with the Royal Injunctions of 1564. No part of the church seemed to have been so signally devastated as the rood lofts and roofs, for not only were they taken down, but, in places, all trace of the supporting beams entering the wall had been, as far as possible, removed.

It was in the reign of Edward VI. that the Royal Arms were first placed on the screens, on a beam over the nave, or on the wall above the chancel arch. At Hurst (Berks), there was a very good example of a Gothic screen across the chancel and north aisle of chancel of XVth or even late XIVth century date; the loft was taken down according to order, and in the place of the rood-screen were now the Royal Arms of the XVIIth century, with characteristic strapwork ornamentation on either side.

The lecture was illustrated by lantern photographs, and, at the conclusion, a vote of thanks to Mr. Marshall, proposed by the Dean of Chichester, was unanimously carried.

COMPLIMENTARY DINNER TO PROFESSOR ADAMS.

A COMPLIMENTARY dinner was given on Tuesday in the Holborn Restaurant, W.C., to Professor Henry Adams, M.Inst.C.E., M.I.M.E., F.S.I., F.R.San.Inst., etc., by students who had worked under him at the City of London College, where he was Professor of Engineering for thirty-five years. The chair was occupied by Mr. J. L. Crouch, and the company included Messrs. H. C. Adams, A. Brackett, H. C. Chevalier, O. C. Hills, Vernon Inkpen, G. C. Lambert, E. Prebble, and others.

After the loyal toast, the Chairman said he would give them the toast of their dear old friend, Professor Henry Adams, and in doing so he would say a few words as to the origin of the dinner that evening. In the autumn of 1904 Professor Adams severed his connexion with the City of London College, with which he had been associated with such distinction and to the advantage for so many years. More than one of his old pupils thought that something should be done to commemorate his retirement, and when a movement was made in that direction letters were received from all parts of the country and all parts of the world expressing the wish of the writers to take some part in the movement, if only the writing of a name on an address or in an album. Many letters were received from those who wished to be allowed to subscribe to some testimonial, but Professor Adams was opposed to that; he was always ready to do something for his students, and little for himself. What they decided to do was to present Professor Adams with an album containing signatures of his students, and to present it at a little complimentary dinner. Their recollections of Professor Adams were of the pleasantest. His kindness had been extended to all of them, and they appreciated it fully. Professor Adams had had many pupils who now occupy important official positions, and those members of his college class who survived would remember him to the end with the greatest affection and gratitude for the example and character he set one and all.

The toast was received with musical honours, after which Mr. A. Brackett presented Professor Adams with the album, a gold watch-chain, and a memento of the evening for Mrs. Adams. In making the presentation, Mr. Brackett asked why that should be the last time the students of Professor Adams met. He hoped there would be future meetings.

Professor Adams, in thanking those who had in any way taken part in the proceedings, said he knew, of course, that his connexion with the college would terminate, but he never anticipated such an ending as this, and really he would have preferred, had the circumstances permitted it, a scholarship at the college to have ended that connexion. The good fellowship which existed between him and his students would always exist, he hoped, and he was glad to think that so many of them had attained such good positions in life, though he must say that he only tilled the ground; the seed was there. He became a teacher in the City of London College, and in 1867 the drawing class, the professor of which, being in delicate health, used to send him his keys and ask him to take the class, and at the end of the session that professor retired. In 1879 the council gave him a separate class—building construction, which developed into the engineering department, and he had worked at the college ever since until 1904. He thought he could claim some success as a teacher, and perhaps that success was due to the fact that he never taught for a living—being in active practice all the time—and that he had always tried to put himself in the place of the student in his endeavour to make them grasp a subject. During his thirty-five years at the City of London College he had given over 10,000 lectures to some 4,000 students, and he had provided at his own expense 1,500 lecture diagrams and smaller diagrams. Since his separation from the college he had been appointed a chief examiner in building construction to the Board of Education. He also founded the art class at the Bow and Bromley Institute, had been lecturer on land

surveying at the Architectural Association for many years, and he had lectured elsewhere. When the Surveyors' Institution first founded their examinations, the principal prizes for some years fell to his students. His advice to his students had always been: "Never shirk responsibility; hard work never hurt anybody"; and he thanked them all for their kindness to him and for the many pleasant hours they had had together.

Other toasts were "The Chairman" and "The Press," and subsequently several gentlemen gave their testimony as to the value of Professor Adams' work and their indebtedness to him.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION:

HOTELS AND RESTAURANTS.

A MEETING of the Discussion Section of the Architectural Association was held at No. 18, Tufton-street, S.W., on Wednesday, the 14th inst., Mr. F. Lishman being in the chair, when

Mr. Stanley Hamp read a paper on "Modern Hotels and Restaurants," which ran briefly as follows:—

The evolution of the great grand hotel of the present day has been steadily growing through the later years of the last century in a slow but curious fashion. About the middle of the last century there were few first-class West-end hotels, and those existing were something like the present "private hotels," but with a coffee-room open to the general public. The opening of the Great Western Hotel at Paddington was a harbinger of the coming change, and with the advent of Northumberland-avenue came the reign of the "monster" hotel. The Langham and the Gorton Hotels were others of this type and date. The location of a hotel is all-important; whether destined to be a commercial hotel or a "hotel de luxe," it must have the best and most suitable position, according to the *clientèle* for which it is intended to cater. The building itself should present a pleasing exterior, the usual tawdry and showy character being avoided, and the building designed simply and architecturally.

The usual accommodation of the modern hotel may be stated as follows:—On the ground floor a lounge or winter garden; dining-room and coffee-room, with service adjoining; reading and writing-room, small drawing-room; smoking and billiard-room, with bar attached; hall-room, with reception-room attached; office and manager; gentlemen's lavatory, and ladies' retiring and toilet rooms. Private dining-rooms are often needed, and in the provinces a large hall for banquets and meetings, with separate service and kitchen arrangements. In commercial hotels a sample-room is needed, with an office, lift, and separate entrance. A café, as at the Savoy, is sometimes added; in Eastern hotels a bazaar, and there should be verandah lounges on each floor. The upper floors are usually devoted to bedrooms, bath-rooms, water-closets, and service-rooms, the latter fitted with sinks, etc., and adjoining the service lifts. In the basement should be the kitchen and offices, stores, wine-cellars, etc. The office should be near the main entrance, as also porters' room and perhaps a cigar counter. Two main entrances are needed—one to the lounge, the other so arranged that visitors on arrival need not cross the lounge to gain access to their rooms; near this entrance should be both the passenger and luggage lifts. The dining-room, especially in large towns, should have an orchestra, and a floor for dancing where no separate ballroom is provided. Certain of the rooms on the upper floors should be in suites. Doors between rooms should be removable and double, and sash windows made reversible for cleaning. Heating coils are needed in principal rooms and corridors; in the latter also hydrants and fire-alarms. The "lounge" is quite a modern introduction in England, and among the first examples was that at the Burlington Hotel at Boscombe, by Mr. T. Colcutt. It forms a popular place for afternoon tea, as well as for coffee and cigar after dinner, and undoubtedly increases the amenities of hotel life. Another feature of modern hotels is the frequent provision of Turkish and medical baths. The telephone has now become such a recognised feature that we find it even in the

private rooms of hotels, especially in America. The lifts must be arranged near the entrance-hall and office. The shutters to the shafts should be fitted with electric contacts, so that the car cannot run while any door remains open. A furniture or luggage box at bottom can be provided. Letter-shutes, with openings to all floors, may be arranged to communicate with ground floor. Electric lighting is now in use in the majority of large hotels, many of these having their own generating plant. When power and lighting are needed on a large scale, it is usually economical to adopt the latter plan. The system of fire-alarm preferable of adoption is that giving notice to the staff only. Frequent fire drills create a ready and efficient staff, and such hotels as the Grand, Metropole, or Savoy may be regarded as practically safe. The position of that important department, the kitchen, used to be a moot point. With modern ventilating appliances the old objections to the basement have vanished, and it is now recognised as the most convenient place. The stores and larders are arranged along the sides of the kitchen, and receive the goods after they have been checked by the clerk. The kitchen staff may be practically divided into five working sections. The first embraces roast, soup, and game; then come entrées, vegetables, fish, and, lastly, pastry and bread. This latter is often a separate department. The ice department usually follows the pastry and confectionery, but should be away from the general kitchen traffic. The plate-cleaning, knives, and general scullery should be near service and kitchen, and near the latter also the pot scouring and cleaning scullery. The vegetable kitchen has its own scullery and store in connexion, and following these the fish larder and store. The chef's room is near kitchen and stores. In addition, there should be larders, stores, staff-room and lavatories, and wine-cellars. The service-room on the ground floor, if there is only one, should serve coffee-room, dining-room, and restaurant. Kitchen service lifts, wine lifts, and luggage lifts are all required, the latter running to all floors. The linen store and mending-room are heated by artificial means.

Mr. Hamp then described in some detail a notable New York hotel, the Manhattan, in Forty-second-street, a fourteen-story building, notable for its admirable lighting. Returning to general planning, he advocated the provision of a Masonic temple. Grill rooms, often in the basement, and a wine bar near entrance are necessary features, and gentlemen's lavatory and ladies' toilet-rooms, well screened, are essential.

Mr. A. H. Belcher, in opening the discussion, expressed his preference for corridors showing clearly from end to end, as being easy for visitors to follow. He referred to the position of kitchens at the Great Eastern Railway Hotel, these having formerly been on the top floor. Now that ventilation difficulties had been overcome, he regarded the basement as the best position. Provision must now be made for cycles and motors.

Mr. A. Horsnell seconded the vote of thanks.

Mr. W. Woodward made some interesting references to the new Piccadilly Hotel, especially pointing out the very thick retaining walls needed in Piccadilly-place. Like Mr. Belcher, he favoured long corridors and basement kitchens. He instanced experimental fire-alarms in various hotels, giving an average of three minutes between the call being given and the hose being ready for use on the top floors.

Mr. A. T. Bolton singled out the *Hôtel Angléterre* at Athens for special praise for its very wide corridors, useful as promenades. Great economy could be effected by a private water supply from a bore well. Service-rooms should be one-third or one-fourth the size of dining-room.

Other speakers mentioned the gain of having the lounge surrounded by galleries entered from the corridors, the economy of using marble skirtings in corridors, and the need of careful provision for the furnace shaft.

The Chairman said that we had still one good example of the "galleried" inn left to us—the George, in Southwark.

Mr. Runtz, the Special Visitor, began by tracing the relation between improved communication and the rise of hotels. The railway

brought us the terminus hotel; probably the motor meant an equally great change to the country hotels, and here the old postings yard was capable of ready adaptation to garage purposes. Supplementary kitchens are wanted for banqueting-rooms and service of breakfasts to the bedrooms. There should be but one trades entrance, with clerk in full control. The "lounge" orchestra can be placed in the mezzanine. He favoured the provision of Turkish baths if compactly planned, and considered all bathrooms should be decorated brightly and look cosy, and be fitted with hot towel-rails. "Prince's" kitchen he singled out as a fine example of good arrangement. Turning to detail and finishing, he welcomed the return of "homeliness" in treatment, and especially praised the new Savoy Hotel for its fine detail and simple colouring.

Mr. Hamp briefly replied, and the meeting terminated.

Illustrations.

DESIGN FOR BACON'S IDEAL PALACE.



HIS design, sent in competition for the Soane Medal, gained its author, Mr. Robert Atkinson, of Nottingham, what may be called the second prize in the competition, viz.: a certificate of Honourable Mention and ten guineas. It is certainly, we think, the second best of those submitted, and in one or two points, as we noticed in our review of the students' drawings, it realises Bacon's directions as to plan more precisely than the winning design. The exterior is hardly sufficiently domestic in character for a dwelling-house even on a large scale. That it does not represent anything that could have been built in Bacon's time, did not, however, we suppose, in any way disqualify it, as no special requirement was made in the instructions, in so many words, that the design should represent the architecture of the period; it was perhaps a defect in the drawing up of the instructions that this point was not precisely defined. As the matter stood, it was, as far as the wording was concerned, open to the competitors either to represent what Bacon would have had built in his day, or to design a modern mansion on the basis of his requirements. Mr. Atkinson has adopted the latter interpretation. He writes:—

"Having read the essay, the first and perhaps the chief difficulty was to determine whether the building was to be of Bacon's period entirely or a modern one, keeping as closely as possible to his description. The idea of passing two or three rooms to get to the innermost does not commend itself, and to build a house in this manner would serve no useful purpose.

Having decided on a modern house and the elevations in a modern spirit, the idea of getting the whole of the building on a good basement occurred to me, thus giving ample room for kitchens, etc.

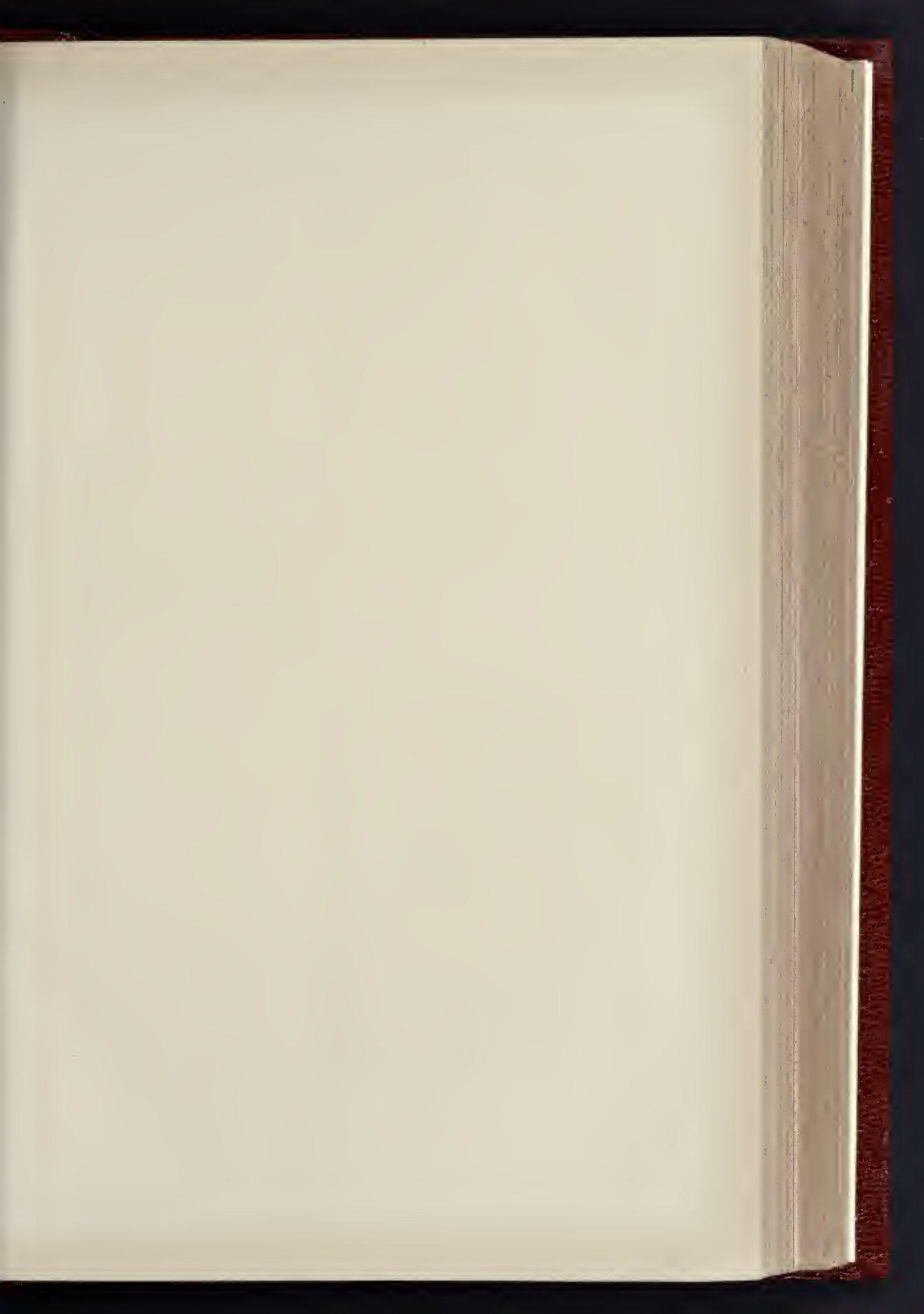
The scheming of the various forecourts, concealed galleries, offices, and lay-out of gardens was not less difficult to deal with."

ST. LEONARD'S CHURCH, WALTON-LE-DALE, LANCs.

THE nave and transepts of this church have just been re-erected. The tower and chancel date from the XVth century. The old nave was a good specimen of the Churchwarden period, with galleries boxing it in, and was in a ruinous state.

The new church had to be made almost exactly the same on plan, the graves being close on all sides. Owing to this and to the desire to avoid internal columns the span of the roof is 42 ft.

The walls are, externally, of local Houghton stone, and internally, of beautifully-marked Runcorn stone. The roof, seating, pulpit, etc., are of oak. The roof covering is green Westmorland slates. There are three old stained-glass windows refixed. The total cost of the church is nearly £10,000; the contractors being Messrs Hatch & Sons, of Lancaster, the glazing and adapting of old windows by Mr. H. G. Murray, of Caroline-street, Eaton-square. The architect was the late Mr. John P. Seddon, this being the last work carried out by him.





Honourable Mention, Soane Medallion Competition, 1906.

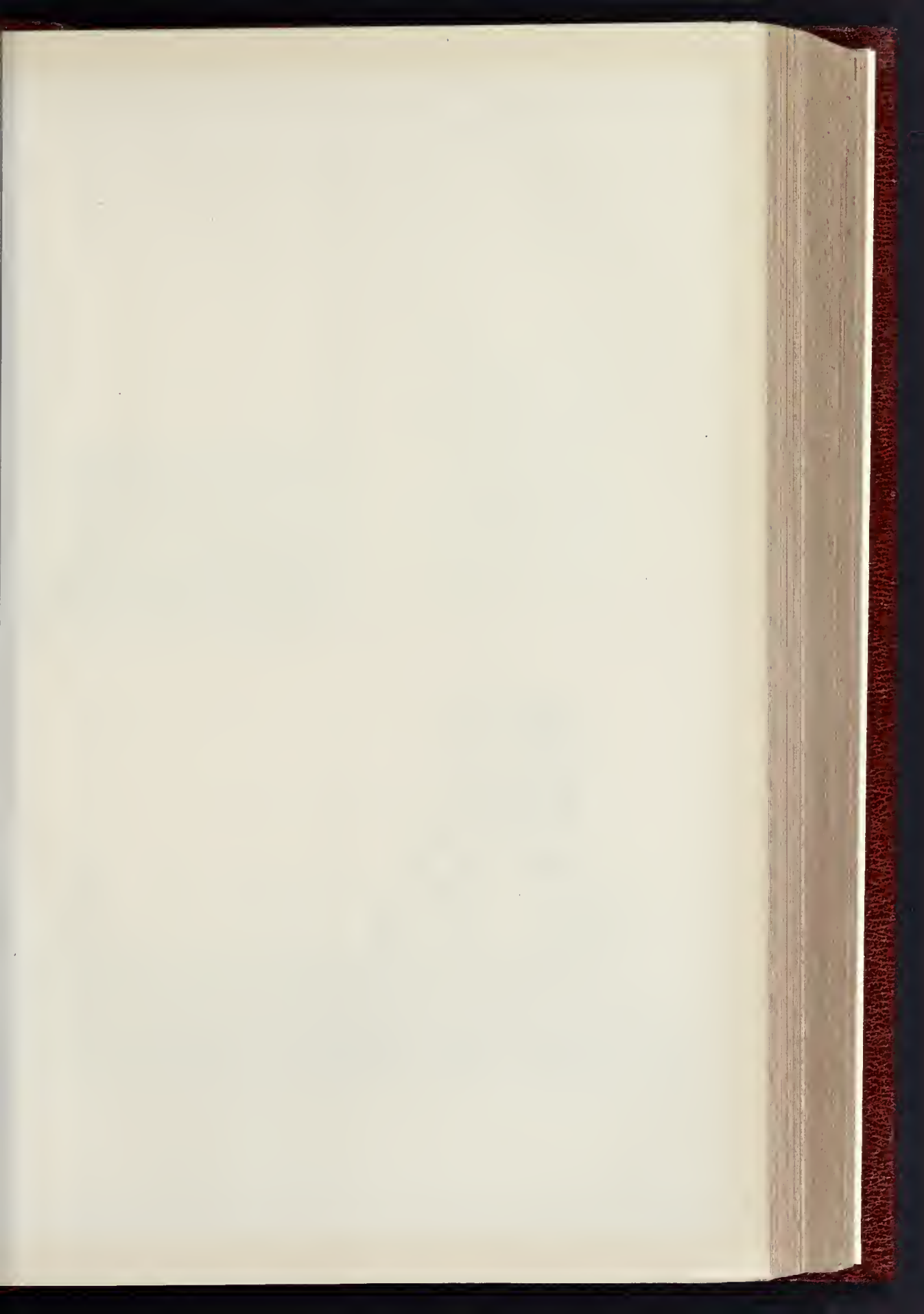
BACON'S IDEAL PALACE



INK PHOTO SYRACUSE, N. Y. LOTS 4 & 5 EAST HARDING STREET TETTER LANE E. C.

IGN BY MR. ROBERT ATKINSON.



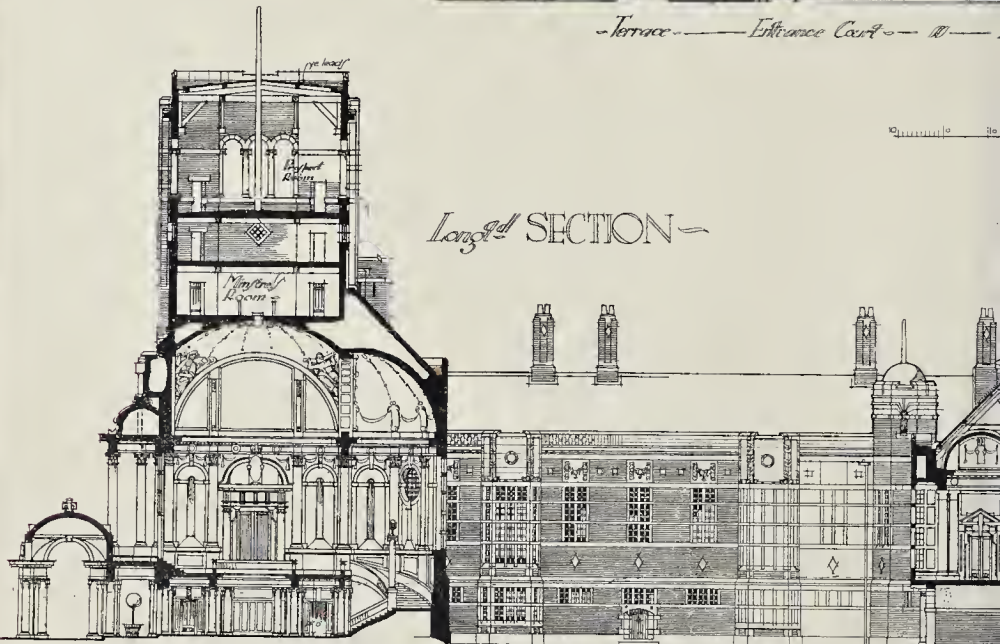


A Realization of the
IDEAL MANSION
Described in BACON'S
"Essay OF BUILDING."

ELEVATION of
ENTRANCE
COURT.



Terrace — Entrance Court — 10 —

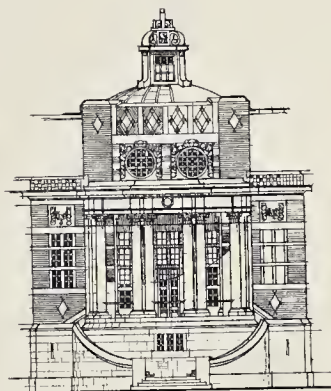


Longitudinal SECTION

North Cloister - Arch - Entrance Hall - Grand Staircase — 22 — Inner Court — 10 — 10 — Library - Study



ere ——— 101 ——— 101 ——— Terrace —



— Garden Entrance —

Scale of feet

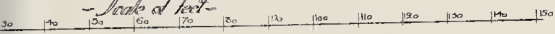
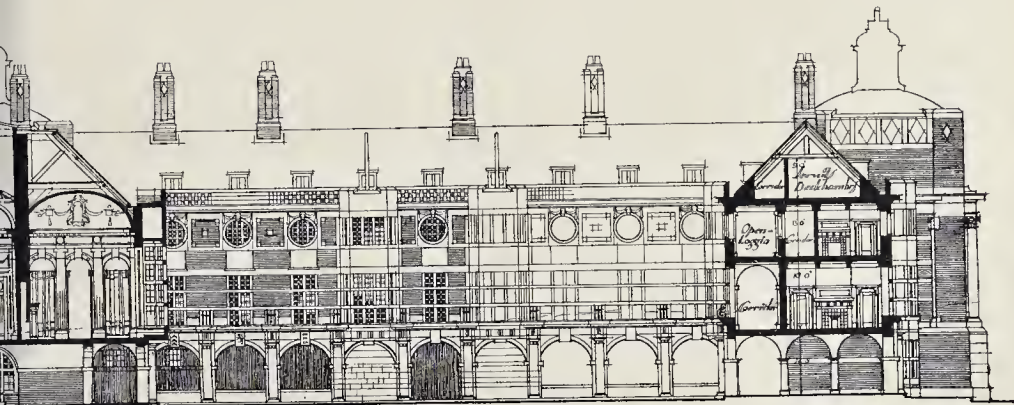
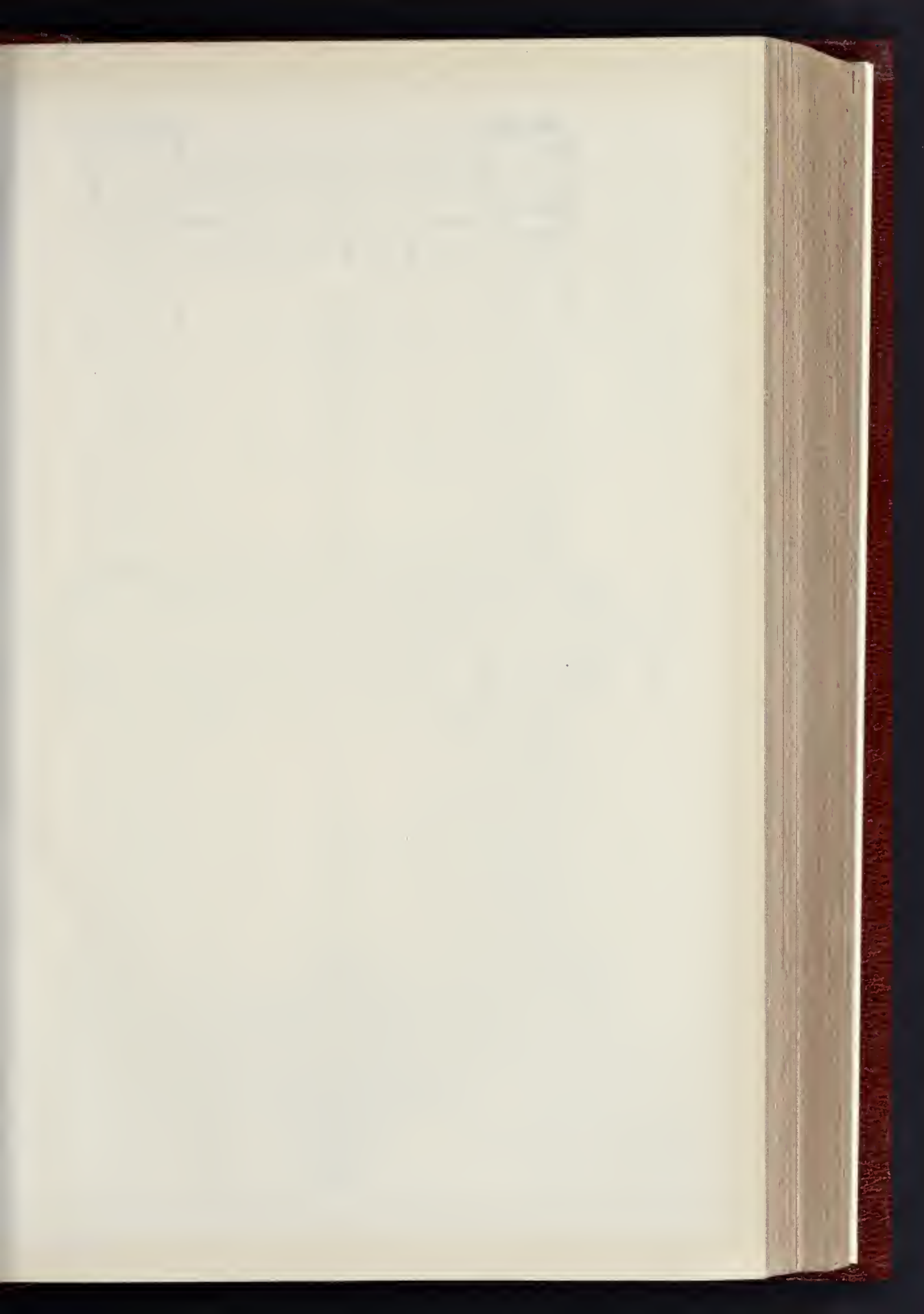


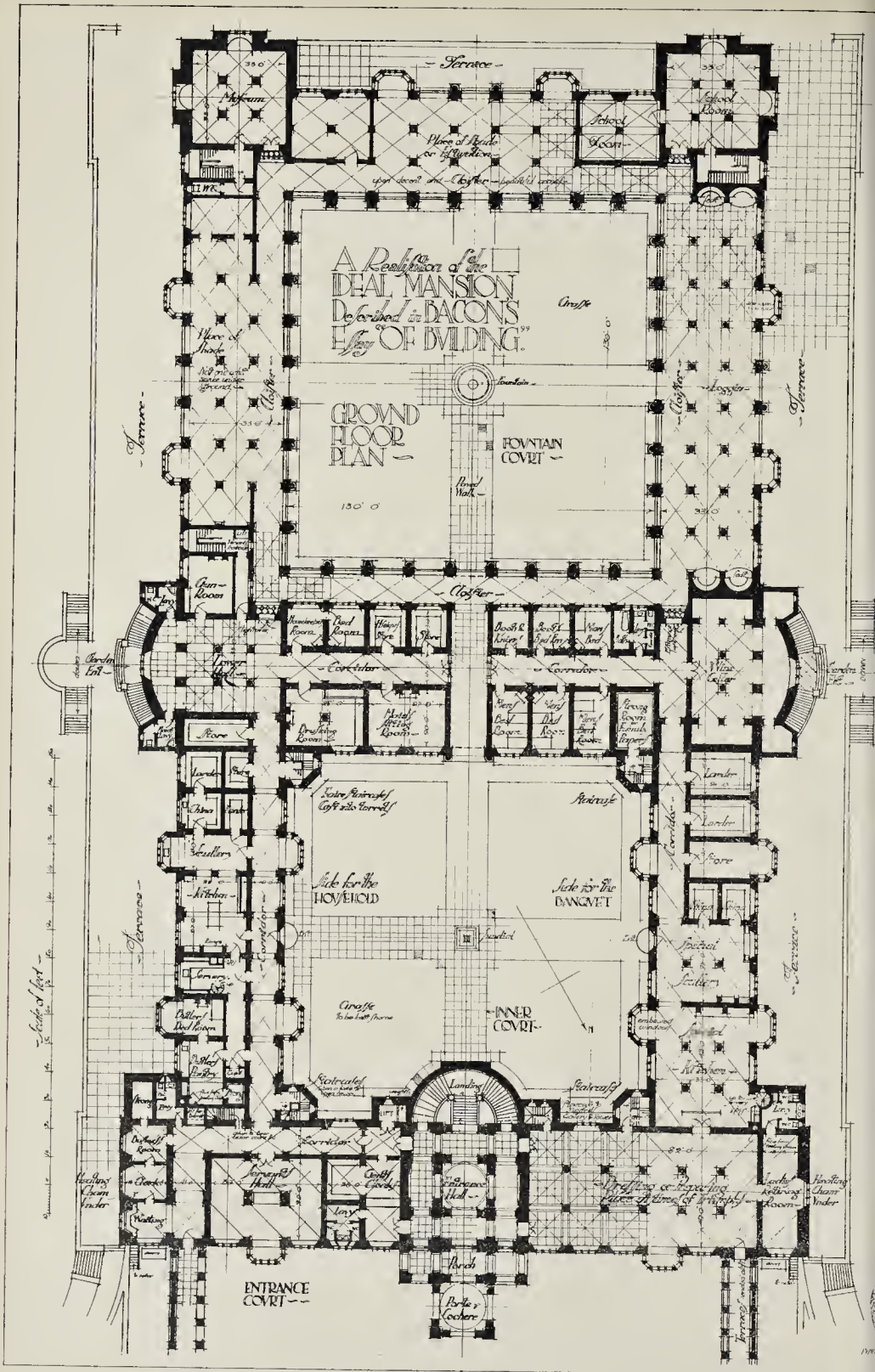
PLATE LXVI



rie-Withdrawing Room ——— 101 ——— Fountain Court —

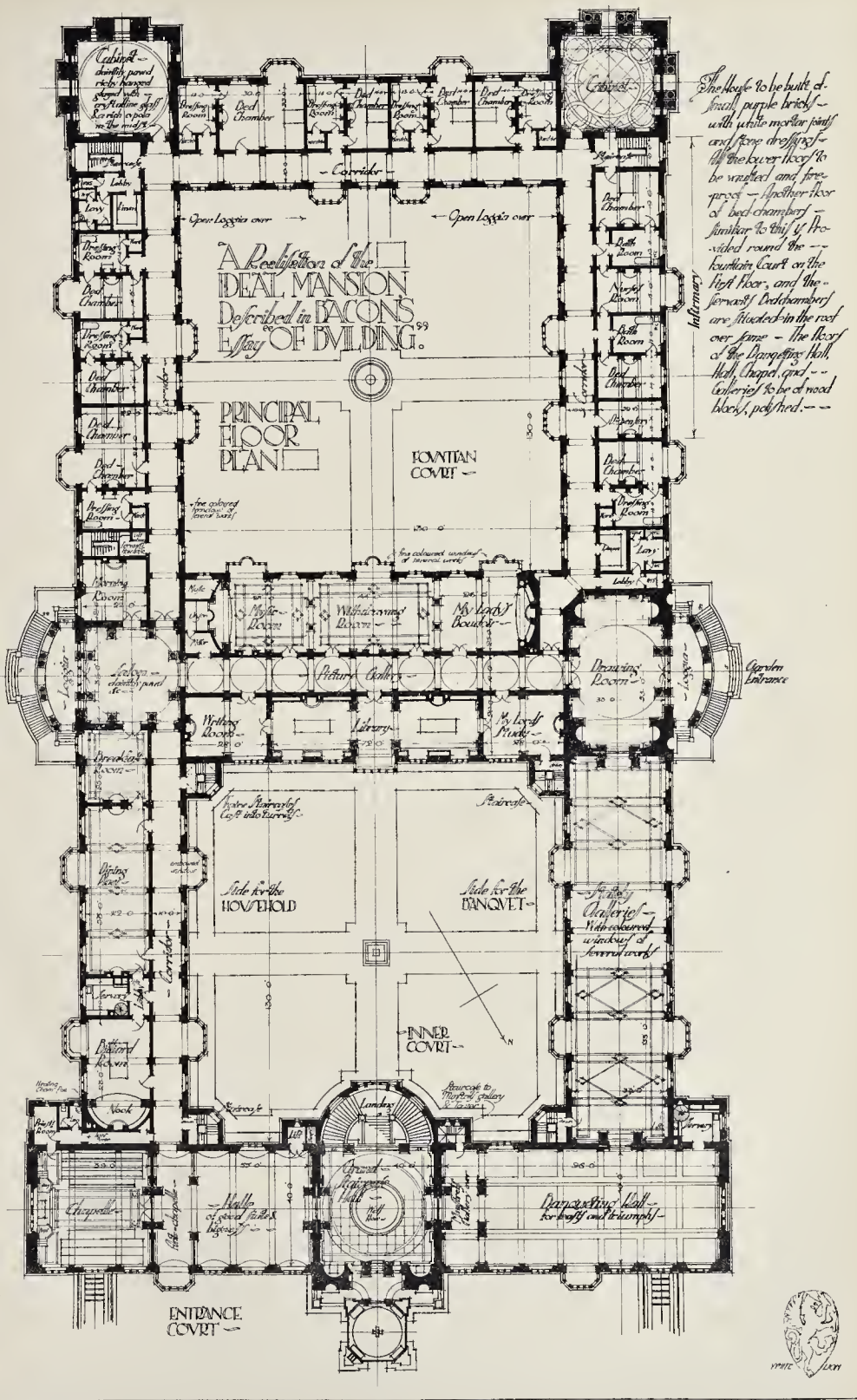
— Bed Chamber —





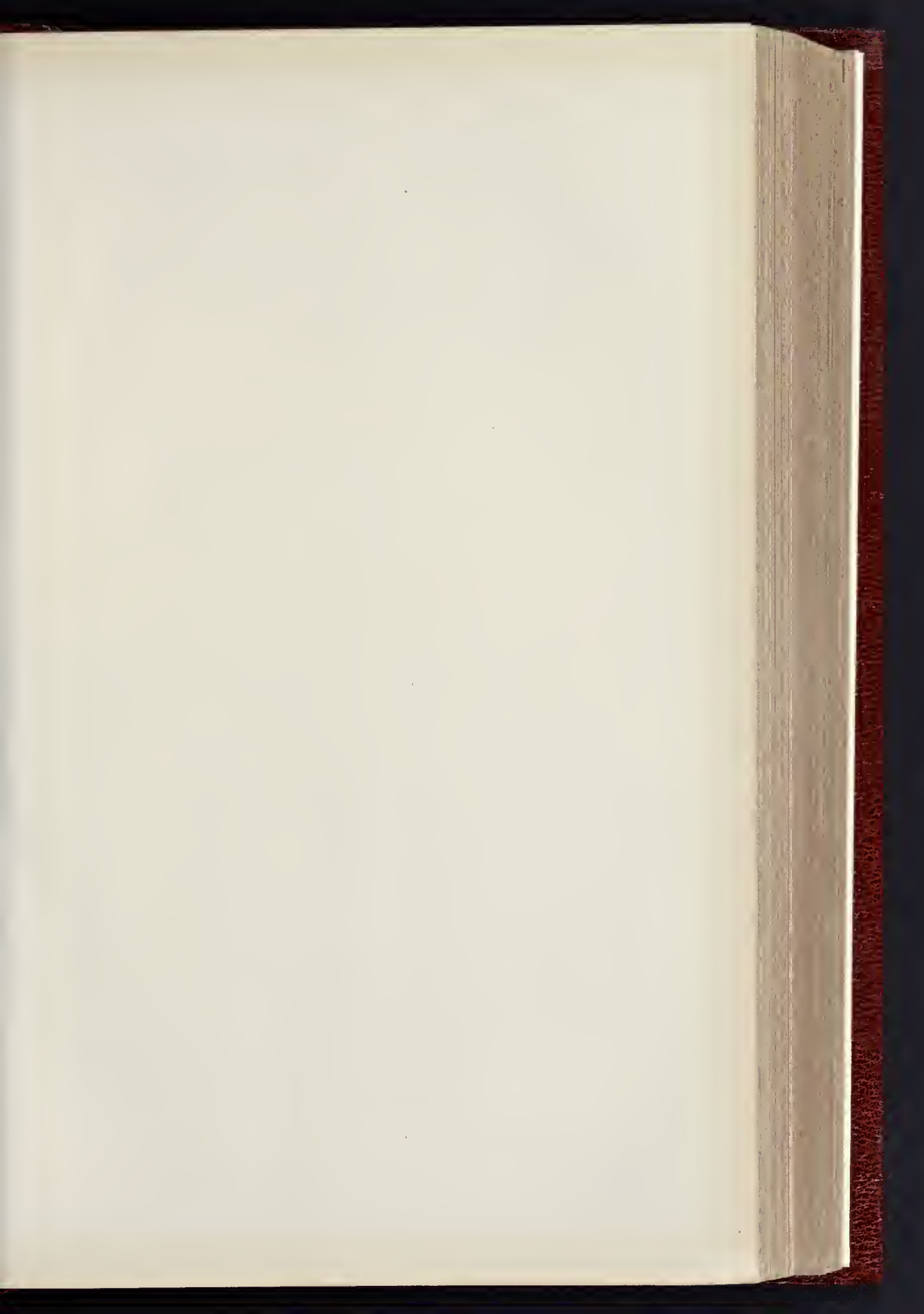
Honourable Mention. Soane Medallion Competition, 1906.

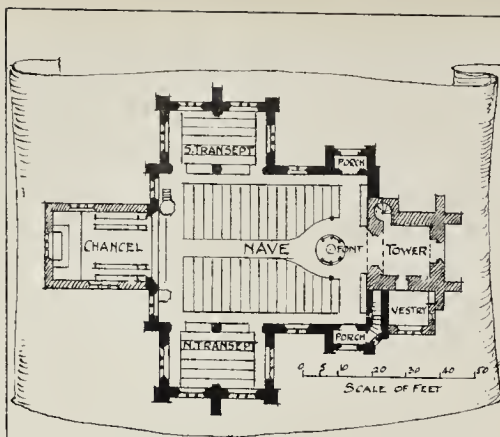
BACON'S IDEAL PALACE



The floor to be built of small purple brick with white mortar joint and floor dressing for the lower floor to be washed and fire proof - another floor of each chamber - similar to this is provided round the fountain Court on the first floor, and the former of each chamber are situated in the red over same - the floor of the Parquetting Hall, Hall, Chapel, and - colored to be of wood blocks, polished.

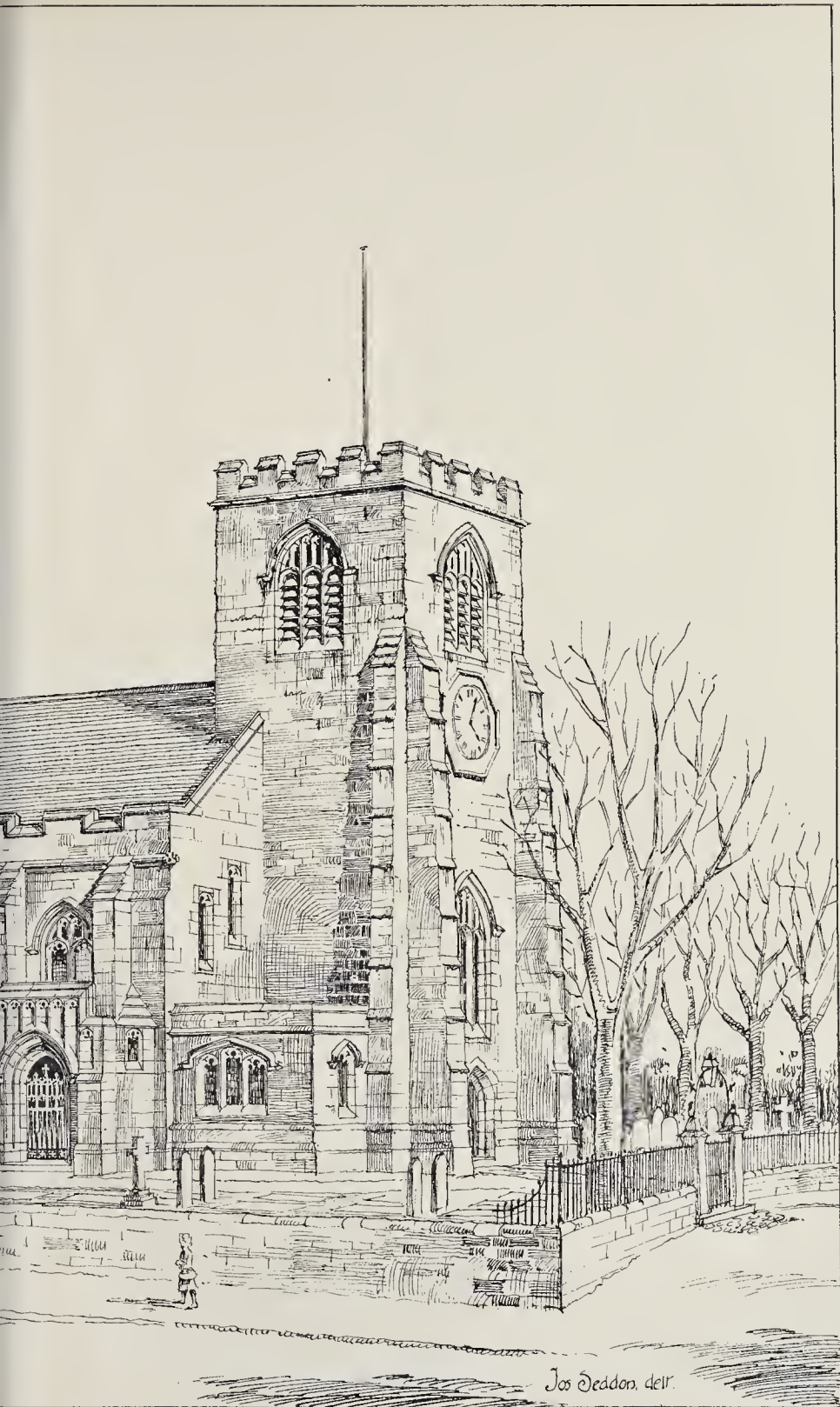






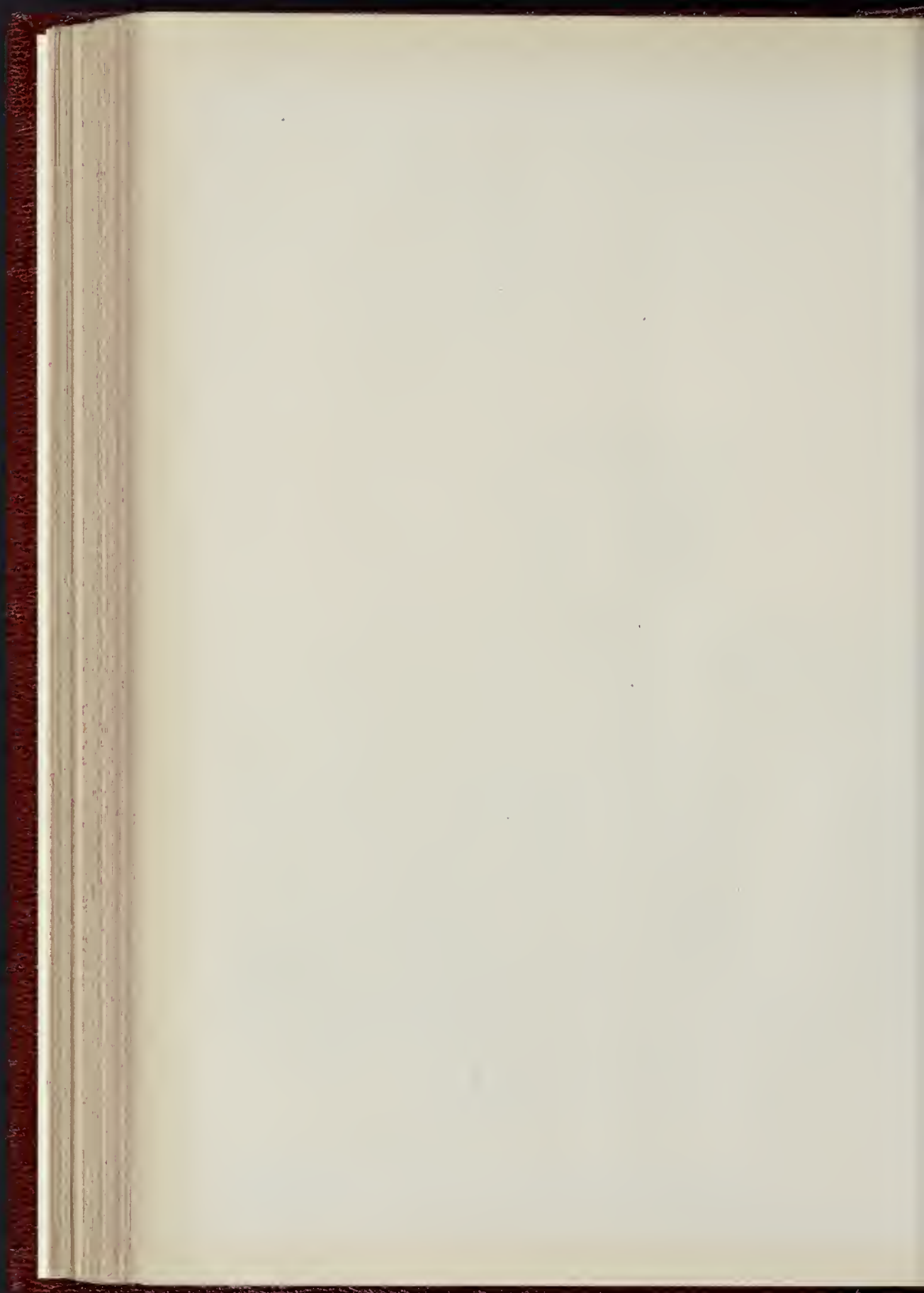
St Leonard's
 Church
 Walton-le-Dale
 James





Jos Seddon, del.

PHOTO LITHO SPRAGUE & C. L. 435 EAST HAWKING STREET PETER LANE, N. C.



Fifty Years Ago.

FROM THE *Builder* OF FEBRUARY 23, 1856.

CANNING TOWN.

In the view of Canning Town, as it appears from near to the iron bridge, the green level shown extending over a great extent along the margin of this flat land, in every direction, houses, shops, public-houses, and churches are now to be seen skirting the level, and gaining every week further and further upon the space, which is chiefly level feet below the high-water mark of the Thames. The new town, which already consists of several long streets, will, in the course of a few years, spread out and meet the approaching houses, and all this level will be planted with dwellings and inhabited by many thousands of people. The artificial bank of ooze creek and the embankment of the Thames are all that prevent the houses here from being flooded every high tide. To provide for the effectual drainage of this district by the ordinary means is impossible. The houses here have been erected without the means of either carrying off the refuse or properly getting rid of the damp. In course of time the *débris* of these and other houses will raise the level; but, in the meantime, it is sad to think of the sacrifice of human life which must take place without prompt measures. With some difficulty we managed to reach the place on foot from the turnpike road, and to find the condition of the streets insupportable—many of them, although the day was tolerably fine, were almost impassable, and vehicles sank almost up to the axletrees in the mud. In many parts were great pools of stagnant water. Several of the inhabitants said that, if we had come a few days before, during the rain, it would not have been an easy matter to get along the streets at all. Most persons complain already of the drainage. We understand that it is proposed to take the sewerage to a certain depth, and dump it into the Thames by steam power. If something is not done, in two or three years' time the ground will be poisoned by cesspools, water will stand on the surface, and vills of a serious nature will follow.

In a score of years or less, Canning Town will be an important place, with its churches, bathing and cal stations, and its masses of rich and poor. Let us hope for the introduction of measures proportionate to the extent of the future requirements. Flesh and blood are precious materials.

THE LONDON MASTER BUILDERS' ASSOCIATION.

The annual dinner of the London Master Builders' Association was held on Thursday last week at the Whitehall Rooms, Hôtel Metropole, Charing Cross, Mr. Frederick Higgs, President, in the chair. There were also present—Messrs. W. E. Riley, Superintendent Architect London County Council; E. L. Gomme, Clerk to the London County Council; Walter Lawrence, President of the Quantity Surveyors' Association; G. Macfarlane, President National Federation of Building Trade Employers; W. F. Wallis, President Southern Counties' Federation; Alex. Ritchie, J.P., C.C., A. C. Blomfield, J. M. Severidge, A. C. Bulmer Booth, E. J. Brown, H. W. Burrows, J. Carmichael, J. W. Chessum, G. Corderoy, W. Clarkson, J.P., R. A. Denell, S. B. Depree, F. L. Dove, F. E. Dornier, W. Downs, W. Farthing, E. Gabriel, T. Gregory, G. Bird Godson, R. C. Glead, W. Hunt, H. H. Holliday, G. Hubbard, T. Holloway, H. F. Higgs, E. B. Anson, E. Keynes-Purchase, W. Lawrence, F. W. Lorden, F. M. May, D. W. McInnes, F. G. Minter, L. J. Maton, W. H. Nightingale, H. Northcroft, A. E. Parker, C. W. Reeves, F. G. Rice, R. M. Roe, R. Sawyer, W. Shepherd, H. J. Treadwell, A. W. Turnbull, C. Wall, Howell J. Williams, L.C.C., F. E. Williams, W. Woodward, T. Costigan, Secretary, and others.

The loyal toasts having been honoured, Mr. F. W. Lorden, Vice-President, proposed the toast of "Municipal Bodies." In referring to the London County Council, he said that that body did an enormous amount of work, and, speaking generally, they did it in an excellent way, and the same remark applied to other municipal bodies. Builders did not mind the Building Act, or amendments of the Act, if

it was applied and carried out in the same way. As to the Works Committee of the London County Council, certain builders had regarded that as a competitor, but was it? He did not think it was, for the London County Council could not do the work as cheaply as the contractor, and they could not do it better. The Master Builders' Association included within its ranks all the principal builders and contractors of London, and it should include all kinds of builders except the jerry builder, and the jerry-builder they declined to have.

Mr. G. L. Gomme, in response, said he could assure them that, so far as the Association was formed for the purpose of doing good building, no one would do other than properly recognise them. There were beautiful old buildings existing in London the names of the builders of which they did not know, but they did know the names of the builders who were rebuilding London, and when they saw some of the work which was being carried out to-day they could not deny that the builder and his workmen were worthy of the best traditions of their class. As to the Works Department, he might remind them that the London County Council did occasionally apply to the master builders when they had a difficult or delicate job, such as the restoration of No. 17, Fleet-street; and the master builder, Mr. Downs, who carried out that work under Mr. Riley was sympathetic with the work, which he understood and carried out thoroughly. Some beautiful buildings were being erected in London, which were a joy to see; and he should like to suggest that if the master builders of London would say that they would never take in hand a piece of work which was bad, even at the prospect of a high price, some time or other we should find London, so far as its buildings were concerned, in the same position as that it holds in the country's history. He hoped that in the rebuilding of London there would be swept away some of those jerry-built houses which were a disgrace to any city, and that they would be replaced by buildings like some of those they had about them.

Mr. W. F. Wallis then proposed "The London Master Builders' Association," which, he said, was to them in the south of England an object of envy and admiration, seeing how strong it was, how up-to-date, and how much in touch with its work. Taking into consideration the great progress which the Association had made during the past year, it need not now fear comparison with any similar association in the kingdom. The Association was over thirty years old, it was doing a good work, and it had been loyal to its motto of "Defence, not defiance." There had been peaceful times for the Association in recent years, but they did not know what the future held for them. The Labour Party in the House of Commons was likely to be an effective body for working out the aims and objects of the working class, and no one knew what line it was likely to take. Of the President, it could be said that he had worthily followed in the footsteps of those who preceded him. There had been as many as seventy committee meetings of the Association during the year, and these the President had attended, as well as spending a good many hours in the office with their excellent secretary, Mr. Costigan, and the President was to be congratulated on the excellent results of his year's work.

The toast was drunk with musical honours. The President, in response, said that the objects of the Association had been fully set forth in a little pamphlet which had been published by the Association. It was one of the chief branches of the National Federation of Master Builders, which was the organisation of the building trade throughout the whole of Great Britain and Ireland—not such a perfect organisation as they hoped to see it, but still one which covered the country and which in the north, was tolerably complete. London occupied an important position in the Federation, and it derived benefits from the connexion—or would do so in the event of difficulties with workmen, when the Federation would be called on to assist. The Association was the business representative of the trade. It was recognised by Government and the municipalities and they frequently came to the Association for information, etc., as to

custom and other matters relating to the trade. Shortly, the Association was the employers' trade union. Workmen had taught them a lesson—i.e., that unity is strength. The Association made rules to govern the operations of the trade; it defended trade interests wherever assailed, and it settled disputes with workpeople. There had been many difficulties which, in the past, would have given rise to strikes, but which had been settled by amicable conference. The Association gave advice and assistance to members on trade matters of all kinds—legal advice in law cases, technical usage, etc.—and that was of great help to builders, and in cases of vital interest affecting the trade generally they would have no hesitation in materially assisting the member of the Association interested. The Association fostered friendship and good feeling between members, and that was a good thing.

They had also revised and unified the trade rules during the year, and they had found the leaders of most of the trades very reasonable. The President, then explained what had been arranged with the various trades, and the nature of the rules and regulations in force. Proceeding, he said that most disputes had been settled, and something had been done to oppose the harassing legislation proposed by certain public bodies. The Association had had to spend a lot of money in opposing a certain Bill in Parliament, and, in his opinion, the procedure at present necessary to oppose Bills involved a scandalous waste of public money, and ought to be revised. Their friend, Mr. Shepherd, did yeoman service, but they ought not to have been put to the trouble and expense they had to face in order to oppose the Bill. The Association expected to get new offices, and he hoped that in those offices there would be accommodation and opportunities for members to make appointments to meet clients, and to use the board-room for trade disputes or arbitration. It had been a pleasure to him to act as President during the past year, and he greatly appreciated the support he had had from the members of Council and their friend the secretary, Mr. Costigan, as well as from his partner and subordinates, who had allowed him to devote so much time to the Association business.

Mr. F. L. Dove, Treasurer of the Association, then proposed "The National Federation of Building Trade Employers." The Federation supplied a long-felt want. Many local builders' associations had done sterling work in trade disputes, but it was found that the workmen were better organised all over the country, and they fought the employers in detail, first in one town and then in another. As a result, the employers organised the whole trade throughout the country, though not without much difficulty. The Federation was now in a strong position, and each year the prospect of strikes and lock-outs grew less and less, as both men and masters were well organised, and both had money at their disposal.

Mr. G. Macfarlane, President of the National Federation, responded to the toast, and said that it had been found that, single-handed, no local builders' association could do combat with the strong trades unions, and the object of the Federation was to stop the hammering of town after town that had previously taken place, and if they were strong enough the trades unions would hesitate to attack them. They were faced by a strong labour movement which might have a serious effect on the building industry, and some of the new members of Parliament would endeavour to get a change made in the laws of the country which would affect the trade. They might take it from him that the Taff Vale decision would be overruled, but if it was, he hoped that something fair and just would be put in its place. As to conciliation, law suits were never satisfactory to either party, and generally the winner was a loser. The other day a woman had awarded her 200l. for the loss of her husband, and when all the expenses and costs were paid she received 20l. Diplomacy was far better than warfare, and the way the Association in London managed in the matter of conciliation, and the way the President had managed the work, was very creditable. As to the Workmen's Compensation Act, he did

* See our issue for October 21, p. 427

not know what their experience in London was, but in the north the Act had proved to be the most prolific Act for litigation of any he knew, and it had been a gold mine to lawyers. The success of the Federation depended upon the associations, and he hoped they would all pull together in one direction. They should not let London or provincial jealousy spring up amongst them; unity was what they wanted. The Federation was doing its best to organise the various associations throughout the country, but there were numbers of large employers whom they could not draw into the fold, and it was a shame that these men should not help them, seeing that they benefited from the work of the Federation.

Mr. Howell J. Williams, L.C.C., then proposed "The Architects and Surveyors." The architectural profession was one of the most noble in the country. A good deal had been heard lately about Imperialists, but who were really the great empire-builders but the architects? What would London and other great cities be but for architects?—and yet how miserably were their rewards! In other professions, particularly the legal profession, there were great rewards for its followers, but these were wanting in the architectural profession because architects had their heart and soul in their work and had not taken that interest in the legislation of the Government to make it possible to secure those adequate rewards for their own profession. He advised architects to seek more seats in the House of Commons. He did not think there was any profession more harassed in this country at the present time than the architectural profession. They had to face Building Acts here, amendments, by-laws, sub-by-laws there, and such bodies as borough councils, guardians, etc., everywhere. As to the Building Act, he had repeatedly urged that what was wanted was not an amendment of the Act, but a codification of the Acts in such a form that one could easily know what was desired. Instead of that one had to turn to an amendment which referred to an amendment, which in turn referred to a previous amendment. He believed the London County Council tried to do what was right in the interests of London, but he urged upon them to remember that the people they should go to to assist them in any piece of legislation were those who knew most about the matter. Every town had a right to control the building work which went on around it, but a great deal depended on the way the control was exercised, and upon that sweet reasonableness in administration which was so necessary and yet so often absent. He believed in the *entente* in everything, even in the building trade. As to the attempt to Americanise the bidding trade of London, he warned everyone to discourage that system. What we wanted was the old system brought up-to-date; the architect to create, and the builder to carry out. As to the surveyors, it was a most unhappy state of affairs when there was no quantity surveyor on a large job. Litigation was avoided where a quantity surveyor was engaged, and the quantity surveyor, though a new institution, had come to stay. As to district surveyors, he was opposed to doing anything which would destroy the position and independence of the district surveyor, whatever else might be done by the London County Council in the matter. The independent district surveyor was really essential as a buffer between the architect and builder, and the unreasonable administration of Acts of Parliament. He hoped that no architect or surveyor would be party to such an outrage upon the public as was to be seen in Fleet-street where was being erected a building, the front of which was being treated with horrid plaques of colour; to prevent such an outrage, further powers should be granted even to the London County Council. As to the visit of the London County Council to Paris, what he had noticed was that in Paris art led the way before commerce, whereas in London, unfortunately, commerce came first and art afterwards. He was afraid that London would never be what Paris is, for difficulties were in the way, but with the rising generation of architects everything was possible—even a new London County Council hall.

Mr. W. E. Riley, who responded for the architects, said that it was remarkable that,

while he was constantly meeting people who told him all about the canons, and all the details about it, they never heard a man tell his lawyer where the lawyer was wrong—if he did, he would have to pay for it. Architects and builders were supposed to be in opposite camps by those who did not know. There were fourteen builders in that room with whom he had had close relations in building work, and he had never had a quarrel with any one of them. Any feeling of opposition they had could be got rid of by the exercise of a little forbearance. In nearly every instance in which he had carried out contracts he had insisted on a good arbitration clause. He disliked to see in any specification the words: "Make all clean and perfect." It was a most foolish expression, and the man who put it in did not know what he wanted. It really meant that the builder must do what he had forgotten to tell him to do. As a rule they did not sufficiently appreciate the very great necessity there was for them to try and get more sympathy in the interpretation of what they wanted done by the builder. He had never seen a good design on paper which would not be seriously impaired by bad building, and he had never seen a bad design which was so had on paper that it would not be materially improved and given character to by sound and good building, and in that lay what he called the true art of building. As to the recent depressed state of the building trade, he hoped things would soon brighten up.

Mr. G. Corderoy briefly replied for the surveyors.

The remaining toast was "Our Guests," suitably proposed by Mr. Alex. Ritchie, J.P., C.C., and acknowledged by Mr. G. Hubbard.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Fulham Borough Council 6,000*l.* for laying out cemetery, and 15,000*l.* for street improvement; Hackney Guardians 10,000*l.* for poor law purposes; Hammersmith Borough Council 15,210*l.* for electric lighting; Wandsworth Borough Council 5,850*l.* for street improvements; Woolwich Borough Council 10,000*l.* for baths and wash-houses, and 1,580*l.* for advances under the Small Dwellings Acquisition Act, 1899.

The Works Committee.—The Works Committee submitted statements of works completed during the half-year ended September 30, 1905. In statement I. are included the accounts for thirteen works, in respect of which complete specifications and bills of quantities have been prepared. The cost of two works has exceeded the final certificate; the net balance of cost below certified value is 27,785*l.* 9*s.* 4*d.*, or over 10 per cent. Statement I. showed that the total estimated cost of the thirteen works was 265,103*l.*, and that the actual cost was 237,317*l.* Statement III. shows the results of the execution of jobbing works during part of the year 1904-5 and of the year 1905-6. The cost of works executed in the year 1904-5, and not previously reported, is 15,474*l.* 15*s.*, and the balance of cost below schedule value is 1,500*l.* 19*s.*, or 9 per cent. The balance of cost below schedule value in the case of the works executed in 1905-6, and now reported, is 190*l.* 6*s.* 3*d.*, or 8 per cent. In their general observations the committee state that: "The total cost of the works included in the statements now presented does not represent the turnover of the department, because much of the expenditure on these works occurred previous to the half-year in question, while, on the other hand, much of the expenditure during the six months was upon works which are still unfinished. The approximate expenditure on works executed by the department during the half-year was 305,000*l.* The expenditure in the previous half-year, reported by us on August 1, 1905, was 402,300*l.*, but this figure is hardly comparable, as all indirect charges, such as those for plant depreciation and general and establishment charges, are always brought into account in the second half of the financial year. The turnover for the financial

year 1905-6 will probably exceed the turnover for the previous year. The number of estimated works referred to us for execution and not yet included in the half-yearly statements of completed works submitted to the Council is fifty-three (the several sections of Aldwych and Kingsway being regarded as one work), representing an estimated expenditure of approximately 1,442,000*l.*" They recommended: "That the excess, amounting to 148*l.* 10*s.* 10*d.* and 589*l.* 14*s.* 11*d.* of actual cost over final certificate in respect of the erection of workshops at Shoreditch Technical Institute and the enlargement of Windsor-road school respectively, be approved."

In answer to a question, Mr. Torrance, chairman of the committee, said that the committee did not want to be put in competition with the contractor.

Mr. E. Collins said that had the work been put out to tender large sums of money might have been saved.

Mr. R. A. Robinson said that there were many responsible contractors who could do the work more cheaply than the Works Committee. That had been proved over and over again. The committee took its work in an exclusive way. When the Works Department was first started they were told that the work would be done 10 per cent. cheaper than if let to contractors; but not only did the committee fail to do that, but it did the work at a greater cost.

Mr. Ward counteracted these statements, and said that by the present system the responsible officers would always be able to make a close estimate of the probable cost of work.

The recommendation was then carried.

Rating of Site Values.—The following recommendation of the Local Government, Records and Museums Committee was agreed to:—"That a petition be presented to the House of Commons praying that a Bill may be introduced by His Majesty's Government to provide for the separate assessment and rating of site values; that the Parliamentary Committee do prepare such petition; and that the seal of the Council be affixed to the petition when ready."

Mr. H. P. Harris said the Government programme had been announced in the King's Speech, which contained nothing about a Site Values Bill, and, as many of the subjects mentioned in that speech would not be carried into law, it was hopeless to expect that any measure would be carried which was not there mentioned. The rates would not be relieved by the Equalisation of Rates Bill, which would only redistribute the pressure, neither would a Site Values Bill reduce the burden. That burden would, however, be relieved if the Government would carry out the recommendations of the Royal Commission, and if they therefore moved the report be referred back, with an instruction to the committee to approach the Government on the lines which he had suggested.

On a division, the amendment was rejected by fifty-three votes to twenty-five. The recommendation of the committee was thereupon adopted.

Cost of Erection of Schools.—The Education Committee reported as follows:—

"We submitted on December 5, 1905, a report with reference to the preliminary plans of the schools proposed to be erected on the undermentioned sites:—

(i.) Kensington—Lawn-lane: New school for 798 children, three-story building; total estimated cost of erecting school, including furniture, possible extras, plans, supervision, etc., 20,322*l.* equivalent to 25*l.* 9*s.* 6*d.* a place; estimated cost of building only, 18,700*l.* equivalent to 23*l.* 8*s.* 7*d.* a place.

(ii.) Wandsworth—Fontaine-road: New school for 840 children, two-story building for boys and girls, one story for infants; total estimated cost of erecting school, including furniture, possible extras, plans, supervision, etc., 21,414*l.* equivalent to 25*l.* 9*s.* 10*d.* a place; estimated cost of building only, 19,871*l.* equivalent to 23*l.* 13*s.* a place.

(iii.) Wandsworth—Franciscan-road: New school for 804 children, three one-story buildings; total estimated cost of erecting school, including furniture, possible extras, plans, supervision, etc., 19,600*l.* equivalent to 24*l.* 9*s.* 9*d.* a place; estimated cost of building only, 18,085*l.* equivalent to 22*l.* 9*s.* 9*d.* a place.

(iv.) Poplar—Janet-street: School for the accommodation of sixty mentally defective children; total estimated cost of the building, 3,722*l.*

We then recommended that estimates in respect of the preparation of working drawings, etc., which had been submitted by the Finance Committee in response to our plans should be approved. The Council, after some discussion, postponed the consideration of this recommendation, our chairman undertaking that an inquiry should be made into the cost of public elementary schools with a view to ascertaining whether it would be possible

to effect any economies in the matter of school building.

Have obtained reports from the architect (Education), copies of which have been sent to the members of the Council, and which we think will be of interest to the Council. So far, however, we have had no opportunity of erecting schools does not appear to be excessive.

The late authority on several occasions considered to whether it was possible to reduce the cost of building schools, the last occasion being in 1903. The question then arose upon observations made by the chairman of the Croydon School Board upon the public opening of the Portland road school, to the effect that the cost of building (exclusive of site and furniture) had been 13s. 11s. 4d. a place, as against a cost of 28s. 10s. and 30s. 11s. 4d. in two London schools.

In order that a comparison might be made between two schools, where the conditions of planning, etc., were as nearly as possible identical, the Invicta road school, Westcombe-park (Greenwich), was taken as corresponding fairly in general arrangement and size with that of the Portland road school, Croydon. The Portland road school, which was erected in 1902, accommodates 1,310 children, the cost of which the chairman of the Croydon School Board was reported to have stated to be £17,500. The Invicta road school, which was built in 1893, has 955 places, and cost 20s. 7s. 4d. a place. The graded portion of both schools consists of a two-story building, the latter being accommodated in a separate one-story building. A comparison was made, item by item, of the various branches of the work done at these schools, and the cost of building joints and girders to materials, quantities, and prices. The sub-committee which then reported arrived at the conclusion that the facts before them showed that, having regard to the extra cost provided and the character of that accommodation, and the conditions under which the London School Board are required to work, the London Board had done their work done as cheaply as the Croydon Board as the Croydon Board at their Portland road school.

In the course of the inquiry it was ascertained that it was cheaper to build a school in two separate blocks, consisting of a two-floor building for the graded school and a one-floor building for the infants' department, than in a single block of three or four floors. This was ascertained by the fact that, although, in the case of a three-story building there is a saving in having to provide one roof only instead of two, this saving is more than counterbalanced by the additional cost of the greater thickness of brickwork required for the walls, the extra cost of the scaffolding to the upper floors, and the cost of hoisting joints and girders to a great height, etc. In planning new London County Council elementary schools, this practice is adopted wherever the site is of sufficient size for the purpose.

As regards the question of the estimated cost of the buildings referred to above, it should be pointed out that the three new schools (i.) (ii.) and (iii.) have been planned for future enlargement (the accommodation being given below), and provision is made in the preliminary plans and estimates now under consideration for the building of halls of sufficient size for the schools when enlarged, it being impossible to enlarge the halls after they have been erected and the building planned for the specified accommodation. This cost for the Lawnton school also includes a provision for the erection, with the first portion of the school, of the cloakrooms, lavatories, and teachers' rooms required for the complete school; in the plans of the Fountain-road school, additional staircases for the complete school are included for boys and girls, and in the case of the infants' school, additional cloakrooms, lavatories, and teachers' rooms are provided for the complete school, the cloakrooms and lavatories for the complete school are included in the plans and estimates. This provision for future requirements, while it adds to the initial cost, is a very considerable saving to the Council, as when the additional class-rooms are erected the cost is about 7s. 10s. a place. The architect's (Education) estimates for the cost of building in each case, calculated on the accommodation of the complete school, are as follows:—

Name of School.	Area of Site, Square feet.	Accommodation of Completed School.	Estimated Cost of School Building Only.	Estimated Cost a Place.	Total Estimated Cost including Furniture, Possible Extras, etc.	Total Estimated Cost a Place.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(i.) Lawnton	32,380	1,111	16,502 0 0	14 17 0	23,099 0 0	20 15 9
(ii.) Fountain	86,900	1,140	17,205 0 0	15 1 11	27,347 0 0	23 19 0
(iii.) Francisca-road	75,200	1,124	14,958 0 0	13 0 9	23,511 0 0	20 18 4

In this connexion we have had before us a letter from the architect (Education) dated 23rd 1905, drawing attention to the high estimated cost of certain schools, the preliminary plans of which have recently been submitted to them for approval. The Board state that the average cost per head in five instances works out at nearly 20s. per head for the schools when completed for the full numbers proposed; that there is nothing in the plans as to which they would raise any question, except in regard to the provision of special rooms for instruction in science and drawing; and inquire whether the Council cannot secure that the charge per place for the erection of new schools can be reduced. The Board add that they recognise that the cost of building in and near London is distinctly higher than it is in many other parts of the country, yet they find that even close to London satisfactory schools can be built at a cost per scholar materially lower than that proposed in the case of the schools, plans of which have recently been submitted to them.

We have given careful consideration to this matter, and the Council have had in communication with the Board of Education with a view to obtaining further particulars of some of the cheaper schools erected by educational authorities in those districts are contiguous to London. The

Board, however, did not see their way to furnish the Council with these particulars, but suggested that if inquiry were made of the authorities in question no doubt they would be willing to supply the information necessary to assist the Council in its inquiry. Acting upon this suggestion we have communicated with the undermentioned authorities asking them whether they would be good enough to furnish particulars as to the cost and accommodation of any school recently erected under their jurisdiction, and to lend the Council the plans and specification of any such school—Boroughs of Wimbledon, Hammersmith, and East Ham; County Councils of Middlesex, Surrey, and Kent; County Borough of West Ham, Urban District Councils of Chislewick and Willesden.

This information will give a basis for a fuller investigation of the question, and although at the present we are convinced that the Council should proceed upon the lines at present had down, the Council may be assured that the question will continue to engage our serious attention, and that we will not fail at once to recommend any possible changes in the direction of economy.

The committee recommended that working drawings, etc., be prepared.

Mr. Dickinson Wood, M.P., moved that the matter be referred back with a view to getting more information. In his opinion, the cost appeared to be excessive. Sir Melville Beachcroft seconded.

Canon Jephson explained that one reason why the cost in London was so high was that the Council jobs had been carried out in cement and the school at Croydon was built with mortar. He had visited schools in Switzerland, France, and America, and he believed that the elementary school buildings in London were the best. Whether they were too expensive was a matter for the Council; but he earnestly hoped that these schools would be built, for they were absolutely necessary.

Mr. Stephen Collins, M.P., said that the difference between erecting buildings in mortar and cement would not come to more than 10s. per place. The great difference between the cost per place needed a much more satisfactory explanation.

In the course of subsequent discussion, Mr. Saunders said that if the Council wanted decent buildings, which would not spoil the neighbourhood and which would be carried out in a sanitary manner, they must not think of erecting them more cheaply. It was not right that for the sake of a few pounds the architectural appearance of our schools should be spoiled.

The amendment was carried on a division by sixty-eight to fifty-one.

Theatre, etc., Works.—Sanction was given to the following works:—

- Hollan Hall.—Gallery at the north end of the hall (Mr. W. Gwyn).
- His Majesty's Theatre.—Exits from orchestra, etc. (Messrs. Romaine-Walker & Besant).
- Hollern Empire.—Gates across the open passage from the Hollern Empire into Wheatstone Park (Messrs. F. Metham & Co.).
- Royal Victor Hotel.—Alterations in connexion with exits (Mr. E. Stephens).

Payment of District Surveyors by Salaries.—The Building Act Committee again reported as to the future payment of District Surveyors by salaries instead of fees. They stated that

office of district surveyor, and in this connexion it should be noted that the order of reference to the Building Act Committee [paragraph A 21 (1)] provides that the districts are to be reorganised by the Committee as opportunities occur, so that the average of the fees received may in no case amount to less than 500l. per annum.

(4) Delay in introducing payment by salaries will, so far as can be seen, result in increased cost, and we are supported in this opinion by the fact that, while in 1890 the cost would have been 40,638l., the cost had risen in 1905 to 50,748l.

(5) There are now eight districts vacant, two districts where the district surveyors are not acting owing to ill health (one is mentally weak) and six districts where the surveyors are over seventy years of age, so that the present time is an exceptionally favourable one for the introduction of a new system of payment.

Having regard to the near approach of the next financial year and the obvious advantage of any system of payment by salaries commencing at the beginning of the financial year, we are of opinion that the matter should be dealt with at the earliest possible moment, and with a view to members of the Council having before them all possible information on the subject we have given instructions for a copy of a memorandum, prepared by our chairman, answering in detail the various criticisms made with regard to our proposals, to be sent to each member of the Council.

We understand that the Finance Committee are prepared to report on the proposals, and we recommend:—

(a) That as from and including April 1, 1906, all district surveyors be paid a fixed salary by way of remuneration instead of fees; that the amount of salary to be paid to each of the present district surveyors be equal to the amount of the average of the fees received in his districts during the seven years ending December 31, 1905, as provided in section 156 of the London Building Act, 1894; and that the Building Act Committee do submit the necessary recommendations to give effect to this decision.

(b) That with regard to the existing and all future vacancies the Building Act Committee do submit to the Council such recommendations, giving full particulars of their proposals in every case as will be in general accord with the 'model' scheme described in the report of the Building Act Committee, dated February 12, 1905.

The report of the Finance Committee was practically the same as their previous report, printed in our issue for February 3.

The consideration of the matter was adjourned.

White Hart Lane Estate.—Erection of Cottages on the Tower-gardens Section.—The Housing of the Working Classes Committee recommended, and it was agreed:—

"That the tender of Mr. G. E. Pulford for the erection of twenty-nine first-class cottages, eight second-class cottages, and twenty-three third-class cottages for the sum of 13,435l., and the tender of Mr. D. Barnes for the erection of three first-class cottages, thirty-six second-class cottages, and twenty-three third-class cottages for the sum of 10,855l. on the first part of the Tower-gardens section of the White Hart Lane estate be accepted; that payments to the extent of 80 per cent. of the work done be made to Mr. Pulford and Mr. Barnes in fortnightly instalments upon the architect's certificate that a further 15 per cent. of the value be paid on the completion of each cottage, and that the remaining 5 per cent. be paid within one month after the completion of each cottage."

The Council adjourned at half-past seven o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

- Lines of Frontage and Projections.**
- Islington, East.**—The retention of an addition in front of No. 198, Essex-road, Islington (Mr. W. H. Winder for Mr. T. Singlehurst).—Consent.
- Strand.**—Projecting balconies at Nos. 93 and 94, Long-acre, Strand, abutting upon Wilson-street (Messrs. F. Chambers & Son for Messrs. Odhams, Limited).—Consent.
- Brixton.**—A deviation from the plan approved for the erection of blocks of buildings on a site on the north-west side of Coldharbour-lane, Brixton, abutting also upon Lilford-road and Kenbury-street, so far as relates to an increase in the height of the buildings next Coldharbour-lane (Mr. E. E. Bird).—Consent.
- Marylebone, West.**—Buildings on the north-east side of Maida-vale, St. Marylebone, to abut upon Maida-vale and St. John's-wood-road (Mr. V. S. Galloway for the Governors of Harrow School).—Refused.
- Paddington, North.**—One-story shops in front of Nos. 431 and 433, Edgware-road, Paddington (Messrs. Gardiner & Theobald for Messrs. Matthews & Sons, Limited).—Refused.
- Paddington, North.**—One-story shops in front of Nos. 435 and 437, Edgware-road, Paddington (Messrs. Gardiner & Theobald for Meux's Brewery Company, Limited).—Refused.
- Paddington, North.**—One-story shops in front of Nos. 439 to 451 (odd numbers only), Edgware-road, Paddington, to abut also upon Maida-hill,

* See our issue for December 16, 1905.

West (Messrs. Boehmer [& Gibbs] for Mr. W. Hirsch).—Refused.

Width of Way.

Greenwich.—For the retention of buildings between Nos. 7 and 9, Coldbath-street, Greenwich, with a forecourt fence at less than the prescribed distance from the centre of the roadway of such street (Messrs. Cooper & Goulding).—Consent.

Bethnal-green, North-East.—Buildings on the north-east side of Wharf-road, Bethnal-green, with external walls at less than the prescribed distance from the centre of the roadway of such street, as shown on the plan (Messrs. M. W. King & Son).—Consent.

Width of Way and Working-Class Dwellings, Holborn.—Deviation from the plans approved for the erection of dwelling-houses to be inhabited by persons of the working-class, on a site abutting upon Leather-lane, Portpool-lane, Verulam-street, and Baldwin's-place, Holborn (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. E. B. I Anson, sanctioning the formation or laying-out of new streets for carriage traffic on the Mortimer estate, Streatham High-road, Streatham (for Mrs. Mortimer).—Consent.

Norwood.—That an order be issued to Mr. C. Death sanctioning the formation or laying-out of a new street for carriage traffic to lead from Trinity-road to Norwood-road, Lambeth.—Consent.

Lewisham.—That an order be issued to Mr. W. Wilkinson sanctioning the formation or laying-out of a new street for carriage traffic in continuation northward of Oatfield-avenue, Wells-road, Sydenham (Mr. T. Covell).—Consent.

Hammersmith.—That an order be issued to Messrs. H. Macintosh & R. J. W. Newman refusing to sanction the formation or laying-out for foot traffic only of streets to lead from Uxbridge-road to Bulwer-street, Shepherd's-bush, and the erection of a building in connexion therewith.—Refused.

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

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—This Society held an adjourned meeting at its rooms, Harrington-street, on the 19th inst. when the discussion was resumed on the paper by Mr. T. T. Rees on "Architects and City Improvement."* Mr. S. P. Morter presided. Mr. T. Myddelton Challcross opened the discussion and criticised the various sections of the paper in detail. He dealt at length with streets, buildings, and open spaces, and suggested that prizes might be offered for the best suggestion of improving Liverpool in its future expansion. With regard to street advertisements, Mr. Challcross said there seemed a need for the fixing of some standard to be attained by advertisers in their own interests and those of the general community. He suggested improvements to the city might be effected by the remission of some portion of the rates to those who voluntarily gave to the community such benefits as air spaces and ornamental trees, and so on, or to the householder who took steps to lessen the smoke nuisance. Mr. Hastwell Grayson followed, and advocated the establishment of a movement on the lines of the Cockburn Society of Edinburgh. This Society did much good work in Edinburgh on the lines aimed at by those who wished to see the city beautified. For instance, when an insurance society desired to raise a building of red brick, the Society, by influencing public opinion, obtained the substitution of stone for brick, Edinburgh being essentially a stone city. Objectionable advertisements were also dealt with in the same way, and Mr. Grayson suggested that an organisation working in similar fashion in Liverpool would achieve beneficial results.—An interesting discussion took place, during which speeches were made by Mr. Rathbone, Professor Reilly, Mr. H. B. Bare, Mr. P. C. Thicknesse, Mr. Hall Neale (President of the Liverpool Academy), Mr. Abraham, and others. The following resolution was adopted:—"Having regard to the commercial importance and prosperity of the city of Liverpool, this members' meeting of the Liverpool Architectural Society considers the appearance of the city should be worthy of such commercial greatness, and

should express its own dignity. This meeting realises that this is only to be done by the combined efforts of all our worthy citizens. It therefore suggests to the Council of this city the advisability of having a committee to deliberate as to the best means of obtaining that end." It was also resolved:—"That the best thanks of this meeting be tendered to the various railway and other companies who have kindly sent copies of their posters in illustration of the advances made in well-designed poster production in England."

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—During the past few years this Institution has in various ways exercised itself in promoting a closer relationship between the professions of engineering and architecture. A movement in this direction took the form of a very fully illustrated lecture on "Architectural Design and Expression," which was delivered before the Institution at the Westminster Palace Hotel on Friday last week by Mr. H. Heathcote Statham, Mr. Lewis H. Rugg, A.M. Inst. C.E., presiding. The lecturer first pointed out the distinction between architecture and engineering, and dealt with the questions of the probable origin of the column and its wide influence on architecture. He then compared Egyptian columnar architecture with Greek, and showed the difference between imitative architecture and the quality of style. Architecture was not an imitation of nature. He cited the Parthenon as an example of intellectual refinement. The gradual transmutation of the column into the buttress was treated, and considerations in regard to mouldings, scale, and ornament were touched upon. Illustrations from some of the cathedrals were depicted, and the lecturer passed on to the architectural element in engineering works. Some interesting observations followed with respect to railway-stations, bridges—often a fit meeting-ground of architecture and engineering—and suggested principles of treating masonry bridges were introduced, comments on some existing examples and conclusions derived from them being given. He held that judgment in regard to architecture rested on acquired perception rather than on theory. A vote of thanks was accorded the lecturer, and the speakers in the discussion were Messrs. J. H. Pearson, J. Rennie, W. J. Tennant, J. Horsfield, S. Bylander, J. W. Nisbet, G. T. Bullock, G. Peyrecave, and Mr. Rugg.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting on Tuesday, the 20th inst., Sir Alexander Binnie, President, in the chair, the papers read were:—"A Plea for Better Country Roads," by Mr. G. R. Jelby, M. Inst. C.E.; and "Country Roads for Modern Traffic," by Mr. J. E. Blackwall, Assoc. M. Inst. C.E. The author of the first paper, after pointing out that the proper maintenance of the country highways is a matter in which the whole community is interested, that the traffic on them is probably greater now than it ever has been, that many of them are hadly maintained at extravagant cost, and that a new kind of traffic, viz., the motor-car traffic, has sprung up during the past few years, urges that the present is a specially fitting time for engineers to consider:—

(1) Whether they are adopting the best methods of maintaining the roads;

(2) What improvements are necessary to fit the roads for the new and increasing traffic.

With regard to (1) the author specially advocates that the roads should be better drained, and kept dry and free from mud; and he enumerates some of the advantages which the public would enjoy if this were done. Among these advantages is the fact that the dust nuisance, which has become a very serious question, would be practically abolished. He considers that the extra cost of labour would be more than counterbalanced by less outlay on future repairs. With regard to (2) the author considers it impossible to lay down any general rules that would be applicable to all roads in all districts; he recommends that the roads should be classified, and that they should be strengthened and improved on scientific principles according to special circumstances. More care should be taken in the selection of

stone for macadam, and he deprecates using local stone because it is the cheapest. He invites discussion, and hopes engineers to county councils and others will state the result of their experience in the maintenance of roads, and especially as to the use of "Tarmac" or other dust-preventing material. He thinks that money would be better expended in improving the existing roads than in making new ones. The author also strongly recommends that all country roads should be repairable by the county councils, and points out generally, and also by reference to a special case, some of the serious disadvantages of the present system, under which the main roads only are repairable by the county councils, all other roads being repairable by district and borough councils.

If the author's suggestion as to keeping the roads free from mud were adopted throughout the country, a large number of additional labourers would be permanently needed, and he believes their work would be remunerative. If the roads were generally improved, a further large number of men would be wanted for several years to come, and the author thinks that no better or more useful work could be found for some of the able-bodied men who now swell the ranks of the unemployed, and that the work would be free from the serious objections which have been raised to many of the schemes which have been suggested for the benefit of that class.

The author of the second paper points out that it is now universally acknowledged that a radical improvement is required in the main roads of England, so that heavy traffic, consisting of traction engines, motor-lorries, and heavy carts, shall not cut up the surface and render it inconvenient for light, fast traffic, including motor-cars, light carriages, and cycles, and that foot passengers shall be protected from being run down or choked with dust by motor-cars. He suggests the gradual alteration, as funds allow, of existing main roads into twin roads, one for heavy traffic and the other for light, separated by a fence and a footpath. From what little data at present exist on the subject of the cost of maintenance of roads required for heavy traffic only, or for light traffic only, it appears probable that a saving of expense would be in the long run result; and there would be, beyond doubt, advantages to the users of the road by separating the traffic. Whether the advantages would be worth the initial cost of alteration is a matter of opinion.

The details of construction would vary considerably according to local circumstances, the amount and weight of traffic, the value and nature of adjoining land, the cost of material delivered, etc. The minimum width of the two roads and footpath together should be at least 46 ft. between fences, 21 ft. for each road and 4 feet for the footpath. The surface water would be conducted into a pipe-drain under the footpath by pipes laid near the surface under the light road, and by cross-gutters over the heavy road, both roads sloping down towards the outer sides and towards the footpath. The two roads would converge into one at the entrance of a village or any confined space. All crossings of roads would be notified by sign-posts, and speed of traffic reduced to a safe maximum. At gateways into fields on the side of the light road a space would be left in the wire fence, closed by a rail pivoted to a post near one end, and opening upwards, assisted by a counterpoise at the other end.

For purposes of considering the probable cost of conversion of a road into a twin road the items which would occur on a typical road are set out below with suggested prices. It is assumed that the road, originally 30 ft. wide, is widened to 46 ft. between fences, and that the extra land required for this widening is given by the adjoining owner for the good of the public.

	Per lineal yard.
Moving fence	2 s. 4.
Removing sod and earth	0 1 0
Foundation stone delivered	0 0 2
Reed mats (3 in. gauge), delivered	0 4 0
Labour, packing, spreading, and rolling	0 3 4
Labour, making up footpath	0 2 0
Making up light road	0 1 0
Fencing	0 9 6
	0 7
	21 1 7

This would be practically 1,900l. per mile.

* See our issue for Feb. 3.

COMPETITION.

NATIONAL CONGRESS HALL, BRAZIL.—The Commercial Intelligence Branch of the Board of Trade have received from H.M. Consul-General at Rio de Janeiro an extract from the *Brazilian Review* giving particulars of a competition for the presentation of plans for the construction of a building for the National Congress of Brazil. Projects destined to compete will be received in the Secretariat Department of the Federal Senate up to 4 p.m. on May 31 next. Three prizes, of 15,000, 10,000, and 5,000 milreis, respectively, will be awarded to the authors of the best projects presented, and a further sum of 5,000 milreis is to be spent in acquiring projects which, although not awarded prizes, are in the opinion of the judging commission deserving of being acquired for the National Congress. The text of the programme, in accordance with which projects must be drawn up, may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 75, Basinghall street, London, E.C.

BOOKS RECEIVED.

IMPRESSIONS OF JAPANESE ARCHITECTURE. By Ralph Adams Cram. (John Lane, 10s. 6d.)

MODERN BUILDINGS: THEIR PLANNING, CONSTRUCTION, AND EQUIPMENT. By G. A. T. Middleton, A.R.I.B.A. (The Caxton Publishing Company, 10s. 6d.)

BRIDGE AND STRUCTURAL DESIGN. By W. Chase Thomson, M.Can.Soc.C.E. (Engineering News Publishing Company, New York, 8s.)

TRADE CATALOGUES.

We have received from the Leeds Fireclay Company three catalogues containing illustrations and prices of various sanitary goods manufactured by Messrs. Joseph Cliff & Sons, one of the associated firms in the Company. The catalogues are very well produced on good paper, all the illustrations being coloured, and full information is given as to qualities and prices. One catalogue deals with porcelain-enamelled fireclay baths and lavatories, the trade name for the ware being "Imperial Porcelain." The baths are made in various sizes, either taper or parallel, and with either plain rims or glazed rolls; the outside may be plain, white-glazed, or stone-enamelled in a selected tint. Special baths, such as sitz, foot, and sponge, are also shown, together with a number of taps, and other accessories. The lavatories are of a substantial character suitable for schools and factories as well as for houses and hotels; the new overflow for the "Carlton" basin is a great improvement on the older type. A second catalogue contains illustrations of fireclay closets and urinals. All the pedestal closets are of the usual wash-down type, but trough-closets are also shown. The urinals are of the stall type in salt-glazed ware or porcelain-enamelled fireclay, and are of different patterns suitable for the angles of rooms, for straight walls, and for independent groups. Various plans of urinal ranges are given, and there is a sheet of illustrations of flushing-cisterns, sprays, etc. The third catalogue deals with sinks of various kinds from the inexpensive cottage sink in brown-glazed stoneware to the special sinks for hospitals, etc. The combined sink and slop-sink in one piece of fireclay with separate trap to the slop-sink will prove useful, and the "open-overflow" sink, with drainer and skirting in one piece, is also a good fitting. Illustrations of slop-sinks, wash-tubs, bed-pan sinks, post-mortem and mortuary tables, sink fittings, etc., are also given.

From Messrs. G. Shrewsbury & Co. we have received a catalogue of their "Calda" water-heaters and other appliances. The "Calda" heaters have been extensively used for a generation for heating the water required for baths and other purposes, and many of the varieties serve the purpose admirably. It is, we think, a serious error of judgment to say that ventilating flues are "unnecessary," even though the statement is qualified by adding "if the bathroom is fairly large and the gas is slight." It is true that such flues are not absolutely necessary in the case of geysers in which the products

of gas-combustion are condensed by the water in its passage through the fitting, but such geysers do not yield *pure* hot water. The claim is made on page 2 that all "Caldas" yield "pure hot water . . . suitable for drinking and culinary purposes," but, unless we are mistaken, the "Unique" and "Favourite" Caldas shown on page 9 are of the condensing type. The catalogue contains illustrations of oil-heated Caldas, baths, gas-heated conservatory boilers and pipes, washing-coppers, etc.

The Down-draught Fireplace Co. have sent us a catalogue of Regester's patent down-draught fireplaces for burning anthracite or any other fuel. The special feature is the pair of openings (one at each side of the fire) level with the bottom of the grate, from which concealed smoke-pipes are carried up to the main smoke-flue above the fire. The illustrations do not show any method of regulating the draught in the upper and lower flues. Some of the grates are made with hot-air chambers, and ducts can be formed to convey the heated air into a room above.

The David Maydole Hammer Co., of Norwich, U.S.A., send us their catalogue of hammers as used by bricklayers, masons, tile-setters, joiners, engineers, machinists, boiler-makers, blacksmiths, and others. The heads of all hammers made by this firm are forged from crucible cast steel, and the standard manufactures of the firm include some 343 styles, sizes, and finishes. The fact that a large establishment is kept fully employed in the manufacture of hammers alone serves as a practical proof of the reputation for high quality enjoyed by the Maydole hammers, and illustrates the system of industrial specialisation practised in the United States.

Correspondence.

R.I.B.A.—ELECTION OF FELLOWS.

SIR.—In compliance with requisitions in writing duly signed according to the provisions of By-law 9, the election of the twenty-eight candidates for Fellowship, nominated by the Council for election at the business meeting on the 5th March, will be taken by voting papers.

The Council are aware that these requisitions proceed from a widespread feeling that the Institute should avail itself of the permission granted by clause 3 of the Charter to declare that every person desiring to be admitted a Fellow shall be required to have passed such examination or examinations as may be directed by the Royal Institute.

Sympathising with this feeling, the Council adopted it as their policy in 1904, and at a special general meeting, held on February 29, 1904, a resolution was passed to the effect that after December 31, 1906, no person shall be admitted a Fellow unless he is either an Associate or has passed the examination or examinations qualifying him as an Associate.

On the same evening, however, the general body passed the following resolution of the Royal Institute:—

"That during the intervening period (i.e., till December 31, 1906) every architect eligible under the Charter for election who desires to join the Institute as a Fellow be encouraged to do so."

In consequence of these resolutions becoming generally known in the profession a large number of eligible candidates have come forward during the last two years. The Council are convinced that it is to the interests of the Institute that thoroughly qualified architects in various parts of the country whose age and busy practice preclude from entering for examinations should become Fellows before the door is for ever closed against them.

At the same time the Council has subjected the qualifications of candidates during the last two years to the same careful scrutiny and inquiry as has been their practice during the whole existence of the Institute.

To avoid any possible misapprehension the Council declare that the last election of Fellows under the existing system will be on December 3, 1906.

In view of the requisitions for a poll the Council think it right that members should be reminded of the above facts, and, as one

adverse vote in four excludes, they desire to direct the attention of members to the gravity of their responsibility when they fill up their voting papers.

ALEXANDER GRAHAM, Hon. Secretary.

W. J. LOCKE, Secretary.
Institute of Architects, 9, Conduit-street,
February 21.

FELLOWSHIP OF THE R.I.B.A.

SIR.—Will you permit us to return to this subject, in the hope of making clearer the points raised.

If only we could have the actual position and purpose of the Fellowship definitely explained, we should all know better where we stand. Surely it may be assumed that the original idea was to make the Fellowship a sign of eminence, more or less; otherwise why have a second class of the subscription being higher? And does not the much discussed resolution of the Institute to shortly elect this class only from the ranks of the Associates prove it? If the contention that every competent architect has a right to election as a Fellow is correct, it seems to us that to force him after this year to go through an examination will be not only a distinct hardship, but an inconsistency. We cannot see what purpose of a worthy kind the Fellowship fulfils, unless it is to recognise a select or eminent class of men.

Our views (which we have reason to know are very widely shared) seem to be much misunderstood in London. We are working solely for fair play, and for the dignity of the R.I.B.A. So far are we from holding that the Associate's examination is the main essential, that we would willingly see the entrance to our class widened, and a man's practical work accepted in substitution for some or even all of the examination work; so long as it was definitely ascertained that the conception and details were entirely his own.

But, knowing the educational value of preparation for the examination, and remembering the constant emphasis hitherto placed upon it by the leaders of the R.I.B.A. and the Provincial Societies, we are bound to insist that it is (1) unfair to such examined men, (2) derogatory to the dignity and consistency of the Institute, and (3) unworthy of the candidates, as architects and gentlemen, to bring about this unseemly scramble for easy entrance to the Institute.

We are informed that "the By-laws allow this." We admit it; but the By-laws also allow the means of protest—the demand for a poll of the Institute. In demanding this, and for the whole of the candidates, we have acted on principle only; and we earnestly hope our action will not cause any injustice to the Associates in the nomination list.

We are further told that "the close time will expire in a year from now; cannot things be allowed to take their course"? This we would gladly have done; but our information shows that due care is not exercised by the Council in their nominations. We must protest, and have already effectively protested, against the official nomination of men who hope by the Fellowship to obtain that entrance to the Institute which they have signally failed to obtain as Associates, or of men whose practice is chiefly connected with Estate Agency and kindred work.

One other remark in conclusion. Of the present members of the R.I.B.A. Council, we find that more than 75 per cent. have at some time qualified as Associates. No further argument is needed; the Council has itself fully justified our contention.

Signed on behalf of the meeting of Leeds Associates,
W. G. SMITHSON, Chairman,
FREDK. MUSTO, Secretary.

Leeds, Feb. 21.

SIR.—I must beg leave to say a few words on behalf of the London men, in reply to Mr. Musto's letter.

I number among my friends a good many Associates who are by no means indifferent to the course of events during the last year or so, and I think I shall do no injustice to the majority of the London Associates when I say that it is an excess of discretion, rather than a lack of valour or conviction, that prevents their openly joining their provincial comrades and presenting a united front.

It is undoubtedly the opinion of a great many of us that the present policy of the Council is a mistaken one, inimical to the best interests of the Institute and derogatory to the dignity of the Fellowship; but few have or can have the opportunity of taking part in an ordinary election, and fewer still, it is to be feared, can afford, here in London, to be publicly identified with the whole-hearted action of the provinces, with its attendant risk of forfeiting the goodwill of their elders.

Nevertheless, a very strong current of opinion undoubtedly exists even in London; and as the question seems now likely to be brought to a definite issue, the opinion of the majority will doubtless be ascertained, and the future policy of the Council ordered accordingly.

PERCIVAL W. HAWKINS.

THE SOANE MEDAL PRIZE DESIGN.
 Sir,—It may interest your readers if you can add the following particulars as to the author of this scholarly, beautiful, and masterly design for Lord Bacon's Ideal Palace.

Mr. W. S. George is the son of an architect practising at Ashton-under-Lyne. After training in his father's office, he obtained a Lancashire County Council Scholarship in art, and was awarded a Royal Exhibitionship by the Board of Education. He entered the Royal College of Art in 1901 and obtained the travelling studentship in architecture of the College in 1903.

The interest and charm of Mr. George's draughtsmanship can be estimated from the plates that you published last week, *Beznorsford Priory*, Royal College of Art, Feb. 21.

ROYAL SANITARY INSTITUTE.

Sir,—Many of your readers will, I think, be interested in having particulars of the Saxon Snell Prize.

This Prize was founded to encourage Improvements in the Construction of Adaptation of Sanitary Appliances, and is to be awarded by the Council of The Royal Sanitary Institute at intervals of three years, the funds being provided by a legacy bequeathed to the Institute for this purpose by the late Henry Saxon Snell, F.R.I.B.A.

The Prize consists of 50l. and a medal of the Institute, and is offered in 1906 for an Essay on "Suggestions for Improvements in Sanitary Appliances for use in Workmen's Dwellings and Labourers' Cottages under the varying conditions of Water Supply and Drainage usually obtaining in Towns and Villages."

E. WHITE WALLIS,
 Secretary.

THE PURPLE PATCH.

Sir,—In the course of your very kind notice of the *Purple Patch* in your last issue you refer to a "delightful mock-medieval" headpiece. This illustration was made from a very careful tracing of Mr. Elliot Hodgkin's reproduction of the original woodcut, which is perfectly genuine; the text also is a careful transcript, except in the matter of "long S's," which are unfortunately lacking in our font of type. I think this slight correction is due to Mr. Hodgkin (whose name was quoted in the article), as he is one of the leading English authorities on early typography.

C. F. BEACHBURNE DANIEL,
 One of the Editors, *Purple Patch*.
 . Evidently we overlooked the prefatory remarks above the drawing, which we took to be head-piece of the article. It was, as Mr. Pleydell said of *Domine Sampson*, "a curiosity worth preserving."—Ed.

WEST WALTON CHURCH, NORFOLK.

Sir,—I should be obliged if you would allow me to ask through your columns if any of your correspondents can inform me whether the ground plan of West Walton Church, Norfolk, has been published in any book, and, if so, where it is to be found.

BERNARD J. McADAM.

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday, last week, the Lord Mayor presiding.

Street Improvements.—On the recommendation of the Improvements and Finance Committee, it was agreed to serve notices to acquire so much of the premises of 117 and 120, Fleet-street, and 33, Throgmorton-street, as is required for the improvement of those thoroughfares, and that 2,800l. should be offered for the last-named premises. The same committee also submitted arrangements, which the Court adopted, with St. Bartholomew's Hospital for acquiring their freehold interest in the ground needed for the improvement of Giltspur-street for the sum of 2,221l., and with Messrs. Blessey for the freehold of the land required to widen the public way in front of 2 and 3, Warwick-lane, for 2,000l.

Heating of the Library.—The Library Committee were authorised to carry out an improvement of the heating apparatus in the library at a cost not exceeding 100l.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—VII.
 SHORT CUTS TO DIVISION.

THE process of division can be much simplified by various devices, generally similar to those explained in the two preceding articles.

Contracted Method.

In cases where the numbers to be dealt with contain several decimals, the process of division can be considerably abbreviated without

affecting the substantial accuracy of the result, as the quotient can be obtained correctly to a reasonable number of decimal places.

Rule.—The contracted method consists in cutting off a figure at the right-hand of the divisor after each new figure has been obtained in the quotient; but carrying any figures furnished by mental multiplication of the figures rejected from the divisor, and adding 1 to the figure carried if the next figure of the mental product has the value of 5 or more.

In the following examples the numbers are the same as those used in Examples (1) to (3) in Article V., p. 147.

Example (1): Divide 512.2122945 by 58.645 so that the quotient shall be correct to four places of decimals.

Contracted Method.		Ordinary Method.	
58645	5122122945	58645	5122122945
469160	= 8.7341	469160	= 8.7341
43052		43052	
41052		410515	
3000		300079	
1759		175935	
241		241444	
235		234580	
6		68645	
6		68645	
6		10000	

As the result is not required to contain more than four decimals, we reject the figures 2, 9, 4, 5 in the dividend, and proceed as follows:—

Line (1).—Multiply the divisor by 8 to obtain the product 469160, which is subtracted from 512212, leaving the remainder 43052.

Line (2).—Reject the right-hand 5 in the divisor and divide into 43052. Multiplying 5864 by 7 take the canceled 5 into account mentally, thus 5 x 7 = 35; then as 5 is to be taken as 10, carry 4 instead of 3 to the product of 4 x 7, making that individual product 4 x (4 x 7) = 32. Consequently the 5 is set down and the 3 carried to the next multiplication in the same line. The process is continued in the usual way until 41052 is obtained, this being subtracted from 43052, leaving 200 as remainder.

Line (3).—Reject the figure 4 in the divisor, multiply 586 by 3, carry 1 from the mental multiplication of the two rejected figures, and proceed as in Line (2) to obtain 1759, which taken from 2000 leaves 241.

Line (4).—Reject 6 in the divisor, multiply 58 by 4, carrying over 3 from the mental multiplication of the figures rejected from the divisor. Proceed as before, obtaining the remainder 6.

Line (5).—Cancel 8 in the divisor, multiply by 1 carrying over 1, the value of the rejected figures.

The last figure in the quotient is 1, the required answer, after insertion of the decimal, being 8.7341. The preceding example it is demonstrated that the contracted method is quite as suitable for practical purposes as the ordinary process, while the saving of time and space is too obvious to require comment.

As in the converse process of multiplication we can adopt the contracted system for the treatment of large whole numbers in cases where minute accuracy in the units, tens, hundreds, or thousands places is not of importance.

The Italian Method.

This method of abbreviation has the effect of shortening the process of division, while still permitting exact results to be obtained. Instead of writing down the various products, and the difference between these products and the lines immediately above these, it is only necessary to record the difference between the separate figures of each product and the figures over them.

It is certain that familiarity with the Italian method enables the operator to diminish the mental exertion required for the performance of a given division sum by a very large proportion, because the complete calculation of the separate products of the divisor by each digit in the quotient is not necessary.

Example (4): Divide 6843580648 by 7324.

The following are the workings by the Italian method and the ordinary method:—

Italian Method.		Ordinary Method.	
7324	6843580648	7324	6843580648
52198		65916	
32260		25198	
29646		21972	
35048		32260	
5752		29296	
		35048	
		29296	
		5752	

The process is conducted as follows:—

Line (1).—Under the dividend draw a line to indicate the digits necessary to express a number greater than the divisor. In this example the line extends below the figures 68435. By inspection the first figure in the quotient is evidently 9 representing 900,000. Then, as 4 x 9 = 36, we have to deduct 36 from 5, but as this cannot be done we borrow 4 (representing 40) and get

45 - 36 = 9, which is the first figure to be written. The figure 4 has to be carried to the next product 2 x 9 = 18 and 18 + 4 = 22, which taken from the sum of 3 and 20 borrowed leaves 23 - 22 = 1, this again being the figure to be recorded, while the 2 borrowed is carried forward. Next we have 2 + (3 x 9) = 29, which deducted from 4 + 30 = 34 gives 5 as the difference to be written and 3 to be carried. Finally, 3 + (7 x 9) = 66, and taking this from 68 we are left with 2, the last figure of the difference 2519. Repetition of the same process for the other figures of the dividend gives the quotient 934,404 with 5752 as remainder.

A more facile mode of dealing with the figures is to avoid instead of subtracting the figures in ascertaining the differences.

Thus:—

(4 x 9) + 9 = 45	(carry 4)
4 + (2 x 9) + 1 = 23	(carry 2)
2 + (3 x 9) + 5 = 34	(carry 3)
3 + (7 x 9) + 2 = 68	

The figures printed in italics represent the first figure of the quotient and those in thick-faced type constitute the first line of differences.

The other figures in the quotient and the lines of differences are ascertained in a similar manner, giving the quotient 934,404 +, as before.

Comparison of the working with that under the ordinary system will be sufficient to indicate how great a saving of time can be effected by using the Italian method.

Simplified Method by Reduction of the Terms.

If the divisor and the dividend can be reduced materially by the use of the greatest common divisor (termed the *Greatest Common Measure*, or *G. C. M.*) of the two numbers, considerable simplification of division can frequently be effected.

Even if the determination of the *G. C. M.* would not repay the trouble involved, time can often be saved by using a smaller common measure which can be ascertained by inspection.

Thus we have available two variations of the same principle, which is illustrated in the following examples:—

Example (1): Divide 3072 by 108.

If the *G. C. M.* = 12, and the process of reduction and division is:—

12108	3072
9	256
	2844
	9
	1285
	35
	1285
	7
	1287
	3671

Hence we have

Example (2): Divide 1285 by 35.

Here both numbers are evidently divisible by 5.

Hence we have

535	1285
7	257
	3671

Division by Certain Numbers.

To divide any three-figure whole number by 11.

Rule.—In any three-figure whole number in which the second digit is equal to the sum of the first and third digits, the first and third digits represent the quotient of the number after dividing by 11.

Example (1):—

792	+ 11 = 72
242	+ 11 = 22
341	+ 11 = 31
110	+ 11 = 10

Note.—The same principle can be applied conveniently to the division of some three-figure and four-figure numbers by multiples of 11, as demonstrated by the following examples:—

484	+ 22 = 22
748	+ 22 = 34
1386	+ 22 = 63
693	+ 33 = 31
1059	+ 33 = 33
2079	+ 33 = 63

A little practice will enable the user to deal with suitable numbers in this way, even when figures have been carried from one place to another.

To divide any whole number by 11.25, 112.5, 1125, and so on.

Rule.—From the number subtract one-ninth of that number, and by a decimal point mark off from the right-hand end of the result one, two, or more figures, according as the integral part of the divisor represents tens, hundreds, and so on.

Example (2): Divide 72543 by 11.25.

912543	
806033	
6448266	= 6448266

To divide any whole number by 12.5, 125, 1250, and so on.

Rule.—Multiply the number by 8, and mark off by a decimal point as many figures from the right-hand end of the number so obtained as there are figures in the integral part of the divisor.

Example (3): Divide 72543 by 12.5.

72543	
580344	= 580344

To divide any whole number by 13.3, 133.3, 1333.3, and so on.

Rule.—From the number subtract one-fourth of that number, and by a decimal point mark off from the right-hand end of the result, one, two, or more figures according as the integral part of the divisor represents tens, hundreds, and so on.

Example (4): Divide 72543 by 13·3.

$$\begin{array}{r} 472543 \\ 1313575 \\ \hline 5440725 = 5440725 \end{array}$$

To divide any whole number by 14·2857, 142·857, 1428·57, and so on.

Rule.—Multiply the number by 7, and mark off by a decimal point as many figures from the right-hand end of the number so obtained as there are figures in the integral part of the divisor.

Example (5): Divide 72543 by 14·2857.

$$\begin{array}{r} 72543 \\ 7 \\ \hline 507801 = 507801 \end{array}$$

To divide any whole number by 15, 150, 1500, and so on.

Rule.—From the number subtract one-third of that number, and by a decimal point mark off from the right-hand end of the result, one, two, or more figures according as the divisor represents tens, hundreds, and so on.

Example (6): Divide 72543 by 15.

$$\begin{array}{r} 72543 \\ 372543 \\ \hline 24181 \\ 48502 = 48302 \end{array}$$

To divide any whole number by 16·6, 166·6, 1666·6, and so on.

Rule.—Multiply the number by 6, and by a decimal point mark off from the right-hand end of the result one, two, or more figures according as the integral part of the divisor represents tens, hundreds, and so on.

Example (7): Divide 72543 by 16·6.

$$\begin{array}{r} 72543 \\ 6 \\ \hline 435258 = 435258 \end{array}$$

To divide any whole number by 25.

Rule.—Multiply the number by 4, and mark off by a decimal point the two right-hand figures of the number so obtained.

Example (8): Divide 72543 by 25.

$$\begin{array}{r} 72543 \\ 4 \\ \hline 290172 = 290172 \end{array}$$

GENERAL BUILDING NEWS.

CHURCH, TOTTENHAM.—The Lord Mayor laid the foundation-stone of the permanent Church of St. Philip the Apostle, South Tottenham, the building being intended to supersede an iron mission church in Philip-lane, connected with Holy Trinity, Tottenham. Accommodation for a congregation of 750 will be afforded by the new church, which will be built in brick and stone by Dove Brothers, from Mr. J. K. Cutts's designs.

ROMAN CATHOLIC CHURCH, READING.—The new Church of St. William, in Upper Redlands-road, Reading, was opened recently. The church will, when completed, be 90 ft. long and 50 ft. wide, with seating capacity for 450 persons, but until sufficient money is raised the erection of the sanctuary will remain in abeyance, and a building 63 ft. long by 24 ft. wide, capable of holding 200 persons, has been erected. The architects are the Rev. Canon A. J. C. Scoles and Mr. G. Rayment, of Basingstoke. The church is built of red brick with stone facings. The builder is Mr. W. Hawkins, Reading.

PROPOSED CHURCH, BURNLEY.—The new Church of St. Cuthbert is to be built in Townley-street, Burnley-lane. The plan is the usual one of nave with north and south aisles, chancel, south chapel, and vestries, the organ being in the north chancel aisle. The west wall of the nave is segmental in form so as to provide a baptistery, and at the south-west corner a bell turret rises. Two porches on the south side give access to the church, and there is an emergency exit on the north. Six arches on each side divide the nave and chancel from the aisles and chapel, and carry the clearest walls, which are pierced with lancet-headed windows. The nave and aisles accommodate 450, the chapel 42, and the chancel 40. The walls are to be faced inside and out with Accrington red plastic bricks, having external dressings of Cullingworth stone and internal dressings of white Hollington stone. All the roofs are to be of wrought pitch-pine, open timbered, country slates, and covered with north country slates. The floors in the nave and aisles are to be of joists and boards under the seats, and polished flags in the passages, the chancel and chapel of vitreous mosaic and wood blocks respectively. The designs are by Mr. R. B. Preston, architect, Manchester.

CHURCH RESTORATION, HUNTINGFIELD.—The restoration of Huntingfield Church, which was commenced some ten years ago, has now been completed. The work has been executed by the contractor, Mr. Robert Etheridge, of Fressingfield, and the masonry by Mr. Perfit, of Harleston, from plans and designs and under the supervision of Mr. C. H. Lohr, architect, of London and Leicester.

SCHOOL, HANWELL.—A new school has just been opened at Oaklands-road, Hanwell. The Oaklands-road School affords accommodation for 1,143 scholars—viz., senior mixed department, 388; junior mixed department, 388; infants department, 367. The school is arranged in a two-story building for mixed classes, and a separate building for infants. Each department has a central hall and classrooms. There are also lavatories, teachers'-rooms, store-rooms, etc., on the mezzanine floors. The buildings are heated by hot water and open fireplaces. The floors are fireproof, being constructed with concrete on steel girders. Each department has two entrances, and the senior mixed department has two staircases. Two cloakrooms are provided for each department. The external walls are built with stock bricks, and the roofs are covered with slates. The playgrounds are large, and will be paved with asphaltic tar, and have two covered shelters. A caretaker's house is provided. The contract price is 18,250*l.* Mr. W. Pywell is the architect.

SCHOOL, CARTER KNOWLE, SHEFFIELD.—A new school has been erected at the junction of Carter Knowle-road and Bannardale-road off Sheffield Education Committee. The school will accommodate 900 infants, and 400 older boys and girls. It is arranged on the central hall principle. The hall measures 84 ft. by 30 ft., and is divided by sliding screens. Around it are twelve classrooms, varying in size from 25 ft. by 24 ft. to 25 ft. by 22 ft. The whole of the buildings are heated with a low-pressure hot water apparatus. The site, being a West Calder, has a large area of open ground, and is provided on the low level, each department affording accommodation for upwards of forty pupils. All the classrooms are at least 14 ft. high, and an area of 10 superficial feet is allowed for each child. The total outlay on the school has been 15,220*l.* The site covers two acres (one of which is devoted to playgrounds), and there is space for the erection of another department in case of need. The building has been erected from the designs of Messrs. Holmes & Watson, architects, Sheffield.

SCHOOL, WEST CALDER, GLASGOW.—Gavieside School, which has been reconstructed and enlarged by the West Calder School Board, was opened on the 12th inst. The boys' and girls' entrances and five class-rooms, giving accommodation for about 280 scholars, are grouped round three sides of a central hall, and each apartment opens directly off it. Two teachers' rooms and the boys' and girls' cloak-rooms and lavatories form the remaining side of the hall, and look towards the West Calder. The cost of the new work is about 1,750*l.*, and the architect is Mr. William Baillie, Glasgow.

RAILWAY MISSION HALL, SALISBURY.—The foundation-stones of a new mission hall have just been laid in Devizes-road, Salisbury. The work is being carried out from designs prepared by Mr. A. C. Bohame, architect.

HOSPITAL EXTENSION, MANSFIELD.—The memorial-stones were recently laid of the extensions which are being made to the Mansfield Hospital. The scheme provides for a ward capable of containing twenty-six additional beds, as well as extra kitchen accommodation and rooms for the augmented staff. Mr. R. F. Vallance is the architect of the work, the estimated cost of which is 6,600*l.*

COUNTY MUSEUM, LINCOLN.—The conversion of the building known as the Grey Friary, at Lincoln, into a county museum has just been completed. The Grey Friary is a building of two stories, and forms a small portion of what was once a complete monastic establishment, erected in the first half of the XIIIth century. The architects who have been responsible for the conversion of the building (Messrs. Watkins & Son), in their report to the Corporation, state that the original roof still remains intact over the eastern end of the main building. It consists of trussed rafters, with semi-circular trusses to each pair. The rooms are well lighted and heated, and the structure well arranged for its purpose, while its ancient character has been preserved.

NEWPORT LUNATIC ASYLUM, CAERLEON, MON.—The new asylum for the county borough of Newport, situate at Caerleon, has just been opened. The buildings, with their equipment and furniture, will cost 116,000*l.*, and roads and bridges represent about 6,000*l.* The laying-out of the grounds and fencing, architect's commission, clerk of the works' salary, legal costs, and miscellaneous expenditure not yet completed are estimated at 17,000*l.*, bringing the total estimated expenditure to 139,000*l.* The accommodation provided is for 328 patients, with administration offices sufficient for 500 patients, thus enabling two further blocks of buildings for patients to be erected without requiring any addition to the

administrative block. The architect for the buildings was Mr. A. J. Wood, of London, the contractors Messrs. John Linton & Co. (Limited), of Newport, and the clerk of works Mr. W. B. Partington. The Borough Engineer (Mr. R. H. Haynes) carried out the diversion of road and the construction of a new bridge over the Great Western Railway. The blocks for patients are two stories in height, those nearest the centre being allotted to sick and infirm cases, and consisting of a ward for 30 patients on each floor. The next block is designed for 35 epileptic and 35 quiet chronic cases, the epileptics being accommodated in a ward on the ground floor and the quiet chronics in a similar ward on the first floor. Next this is the recent and acute block, comprising a ward for 27 patients on either floor. The future extensions will consist of a block beyond the recent and acute on each side for working patients, that on the female side being contiguous to the laundry, and that on the male side adjacent to the workshops. The asylum is so designed that these additional blocks may be added without in any way disturbing the patients or interfering with the working of the institution. The official block is placed centrally to the south of the administrative offices. The great fall in the ground from back to front would not admit of this block being placed to the north, the position recommended by the Commissioners in Lunacy. It is a two-story building, containing on the ground floor committee room, receiving room, photographic studio, etc. The upper floor is allotted to the assistant medical officer and the matron, their quarters being quite separate and reached by different staircases. On the male side, in close proximity to the site for the future block for working patients, are the workshops. They comprise shops for shoemakers, tailors, upholsterers, carpenters, plumbers, painters and glaziers, bricklayers' shed, foreman's office, etc. The boiler-house block is placed to the east of the workshops, and contains, in addition to the boiler-house, coal stores, electric plant room, battery-room, pump-room, engineers' shop, office, etc. The blocks for attendants and nurses are placed in the usual position east and west of the administrative offices. They include the necessary mess and recreation rooms on the ground floor, the upper floor being allotted to the night nurses and domestics on the female side and to night attendants on the male side. The buildings are lighted throughout by electricity, the current being generated in the institution. Electric fire-alarms, tell-tales, bells, and telephones are installed throughout the buildings. Fire-alarms are provided in each ward and section of the building. In addition to the two means of exit provided from each ward ample precautions have been taken in case of fire, both the interior and exterior of the building being commanded by hydrants of the latest type. The following detached buildings are provided in addition to the main asylum:—Chapel, mortuary, farm buildings, six cottages for staff, two entrance lodges, cottage for bailiff, and garden buildings.

WORKMEN'S INSTITUTE, YNYSHIR.—The new workmen's hall and institute at Ynyshir was opened on the 3rd inst. The building is of native stone and, in addition to the hall, contains a library, billiard-rooms (two tables), a committee-room, providing seating accommodation for 200 people, games rooms for boys, a gymnasium, and a large reading-room. The institute will be provided with its own electricity and gas. The electric plant was supplied by Messrs. Clay Bros., Cardiff; the suction gas plant by Messrs. William Grice & Co.; and the heating apparatus by Messrs. Stoll & Co., of Oldham. The contractor was Mr. David Richards, Ynyshir, and the architect Mr. E. Williams, Cardiff. The cost was 7,900*l.*

FREE LIBRARY, CHELMSFORD.—The Chelmsford Free Library and Reading Room, Museum, and School of Art were opened recently by Lady Rayleigh. The building consists of a central block, with two wings. On the ground floor are the entrance-hall, librarian's and curator's offices, the library and reading-room, and the museum and museum library. The school of art occupies the whole of the first floor, and above are a store-room and caretaker's apartments. The cost of the work, including the site, was about 8,000*l.* Mr. Cuthbert Brown is the Borough Surveyor.

PROPOSED HOSPITAL EXTENSION, MIDDLESBROUGH.—At a meeting of the council of the North Ormsby Hospital, Middlesbrough, on the 9th inst., Mr. J. M. Boitcomley, architect, reported that the proposed addition, to be known as the Elizabeth Brown wing, would cost 6,000*l.*, and the alterations to existing buildings he estimated would cost 1,375*l.* After some discussion it was decided to carry out the improvements, omitting the staircase and lift, with approaches, estimated at 500*l.*, the amount to be expended thus being 6,875*l.*

LIBRARY, CARLETON.—A new free library was opened at Carleton on the 10th inst. The building contains a newspaper and magazine room, lending and reference departments, recreation-room, and librarian's room. There is also lavatory accommodation. The exterior of the building is of red brick with Hollington stone dressings. The

internal fittings are of polished oak with pitch-pine wood blocks. The contractors have been as follows:—Bricklayers and joiners, G. T. Taylor, Carlton; masons, Ward & Adams, Nottingham; slater, A. Wright, Nottingham; plumber, J. Straw, Carlton; painter, J. Bryan, Carlton; plastering and mosaic paving, Midland Plastering Company. The total cost of the building has been £1,800. Mr. J. C. Haller, from whose plans the library has been built, has superintended the erection.

APPOINTMENT.

LLANDEFF DIOCESAN ARCHITECT.—The Bishop of Llandaff presided over a meeting of the Llandaff Diocesan Society at Cardiff on Friday last week, and the appointment of an architect in succession to the late Mr. John P. Seidson was considered. Mr. F. R. Kempson, of Cardiff, was appointed.

SANITARY AND ENGINEERING NEWS.

SEWERAGE WORKS, ABBOTS LANGLEY.—These works have been carried out by Mr. H. Brown, contractor (Watford), from the designs of Mr. E. Lailey, Surveyor to the Watford Rural District Council. The sewage from Hunton Bridge, Upper Highway, and Abbots-road gravitates to a large receiving tank at Hunton Bridge, holding some 120,000 gallons. From this the sewage is lifted by pumps to the new disposal works near Abbots Langley, 12 acres in extent, where it is first treated in a large septic tank, holding 60,000 gallons, and then passed through continuous filters composed of beds of washed clinkers, broken to various sizes by means of automatic sprinklers supplied by Messrs. Hann, Baker, & Company. The effluent from these filters is then taken on to the land, which is of a porous nature, and well adapted for further filtration. The cost of the work was 20,000.

MISCELLANEOUS.

PROFESSIONAL FUND BUSINESS ANNOUNCEMENTS.—The partnership between Mr. W. Clifford Parnell and Mr. J. F. Fogarty, architects, has been dissolved, and Mr. Fogarty has taken into partnership Mr. George Brunell, A.R.I.B.A. The practice will be carried on as heretofore, at Belfast House, Gervis-place, Bournemouth, under the names of Fogarty & Brunell.—The *Sanitary Journal* has removed its offices to 13, Victoria-street, S.W.—Messrs. Johnson, Clapham, & Morris, of Manchester, manufacturers of steel concrete wire lattice, have opened London offices at Queen Anne's Chambers, Broad-street, Westminster, S.W.

IMPORTS AND EXPORTS OF CEMENT.—According to the Board of Trade's return of accounts relating to trade and navigation of the United Kingdom, the imports of cement for building and engineering purposes in the year ended December 31 last amounted to 234,588 tons, valued at 300,324*s.*, as compared with 272,945 tons, value 393,143*s.*, in the year 1904, and 261,077 tons, value 410,027*s.*, in 1903. The exports of British cement for the last three years have been as follows:—

	1903.	1904.	1905.
	Tons.	Tons.	Tons.
To Netherlands	2,471	5,311	12,292
U.S. of America	21,235	5,073	11,590
" Brazil	4,052	6,445	13,919
" Argentina	17,929	15,014	17,688
" British S. Africa	80,670	83,625	85,919
" E. Indies	63,472	81,685	97,864
" Australia	17,765	16,292	15,432
" New Zealand	51,222	24,805	28,351
" Canada	29,194	16,261	28,303
" Other Countries	131,969	133,154	153,073
Total	399,988	384,583	456,558
	Value	£	1905.
To Netherlands	4,565	3,009	8,862
" U.S. of America	38,085	12,210	22,633
" Brazil	8,363	12,321	23,134
" Argentina	31,584	24,877	29,326
" British S. Africa	132,210	130,199	126,111
" E. Indies	108,643	138,238	159,354
" Australia	29,140	25,732	22,913
" New Zealand	51,343	40,458	44,545
" Canada	50,277	29,249	47,966
" Other Countries	222,582	215,394	237,942
Total	£676,752	£632,236	£721,736

PILGRIMAGE OF THE ROMAN WALL.—The Newcastle Society of Antiquaries have resolved, in conjunction with the Cumberland and Westmorland Antiquarian and Archaeological Society, to repeat the decennial pilgrimage of the Roman Wall. The event is proposed to be held during the last week in June, and the entire length of the works, from Wallsend-on-Tyne to Bowness, will be examined on consecutive days. The annual report of the Council of the Newcastle Society of Antiquaries (established ninety-three years ago) contains the following reference to the matter:—The Council received a communication from the Cumberland and Westmorland Antiquarian and Archaeological Society as to the desirability of repeating the decennial "pilgrimage" of the Roman Wall, and they unanimously resolved to

act in conjunction with the Cumbrian Society in making necessary arrangements for the purpose. It was proposed to negotiate with a view to holding the pilgrimage during the last week in June next, and to examine the entire length of the works from Wallsend-on-Tyne to Bowness-on-Solway on consecutive days. This would count as the fourth of similar undertakings due to the initiative of the late Dr. Bruce. The first of these began on June 26th, 1849. After a lapse of thirty-seven years the project was revived, and a second expedition was organised, beginning on June 26th, 1886. Of this undertaking Dr. Bruce was announced as "chief pilgrim and expounder-general." After his death, in 1892, it was proposed to hold another pilgrimage at an interval of a decade, having it specially in view to commemorate thereby the distinguished services of Dr. Bruce as historian and elucidator of the wall. In this way the third of the series was begun on June 22nd, 1896. Another decade has now elapsed during which, as the results of further investigation, many new and important facts relative to the Roman occupation of these parts had yielded themselves to examination. The tenth anniversary of the pilgrimage of 1896, occurring in the present year might therefore be commemorated appropriately by a repetition of the journey, directed by the united Societies, who were the more specially and intimately concerned, inasmuch as the Roman Wall was within their province. Its investigation and elucidation is so remarkable a degree in the XVIIIth century by John Horsley, was notably continued in the XIXth century by two former secretaries of their own Society, John Hodgson and John Collingwood Bruce. By the last this had been done so conspicuously that he had identified himself with any reference to the Society and its popular association, Dr. Bruce would continue to be regarded as its "chief pilgrim and expounder." The commemoration of his great services would thus add a further interest to the projected pilgrimage of 1906.

THE CONDITION OF PUBLIC MONUMENTS IN EDINBURGH.—A meeting of the sub-committee of the Lord Provost's Committee of Edinburgh Town Council had under discussion on the 8th inst. Councillor Fraser's motion as to what should be done to restore and preserve the public monuments of the city. A report on the condition of the various monuments in the city, which was submitted, stated with reference to the Scott Monument that though the monument might be considered in fairly good order there were parts which required attention. The stonework would have to be carefully gone over, and any parts that required it judiciously painted. Owing to exposure the marble figure of Scott had not a granular surface, which would have to be removed by careful scraping or fling, after which the figure would have to be repolished. The same treatment would have to be given to the marble figure of Allan Ramsay, which, owing to its more exposed situation in Princes-street-gardens was black and discoloured in parts.

In connexion with the Burns Monument on Calton Hill, the report stated that the stone showed signs of increasing waste. Some years ago portions of the more delicate parts were found to be obliterated, and they were renewed with cement work. Now, however, it would be advisable to effect any renewals of this description by stone insertions. The Burns Monument, the Adam Black, Wilson, and Simpson memorials in Princes-street-gardens, it was further stated, would require to be thoroughly washed and polished; and the bronze figure and the granite stonework of the Prince Albert Memorial in Charlotte-square, the Chalmers, Pitt, and George IV. monuments in George-street, would have to be similarly treated. The Dugald Stewart Monument on Calton Hill was in need of attention, particularly the panel, and the inscription required recutting. A considerable amount of pointing required to be done on Nelson's Monument, but though some portions of the rock below it were found to be wasting, it was not necessary to deal with it at the present time. The Committee agreed to recommend in terms of the report, with the further recommendation that expert advice be taken as to the manner in which the marble figures of Scott and Ramsay should be treated.

MEMORIAL TO THE LATE MARQUIS OF WINCHESTER.—A memorial to the late Marquis of Winchester, erected by all ranks of the Coldstream Guards, was unveiled by General Sir F. Stephenson a short time ago at Ampert St. Mary church, near Andover. The memorial, which was designed and executed by Mr. Goscombe John, A.R.A., consists of a mural tablet in alabaster, with medallion portrait of the late Marquis, and into the design are worked angels with trumpets, the badge and motto of the regiment, and the arms and motto of the Paulet family. There is a suitable inscription in gold lettering, and the whole is surmounted with a bronze figure of a Crusader.

EDUCATIONAL POST-CARDS.—The publishers of the *Country Press* send us specimens of the first issue of their Educational Post-Cards, which form the commencement of a National History Series. The specimens sent give photographs of various

types of British ferns, several on each card, with number references and names in the margin.

HAMPSTEAD HEATH PROTECTION SOCIETY.—The Report of this Society for 1905 shows that it is keeping up its vigilance to prevent any injury to the character of the Heath. The Report was presented at the eighth annual general meeting on the 17th inst., at Stanfield House, Lord Mansfield presiding. Among other points, the Committee had suggested to the Loudon County Council that a greater vigilance on the part of the custodians would prevent much wanton damage to trees, shrubs, and flowers, and had called the attention of the Council to the deposition of clay and rubbish on the piece of ground adjoining the stream above the Hampstead Bathing Pond, and suggested that if that rubbish depository were retained in use it should be screened from sight by an irregular planting of gorse and hawthorn bushes. The Committee wrote to the Coal Smoke Abatement Society with reference to the daily emission of black smoke from a chimney-stack belonging to the generating-station of the Metropolitan Railway at Neasden, which was a detriment of the landscape seen from the crest of the Heath, and from Golders' Hill. The Coal Smoke Abatement Society had been some time watching this case, and, as soon as possible, took prompt action thereon, with the result that the railway company was fined. The Committee in October last considered the subject of the proposed erection of shelter seats on the Heath; that there is little or no demand or necessity for such structures, and that they would be objectionable on sanitary grounds, and be liable to misuse, and all of which were in agreement with them. The result was that the proposed donor of these shelter seats finally withdrew his offer, at the same time expressing his desire to serve the interests of the inhabitants of Hampstead, and the general visitors to Hampstead Heath.

INCORPORATED CHURCH BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday, the 15th inst., at 7, Dean's-yard, the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects:—Building new churches at Brentford, S. Faith, Middlesex, 225*s.*, and Hilderthorpe, Emswold, near Bridlington, 120*s.* in lieu of a former grant of 80*s.* towards rebuilding the church of S. George, Kendal, Westmoreland, 100*s.*; and towards enlarging or otherwise improving the accommodation in the churches at Huicknell Huthwaite, All Saints, near Sutton-in-Ashfield, Notts, 40*s.*, making in all 80*s.*; Streatham Hill, S. Margaret, Surrey, 150*s.*, in lieu of a former grant of 100*s.*; and towards enlarging the church of S. George, Kendal, Westmoreland, 60*s.* A grant was also made from the Special Mission Buildings Fund towards building a mission church at Cynllwyn-du, S. David, near Tylorstown, Glam., 50*s.* The following grants were also paid for works completed:—Manselton, S. Michael, near Bridlington, 150*s.*; S. Andrew, Usworth, Holy Trinity, Co. Durham, 35*s.*; Breton, S. Oswald, near Sandbach, Cheshire, 25*s.* In addition to this, the sum of 120*s.* was paid towards the repairs of eleven churches from Trust Funds held by the Society. The Annual General Court of the Society will be held at the Church of St. Dunstons, Westminster, on Thursday, May 17th, at 3 p.m., when the chair will be taken by His Grace the Lord Archbishop of Canterbury, President of the Society.

ROYAL SANITARY INSTITUTE.—The following is the list of Fellow, Members, and Associates elected during February, &c., *Fellow*—S. E. Burgess, M.Inst.C.E. (Borough Engineer, South Shields). *Members*—G. S. E. Andrews, M.Inst.C.E. (Town Engineer, Johannesburg); T. C. Aveling, A.M.Inst.C.E. (Birmingham); H. Chesson, D.P.H.Lond., M.R.C.S., L.R.C.P. (Clapham Park, S.W.); J. H. Frogley, A.M.Inst.C.E. (Bradshaw, Bolton, Lancs.); Miss E. Halsey (Sally, Birmingham); Miss A. E. Moss (Small Heath, Birmingham); Miss A. E. (Dartford, Kent); G. Pettit (North Kensington, W.); G. H. Reynolds (Ekestone); T. F. Roddick, M.D., LL.D.Edin. (Montreal, Canada). *Associates*—A. J. Abbott (Totnes); T. W. Andrews (Feignmouth); R. Basford (Plymouth); Miss A. M. Budge (Stone, Devonport); H. Brooks, (Gosport); T. W. Clarke (Horbury, near Wakefield); S. S. Dillingham (Luton); J. T. Durkin (West Hartlepool); W. Ellis (Wakefield); C. E. Hagley (Claremont, Cape Town); W. Hardy (Bradford); H. T. Hay (Grimsby); J. Herrin (London, S.W.); Miss A. A. Hogarth (Preston); W. H. Hughes (Stone, Devonport); Miss M. S. Jarvis (Moss Side Manchester); W. Johnson (Wallsend-on-Tyne); R. W. Kitchen (Manningham, Bradford); J. Lamond (Wallsend); I. C. Morrison (St. Albans); R. E. Price (Mold, Flint); A. Rance (Claremont, Cape Colony); Miss E. Reinherz (Bradford); E. G. Southon (Cranbrook); W. J. Slonewick (Boyle, Liverpool); L. Tat (Tilbrook Common, Northumberland); T. T. Tibbott (Plymouth); B. P. Tarrt (Kingsbridge, Devon); J. Turner (Waterfoot, near Manchester—W. W.

Walker (Fulwood, Sheffield).—At the twenty-third annual Congress, to be held at Bristol from Saturday to 14th, Sir Edward Fry, F.R.S., has consented to act as President. The Duchess of Beaufort will preside over the Ladies' Conference, and the following will act as Presidents of Sections:—*Section I.*—"Sanitary Science and Preventive Medicine," Sir William J. Collins, M.D.; *Section II.*—"Engineering and Architecture," Mr. Edwin T. Hall, V.P.R.I.B.A.; *Section III.*—"Physics, Chemistry, and Biology," Mr. W. N. Shaw, F.R.S.

PATENT OFFICE.—An open competitive examination for not fewer than twelve situations as assistant examiner in the Patent Office will be held by the Civil Service Commissioners in April next. The examination will commence on the 1st of the month, and forms of application for admission to it are now ready for issue and may be obtained on request addressed by letter to the Secretary, Civil Service Commission, Burlington-gardens, London, W.

BUILDERS' EXCHANGE, BIRMINGHAM.—The second of the series of the lectures at the Builders' Exchange, Birmingham, was delivered on the 15th inst. by Mr. B. Whitehouse (President of the Birmingham Master Builders' Association) presided, Mr. F. G. Whittall (President of the Midland Centre of the National Federation of Building Trade Employers) lectured on "The Housing Problem." He emphasised the necessity for the abolition of slums and for proper supervision of all property in which the very poorest are compelled to live. By the aid of modern slides he showed the condition of houses, exteriors and interiors, before and after repairs. He contrasted property in which landlords take an interest with that which landlords neglect; stating that if the landlords take no interest, neither will the tenants. The lecturer compared the conditions which obtain in Birmingham with those which obtain in German cities. In Germany, since the necessity for walled cities had disappeared, building operations had extended outside the city walls. The authorities retained the power to develop the land on definite plans, which embraced good wide roads as main thoroughfares, with narrower roads for inter-communications. They curved the line of the roads, as affording rest for the eye, and provided open spaces, the selection of which was governed by the prevailing direction of the wind, to secure an abundant supply of fresh air.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of Mr. J. W. Hall as sanitary inspector in the metropolitan borough of Hackney; and of Mr. J. H. Pearson as sanitary inspector in the metropolitan borough of Shoreditch. The Board has also sanctioned increases in the salaries of sanitary inspectors in the metropolitan borough of Deptford as follows:—Mr. J. H. Danson, Mr. J. V. Snowden, and Mr. J. Owen.

DISPLACEMENT OF PERSONS OF THE WORKING CLASS.—The Working Classes Committee of the Local Government Council brought up the following report at the meeting last Tuesday:—"In continuation of previous reports on the subject of the displacement of persons of the working classes in connexion with the development of private property, we desire to draw attention to clearances effected in the metropolitan boroughs of Finsbury, Islington, Edmonton, Lambeth, and Southwark. In Finsbury 43 houses containing 154 rooms forming a block between Ironmonger-row, Dingley-road, Lever-street, and Hull-street have been demolished, and it is estimated that about 265 persons of the working class have been displaced. As regards Holborn, we are informed that 9 shops with tenements over situated in Great St. Andrew-street and Great White Lion-street, Seven Dials, are about to be sold by public auction. The buildings contain 67 rooms, which were occupied by persons of the working class, of whom about 120 have been displaced, 10 others being under notice to quit. In Islington 15 houses have been demolished and 11 others are about to be demolished in Norfolk-street. The buildings contained 146 rooms, inhabited by about 216 persons of the working class, and it is proposed to erect upon the site working-class dwellings, containing accommodation for a number equal to that displaced. In Lambeth 9 houses containing 45 rooms in Chester-street have been demolished and about 70 persons of the working class have been displaced. On the site dwellings are being erected which will provide nearly double the accommodation contained in the old buildings. As regards Southwark, an important scheme for the reconstruction of working-class dwellings in Walworth-road is in progress. In all 100 houses containing 623 rooms in Hillingdon-street, Heiron-street, Jerome-place, and Kettle-place will be demolished, and about 617 persons of the working class will be affected. On the site it is proposed to erect 85 houses containing 170 four-roomed tenements, or 157 rooms more than were contained in the old houses."

BOURNEMOUTH AND DISTRICT MASTER BUILDERS' ASSOCIATION.—The eighth annual dinner in connexion with the Bournemouth and

District Master Builders' and Decorators' Association was held at the Princes Hall of the Grand Hotel on the 15th inst. The President (Mr. George Martin) occupied the chair. The loyal toasts having been submitted and duly honoured, Mr. C. W. Keep proposed "The Trades and Gouernment of the Borough," to which Mr. William Honre responded. The next toast—"The Mayor, Corporation, and Borough Officials" was entrusted to Mr. Fogerty, the Mayor and Councillor Doulsan responding. Mr. G. Shears gave the toast of "Kindred Associations," which was replied to by Messrs. Hasleley and Haydon. In submitting the toast of the evening, "The Master Builders' and Decorators' Association," Dr. Hosker said that he was sure that as an association they were desirous of protecting not only their own interests but of protecting the building trade as between employer and employed in the town. He felt certain that whatever might be their grievances they must feel that they had the respect of the Town Council, but he could never understand how it was that builders and architects were kept off the Building Committee, for they might just as well keep medical men off the Sanitary Committee. Surely the Town Council ought to make up their Committees of gentlemen who thoroughly understood the business before them. He believed that it had been very largely due to the enterprise of the builders of the town that Bournemouth occupied the very high position which it did at the present day. The Chairman, in responding, said that the Association was formed nearly nine years ago, during a time of stress and trouble, through carpenters having made a claim for an advance of wages. They all agreed with Trades Unionism, but they wished that Trades Unions would keep to their legitimate objects. They had no objection to paying a man what he was worth, but they did object to paying a higher rate of wage simply because that man belonged to a Trades Union. Speaking on behalf of the members of the Association, he believed, notwithstanding the bad repute in which builders stood in the minds of some people, that they endeavoured to carry out their undertakings in a legitimate and proper manner and according to the interpretation of the plans and specifications; and the good feeling which existed between the great bulk of architects and builders in the town was evidence of the fact that their efforts in that direction were to a very great extent successful.

OZONE GENERATORS.—Mr. J. Richardson Craig, of Glasgow, has sent us a pamphlet containing descriptions and illustrations of his patent ozone generators. Air is drawn or forced through the generator by means of a fan and ozone "is obtained by the silent discharge of a high-tension electric current." The test by Dr. John Clark, City Analyst, of Glasgow, shows that an appreciable quantity of ozone is generated by the apparatus, and it is said that Dr. John Glaister has expressed his approval of the system. Whether the generator will purify the air of buildings to the degree anticipated by the inventor is a point which can be settled only by a long series of experiments under normal conditions, and these experiments will doubtless be carried out in due course.

CITY POLYTECHNIC.—A scheme framed by the Charity Commissioners provides for the abolition of the City Polytechnic, which consists of the Birkbeck Institute, the City of London College, and the Northampton Institute, Clerkenwell. The last-named will constitute a separate charity, and will be administered as heretofore pending the settlement of a further scheme by the Commissioners; the two other institutions will be constituted as separate foundations, likewise, pending the issue of further schemes by the Board of Education. Meanwhile the whole of the endowments is to be applied to educational purposes only, and the Birkbeck Institute will change its name to that of Birkbeck College.

PATENTS TO INVENTORS.—Messrs. Percival Marshall & Co. send us a 3d. pamphlet on this subject, written by Mr. A. H. Stanley (Fellow of the Chartered Institute of Patent Agents), which contains short practical directions to those who wish to patent an invention, which, coming from a member of the representative body of Patent Agents, may no doubt be regarded as reliable. It is a pamphlet which intending patentees would do well to get.

CAPITAL AND LABOUR.

STATE OF THE BUILDING TRADES.—Employment in the building trades remained dull in January, and showed little change as compared with a month and a year ago. Returns received through the Trade Correspondent from 53 London employers showed that in the last week of January they paid wages to 9,961 workpeople of all classes, compared with 9,745 in December and 11,127 in January, 1905. Employment generally in London was rather worse than a month ago, and much worse than a year ago. Returns were received from Employers' Associations in 63 districts outside London. In three-fourths of these employment was reported the same as a month ago, and in one-sixth, including Halifax,

Birmingham, Swansea, and Aberdeen, it was worse than a month ago. Compared with a year ago, employment was reported worse in 25 towns, and about the same in 30; in 7 it was better.—*Labour Gazette.*

Legal.

SOUTHWARK PARTY WALL DISPUTE.—In the Chancery Division, on the 21st inst., the hearing of the case of Frederick Betts, Ltd., v. Piekfords, Ltd., was concluded before Mr. Justice Kekewich.

In this case the plaintiffs claimed an injunction to restrain the defendants, their servants and agents, from committing any trespass upon the walls of the plaintiffs' warehouse situated in Long-lane, Southwark, erected on land demised by the defendants to the plaintiffs by a lease dated October 28, 1903, and from converting any part of the walls of the warehouse into a party wall, and from doing any act or thing whereby the plaintiffs might be prevented from having the use of the walls of the warehouse as external walls. The plaintiffs further claimed a mandatory injunction restraining the defendants from permitting the walls on the defendants' land at the back of the plaintiffs' warehouse to remain connected with the plaintiffs' warehouse, and in particular from permitting the defendants' walls to remain so erected in such a way as to cause the wall at the back of the plaintiffs' warehouse, or any part thereof, to be a party wall, or to be other than an external wall, and directing or requiring the defendants to disconnect the walls on their land at the back of the plaintiffs' warehouse from the walls of the plaintiffs' warehouse where they had been connected by the defendants, and directing and requiring the defendants to restore the wall of the plaintiffs' warehouse to the state it was in before any such connexion was made. Plaintiffs also asked for an injunction restraining defendants from doing any act which might prevent or hinder the plaintiffs from enjoying their warehouse and the lights and windows at the back thereof according to the rights of the plaintiffs under the demise in the lease according to the terms and intention of the lease. There was also a claim for damages.

Mr. P. Ogden Lawrence, K.C., and Mr. R. J. Parker appeared for the plaintiffs; and Mr. Stewart Smith, K.C., and Mr. Leveson for the defendants. The facts of the case sufficiently appear from the following judgment.

His lordship, in giving judgment, said that the case arose in these circumstances. The plaintiffs were lessees of the defendants under a deed of October 28, 1903, which was a lease of land which at that time had some buildings upon it. The lease contained a covenant by the lessees to erect buildings of a certain description according to approved plans, those plans being in existence, and there being no doubt what they were. These plans showed a certain number of windows. They knew from the evidence that the plaintiffs stipulated for these windows, and that they stipulated for them for a certain purpose, and that the defendants knew why that stipulation was made. But he put that aside because it was sufficient for him to know that as a matter of fact the parties between the two parties was that the plaintiffs should erect buildings containing certain windows, the windows being an essential part of the approved plans. Therefore he thought that the special purpose for which the windows were required became immaterial. Then it was said that the defendants had acted in derogation of the grant and especially as regarded the grant of the windows, the right to open those windows, and the privilege of having light coming through them by what they had done. What the defendants were said to have done was this: The plaintiffs said that defendants by their acts had converted what ought to have been an external wall into a party wall within the meaning of sect. 5, sub-sect. 16, of the London Building Act, 1894, and the result of that was that the local authority was competent to demand, and it had demanded, these windows should be shut up. It was unnecessary to go into the question as to what was the foundation of the local authority's demand except that they said that if the wall was used as a party wall the windows could not be allowed to remain. It was said that that was a derogation from the defendants' grant. Assuming that what the defendants had done had made a party wall where it ought not to be, then they had led directly to the local authority's demand, which must be complied with, and so in that they seemed to his lordship to have acted in derogation of their own grant. He had said there was evidence to show that a special business was in contemplation, and that the windows were required by the plaintiffs for that business to the knowledge of the defendants. But he did not go on that. The defence was that you must regard any alleged derogation of grant with reference to all the circumstances under which the grant was made. What the defendants said was that the plaintiffs accepted the lease

with the obligation of building according to the plans, knowing that they were bound to build a wall separating the demised premises from the adjoining premises retained by the lessors, and that they must be taken to have known that there would be necessarily this external wall which must become a party wall. Defendants said that the plaintiffs knew there were to be buildings on the other side, and must have known that when the buildings were erected the dividing wall, at any rate, in all probability would become a party wall. Therefore, said the defendants, they must be taken to have made the grant or entered into the implied obligation derived from the lease with the knowledge that there would probably be set up a party wall, and that if there was a party wall the consequence would follow that the windows they had guaranteed could not be made. In the first place, he was not sure whether the plaintiffs ought to be treated as contemplating the existence of a party wall. He would take it that plaintiffs contemplated defendants would erect buildings, but he saw no reason for concluding that plaintiffs knew that defendants would use their wall so as to make it a party wall. The next thing the defendants said was that they had taken the ground by virtue of a contemporaneous agreement with the lessor, and when they came to do that they found overhanging the demised ground some beams which belonged to the remaining building which to some extent had to be pulled down in order to clear the ground. Defendants said they did not take them away without the consent of the plaintiffs' architect they were allowed to be built into their wall. The same was true of the stanchions and purlins left on the ground on the plaintiffs' side of the wall. Defendants said they were willing that they should be built into the wall, and that they did not want to remove them. They said they had done nothing by which they could be treated as trespassers. To his lordship's mind defendants were using the property they had demised to the plaintiffs and occupied it for their stanchions and purlins, and in respect of which the plaintiffs were entitled to relief. They were using the plaintiffs' property for unauthorised purposes which seemed to be a trespass the court could remedy. Then, defendants said that if they did it they did it with authority. All that could be said to support that was that plaintiffs' architect and defendants' architect agreed between them that the purlins and stanchions should be built into the wall. But plaintiffs' architect did not communicate that to his clients, and allowing that to be done was clearly outside the scope of his authority. He had no authority to allow the slightest deviation from the plans. There was only one other important question. Down below the ground on the other side of the wall in question were stables used by the defendants, and they used the wall between their stables and the plaintiffs' premises, the wall being on the plaintiffs' ground. That might or might not make it a party wall, but he did not decide that. He would assume that using it in that way was using it as a party wall. If the defendants desired to use the adjoining premises for stables or any other purpose they could make their own retaining wall. They had no business to use the plaintiffs' wall. As soon as the plaintiffs knew of it they protested and said it must not be used in that way. There was a question raised about a breach of the covenant for quiet enjoyment in the lease, but his lordship did not think there had been any breach. He need not say anything more about that, because he gave the plaintiffs what he thought was right on the other ground. In the result, his lordship granted an injunction in the terms of claim 1 of the statement of claim, viz., restraining the defendants from injuring or committing any trespass upon the walls of the plaintiffs' warehouse, and from converting any part of the walls of the warehouse into a party wall, and from doing any act or thing whereby the plaintiffs might be prevented from having the use of the walls of the warehouse as external walls. He also granted the plaintiffs an inquiry as to damages and gave them the costs of the action.

ACTION AGAINST AN ARCHITECT AND SURVEYOR.

The case of Southorn v. Wakerley came before Mr. Justice Farwell in the Chancery Division on the 13th and 14th insts., an action by the plaintiff, Mr. Henry H. Southorn, of Leicester, against Mr. Arthur Wakerley, an architect and surveyor, of the same town, to set aside an agreement of sale by the defendant to the plaintiff of a piece of building land.

Mr. C. E. Jenkins, K.C., and Mr. T. K. Crossfield appeared for the plaintiff; and Mr. W. H. Upjohn, K.C., and Mr. Wurtzburg for the defendant.

It appeared from the statement of Mr. Jenkins that the plaintiff claimed to set aside the sale to him by the defendant of a piece of building land forming part of a building estate known as the Evington-road estate at Leicester on the ground that it was subject to a right of way across it of

which the plaintiff had no knowledge and which was not communicated to him by the defendant. The defendant had acquired this building estate and got out plans and particulars showing the road or roads made or proposed to be made, and the plots into which it was divided, and he advertised it as a building estate and represented to the plaintiff that it was suitable for building purposes. The purchase executed by the plaintiff and the conveyance executed by the defendant were entered into a building agreement with a Mr. Skillington to erect a private dwelling-house, with stabling and other buildings, upon the building plot. The house and buildings were commenced and the building operations were continued until April 7 last, when the walls had been raised to the height of several feet. On April 7 several men acting on behalf of the owner of an estate adjoining the Evington-road estate entered the building plot, pulled down part of the dwelling-house and buildings in course of erection, and drove a horse and cart over a portion of the building plot, including the site of the dwelling-house and buildings, and back again, alleging and claiming that this gentleman, as owner of the adjoining estate, had a right of way over a portion of the building plot, including the site of the dwelling-house. It appeared that the right of way claimed had existed for many years, and by reason of that right of way the plaintiffs' building plot was not capable of being built upon as proposed under the building agreement had to be discontinued. The plaintiff accordingly brought the present action, claiming repayment by the defendant of the money paid by him with interest and a declaration that he was entitled to a lien on the building plot for the said moneys and interest.

After hearing the evidence of the defendant and other witnesses, his lordship held that the plaintiff had not proved his case, and dismissed the action with costs.

CLAIM THROUGH DEFECTIVE SCAFFOLDING.

The case of Tozeland v. The West Ham Union came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Ridley and Darling, on the 14th inst., on the appeal of the plaintiff from a decision of the judge of the Shoreditch County Court.

The short facts of the case were as follows:—Tozeland, a box-maker by trade, was a pauper inmate of the defendants' workhouse, and upon the electrical engineer asking for an assistant to do some work was assigned to do it by the labour master. In order to execute his work plaintiff had to go upon a scaffold, which was held by the said County Court judge to have been negligently constructed, and in consequence plaintiff sustained a fall, and was so injured that one of his legs had to be amputated. The plaintiff claimed 100l. damages, which the County Court judge held to be proper damages, but although holding in the plaintiffs' favour on every other point the learned judge came to the conclusion that he could not recover because he was in a common employment with the person responsible for the erection of the defective scaffolding.

Mr. Wallace, K.C., and Mr. Abinger, appeared for the appellant; and Mr. Avory, K.C., and Mr. S. Lynch, for the respondents.

In the result, the Lord Chief Justice, in giving judgment, said it appeared to him that the County Court judge overlooked the broad consideration which was at the root of the common employment doctrine, viz., that the servant had an option of entering into the contract or refusing employment. The plaintiff if he did not do this work was subject to punishment. He thought the appeal should be allowed and judgment entered for the plaintiff for 100l.

Justices Ridley and Darling concurred, and the appeal was accordingly allowed with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

2,495 of 1905.—C. E. LONG: *Latch or Latch Lock for Doors, Hinged Panels, Sliding Partitions, and such like.*

This relates to a pivoted or swinging bar latch, provided with a key operated mechanism for locking it in its fastened position, and consists in arranging the said key operated mechanism as a part of the stationary pivot or mounting for the swinging bar, and providing the said bar so that it can be engaged by the bolt of the said mechanism when in its fastening position, the said bar thereby not having as part of it any of the key operated mechanism.

5,248 of 1905.—D. M. NESBIT and ASHWELL & NESBIT, LTD.: *Radiators.*

This relates to a radiator for heating buildings and like purposes, and consists in having a baffle plate placed longitudinally between the radiator

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

columns so that the air to be heated is spread over the surface of the radiator columns and thereby thoroughly heated.

5,428 of 1905.—W. H. TURNER: *An Appliance to Regulate the Supply of Water to Water Waste Preventing or other Cisterns or the like.*

This relates to an appliance to regulate the supply of water to water-closets, preventing or other cisterns or the like, and consists of a ball made in two parts, one being connected to and above the other part by means of a pin at one end, and provided with a regulating screw passing through a slot in the upper part into a hole tapped to receive it in the lower part, the end being enlarged to allow for hole in same. The two parts when adjusted form one lever.

5,513 of 1905.—R. ZELLENSKA: *A Cementing Material and the Manufacture of the same.*

This relates to the manufacture of cementing materials such as have hitherto been composed of sulphur melted to a thin liquid, sand, reduced iron, and colouring matter, and consists in the use of ferrous sand foundries or sand from iron or steel fettling or the like operations, in lieu of ordinary sand and reduced iron.

7,372 of 1905.—W. A. McCORMICK: *Siphon Flushing Cisterns.*

This relates to a flushing device having an oscillatory plunger, and consists in the combination of a wide sunk portion to the chamber forming the lower portion of a cistern, and a siphon communicating with that sunk portion of the chamber and opening into same, so that water can only pass into the siphon one way.

7,502 of 1905.—F. GRIFFITHS: *Flushing Cisterns for Water-closets, Urinals, and like purposes.*

This relates to a siphon-flushing apparatus, and consists in the combination with a main cistern filled from the supply valve, and a supplementary cistern filled by the water overflowing into it from the other, of a non-return valve in the bottom of the supplementary cistern arranged to enable water to be emptied from it into the other when the siphoning action is started, and to prevent it running back, and a secondary overflow in the wall of the main cistern slightly above the level of the overflow, and a siphon, the under side of whose bend that leads into the outlet pipe or discharge being slightly above the secondary overflow but below the top of the cistern.

8,356 of 1905.—DORRATOR CO., LTD., W. W. MORRISON, and J. BAIRD: *Fire Grates.*

This relates to a fire grate, and consists in the combination therewith of side standards with frontal stops and oblique slots, each slot having two pockets, a firebreast with side pins and frontal spurs united to a bottom grate, the grate and breast being adapted for simultaneous oscillation within the firebraces, an ash pit frame with ledges and bottom closed by a damper, a front plate having a fresh-air damper opening, and a hopper containing trivet seats and a trivet with pendant prongs.

11,719 of 1905.—J. ALTY: *Water Waste Preventing Valveless Siphon Cistern for the Flushing of Water-closets and the like.*

This relates to a water waste preventing valveless siphon cistern for the flushing of water-closets and the like, and consists in the introduction of an upper dome top cylinder, and the method of connecting the discharge outlet of the cylinder to the centre of the same, by which means or arrangement a better water way is given to the siphon and which arrangement also reduces the friction in the flow of the water.

13,644 of 1905.—W. J. BEASLEY: *An Iron Drain Pipe Stopper.*

This relates to an iron drain pipe stopper, and consists of a stopper or plug of a thickness and diameter made to fit the standard sizes of earthenware and iron drain and other pocketed pipes, and which is cast in one piece of a specially tapered form, the thicker end being surmounted by an inverted groove of a section suitable to the size of the plug. The upper or outer surface of the plug is provided with a square stud, which may be either cast on with the plug or otherwise screwed in position as may be most convenient, to which is attached by a suitable bolt and washers a spring lever.

14,416 of 1905.—N. BURGER: *Pneumatic Door Closing Apparatus.*

This relates to a pneumatic door closing apparatus and is characterised by the use of two pistons in two separate cylinders mounted on one base, the main piston being coupled by means of a lever and a toothed segment, provided on one end of the said lever, and the side piston formed as a track and acted upon by a spiral spring, which can be regulated by a screw. When the door is opened the lever connected by a rod with the door is swung round, whereby the main piston draws forward, and presses back by means of the toothed segment, the side piston at the same time compressing the spiral spring while the automatic screw in position as may be most convenient, to which is attached by a suitable bolt and washers a spring lever. When the door is closed the door is swung round, whereby the main piston draws forward, and presses back by means of the toothed segment, the side piston at the same time compressing the spiral spring while the automatic screw in position as may be most convenient, to which is attached by a suitable bolt and washers a spring lever. When the door is closed the door is swung round, whereby the main piston draws forward, and presses back by means of the toothed segment, the side piston at the same time compressing the spiral spring while the automatic screw in position as may be most convenient, to which is attached by a suitable bolt and washers a spring lever.

lever by turning the toothed segment and thereby pushes back the air piston to its former position.

18,162 of 1905.—A. BELL: Fireplaces having Circulating Hot-water Boilers.

This relates to a fireplace having a circulating hot-water boiler, and consists in the combination with such boiler of a setting adapted to receive the grating, and having a chamber formed therein with inclined back and removable door.

18,572 of 1905.—J. DELPORTE: Roof Framings.

This relates to a roof framing of the Raikien type wherein the two sides or slopes of the Raikien type supported upon a triangular beam composed of three stays connected together by bracing.

19,929 of 1905.—A. BELL: Kitchen Range Fittings and their Attachments.

This relates to kitchen range fittings and their attachments, and consists in making the hinges and latches or other similar parts as plain in shape as convenient, and forming at the rear side of said parts one or more bosses or projections, which shall pass through holes formed in that part of the door or grate to which they are to be attached. In these said bosses holes are drilled and tapped so that upon the inner side a pin and washer may be employed to secure the said fittings firmly thereto.

22,920 of 1905.—A. H. MARTEL: Travelling Greenhouses.

This relates to a travelling greenhouse, and consists of concrete walls formed of spaced blocks of concrete having grooved sides to receive the ends of a connecting valve of concrete, and of means for keeping out the draught, the said means consisting of a plate of metal placed between the castings carrying the wheels on which the greenhouse travels.

1,554 of 1905.—R. F. HUNTER: Methods of Construction as Applied to Roofing and other Structural Purposes.

This relates to the construction of roofs, walls, and the like structural work and consists in the combination with principals or main rafters consisting of rolled girders, of sheathing with scroll-sheathed dependent extensions adapted to be threaded thereon and panels or tiles interlocked therewith, by means of returned edges.

TERMS OF SUBSCRIPTION.

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SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing real estate transactions with columns for location, date, and price. Includes entries for Norwich, Fulham, Chelsea, Stoke Newington, Chelsea, Fulham, and various other locations.

Table listing real estate transactions with columns for location, date, and price. Includes entries for various locations such as Fulham, Chelsea, and others.

Table listing real estate transactions with columns for location, date, and price. Includes entries for Lewisham, Old Kent-road, and others.

PUBLISHER'S NOTICES.

Nat. Tel., 6112, Gerrard. Telegrams, "The Builder, London." THE INDEX (with TITLE-PAGE) for VOLUME LXXIX. (July to December, 1905) was given as a supplement with the issue of January 15th.

CHARGES FOR ADVERTISEMENTS. COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, etc., etc.

ADVERTISERS in "THE BUILDER" may have Replies addressed to the Office, Catherine Street, Covent Garden, W.C., first of charge. Letters will be forwarded if addressed envelope are sent, together with sufficient stamps to cover the postage.

MEETINGS.

FRIDAY, FEBRUARY 23. Architectural Association.—Mr. F. T. Baggalay on "Porches and Approaches," 7.30 p.m. Royal Institution.—Professor J. Oliver Arnold on "The Internal Architecture of Metals," 9 p.m.

Bryce, M.P., F.B.S., on "The Relation of Architecture to History." 8 p.m.

Birmingham Builders' Exchange.—Mr. J. Miller Carr on "Architectural Ceramics." 6 p.m.

FRIDAY, MARCH 2. Royal Institution.—Dr. R. Caton, F.R.C.P., on "Hippocrates and the Newly-Discovered Health Temple at Cos." 9 p.m.

Junior Institution of Engineers (Westminster Palace Hotel).—(1) Paper on "Acceleration and Accelerometers" by Mr. A. P. Trotter, B.A., Electrical Adviser to the Board of Trade, 7 p.m.; (2) Paper on "Gas Engine Indicators" by Mr. L. E. de Peyceave, Studinst.C.E. 8 p.m.

SATURDAY, MARCH 3. Royal Institution.—Professor J. S. Thomson on "The Corpuscular Theory of Matter," 1. 3 p.m.

PRICES CURRENT OF MATERIALS.

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

Table listing prices for various materials including Hard Stocks, Rough Stocks, Pickled Stocks, and various types of bricks and tiles.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks. Grey Stone Lime 11s. 6d. per yard, delivered. Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE. BATH STONE—delivered on road wag. a. d. gons, Paddington Depot..... 1 6s. per ft. cube.

YORK STONE—Robin Hood Quality. Scappled random blocks. 2 10 " " "

HARD YORK.—Scappled random blocks. 3 0 per ft. cube, in. sawn two sides landings to sizes (under 40 ft. super.)..... 2 8 per ft. super., "

STONE (continued).

HARD YORK (continued). HOPTON WOOD (Hard Bed) in blocks 2 0 per ft. cube, deld. rly. depot.

SLATES. In. In. £ s. d. 30x10 best blue Bangor 13 2 6 per 1000 of 1200 at r. d.

TIILES. Best plain red roof tile s. d. Hip and Valley tiles 3 7 per doz.

BUILDING WOOD.

Deals: best 3 in. by 11 in. and 4 in. £ s. d. 13 10 0 15 0 0 Deals: best 3 by 9 " 13 0 0 14 0 0

WOOD.

Deals: second 3 in. by 11 in. and 4 in. £ s. d. 10 0 0 11 0 0 Deals: second 3 by 9 " 10 0 0 11 0 0

JOISTERS' WOOD.

White Sea: first yellow deals, 3 in. by 11 in. 24 0 0 25 0 0 3 in. by 9 in. 22 0 0 23 0 0

Petersburg: first yellow deals, 3 in. by 11 in. 18 0 0 19 0 0 Do. 3 in. by 9 in. 18 0 0 19 0 0

White Sea and Petersburg.—First white deals, 3 in. by 11 in. 14 0 0 15 0 0 Do. 3 in. by 9 in. 13 0 0 14 0 0

Yellow Pine—First, regular sizes 4 0 upwards. Oddments 0 0 " "

WOOD (continued).

JOISTERS' WOOD (continued). At per standard. DRY MABOGUAY—Honduras, Ta. £ s. d. 0 0 9 0 1 0

JOISTS, GIRDEBS, &c.

In London, or delivered. Bolled Steel Joists, ordinary Railway Vans, per ton sections 7 0 0 7 10 0

METALS.

Per ton, in London. £ s. d. Common Bars 8 0 0 8 10 0 Staffordshire Crown Bars, good merchant quality 8 10 0 9 0 0

LEAD, &c.

Per ton, in London. £ s. d. LEAD—Sheet, English, 3lb. and up. 18 15 0 18 15 0

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds 24d. per ft. delivered. 21 oz. thirds 34d. " "

OILS, &c.

per gallon £ s. d. Baw Lined Oil in pipes 0 1 10 " " in drums 0 2 0

VARNISHES, &c.

Table listing various varnishes and their prices per gallon. Includes items like Fine Pale Oak Varnish, Pale Copal Oak, and Superfine Hard-drying Oak.

DARTFORD.—For external painting work at the Orchard Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief—

DARWEN.—For erecting new free library, for the Corporation. Messrs. Haywood & Harrison, architects, Church-street, Accrington—

DUNFERMLINE.—For erecting a block of eight houses at Steelend, Saline, near Dunfermline, for Wilson's & Clyde's Coal Co. Mr. J. Houston, architect, Dunfermline. Quantities by architect—

Plaster and Cement Work. P. McGregor, J. A. McLanachan, W. Ure, D. Kirk, J. C. Lowe & Son, J. Walker.

Plaster Work. J. C. Lowe & Son, A. Lamber, C. Brand, P. Kelly, J. Walker, Hogg & Marshall.

ENFIELD.—For alterations to the pumps at the Alma-road Pumping Station, Enfield, for the Metropolitan Water Board—

ENFIELD.—For 700 tons of cast-iron pipes, for new River District (Enfield Division), Metropolitan Water Board—

Price per ton. D. V. Stewart & Co., Ltd., A. G. Cloake, W. J. Galdy, Cochrane & Co. (Dudley), Sheppridge Coal and Iron Co., Ltd., Yarrow & Co. (Bolton), Ltd., Cochrane & Co., Ltd. (Cochranes Grove Branch), Staveley Iron and Coal Co., Ltd., Holwell Iron Co., Ltd., J. Gales & Co., Stanton Ironworks Co., Ltd.

EPSOM.—For waterworks pumping plant, for the Urban District Council. Mr. W. Vaux Graham, engineer, 5, Queen Anne's-gate, Westminster—

GREAT CROSBY.—For bricks for the construction of outfall sewers, for the Urban District Council. Mr. Wadkin Hall, Surveyor, Council Offices, Corporation-road, Great Crosby—

Bricks for "inner ring" and "manholes." P. Wood, E. Bridge.

GREAT GRIMSBY.—For erecting gallery, office and bookcases at the Public Free Library. B. W. Smith, C. W. Dixon, C. Wright, Ltd., Bolton & Paul, Ltd.

GUILDFORD.—For sewerage works, Stoke, for the Town Council. Mr. C. G. Mason, Borough Engineer, Guildford—

HASLEMERE.—For new temporary Church of St. Paul, Fernhurst, near Haslemere, Sussex, to seat 256 persons. Mr. C. L. Morgan, architect, Haslemere, Surrey, and 43, Cannon-street, E.C.4. Frazzle Construction Co., Essex Wharf, Whitechapel, E. 400

HESWALL (Cheshire).—For constructing Pole Hill Road, for the Wirral District Council, Mr. Thomas Davies, surveyor, Kings-road, Birkenhead. Quantities by surveyor—

HILLINGDON EAST.—For cast-iron and stone-ware pipe sewers, siphon, etc., for the Uxbridge Rural District Council. Mr. J. Freshair, Surveyor, Engineer, Corn Exchange, Uxbridge. Quantities by Engineer—

Langly, Hardy, & Co., J. Mowlem & Co., R. C. Babner & Co., G. G. Rayner, J. Jackson, G. Rutter, Wilson, Border, & Co., Co., Leads, T. Firr & Sons, H. A. Bradhead, J. & W. Dean, Ltd., G. Dickson, London, G. Bower Bros., Notingham, J. H. Macdonald, G. J. B. Smith, G. J. B. Smith & Co., London, 4,165

LANAEHLIARN.—For additions and improvements to Trevor Congregational Chapel. Mr. R. L. Jones, Council Architect, Carnarvon—

LONDON.—For supplying cast-iron posts and fencing and delivering same to Northern Hospital, Winchester Hill, N. for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief—

J. Williamson & Co., Ltd., Wilson, Pease & Co., Ltd., C. H. Hampden & Co., G. Napier & Sons, Ltd., J. Gales & Co., D. King & Sons, Hart, Son, Peard, & Co., Ltd., Barnard, Bishops, & Barnards, Ltd., Parsons & Wills, Rowland, Carr, & Co., W. Dennis, F. Bird & Co., W. Hayward & Sons, Ltd., Hunt Bros. (Gibbury), Ltd., Wilmer & Sons, Corb, Paul, & Cornick, J. Gibb & Co., Ltd., W. A. Baker & Co., Ltd., W. Randall & Sons, Clydesdale Iron Foundry Co., Hunt Bros. (Gibbury), Ltd., W. Miller & Sons, General Iron Foundry Co., Ltd., McDowall, Steven, & Co., Ltd., Peterson & Co., Rowlingsons & Co., Watford Engineering Works, Jukes, Coulson, Stokes, & Co., Hayward Bros., City Foundry, Featherstone-street, E.C.4. 107 0 0

LONDON.—For the repairs to and the decoration, heating and ventilation of the Corcorst's Court, High-street, Lambeth, and for the erection of new waiting-room, for Lambeth Borough Council—

Table with columns: Repairs, Decoration, Heating and Ventilation, New Waiting Room, Tile Estima Work. Lists contractors like Jones Bros., F. Kinnaird, W. A. King, A. Goldman & Son, etc.

Includes the £53 provisional for extras.

LONDGN.—For constructing two underground conveniences, Sutton-street, Commercial-road East, St. George's-in-the-East, for the Stoney Borough Council. Mr. H. W. Jamieson, A.M.I.C.E., Borough Engineer, 15, Great Alle-street, Whitechapel, E.—

Includes the £53 provisional for extras.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications, and the Editor cannot be responsible for any loss of articles, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

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

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is strictly subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a copy of an article in type does not necessarily imply his acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

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

* Denotes accepted. † Denotes provisionally accepted.

BALDNO.—For road repairs at West-lane, for the Urban District Council. Mr. T. Waddingham, Surveyor, Westgate, Balldno—

Wills & Ross, Shipley * .. £1,042 12

BRIGHTON.—For erecting a public elementary school (Brim-grove mixed school), Wellington-street, for Brighton Education Committee. Messrs. T. Simpson & Son, surveyors, 16 and 17, Ship-street, Brighton—

Table with columns: Main Estimate, Extra for Brick Dadoes, Extra for Glazed Dadoes. Lists contractors like J. Barnes & Son, Brighton, R. Cook & Sons, W. Field & Co., etc.

CASTLE CARROCK.—For erecting a public elementary school (Edin-grove mixed school), Wellington-street, for Brighton Education Committee. Messrs. T. Simpson & Son, surveyors, 16 and 17, Ship-street, Brighton—

Table with columns: Main Estimate, Extra for Brick Dadoes, Extra for Glazed Dadoes. Lists contractors like J. Barnes & Son, Brighton, R. Cook & Sons, W. Field & Co., etc.

CARMARTHEN.—For post-office, Carmarthen—

Credit. Rees Davies .. £8,550 .. £72 10

A. J. Colborne .. 6,970 .. 37 0

Hayward & Wood .. 6,237 .. 50 0

D. Davies & Sons .. 5,765 .. 35 0

TENDERS.—Continued on page 215.

List of Contracts, etc.

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*NEW COUNCIL OFFICES, HIGH HOLBORN.....	Holborn Borough Council.....	Not stated.....	No date.

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Motor Tower Wagon for Overhead System of Tramways.....	Halifax Tramways Committee	W. M. Rogerson, Boro' Electrical Eng., Foundry-st., Halifax	Feb. 27
Widening of Part of Line between Stevenon and Diddot.....	Great Western Railway Co.	N. P. Pattinson, Borough Engineer, Town Hall, Gateshead..	do.
Paving of Streets.....	Gateshead Corporation.....	N. P. Pattinson, Borough Engineer, Town Hall, Gateshead..	do.
Excavations for Sinking Trial Hole, etc.....	Godalming Town Council.....	H. Moon, Surveyor, High-street, Godalming.....	do.
Stores, etc.....	Derby Corporation.....	J. Ward, Borough Surveyor, Babbington-lane, Derby.....	do.
Broken Gurnsey Granite.....	Durham Lunatic Asylum.....	Stewart, Gas Asylum.....	do.
Materials.....	Milton-under-Lyne Corp.....	D. E. Watlow, Surveyor, Town Hall, Milton.....	do.
Diverting Cowbridge, etc., Main Road, near Nash Cross.....	Ashton-under-Lyne Corp.....	Borough Surveyor, Town Hall, Ashton-under-Lyne.....	Feb. 28
Widening, etc., Llandaff, etc., Road at Treosfaen.....	Glamorgan County Council.....	Council Surveyor's Office, Town Hall, Bridgend.....	do.
Lodge at Cemetery.....	Saltburn-by-the-Sea Burial Bd.	County Offices, Windsor-street, Saltburn-by-the-Sea.....	do.
Gravel, Slag, Ash, etc., Tools.....	Shardlow R.D.C.....	J. S. Wooddise, District Surveyor, Aston-on-Trent, Derby..	do.
Additions to Rothes Police Station.....	do.....	J. W. Witter, Architect, Elgin.....	do.
Painting, etc., at Sheffield Royal Hospital.....	North-Eastern Railway Co.....	W. W. Robinson, Secretary, The Board Room, Sheffield.....	do.
Paunting Station Buildings.....	Tynemouth R.D.C.....	C. A. Harrison, Engineer, Forth Banks, Newcastle-on-Tyne	do.
Whitstone.....	do.....	J. Waters, Dist. Surveyor, Long Benton, Newcastle-on-Tyne	do.
Scavenging.....	Saltburn-by-the-Sea U.D.C.....	J. Waters, Dist. Surveyor, Long Benton, Newcastle-on-Tyne	do.
Team Labour.....	do.....	G. S. L. Bains, Surveyor, Windsor-st., Saltburn-by-the-Sea	do.
Forming and Paving with Special Bricks Four Back Streets.....	Guildford Town Council.....	C. G. Mason, Borough Surveyor, Tun's gate, Guildford.....	do.
Making Uplatham-street, with Tareed Macadam.....	Shrewsbury Improvmt. Com.	W. Chappell Eddowes, Boro. Surv., The Square, Shrewsbury	do.
Private Street Works.....	Kingston-upon-Thames Corp.	H. A. Winer, Municipal Offices, Kingston.....	do.
Roadworks, Hawthorn-road, Belle Vue.....	Surbital U.D.C.....	W. Nesfield, Sanitary Inspector, Council Offices, Surbiton..	do.
Erection, Removal, and Repair of Stalls for Markets.....	Genitow Upper District Com.	W. R. Copland, C.E., 145, West Regent-st., Glasgow.....	do.
Reconstructing Combined Drain, Wood-side-villas, Ewell-road.....	Manchester Parks Committee	City Architect, Town Hall, Manchester.....	do.
Sewage Disposal Works, etc., Paisley (Septic Tank, etc.).....	Imshomem R.D.C.....	T. Johnston, Engineer, East Wall, Derry.....	do.
Sewage Disposal Works, etc., Paisley (Intercepting Sewer).....	Mission to Deaf and Dumb	H. Seaver, Architect, 22, Donsgate-place, Edinburgh.....	do.
Stable, Carriages, etc., Crowcroft Park.....	Co-operative Society.....	J. Stalker, Architect, Kendal.....	do.
Outfall Sewer, Buncrana.....	Nottingham Corporation.....	A. Brown, City Engineer, Guildhall, Nottingham.....	Mar. 2
Alterations, etc., to Premises, College-square, N., Belfast.....	Stockport Parks Committee.....	J. Attkisson, Borough Surveyor, Stockport.....	do.
Shops, Warehouses, etc., Kendal.....	West Ham Corporation.....	Central Electricity Station, Tucker-street, Canning Town..	do.
Bridge over Nottingham Canal, Troutbeck.....	Worsley U.D.C.....	J. A. Curson, Engineer, District Offices, Walkden.....	Mar. 3
65 Tons of Steel Work for Bridges.....	Bolton-upon-Dearne U.D.C.....	J. Lodger, Hawkesworth, Clerk, Stn.-rd., Bolton-upon-Dearne	do.
Supplies.....	Northampton Corporation.....	A. Fidler, Borough Engineer, Guildhall, Northampton.....	do.
Making-up Streets.....	Ovenport Works Committee.....	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry	do.
Materials.....	Ardsley U.D.C.....	T. Harper, Surveyor, Stairfoot, near Barnsley.....	do.
Materials.....	Newburn U.D.C.....	T. Gregory, Surveyor, Council Offices, Newburn-on-Tyne.....	do.
Granite and Slag.....	do.....	do.....	do.
Highway Materials.....	Billesdon R.D.C.....	W. E. Richardson, 18, New-street, Leicester.....	do.
Scavenging.....	Hereford Corporation.....	City Surveyor, Town Hall, Hereford.....	do.
Lending of Road Materials.....	Manchester Corporation.....	J. M. McElroy, Corp. Tramways, 55, Piccadilly, Manchester	do.
Granite.....	Southampton Corporation.....	W. Matthews, Waterworks, Eng., 19, French-st., Southampton	do.
Materials.....	East Riding County Council.....	do.....	do.
Cement, Chippings, and Broken Stone, etc.....	Chingford U.D.C.....	L. C. Bowen, 34, Station-road, Chingford.....	do.
6,000 tons of Stone.....	do.....	do.....	do.
Cartage.....	Padham U.D.C.....	J. Giegson, District Engineer, Padham.....	do.
400 tons of Granite.....	do.....	do.....	do.
Use of Steam Roller.....	Paddington Borough Council	Borough Surveyor, Town Hall, Paddington, W.....	do.
Stores.....	Swansea Borough Council.....	Borough Surveyor, 13, Somerset-place, Swansea.....	do.
IRON PIPES AND MATERIALS.....	do.....	Waterworks Engineer, Guildhall, Swansea.....	do.
Cast-iron Pipes, Steel Tubes, Water Meters, etc.....	West Hartlepool Corporation	N. F. Dennis, Boro. Eng., Municipal-bldgs., West Hartlepool	Mar. 5
Extension of Electricity Station, Bury-road.....	Sheffield Education Committee	Gibbs & Pockton, Architects, 15, St. James's-row, Sheffield	do.
Extension of Training College, College-crescent.....	King's Norton, etc., U.D.C.....	Surveyor, 23, Valentine-road, King's Heath.....	do.
Supplies and Stores.....	Wangford R.D.C.....	F. S. Rix, Clerk, Beccles.....	do.
Road Materials.....	Rotherham R.D.C.....	B. Hey, Surveyor, 29c, High-street, Rotherham.....	do.
Disinfectants.....	do.....	do.....	do.
Night Soil Removal.....	Carlisle Gas Committee.....	W. J. Smith, Engineer, etc., Gas Works, Carlisle.....	do.
Materials.....	Esher and the Diltons U.D.C.	A. J. Henderson, Engineer, Brabant-villa, Thames Ditton.....	do.
Pumping Station, Scotland-lane, Hoxworth.....	Horsforth U.D.C.....	E. J. Silecock, Engineer, 10, Park-row, Leeds.....	do.
Five Double-Deck Top Covered Cars.....	Stockport Corporation.....	J. Atkinson, Borough Surveyor, Stockport.....	do.
Materials and Stores.....	Levenshulme U.D.C.....	J. Jepson, 8A, Tivendale, Stockport.....	do.
Flints.....	Steyning East R.D.C.....	E. Cripps, Union Offices, New Shoreham, Sussex.....	do.
Stores (Gas Works).....	Middleton Corporation.....	E. E. J. Anderson, Gas Engineer, Town Hall, Middleton.....	do.
Disinfectants (Sanitary Department).....	do.....	G. H. Norton, Sanitary Inspector, Town Hall, Middleton.....	do.
750 yds. of Granite Setts Paving.....	Luddenden Foot U.D.C.....	J. S. Bottomley, Surveyor, Council-chambers, Luddenden Foot	do.
Grants and Limestone Macadam, etc., at "The Abbey".....	Seaford U.D.C.....	Pollard & Tonge, Engs., 31, Old Queen-st., W'mster, S.W.	do.
100 yds. of 15-in. Cast-iron Pipes, etc.....	Heston and Isleworth U.D.C.	P. G. Parkman, Surveyor, Council House, Heston, W.....	do.
Stores.....	Sheffield Gas Company.....	J. W. M. Tringle, Engineer, Commercial-street, Sheffield.....	Mar. 6
Steel Roof, etc., Neppend Station.....	Belfast Quardians.....	S. C. Hunter, Bldg. Surv., Scottish Provident-Bldgs, Belfast	do.
Four Crematory Pavilions, etc., at "The Abbey".....	do.....	do.....	do.
A Two-story Hospital for a Mortuary, etc.....	Cheshunt U.D.C.....	R. H. Jeffes, Engineer, Manor House, Cheshunt.....	do.
Private Street Works.....	Finchley U.D.C.....	E. H. Lister, Council Offices, Finchley, N.....	do.
Annual Contracts.....	Gt. Central Railway Co.....	A. W. Longden, Storekeeper, Corwall-street, Openshaw.....	do.
Stores.....	Margate Corporation.....	Surveyor's Office, Town Hall, Margate.....	do.
Small Granite and Pitch and Tar.....	Woodford U.D.C.....	W. Farrington, Surveyor, Council Offices, Woodford Great	do.
WORKS AND MATERIALS.....	Willenden D.C.....	Council's Engineer, Dyne-road, Kilburn, N.W.....	do.
Materials.....	Cheside and Gadeley U.D.C.....	E. Sykes, Surveyor, 9, High-street, Cheside.....	Mar. 7
Granite, etc.....	Wetherby R.D.C.....	Mr. Wiseman, Surveyor, Town Hall, Twickenham.....	do.
Annual Contracts.....	Twickenham U.D.C.....	F. W. Pearce, Surveyor, Town Hall, Twickenham.....	do.
Buildings at the Town Hall, Stamford.....	Town Council.....	F. E. Ryman, Borough Engineer, Stamford.....	do.
Scavenging.....	Sterling West R.D.C.....	E. Cripps, Union Offices, New Shoreham, Sussex.....	do.
Making-up Page-road, Anchor-road, etc.....	do.....	A. B. Robinson, Surveyor, Town Hall, Edinburgh.....	do.
Two and three-quarter Miles of 10-in. Cast-iron Main Pipes, etc.....	Poole Waterworks Co.....	H. F. J. Barnes, Engineer, Poole.....	do.
Repairs on Pavements, Graoulithic Work, etc.....	Edinburgh Corporation.....	Superintendent of Works, Royal Exchange, Edinburgh.....	do.
Tools, General Engineer's Stores, etc.....	do.....	City Chartered Surveyor, City Chambers, Edinburgh.....	do.
Drain Rods, Oil, Fuels, etc., etc.....	do.....	Resident Electrical Engineer, Dewar-place, Edinburgh.....	do.
Cement, Lime, Drain Pipes, etc., etc.....	do.....	Inspector of Cleaning, etc., 331, High-street, Edinburgh..	do.
Fire Appliances, etc.....	do.....	Burg Engineer, Police Chambers, Edinburgh.....	do.
do.....	do.....	Fire Master, Lauriston-place, Edinburgh.....	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Stoneware Pipe Sewers, Ynysyhir, etc.	Rhondda U.D.C.	W. J. Jones, Engineer, Council Offices, Pentre, Rhondda	Mar. 8
Stoneware Pipes, Junctions, etc.	Leyton U.D.C.	W. Dawson, Surveyor, Town Hall, Leyton, E.	do.
Repair and Decoration of Houses, Banbury School and Chapel, Little Eaton	Banbury Municipal Charities	Fortescue & Sons, 45, High-street, Banbury	do.
Surface Water Drainage	United Methodist Free Church	A. E. Eyre, Architect, Almond-villas, Almond-street, Derby	do.
Renovating and Improving Fronts of Town Hall	Guildford Town Council	C. G. Mason, Borough Engineer, Guildford	do.
Alterations, etc., to Corn Exchange	Dorchester Town Council	G. J. Hunt, Boro. Engineer, Guildhall-chambers, Dorchester	do.
*LIGHTHOUSE, DWELLING, etc., PEMBROKE-SHIRE	Trinity House Corporation	Trinity House, E.C.	do.
Residence, Sedburgh, Kendal	Mr. B. Wilson	J. F. Curwen, Architect, 26, Highgate, Kendal	Mar. 9
Carting Work	Willington U.D.C.	J. H. Gardner, Surveyor, Willington	Mar. 10
Repairs, etc., of Street Lamps	do.	do.	do.
Paving, Channelling, Kerbing, etc.	do.	do.	do.
Road Stones	do.	do.	do.
Scavenging	do.	do.	do.
600 Tons of Lime	Colchester Road, etc., Com.	H. Goodyear, Borough Engineer, Town Hall, Colchester	do.
Goods and Materials	do.	do.	do.
Materials	Haslingden Town Council	J. S. Green, Borough Surveyor, Haslingden	do.
Materials for Highways, Sewers, etc.	Middleton Corporation	W. Welburn, Borough Engineer, Town Hall, Middleton	do.
Bridge and Road at Aberaman	Aberdare U.D.C.	Surveyor, Town Hall, Aberdare	do.
Stores	Eastbourne Town Council	A. E. Prescott, Borough Surveyor, Town Hall, Eastbourne	do.
Detached Villa at Greenisland	B. Houston, Architect, Kingscourt, Wellington-place, Belfast	J. Lord, Borough Engineer, Town Hall, Halifax	Mar. 12
Bacteria Beds and Delivery, etc., Channels	Halifax Highways Committee	do.	do.
Pensiocks, Valves, and Castings	Alnwick R.D.C.	H. W. Walton, Clerk, Alnwick	do.
Reservoir, Sturton Grange, Alnwick	Salop Education Department	Shayler & Ridge, Architects, Oswestry	do.
School, Gileston, Wiltshire	Barnes U.D.C.	Engineer and Surveyor, Council Hqs., High-st., Mortlake, S.W.	do.
Annual Contracts	Wimborne& Cranborne R.D.C.	R. T. S. Seymour, District Surveyor, Wimborne Minster	do.
Quarrying, Breaking, Sifting and Yarding Gravel	Edinburgh Corporation	Engineer's Office, 5, Dewart-place, Edinburgh	do.
Stores and Work	Belfast Corporation	Superintendent of Works' Office, Town Hall-street, Belfast	Mar. 13
Works and Materials	Holborn Borough Council	L. Watford, 197, High Holborn, W.C.	do.
Asphalting Carriageways, Great Queen-street, etc.	The Trustees	Hall-Jones & Cummings, 41, Broadway, Ealing, W.	do.
*CONTRIBUTOR OF ROADS, ETC., PITCHANGER ESTE, EALING	H.M. Works	H.M. Office of Works, Storey's-gate, Westminster, S.W.	Mar. 14
NEW POST OFFICE AT WARRINGTON	Eastbourne R.D.C.	T. E. V. Kirtan, Clerk, 92, Terminus-road, Eastbourne	Mar. 15
Road Materials	Lancashire Education Com.	H. Litter, County Architect, 19, Ribblesdale-place, Preston	do.
Public Elementary School, Fensicoles, near Blackburn	Stockport Electricity Comtee	A. J. H. Carter, Electricity Supply Works, Millgate, Stockport	do.
Stores	Walsall R.D.C.	W. P. Young, District Surv., Council Offices, Basill, Walsall	do.
Materials	Reading Corporation	J. Bowen, Borough Engineer, Town Hall, Reading	do.
Stores and Works	Islington Guardians	W. Smith, Architect, 65, Chancery-lane, W.C.	do.
TWO BLOCKS AT ST. JOHN'S-ROAD WORKHOUSE, N.	Wimbledon Corporation	Borough Engineer, Town Hall, Wimbledon	Mar. 17
CONDITIONS AND ALTERATIONS TO SCHOOL, ST. ALBANS	Izets County Council	County Surveyor, Hatfield	Mar. 21
NEW SCHOOL AND COOKERY CENTRE, BUSHEY	do.	do.	do.
Extensions, etc., of Morand Inn, Port Tennant, Swansea	Mr. E. Evans Bevan	J. Cook Ross, Architect, Neath	No date.
Rebuilding Industrial School, Convent of St. Louis, Monaghan	do.	A. Ferguson, Bldg. Surv., Scottish Provident bldg., Belfast	do.
Additions to Moravian Sunday-school, Baldon	do.	W. Ellis, Architect, Measton	do.
Westyan Sunday-schools, Todmorden	do.	W. J. Morley & Son, 269, Swan-arcade, Bradford	do.
Farm House, etc., Epsall	do.	E. E. Ridgway, Architect, Long Eaton	do.
Painting, etc., Burmantofts Congregational Church, etc.	do.	J. Fryer, 29, New Briggate, Leeds	do.
Working Men's Club, etc., Thorpe, near Wakefield	do.	T. A. Buttery & S. B. Birds, Architects, Morley	do.
Parish Church-rooms, Tenarth	Mrs. B. Brocklehurst	J. Coates Carter, Bank-building, Cardiff	do.
Semi-detached Villas, Buxton	do.	Garlick & Flint, Architects, Terrace-road, Buxton	do.
3,500 tons of Road Stone	Abingdon R.D.C.	B. & E. M. Challenger, 59, Start-street, Abingdon	do.
ELECTRIC LIGHTING OF NEW BUILDINGS	South Wales, etc., Univ. Coll.	W. D. Caroe, Architect, 84, Whitehall-place, S.W.	do.
SUPERSTRUCTURE OF NEW COLLEGE BLDGS., CARDIFF	Univ. Coll. of South Wales, etc.	The Registrar, University College, Cardiff	do.
REBUILDING SHOP PREMISES, WESTMINSTER	do.	C. Granville Baker, Architect, 5, Bloomsbury-square, W.C.	do.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*TIMEKEEPER and MATERIAL CLEEK	London County Council	Not stated	No date.

AUCTION SALES.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*ROAD MATERIALS, PLANT, ETC.—Stone Yard, Stony-street, Borough Market, S.E.	H. Langston & Co.	Feb. 25
*SURPLUS BUILDER'S PLANT, OLD KENT-ROAD, S.E.—469, Old Kent-road, S.E.	H. J. Bromley	Mar. 5
*LEASEHOLD PROPERTY, MOORGATE-STREET, E.C.—At the Mart, E.C.	Dobenhain, Tewson, & Co.	Mar. 27
*FREEHOLD SITE, NEAR STRAND, W.C.—At the Mart, E.C.	do.	do.
*FREEHOLD PROPERTY, TINSBURY, E.C.—At the Mart, E.C.	do.	do.
*BUILDING SITE, HAYMAKET, S.W.	May & Rowden	Mar. 29
*FREEHOLD BUILDING LAND, ETC.—At Iford, Harkingside	A. Savill & Sons	March 30
*SUPERSTRUCTURE OF NEW COLLEGE BLDGS., W.C.—At the Mart, E.C.	Tusket & Son	Apr. 2
*THE HOLBORN TOWN HALL, GRAY'S INN-ROAD, W.C.—At the Mart, E.C.	Jones, Lang, & Co.	Apr. 9

* Those with an asterisk are advertised in this number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xvii.; Auction Sales, xxvi.

TENDERS.—Continued from page 213.

London.—	For the erection of factory premises at Montford-place, Kennington, S.E., for Hayward Bros., Ltd., Mr. A. W. Tribe, architect, 120, Clapton-road, London.—
J. Hoare & Son	£15,679
T. Hooper & Son	15,580
G. Brittain	15,570
Hibberd Bros.	15,500
W. Vanstone	15,123
Higgs & Hill	14,984
R. & F. H. Higgs	14,831
Holliday & Greenwood	14,749
Rice & Son	£14,680
W. Hammond	14,576
J. Parsons	14,493
Turtle & Appleton	14,470
H. Whitehead & Co.	14,450
Holloway Bros.	14,400
W. Smith & Son	13,955
Eldon Works, Vauxhall*	13,955

London.—	For oak rails, gravel boards, and pales for fencing for North Hospital, Wincemore Hill, N., for Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief.—
E. C. White	£240 0 0
J. Longley & Sons	214 2 4
A. Turner & Sons	211 0 0
R. Batcheller	205 16 8
M. Marshall	198 0 0
McLies & McEally	197 0 0
Reese, Smith, & Co.	194 13 9
C. Light & Co., Ltd.	£182 2 6
H. Brown & Co.	180 0 0
W. Stebbing & Son	178 0 0
Rowland Hros.	171 9 0
J. & S. A. Galsa Ltd., Horsa-lain*	170 10 0

London.—	For the supply of 800 to 850 tons of 30-in. cast-iron pipes, for use in connexion with the construction of a 30-in. main from Lee Green to Deptford, for the Metropolitan Water Board.—
D. Y. Stewart & Co., Ltd.	25 10 0
Macfarlane, Strang, & Co., Ltd.	5 7 6
Cochrane & Co.	5 0 0
Staveley Coal and Iron Co., Ltd.	4 14 0
J. Oakes & Co.	4 12 0
Shepherbridge Coal and Iron Co., Ltd.	4 12 0
Stanton Iron Works Co., Ltd.	4 11 6
Holwell Iron Co., Ltd.	4 10 0
Cochrane & Co., Ltd. (Cochrane Grove Branch), Middlesbrough-on-Tees*	4 8 8

LIANSAMLET.—For erecting Calvinistic Methodist chapel and vestry at Birch-grove, for the Trustees of the Welsh Calvinistic Methodists, Birch-grove, Swansea. Mr. Rees Lewislyn, architect, Birch-grove House, Birch-grove:—
Lloyd Bros. £4,850 W. Morgan £3,650
Thomas & Jones 3,750 D. W. Rosser 3,630
Waring, Cole, & Price Bros., Cardiff 2,995
Waring 3,673

LONDON EDUCATION COMMITTEE TENDERS.

Rotherhithe, Magdalen-street (New School).
[A permanent one-story school for 324 children (junior mixed and infants) to take the place of the existing school on the Magdalen-street site, Rotherhithe.]
J. Marsland & Sons £5,636 0 0
W. Downs 5,540 0 0
W. Harris 5,431 10 0
G. Munday & Sons 5,398 0 0
Martin, Wells, & Co., Ltd. 5,295 0 0
Fitzman & Potheringham, Ltd. 5,221 0 0
Rice & Son 5,278 0 0
Treasure & Son 5,245 13 8
E. Triggs 5,227 0 0
W. Johnson & Co., Ltd. 5,185 0 0
J. & M. Patrick 5,161 0 0
T. D. Leng 5,127 0 0
Kirk & Randall 5,096 0 0
C. Wall, Ltd. 5,060 14 1
J. Garrett & Son 5,007 0 0
J. Appleby & Sons 4,990 0 0
H. L. Holloway 4,982 0 0
T. G. Sharpington 4,979 0 0
F. & H. F. Higgs 4,960 0 0
W. Lawrence & Son 4,948 0 0
E. Lawrence & Sons 4,931 0 0
Galbraith Bros., 46, Camberwell-green* 4,900 0 0

[The architect's (Education) estimate, comparable with these tenders, is £5,621.]

Leicestershire, Torrington-road (Heating Apparatus).

J. Gray £899
J. Grundy 897
H. G. Price, Leas, & Co. 835
Clars, Bunnett, & Co., Ltd. 825
Wenham & Waters, Ltd. 785
W. Richardson & Co. 775
J. Yetton & Co. 765
J. & F. May 765
Brightdale Foundry & Engineering Co., Ltd., 28, Victoria-street, Westminster* 745

[The architect's (Education) estimate, comparable with these tenders is £697.]

Kensington, N., Portland-road (Rearranging Heating Apparatus).

F. W. Brock £205 15 0 G. & E. Bradley £123 0 0
C. Kite & Co. 175 0 0 Wippell Bros. & J. Dearies & Sons, Row 120 0 0
Ltd. 135 10 0 G. Davis, 28, Sil-verstreet, Ken-sington* 110 0 0
Stevens & Sons 130 0 0
Palowkar & Sons, 129 0 0
[The architect's (Education) estimate, comparable with these tenders, is £195.]

ROMFORD.—For three new classrooms and cloak-rooms, Hornchurch Park-lane schools, for Essex Education Committee (Romford L.A.S. district). Quantities by Mr. S. I. Adams, architect, Weston-chambers, South-end-on-sea:—

J. T. Luton £2,895 0 0
E. Pavitt & Sons 2,860 0 0
E. F. Scoover 2,827 0 0
W. H. C. Heath 2,750 0 0
J. F. Robey 2,748 0 0
Harvey & Co. 2,591 17 0
J. W. Jerran 2,582 0 0
L. F. Lamplough 2,481 0 0
H. Butcher 2,478 9 0
A. Partridge Bros. 2,474 0 0
I. F. Holliday 2,457 0 0
W. H. Hyde 2,437 0 0
Eaby & Chivers 2,389 19 11
J. Barker & Co. 2,387 0 0
W. E. Westgate 2,375 0 0
F. & E. Foster 2,349 0 0
I. S. Hammond & Sons 2,265 0 0
Dowsing & Davis 2,250 0 0
R. Elvys 2,249 0 0
I. C. Fleaman 2,249 0 0
F. & A. Wilmott 2,229 0 0
Myall & Upson 2,210 0 0
F. & E. Davey 2,187 0 0
W. I. Maddison 2,153 0 0
T. Brody, Hornchurch 2,100 0 0
Architect's estimate, £2,258.
* Recommended for acceptance.

MANSFIELD.—For erecting a cottage, Chesterfield-road, for the Water Department. Mr. R. F. Vallance, architect, Mansfield:—
G. Frisby, Mansfield £230

SHORTLANDS (Kent).—For erecting three shops. Mr. Arthur Cole, architect, "Mogok," Thurlstone-road, West Norwood:—
J. Postle £2,077 0 J. Wilford £1,860 0
W. Irwin 1,597 0 J. Hollingsworth 1,350 0
J. Pratt & Sons 1,570 0 J. Abbot 1,300 0
E. Anll & Sons 1,527 0 S. E. Spinner, 1,245 0
A. J. & C. Hock 1,474 0 Parsons,
ing 1,474 0 Gray's Inn- 1,225 0
Jones & Andrews 1,460 0 road, W.C.
W. Ellis & Co. 1,400 0 T. C. Gorham 1,150 12
C. E. Keeworthy 1,390 0

SURBITON.—For certain repairs and alterations to the house known as Westfield Lodge, Port-mouth-road, Surbiton, for the Metropolitan Water Board. E. Benfield £557 Newson & Hawkins. £434
C. Oldridge & Sons 505 W. H. Gaze & Sons* 319

SUTTON.—For drainage work at residences, Belmont Asylum, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief, Messrs. T. Dinwiddie & Sons, architects, 54, Parliament-street, S.W.:—
H. Smith £591 0 0 W. Reason £220 0 0
F. Bull 329 0 0 Hampton & Staines & Son 315 0 0 Sons, Ltd. 245 10 0
Davey & Roberts 305 0 0 O. Jennings 245 2 0
Martin, Wells, & Co., Ltd. 300 0 0 H. W. Haydon 259 0 0
Ltd. 296 0 0 J. B. Potter, Carshaton,
T. Holloway 276 0 0 road, Sutton* 168 0 0

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MARCH 3, 1905.

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Report of the London Traffic Commission.—III.



WO further volumes, which were published on Monday, complete the Report of the "Royal Commission on London Traffic," with the exception of Vol.

IV. still to be issued, and to contain evidence and documents furnished to the Commission by engineers and public authorities in the United States and on the Continent. In large measure the new volumes—Nos. V. and VI.—serve the purpose of illustrating the publications which have been discussed in our previous articles.* But they go considerably beyond the scope of the material already made public, being particularly intended to present, in a convenient form, for the use of the proposed Traffic Board, the chief facts and suggestions placed before the Commission relative to London traffic.

The volumes consist almost entirely of plans, diagrams, drawings, and views to the number of more than one hundred, selected from several hundreds of the same kind, either prepared by the Commission or furnished by witnesses, other than American and Continental witnesses. Each volume is provided with an exhaustive index, which facilitates the reference of plates to the evidence printed in Volumes II. and III. of the Report, a

* Nos. I. and II. appeared on July 22 and 29, 1905.

feature which should be appreciated by all who may have occasion to study the subjects therein considered.

From this introduction it will be clear that while no new recommendations are contained in the volumes now made public, it would be a mistake to consider them simply as illustrations to the previously issued portions of the Report. Those who, like most of our readers, are accustomed to the interpretation of plans and diagrams, will find in Volumes V. and VI. a wonderful amount of valuable information, expressed in graphic manner, and far more easy of assimilation than if it were in letterpress.

Among the most important of the plans are those bearing upon the relation of passenger traffic to the form, area, amount, and density of population of various districts. Plate A illustrates the radial expansion of the metropolis, and includes the boundaries of the City, the Administrative County, the Metropolitan Boroughs, and parishes within a radius of 20 miles from Charing Cross. All railway and tramway routes, areas, and populations within the 20-mile radius are clearly indicated, and in the fact that the area in question includes a total population of more than seven million inhabitants, there is ample proof of the necessity for efficient and centralised supervision over all matters connected with the traffic problem. But the mere statement that some seven million persons are congregated in a circular area of 1,600 square miles is not sufficient to make clear the difficulties which have to be dealt with. The density of population in

different localities is a far more potent factor, and this is represented very clearly in Plate VII., prepared from the census returns by Mr. Edgar Harper. Examination of the data here given shows that while the average density in the outskirts of Greater London is only about five persons per acre, the rate increases up to 200 persons per acre in districts such as Southwark, Finsbury, Shoreditch, Bethnal Green, and Stepney. It would not do, however, to stop here, for even in the central districts of London there are many open spaces, represented by public streets, squares, railways, canals, churchyards, and recreation grounds, and there are also other areas, small individually but large in the aggregate, which are more or less unpopulated. In Paris and some other cities accurate measurement is taken of all such areas so that the real density of urban population can be determined. To fill the gap in our own statistical records, Plate CVI. was prepared by Mr. Harper at the request of the Commission, showing in different colours the various classes of property and open spaces in Central London. The relevancy of this plan may be gathered by a comparison of the population density given by the census returns and those calculated upon the basis of "residential" and "commercial and residential" property as represented in the plan. Thus, while the census returns give the density of the population in the City, Finsbury, St. Pancras, and Holborn, at 40, 172, 87, and 147 persons per acre, respectively, the densities in the net areas of the same districts, as shown by Plate

CVI., are respectively 1,140, 530, 523, and 484 persons per acre. These are eight populations in each case, and if the day population of the City be taken on the net area the density is found to be no less than 848 persons per acre.

From the standpoint of hygiene it is satisfactory to find in the foregoing figures practical testimony to the collective magnitude of the more or less open spaces in thickly-populated parts of London. Considered in connexion with the housing problem the corrected densities are of some importance, but they do not seem to affect the question of traffic facilities very much, except perhaps in one or two districts where the open spaces are proportionately large. Of course, the dense population of the central districts gives rise to a large demand for means of locomotion other than walking, despite the fact that the bread-winners are in the minority, and the presumption that residence in such districts is dictated by the necessity of avoiding journeys to and from work.

Mere statistics of population, however, do not assist the traffic reformer very much unless considered in connexion with records such as those given in Plate VI., which shows the development of internal passenger traffic in Greater London from 1867 to 1902. In the former year, when the population was 3,605,510, the number of journeys was about 23 per head, and in the latter year, when the population was 6,702,063, the number of journeys had increased to nearly 140 per head. No doubt a large proportion of the increase is due to the growth of residential suburbs and the remainder to the temptations offered by improved means of local transport. This diagram indicates clearly that railways have not been responsible to a preponderating extent for the growth of travelling, inasmuch as local railway journeys in 1867 were at the rate of about 12 per head, and in 1902 not more than 41 per head. On the other hand, omnibus and tramway journeys have risen from 10 per head in 1867 to more than 93 per head in 1902. In fact, the omnibus services carry as many passengers as all the local railway lines, and the tramway services carry 50 per cent. more. When we remember that the railways, tramways, and omnibuses of London carry in one year a number of passengers equal to three-quarters the population of the entire world, it must be recognised that transportation on so huge a scale is not a matter that should be left entirely to private enterprise, and the absolute necessity for a central board of traffic is clearly brought home.

From the figures quoted above it is manifest that, up to 1902 at least, railway companies have failed to take their due share in providing means of transport for the growing needs of the metropolis. As we all know, their efforts have been chiefly directed towards opening up fresh districts in the outskirts to the dismay of old inhabitants and the general good of the community. We do not blame the promoters of railway lines for the lack of new routes within the more thickly-populated areas of London. That there has been a widespread desire to construct railways in the district is proved by Plates B. C., LXXVIIA., and LXXVII B. The last two plans, prepared by Sir Henry

Oakley, show all the railway proposals submitted to Parliament between 1855 and 1885, and between 1885 and 1903 respectively. Although these projected lines were not laid out in accordance with any scheme of co-ordination, some of them demonstrate in a remarkable manner the partiality of early promoters for routes still much in need of railway facilities, and the plans are most valuable because they give in ready form information much in request during Parliamentary inquiries, and of which no other public records are available.

The circumstance that railway routes have not developed at the same rate as omnibus and tramway services may be accounted for by three reasons:—(1) The difficulty of getting Parliament to do or sanction anything; (2) the persistent and sometimes combined opposition of existing railways to any prospective rival; and (3) the heavy cost of construction in a city where the price of land is almost prohibitive.

Tramway undertakings have also been handicapped, but not to the same extent, and the entrance of the London County Council into the ranks of tramway promoters has given a great impetus to the expansion of this class of traffic facilities. Omnibus proprietors, of course, are in an exceptionally favourable position. They require no Act of Parliament, no opposition can be raised to their projects, and the public streets provide a gratuitous and ready-made permanent way. So the omnibuses of London have flourished until they have become at once a great boon and a great nuisance, carrying annually a number of passengers equal to more than seven times the population of the United Kingdom.

The approaching completion of some valuable tube railways will do something to adjust the balance between railway and street traffic, but it does not seem likely that many new railway projects for central London will be sanctioned until Parliament has dealt in some way with the Report of the Traffic Commission.

In the meantime, there is ample scope in the outlying regions for the display of energy by existing railway companies. The great service rendered by suburban lines is shown by a series of four most instructive plans included in Plate LXXX., specially prepared for the Commission by Mr. R. W. Perks from old maps and other materials in the British Museum. These plans illustrate in four separate stages the railway route mileage, the population, and the area of land built upon in 1845, 1860, 1880, and 1900. They indicate in an unmistakable way the connexion between building development and the growth of railway facilities. From 29.75 miles in 1845 the route mileage rose to 248.5 miles in 1900—an increase of over 700 per cent. in fifty-five years. At first appearing like a small island in the middle of the present Administrative County of London, the built-up area in 1900 resembles a huge blot covering almost all the county, with large splashes outside something like an advertisement of writing-ink. To those familiar with the environs of London for a distance of 12 miles round the four plans constitute a very interesting study. Among other things they make clear the comparatively slow progress of building in semi-rural

parts where railway services are notoriously bad, and the correspondingly rapid development in parts which are served by railway companies who have kept abreast with the times. They also serve to indicate districts where little or no building has taken place, thus suggesting to land owners and railway companies directions in which judicious enterprise might be undertaken for personal advantage with the ultimate effect of relieving congestion in the centre of the metropolis.

Plate F., prepared by the Commission, evidently as the result of laborious research, throws vivid light on the interconnected problems of housing and transport for the working classes. This plan, in three large sheets, shows the principal factories in and around the metropolis, together with the number of hands employed. It indicates in a striking manner the grouping of certain trades in different districts, and the attractive force of the Thames and other waterways, although this manifestation is by no means so marked as one would expect. The most remarkable feature of the plan is that the bulk of the factories are clustered between Westminster and Poplar in an area measuring about 4 miles from east to west, and some 3 miles from north to south. Beyond these limits, which include the heart of London, clusters give place to scattered groups and isolated dots.

The plan brings home anew the truth that, in spite of vast mercantile and residential districts, Central London is still a large manufacturing town. So long as factories remain in the inner region so long will thousands of working men continue to live near their work, whatever may be done in the way of providing cheap and rapid means of locomotion to tempt them away to more pleasant and more healthful neighbourhoods.

Workmen's trains and trams already convey enormous numbers of working men to and from the central and outlying factories. The number of passengers is on the increase, but not at such a rate as to reduce materially the density of population in such districts as Bethnal Green, Stepney, Southwark, and Bermondsey. Some day, perhaps, large factories will be eliminated from parts of the metropolis where land is most valuable. In the meantime manufacturers cling to the old sites, and, so far as one can judge by Plate F., the proximity of railway goods depôts possesses far greater attraction than the riverside and the low-priced open lands of Essex and Kent. This plan may be usefully examined in connexion with Plate E., showing the position of the various goods depôts in London.

The growth of mercantile London, the distribution of cheap electric power in the Home Counties, and extended railway facilities for goods traffic, may in time combine to push and pull many of the existing factories out of the central districts. But their place will be taken by other industries and businesses requiring manual and other labour, and we shall always be faced with the problem of conveying many thousands of men and women to and from a crowded city. The work of filling and emptying a great hive of industry every day is in itself a

sufficiently serious undertaking, and when we add to it the necessity of increasing means of transport so as to entice many thousands more to live at a distance from their work, the task becomes more serious still.

Very little consideration is needed to prove that radial roads are required to assist the daily migration between every point of the compass and the business centre. However inadequate they may be at the present time, the main highways and railroads of London run generally in the right directions for the conduct of the daily centripetal and centrifugal traffic, and it is a fortunate thing that the early morning immigration takes place before the local traffic of the centre has fully awakened. The evening exodus, again, is facilitated by the different hours at which work ceases in different classes of industry and business. Notwithstanding the preponderance of the great wave which floods and leaves bare the centre of London at the beginning and end of every day, there is a constant inward and outward flow of business people whose daily course of duty is not guided by the rising and setting of the sun, and of visitors to town bent on business or pleasure, and, in addition, there are constant streams of local and through traffic from north to south and east to west. Again, armies of commercial travellers, workmen, and others start out for various districts very soon after arriving at their first destinations, and those who remain in the business centres begin to move ceaselessly from point to point. All these movements taken together provide ample supplies of passengers for long streams of omnibuses and trams, which continue to monopolise the streets throughout the day. Hence, while radial roads and railways may provide admirably for traffic connected with the social aspects of the problem, they are less useful for local traffic in the central districts, and particularly for what may be termed cross-country communications.

Nothing is more easy than the formulation of a scheme on paper to improve the highways of the metropolis. Several witnesses examined by the Commission brought forward schemes for the construction of new highways on an extensive scale. Most of these proposals are centuries too late, for they could only be realised at fabulous cost under existing conditions. As heroic projects of the kind are practically out of the question, the most that can be expected is the gradual improvement of streets on the lines adopted in the past by the City Corporation, the Metropolitan Board of Works, and the London County Council. The advantages derived from the work accomplished by these bodies within the last half-century are too well-known to need recapitulation. Still, Plate IV., showing the chief street improvements effected at a cost of more than 16 millions in London during the past fifty years, is worthy of examination. Plate XC. indicates the admirable improvements carried out by the City Corporation since 1825, at a cost of 5 millions, and demonstrates in a striking manner how much can be accomplished by a definite and consistent policy, without serious disturbance of property.

Various plans and statistical diagrams

relative to traffic are presented in the new volume of the Report. One of the most instructive is Plate VIII., showing the routes of all metropolitan omnibuses and the frequency of the services. The plan makes very clear the immense convenience offered by the omnibus companies, and at the same time the enormous amount of street area occupied by their vehicles. For instance, a passenger in Oxford-street has a choice of twenty-nine routes to different parts of London; in the Strand twenty-three, in Whitehall twenty-two, and in Piccadilly eighteen routes are open. Probably no other city in the world has more convenient facilities for local traffic than these. Unfortunately, the omnibuses take up far more room than can be spared. This is shown at a glance by the plan. At busy times 642 omnibuses pass the Bank an hour, through Oxford-street and Piccadilly the number is 400 an hour, and along other important thoroughfares 200 an hour is a fair average. The omnibus cannot be abolished, although it may be improved, and the problem of providing adequate space for this class of vehicle in addition to other traffic is one that presents serious difficulty.

From details contained in Plates XXXIII. A-1, it appears that the volume of vehicular traffic is fairly constant, or at any rate far more constant than that of foot passengers. The number of vehicles traversing any given thoroughfare does not by itself convey any definite meaning, and, to enable data for computations as to the density of traffic, Sir Alexander Bruce has prepared Plate XXV., giving the actual and relative widths of fifty-one important streets and roads in London. Only thirteen of these reach the width of 50 ft., seven of them being under 60 ft., and six over 60 ft. wide. To these must now be added Kingsway, with a width of 60 ft. The points where congestion is most painfully evident are already pretty well known to Londoners, but for the purpose of recording the facts, Plate XXIII., prepared by Mr. Riley, architect to the London County Council, indicates more than thirty points of maximum congestion. Four other plates set forth the pressing needs of Westminster, Stepney, Shoreditch, and Southwark in the direction of street area. The relief works suggested in the last five plans would fill a sufficiently long programme, and some of the more urgent might well be undertaken as a prelude to anything of ambitious character.

One point that cannot be overlooked is that at present the public are entitled to use the streets for trade as well as for locomotion. The unrestricted employment of busy thoroughfares for the loading and unloading of goods at all hours of the day is a practice that demands regulation without delay. Some photographs in Plates XLV.—XLVIII. show how various streets in the City are blocked all day long by vans. In certain streets fully 50 per cent. of the width is occupied in this way, and in others unhorsed vans of market produce are allowed to occupy half the roadway—a most economical method of securing a substitute for yard and warehouse accommodation. Other photographs published, indicate the obstruction caused by the drivers of

heavy vehicles by the erection of lamp and tramway columns along the middle of the road, by the establishment of tramway termini in crowded streets, and by the breaking up of road surfaces for attention to pipes and ducts. These are all matters which the Commission recommended should form the subject of immediate attention.

With regard to pipe subways London is undoubtedly much behind foreign cities, for, as indicated by Plates XVII. and XCV.—XCVIII., only fifteen streets in the whole of the metropolis have provision of the kind. The drawings in Plate XCVIII. of the Arthur-street East subway, built in 1887, represent an excellent design, and Plate C., prepared by Mr. H. E. Jones, embodies a useful method of connecting house service pipes with a minimum amount of public inconvenience.

Among the remaining plans contained in the volumes a few more relate to schemes and proposals advocated by witnesses as likely to reduce congestion of traffic in particular localities. The most useful idea of the kind is one submitted by Sir Henry Knight on behalf of the City Corporation for relieving the streets of much heavy traffic to and from metropolitan goods depôts and factories by the construction of a railway connecting all the goods depôts of existing railways. To some extent the purpose here mentioned may be fulfilled by the Outer Circle Railway, if the Bill now before Parliament should become law.

Consideration of the plans and diagrams relating to London highways and highway traffic leads inevitably to the conclusion that existing radial thoroughfares have almost reached the limits of their capacity in the older suburbs, and have quite done so in the busy centre. The substitution of motor-driven for horse-drawn omnibuses will give increased carrying capacity, and the continued extension of tramways will have a similar effect. Still, these developments cannot make the present main routes capable of rendering sufficient aid to schemes for housing the masses in the semi-rural outskirts. Nor will they do all that is wanted to facilitate transit across and in the central regions of London.

Therefore, the most pressing need is for measures calculated to add to the carrying capacity of existing main and auxiliary streets and roads, and to encourage the development of new neighbourhoods.

The chief proposals made to the Commission for tramway extension will be found in Plate XLIV., indicating the manner in which Mr. Stephen Sellon suggests that the tramways in the central area should be linked up to form a connected system. It will be remembered that some of Mr. Sellon's proposals were endorsed by the Advisory Board of Engineers and by the Commission, with the proviso that certain lines should be constructed beneath the surface. The Westminster Corporation also advocate shallow subways for tramway lines, and our readers will find in Plate XXXV. a series of valuable drawings representing a subway beneath the Strand with accommodation for two tramway tracks, to which access would be gained at almost every street corner through shops, so

as to obviate obstruction to pedestrian traffic. The subway also provides for the accommodation of pipes and ducts. Duplication of the Strand, Fleet-street, Ludgate-hill, and Cheapside in this way would be a great boon, and deserves consideration. The difficulties, however, would not be small, as demonstrated by Plates XXXIV. and XXXV., prepared by the Westminster Corporation, and Plates XCI.—XCV., prepared by the City Corporation, these plans showing the astonishing network of pipes, drains, sewers, and cables beneath the streets between Charing Cross and the Bank. To deal with these means much outlay, and the cost of the undertaking would be increased by compensation to property-owners whose vaults and cellars in some places absorb the greater part of the area below the streets.

Low-level tube railways already completed, under construction, and projected are shown in plans included in the new volumes. Although this method of transit is not universally popular, plenty of passengers will always be ready to avail themselves of it, and there is reason to believe that the tube boom will be revived as soon as Parliament has decided upon a definite course of action with regard to the Report of the Traffic Commission. The most interesting drawings in connexion with railways of the kind are to be found in Plate LXXIV., wherein Mr. Francis Fox takes various lines across London, and from the results of trial borings traces the depth of blue clay below the surface, the average on the selected lines apparently being about 30 ft.

That the creation of new tube railways is not likely to make a permanent reduction of omnibus traffic seems to be shown by diagrams relative to the Central London Railway, furnished by Sir Henry Oakley. Along the route of that line the omnibuses attract short distance passengers and the railways attract those who have longer distances to travel. New tubes will certainly be appreciated by people wishing to get across London more rapidly than at present. The effect will be to relieve surface vehicles of some passengers and to make room in the same vehicles for others who are now obliged to walk.

Many suggestions for new railways were put before the Commission, among these being a carefully-prepared scheme in Plate LXXXV. for a connected system of urban and suburban tube railways. This and other proposals should be of use for the guidance of railway promoters and the authority by whom new projects will have to be sanctioned.

As we have shown, the matter in Volumes V. and VI. of the Report illustrate almost every phase of the traffic problem, and by the concentrated manner in which the information is presented they serve to emphasise the necessity for the creation of a competent tribunal to whom all matters connected with metropolitan traffic should be referred, and upon whom ample powers should be conferred, so that projects calculated to benefit the people of the greatest centre of population in the world may be approved, if found good, without the disastrous delay, obstruction, and cost attending the process of obtaining Parliamentary sanction in existing circumstances.

NOTES.

NO ONE has a greater admiration than we have for the architectural learning and power of delineation shown in the paintings of Sir L. Alma-Tadema, who, if he has not exactly taught us any facts about Greek and Roman architecture, has certainly added to our comprehension of its effects. We cannot but feel, however, that it was not the turn of a painter this year, and that the Council have shown rather a strange forgetfulness of the claims of one group of professional architects. The medal is stated in the Calendar to be conferred "on some distinguished architect or man of Science or Letters, who has designed or executed a building of high merit, or produced a work tending to promote or facilitate the knowledge of Architecture or the various branches of science connected therewith." It is of course under the latter definition that an eminent painter must come, and it may very well be argued that to have painted architecture well is as good as to have written about it well. But practising architects have the first claim, and it has been usual to give the medal to a practising architect for at least two years in succession, before breaking away again from the professional list. It was given to an English architect in 1902, to an American in 1903; to a distinguished writer on architecture (M. Choisy, who is not an architect) in 1904; to a distinguished English architect last year. It should now be the turn of a distinguished foreign architect; but we should have made no comment on the subject but for the singular ignorance or forgetfulness which the Council seem to be under in regard to the claims of French architects. It seems scarcely credible, and is certainly not creditable, that it is twenty years since the Gold Medal was offered to a French practising architect, in the person of Charles Garnier. Those who know what work is being done in modern French architecture may certainly be inclined to ask the Institute Council whether they know nothing of M. Nénot and the New Sorbonne, or of M. Girault and the Petit Palais—the latter perhaps the most original and most generally admired building of recent years in Europe. We quite approve of presenting the medal to a painter who has been an eminent illustrator of ancient architecture, at the proper time; but we say—architects first, and we consider that the claims to recognition of more than one eminent French architect have been most unduly overlooked.

The Proposed
Exhibition
of Sculpture.

WE sincerely hope that the endeavour of the Society of British Sculptors to get up a special sculpture exhibition will be successful, and that they will receive the support of the London County Council so far at all events as the grant of a site goes. The complaints of the unsatisfactory and crowded manner in which sculpture is shown at the Royal Academy exhibitions are certainly called for; and what Mr. Brock seems to have said to the representative of a daily paper, that "the word 'art' to the general public has come to mean simply the

painting of a picture," is only too true. In fact, to the majority of visitors to the Academy the exhibition is really a popular picture show, the contents of which are looked at for the interest of their subjects and not for their artistic quality. In sculpture the subject generally is much more abstract and ideal than in painting, and therefore makes less impression as a subject or story; to make anything out of sculpture the mind must first have had some artistic training; whereas a picture, even to those who know nothing of art, often represents some incident which interests them for its own sake. Sculpture has none of these adventitious attractions (at least, when it has, it is bad sculpture); it is therefore the more necessary that it should be exhibited in a manner worthy of its importance as an art, and not made a mere appendage to a picture exhibition. The remarkable advance made by British sculpture during the last fifteen or twenty years is an additional reason for seeking an opportunity to make an adequate representation of the recent work of English sculptors. At present sculpture is the leading art in this country, though the public do not know it.

Coast
Erosion.

GENERAL satisfaction must be felt at the announcement by Mr. Lloyd-George that the Government proposed to appoint a Royal Commission at an early date to inquire into the question of coast defence, and two or three kindred subjects, such as waste lands and afforestation. We are rather afraid that the inclusion of these other subjects in the reference will lead to delay, which is particularly to be deprecated in connexion with the problem of coast protection. If the only remedial measures were to be looked for in the form of an Act authorising Parliament to undertake an ambitious scheme for safeguarding all threatened lands at the cost of the nation, there would clearly be every reason for anticipating considerable delay. But it would neither be wise nor fair to relieve local landowners of responsibility, and a more judicious alternative is to be found in the granting of loans for longer periods than the term of twenty-five years at present forming the limit for repayment. The Government could do other things calculated to improve matters. In the first place they could determine at once that the removal of beach material should no longer be practised by various State Departments, and could exercise their powers more fully to prevent other people from offending in the same way. Then, it would not be difficult to arrange for the abandonment of Crown claims upon all lands reclaimed from the sea. That such claims should be enforced is particularly unfair, and nothing is more certain to take the heart out of private enterprise. If lands wrested from the sea became the property of those who have paid for them in money and work—as is the case in some Continental countries—there would be a healthy revival of interest in schemes for the reclamation of land. Recognising the sympathetic attitude of the new Government towards this great question, we hope they will take early action in the directions here indicated.

Ecclesiastical Dilapidations. THE Upper House of Convocation has decided to bring forward a Bill on the subject of ecclesiastical dilapidations. The two main points of the proposed measure will be to establish a survey of the premises at stated intervals, and the payment by incumbents of an annual sum on account of dilapidations to an appointed body. These facts embody what has more than once been insisted on in these columns, that the question of dilapidations should not be left to be decided to the time when the benefice becomes vacant. The surprising thing is that some practical measure has not long ago been passed, and it says little either for the energy or the business capacity of the dignitaries of the Established Church that the question of ecclesiastical dilapidations should have been allowed to remain in its present unsatisfactory state. It will, no doubt, be regarded by some incumbents as a hardship that the already small ecclesiastical incomes should be yearly diminished by an annual payment in respect of dilapidations. But we assume that, if at, say, the five-yearly survey it is found that no expenditure on a benefice is necessary, any sums paid in respect of dilapidations during this period will be repaid to the incumbent. The main points are that houses and buildings should not be allowed to get out of repair, and that there should be a sum in hand to pay for necessary repairs.

Trade Unions' Returns. THE Parliamentary Paper just issued contains some interesting figures relating to the period up to 1904. At the end of 1904 the Trade Unions known to the Labour Department of the Board of Trade numbered 1,148, the total membership being 1,866,755. The year 1901 marked the highest recorded number of members, 1,940,874, so the decline to the end of 1904 is a falling off of 74,119 members, or 3·8 per cent. The Report states that periods of trade depression always cause a decline in the number of members, and it is significant that the Trade Unions of builders and general labourers for the above period lost members to the extent of 19·4 per cent. The membership of the Trade Unions shows a large increase when compared with years previous to 1899. The years 1902-04 brought a large increase of employees of public authorities, 23·6 per cent. gain, and of shop assistants, 60 per cent. Women represent about 6·7 per cent. of the total number of Trade Unionists. Interesting tables covering a period of ten years are given in connexion with the 100 principal Trade Unions, which represent 60 per cent. of the total membership, and their income shows a steady increase, as also does their expenditure, and the funds accumulated also steadily increase. For the year 1904 the figures are:—Income, 2,097,476*l.*; expenditure, 2,042,165*l.*; accumulated funds, 4,616,230*l.* In 1895 these accumulated funds amounted to 1,711,733*l.*, in 1904 they stood at the figures 4,616,230*l.*, having more than doubled in this period.

Trespass on Walls. THE case of Betts, Ltd., v. Pickford, Ltd., reported in our columns last week, is worthy of attention. The plaintiffs had

taken certain land from the defendants on a building lease. The intention of the plaintiffs was well known to the defendants; they proposed erecting warehouses and a show-room on the land thus leased, and the plaintiffs had submitted plans to the defendants which disclosed the fact that there would be windows in the south wall. The defendants had had to clear the site for the plaintiffs, but a shed remained standing, which projected slightly over the plaintiffs' land, and in the course of the erection of the plaintiffs' premises the architect had permitted these projections to be built into the plaintiffs' wall. The projection, which was that of some roof timbers and certain iron stanchions, was very small, only some 4 in., but the local authority served a notice on the plaintiffs under the London Building Act, 1894, treating the south wall as a party wall and requiring them to brick up the windows. This summons stood over until the determination of the action in which the plaintiffs applied for an injunction against the defendants to restrain them from trespassing on their premises, and from using the wall as a party wall. The Court held that the defendants had derogated from their grant and were trespassers. It is to be observed that the defendants to some extent relied upon the action of the plaintiffs' architect in consenting to the projection standing and building it in, but the Court held this to be outside the scope of the architect's authority. The defendants were also, it was discovered, after the commencement of the action, using the east wall as a party wall for some stables, but there is nothing in the case to show that the decision would not have been the same in regard to the trespass on the south wall alone, and its result was certainly serious, as without windows the show-room would have been useless to the plaintiffs.

Liabilities Attaching to Traction Engines. THE case of Dewar v. Tasker & Sons should be noted by those employing traction engines. The defendants were the owners of a traction engine, which they hired out for some months to another company. The defendants supplied a driver with the engine, whose wages they paid and they repaired the engine when necessary, and supplied the oil for it. The hirers had the right to give their orders to the driver, and directed where the engine was to go and what it should carry, etc. The plaintiff was suing the defendants for personal injuries he had sustained through the negligence of the driver. In these circumstances the Court held that the defendants were not liable, they had divested themselves of control over the driver, and the hirers were exercising the complete control.

Sewage Disposal. IN the recent case of Hobart v. Corporation of Southend-on-Sea, in which the plaintiff was suing the Corporation in respect of pollution to his oyster beds, and which occupied the Court some nine days, an interesting question as to the disposal of sewage was decided. The Corporation claimed a right to discharge the sewage into the river both by common law and by statute. The Court held that there was no common law right to

create a nuisance to the plaintiff such as was found as a fact to exist in this case, and that the defendants were bound to keep their noxious matter from trespassing on their neighbour's land. As regards the statutory right, the defendants relied upon sect. 49 of the Public Health Act, 1848, but the Court held that this had been repealed by the Public Health Act, 1875, sect. 23 of which Act omits the provision relied upon as to draining into the sea, and the judgment laid down that the defendants, far from having any statutory rights, were expressly prohibited by the Sea Fisheries Acts and the by-laws made thereunder from creating such a nuisance in this locality. No prescriptive right on the part of the inhabitants as predecessors of the Corporation was set up in this case, and the Court granted an injunction and damages. The case must not, however, be read as prohibitive of the discharge into the sea of any sewage at all; its teaching is that if sewage be discharged into the sea, due precautions must be taken that its discharge shall not be the cause of nuisance to other's rights.

The Design of Dry Docks. IN an eminently practical paper read before the North-East Coast Institute of Engineers and Shipbuilders, Mr. J. Mitchell Moncrieff, M.Inst.C.E., discusses the main points for consideration by those who undertake the construction of dry docks for commercial purposes. Next to the general dimensions, the selection of a site, whenever selection is possible, is the most important matter. Instances of dock companies who have been saddled with excessively heavy capital expenditure owing to lack of care in this respect justify the author in the caution addressed with regard to the most searching preliminary investigation as to the real character of sites under consideration. He shows that the nature of the subsoil has very great influence on the design and cost of the proposed works, and to illustrate this point gives drawings of four docks built under his superintendence in the Newcastle district all exhibiting distinctive features and necessitating essentially different methods of construction. A part of the paper of significance to our readers is that relating to materials of construction, and particularly to concrete. The author says that the cheapness of concrete, its execution by unskilled labour, the facilities it affords for carrying on work in a loose manner, and the presumed monolithic result obtained by the mere deposition of one batch upon another, instead of being virtues are really vices so far as regards works exposed to salt water. We quite agree with the caution as to the necessity for adopting proportions that will absolutely prevent the admission of salt water to the interior of concrete so employed, for if percolation should be established nothing can prevent its ultimate disintegration. Mr. Moncrieff is equally correct in emphasising the importance of making all beds quite level and flat, and of making connexion between the successive beds by a layer of mortar. This is good advice, for neglect of the procedure recommended will result in percolation along the seams and consequent trouble of serious character.

New Traffic
Facilities
for London.

AS THE first installation in this country of a tramway on the shallow subway principle the line which was opened to the public on Saturday last is of distinct interest. Although the underground route only extends from Southampton-row to Aldwych, a direct service is now available from Islington to the Strand, and at some future date the line will serve as the first link between the northern and southern tramway systems. The usefulness of tramway cars able to dive beneath the surface in places where traffic is much congested has been amply demonstrated in Boston, and it may be wished that ere long London may be possessed of many similar lines. A means of inter-communication to which thousands of passengers are looking forward is the Waterloo and Baker-street tube railway, now finished from St. George's-circus to Baker-street, and only awaiting the Board of Trade inspection before being placed at the disposal of the public. It is gratifying to learn that every possible endeavour has been made to eliminate fire risks and to provide for the safety and comfort of passengers. When this line is extended to the Elephant and Castle at one end and to Paddington at the other it will indeed be a most valuable line for those who do not object to subterranean travel. Among its most meritorious features are the connexions provided with the City and South London railway at the Elephant and Castle, the South-Western, the South-Eastern and Chatham, and the City and Waterloo railways at Waterloo, the South-Eastern and Chatham, and the District railways at the Embankment, the proposed Great Northern, Piccadilly, and Brompton railway at Piccadilly, the Central London railway at Oxford-circus, the Great Central and Metropolitan railways at Baker-street, and the Great Western railway at Paddington. A few more schemes like the two mentioned above would do a great deal for the internal passenger traffic of London.

A SOMEWHAT unusual gathering was held on Saturday night last at the offices of the new daily paper, *The Tribune*, as the opening of a kind of club-room or rendezvous for members of the Liberal party and readers of and subscribers to the paper. We are of course of no politics in these pages; but the idea of bringing readers of a journal in closer touch with it by providing a meeting-room and reading and writing-room for them on the premises of the journal, is a new and happy one; and the thing was splendidly done; the only disappointment being the absence of the Lord Chancellor, who was to have been the chief orator, and who was kept away by public business. Bouverie-street was brilliant with electric lighting on the exterior of the offices; there was a large and distinguished company in response to the invitation of Mr. and Mrs. Thomasson, and some very clever speeches were made by Lord E. Fitzmaurice, the Lord Advocate of Scotland, and Mr. T. Gibson Bowles—speeches the humour of which could be enjoyed even by those who might differ from the opinions expressed. The meeting-rooms, and even the stairs to the

printing-rooms (where the visitors were invited to inspect the printing of the report of the meeting), were lined with wire trellis entirely woven over with flowers—an American decorative idea, if we mistake not; and refreshments were on the most liberal scale in respect both of quantity and quality. The whole function was a great success.

ROYAL ACADEMY LECTURES.

THE lectures to the students of the Royal Academy on sculpture commenced on Monday last week by a lecture from Mr. Colton on "Enthusiasm in Sculpture," which was to a considerable extent a repetition of the argument of a lecture delivered by him a year or two back. He wished to offer his advice, as one who was still a student, on some of the difficulties which looked like mountains ahead of them, but would be found to disappear more or less when fairly faced. Though he would not tell them to despise culture, with the examples of Reynolds and Leighton before them, he would say, be content to snatch general knowledge how they could, but let their thoughts be intent, day and night, on their actual work, and not be easily satisfied with it. Those who were satisfied were blind. He had known a gold medal gained stop a man's whole career. Failure should stimulate them; if a work they had spent six months over was a failure, spend two years over the next effort. They must be content to sacrifice comfort and even health in the strife to improve. English sculpture, it was generally admitted, had advanced immensely of late years; it must be their business to push that advance still further. It was said that there was no patronage for ideal sculpture in this country, but surely that was to some extent the fault of the sculptors; if more ideal work were produced, a demand for it would arise. One class of work for which there was now a good deal of demand—decorative sculpture with which jewellery was combined, was one form of ideal sculpture, and might lead up to something more important. But the time and labour which the art demanded was so great that only a great enthusiasm could carry them through it; without that quality a sculptor's life must be intolerable. The classical standards of sculpture were now outworn; their day was passed, and they had already been responsible for the production of many soul-less busts and statues. Realism and Idealism were but words, after all; let them observe the beauty of nature, get as near to that as possible, for in that path realism became also idealism. A little thought beautifully expressed was worth more than a great thought badly expressed. It was perhaps fortunate that there was no system of modelling at the Royal Academy, for, as they knew, one "Visitor" in sculpture was quite prepared to throw aside what the last had said, and thus they were under no temptation to make an idol of a system and to mistake the means for the end. The whole earth was filled with beauty to which unhappily many people seemed astonishingly blind; but it was their part to assimilate all they could of that beauty, and give some of it out again in their works. And in this connexion it might be said that clearness of vision was even more valuable than imagination. On the Royal Academy catalogue for 1902 there had been placed as a motto the words of Théophile Gautier—"Rien n'est usé pour le génie." To succeed in sculpture they must be prepared to make self-sacrifice; and they must take their art seriously. Anyone who made the mistake of approaching sculpture lightly would surely fail. The art was so absolute in its character that nothing sketchy could be admitted into it; and though they might have seen examples of sketchy work of a clever kind, they might feel assured that such work would not last long. A fine idea finely executed was what was required in sculpture. Let them look at the finished beauty of even fragments of Greek sculpture, and make that kind of work their test. He would especially say, be careful with the hands and feet of their figures; details which were often much neglected at present.

Bones were rather a bugbear of English

sculpture at present. The study and knowledge of the skeleton structure was necessary, of course; but bones were not hard and rigid like rocks, or to be shown so, even where they came near the surface. The skeleton should be mastered and then—put on one side. Let them show what Nature showed, and not try to show more. Flesh was of equal importance with bone; it was what we actually saw in the figure; one might apply the well-known proverb, "Beauty is but skin-deep" quite truly in this sense; and flesh modelling must not be neglected, as he feared it was at present, for it alone represented life.

He would advise them to absorb all the criticism they could, and not be too sensitive if it was unfavourable. It would be better if frank criticism were more the fashion. In default of that let them go to nature. He was not attempting to give them anything of the history of the art; he left that to able hands; and after all, if they wanted facts of history, they could find them all in the library. He was rather concerned with their practical attitude towards their art. A sculptor had to copy form as it actually existed, not, like a painter, to show its appearance only from one point of view. And they must bear in mind that truth to nature was concerned not only with form but with texture. Flesh was not of the smoothness of wax; and where a figure had to be made more than life size, the irregularities of surface forming texture had to be magnified in the same proportion. Sculpture was nothing if not vital; in copying life let them take care not to end in death. It had been said by a modern critic that sculpture had no limitations. They would hardly go far in the practice of the art without discovering that it had a good many; limitations in respect of size, shape, balance between subject and execution, etc. They could not model the Lord Mayor's Show; they could not model a landscape; and if the nature and suitability of subject had been considered they would not have seen such a subject as the representation of a public-house in a recent Paris Salon, with the innkeeper and a drunken customer at the door. The finest sculpture should represent a kind of dream, but a dream carried out with infinite patience in detail. Let them not be penny-wise and pound-foolish, in doing easily things of little merit, which might save labour now, but would bring them no ultimate return. Those who would be great in sculpture must labour hard.

At his second lecture on Thursday the 22nd Mr. Colton said that in advocating reference to nature he did not mean to imply that a sculptor might not be dissatisfied with his model and try to find a better one; but as a sculptor was to express himself in the most emphatic manner, and the most emphatic manner was the direct reproduction of nature. No doubt what he had said in the last lecture, that sculpture should be "a fine idea finely expressed," was open to all kinds of questioning; one might begin by asking, "What is a fine idea?" but they must avoid entering into abstract questions of that kind on this occasion. But he would say that the general ideal of what constituted good sculpture had been the same for the Greek, the Roman, the Renaissance, and the greatest of the modern French sculptors. But recently there was a new ideal set up of what might be called brutal execution. A giant rough-hewn out of a rock might be impressive on a great scale, no doubt; but was a reduction of that ideal to ordinary lifelike to take the place of the refined modelling which the highest sculpture demanded? This kind of thing was a part of the general hurry of modern life. Let an artist work to obtain technical skill, at the cost of labour and self-sacrifice, lest he awake and find that sculpture requires definite form which he is not in a position to supply. If he were able to set up what he would regard as an ideal art school for sculpture, he would make students begin with the living model; he would hide away all the antiques; then he would set them to making finished studies for some years, and then they might be let loose among the antiques, and would be in a position to understand them rightly. As it was, he could rather sympathise with the student who looked on the antique as a dull,

convention. Yet we loved the stone idols of the past when we saw them, not in rows in museums, but under the light of a southern or a tropical sun. Transplant them to the East and its vegetation, and they found their souls again. Even in Hindu temples the simple masses of white marble in strong sunlight were beautiful; and the caves of Elephanta contained some of the most wonderful sculpture in the world, carved out of the solid rock. It was a great descent from this to the work of the modern native sculptor in India, who was in fact a craftsman rather than an artist. Yet they must not overlook craftsmanship; a sculptor must be sure of his craft if he wished adequately to express his ideas.

Sculpture had become more or less popular lately, but unfortunately it seemed only to become popular when it had lost the freshness of its first ideals. The wonderfully fine French sculpture of fifteen years ago had given place to eccentricities which were out of the true field of the art; for sculpture must never be theatrical. The praise which was shouted from the house-tops generally went to what was false in the art. There was a modern form of what might be called "arts and crafts" sculpture, which attracted by a gaudy show of sparkling materials and colour; it was not the best, but it might have done some good by popularising the art. But sculpture could express attributes of human character; not by exaggeration of special features or form, which was not originality—it was no more "original" to copy the eccentricities of the "rough-hewn" school than it was to copy the severity of Greek art—but by waiting and watching till they could find and seize the central expression which represented the real and essential character. And in trying to represent soul, let them not forget that the adequate representation of the body came before that. Let them attend carefully to the modelling of hands and feet, often too much neglected at present. They must be sure of their strength in dealing with outward form before attempting to represent great moral qualities; and let them beware of exaggeration; the healthy was the sane in art. Thin ascetic forms were not, as seemed to be supposed, spiritual; the skeleton was not life but death. There was an absurd craze now for exhibiting figures with legs and arms lopped off (perhaps under the idea that it left more scope for the imagination); busts were shown with no crown to the head, or one side of a face without the other. In one exhibition he could mention a large proportion of the works in sculpture were initiated in one way or another; one did not know whether to take this as a sign of effort or as mere hypocrisy. Sculpture, again, should not represent the frivolous or absurd, and it should be as far as possible divorced from matter of fact. Sculpture, for instance, went very well with fountains, which were objects of a poetic association, and with gardens; and one was glad to find that the old cement and lead garden statues and garden ornaments were better appreciated now than formerly, and were being rescued from the gardens and bowling-alleys of country inns.

In regard to the intention or idea in sculpture, a man who was a mere craftsman would want ideas, but on the other hand the artist who had ideas could not adequately express them unless he had the skill of the craftsman; if he had not that he was lost. It was better to be in the position of a skilled worker than to be a dreamer without adequate power of expression.

On Monday afternoon Mr. Goscombe John lectured on "Modern Sculpture." After referring to the influence of Greek art, which continued long after the fall of Greece, which created Roman art and even largely influenced Renaissance sculpture, he referred to the work of Goujon and its highly decorative character, which resembled a good deal the style of the figures on Greek vases, yet with a character of its own. Germain Pilon was a sculptor with a wider range, and his work to some extent recalled Donatello. But the real father of modern sculpture was Bernini, who was a better artist than he was sometimes called, and who at all events infused into sculpture the element of vitality and the disregard of tradition. The Baroque archi-

ture of the period was restless in effect—was always doing something, and the sculpture of Bernini was in the same spirit. Pierre Puget was contemporary with the later career of Bernini; he showed more restraint in design than Bernini, but with both of them the style of modelling suggested clay or terra-cotta rather than marble. During the XVIIth and part of the XVIIIth century the whole of Europe was under the influence of Bernini. In Spain they had Alonso Cano, a sculptor whose work was very emotional in character and showed often very excellent execution. In the XVIIIth century they had Canova and Houdon, two sculptors entirely opposed in principle. Houdon's work retained its value; Canova's was gone, inasmuch as he merely aimed at copying the antique, and acquiring a high finish which made his statues look almost like wax-work. Houdon had a great sense of style and an insight into character, and he never made a mannerism of imitating the antique. Puget, Coysevox, and Coustou might be said to have prepared the way for Houdon. They produced especially a remarkable series of portrait busts, which were as fine as the ancient Roman work of the same type. The revival of the Classic spirit at the end of the XVIIIth century led to nature being set aside, and the production of doubtful "antiques," in which many men of very moderate ability made a temporary success. The Elgin marbles produced little sensation at the time of their arrival; the Apollo Belvidere and the Venus de Medici were the standard at that time. The Elgin marbles were believed by some to be of the date of Hadrian; even Flaxman only said of them that they were "executed with great effect." Reynolds died twenty years before the appearance of the Elgin marbles; had he lived to see them, some passages in his lectures in regard to antique sculpture would undoubtedly have been altered. Canova, however, predicted that they would reverse our ideas as to Classical sculpture.

Roubiliac carried on in England the tradition of Bernini. He was a sculptor of independent genius and great power of expressing emotion, but lacked the feeling of quietude; even the shoes and the buttons on his clothed figures seemed uneasy; yet he was a man whose work it was refreshing to meet with in an age of artistic commonplace and mediocrity. During the Classic revival in England the two most prominent men were Bacon and Flaxman, the former of whom won the first gold medal given by the Academy for sculpture. It was singular that Flaxman apparently knew nothing of the works of Bacon, who was an able sculptor, interesting for his picturesque detail; his statue of Chatham in Westminster Abbey, and his Dr. Johnson in St. Paul's Cathedral, were especially worth mention; he was a sturdy lover of nature, and based his style on that and not on the imitation of antique statues. He invented the pointing machine now so widely used for transferring the model to marble. Banks, of about the same period, was a sculptor of no great charm, but he had a certain power, and it was curious to note that his figure of the fallen Titan was rather like an anticipation of the style of M. Rodin. Flaxman was one of our greatest artists, but his outline designs and small sketches in sculpture were better than his large figures, which were not always very well executed, and the influence of Canova was too perceptible in them. Thorwaldsen, who was a pupil of Canova, and Gibson, who was in turn a pupil of Thorwaldsen, both carried on the "antique" formula of Canova; their works represented the essence of academical art reduced to a formula. Gibson was supposed in his day to be an intellectual sculptor, but he forgot emotion, without which art was mere pedantry. The work of this period had, however, the merit of being simple and sculptural in character; there was no pretentiousness about it; but it was dull. In all good epochs of the art sculptors had been inspired by Nature; sculpture must be a living art and must represent its own age; the Greek sculptors worked for the Greece of their own day. The study of ancient work only meant the production of lifeless forms.

France had always been producing great sculptors; there was no break in her artistic

history in this respect; and French sculpture was always vigorous with its own life and not depending on any outside influence. Her sculptors had written the nation's epic in marble and bronze. The art was never more nobly employed than during the last 150 years in Paris. The modern period was heralded by Rude, who died in 1855, and whose astonishing "Chant de Départ" which decorated the Arc de l'Étoile might be taken as the typical representation in sculpture of the revolutionary spirit. Rude furnished the link between the older and the modern French school, and his pupil Carpeaux was the first of a distinguished band among whom might be especially named Barye, Falguère, Dalou, and (among living artists) MM. Mercié, Frémiet, and Rodin. Barye brought into animal sculpture an entirely new life; before his day animal figures were mostly mere decoration of a very ordinary type; Barye created a school of animal sculpture, which in realistic vigour reminded one of the lion-hunting scenes of the Assyrian marbles. It was curious to note that the study of animal nature had so dominated his style that when he introduced human figures into his groups there was something animal in their character and expression. Falguère was essentially a modeller; his works had created an enthusiasm and had led up to the wonderful proficiency in modelling in the French sculpture of the present day. Dalou's works carried a suggestion of the open air, of inspiration from work-a-day nature; he was a product of the Republic, of the modern democratic France; he had however spent a good many years in England, and his "Triumph of the Republic" was actually designed at South Kensington. Barrias and Dubois represented sound tradition, perfectly scholarly work, but they had exercised very little influence. M. Frémiet and M. Mercié, the former a pupil of Rude, the latter of Falguère, had on the other hand exercised a very wide influence. M. Mercié's work, the "Gloria Victis" especially (of which an illustration was shown), was in the highest degree noble. M. Rodin's career was a fight and a protest; the polemical attitude taken up in regard to him was to be regretted, and did no good; he was an artist to be reckoned with in any case, and the future would judge his work dispassionately. For the students, let them go to nature, and they would not be in danger of being led away by eccentricity. He could not quit the subject of France without a reference to her great modern school of medallists, of whom M. Chaplain and M. Roty were the most conspicuous. Italy all this time was behind; her ancient glory had departed, and the chief merit of her modern sculptors lay in being very skilful carvers. There had been no German sculptor of wide reputation since Rauch, a sculptor of the Classic school, but with much picturesque force in his classicism; among the men of the present day Herr Begas was the most talented. Mr. John also referred with appreciation to the work of the Russian sculptor M. Troubetskoï, and to Mr. St. Gaudens as the first American sculptor of the day. The work of the late Constantin Meunier was mainly pictorial in its idea, though sculptural in treatment; there was no grace in his work, but it showed truth of character and sentiment. His modelling depended on structure, not on detail.

Since the days of Flaxman, England had Chantrey's admirable work; and he would also mention the statue of Wilherforce by Joseph, which was a very fine portrait statue, and in force of character might compare with Houdon's celebrated "Voltaire." Macdowell's "Nymph" in the Diploma Gallery was a beautiful work. Foley was a sculptor who was educated under the old order of things; yet his work, especially his equestrian statue of Sir James Outram, pointed to the coming change. Stevens was a splendid anachronism, whose work resembled nothing else in English and of his period; he was a Renaissance artist born into modern England. English sculpture had been very much alive during the last twenty-five years; Carpeaux and Dalou had exercised a great influence upon it, and Leighton perhaps most of all, who had assisted this art by every means in his power. After some cordial words of appreciation of Harry Bates and Onslow Ford, whose death had been such a loss to

English art, the lecture was concluded by the exhibition of an illustration of M. Mercie's splendid group representing "The Genius of Art," the last of a set of most interesting illustrations which accompanied the lecture.

LUTON SECONDARY SCHOOLS COMPETITION.

FOR this competition, conducted by the Bedfordshire Education Committee, ten architects were selected to compete, and Mr. H. Percy Adams was appointed assessor. We do not know, and from results it is difficult to judge, upon what grounds the ten were chosen in the first instance. At any rate the standard, with one notable exception, falls very far short of what we had looked for in a limited competition of this nature. More than half the competitors have utterly failed to justify their selection. Neither the assessor's report nor the report submitted by Messrs. Spalding & Spalding with their winning designs were on view at the Shire Hall, Luton, on Monday. All the other reports were, however, displayed. We do not like to suggest that these reports were designedly suppressed by the authorities at Bedford. Indeed, telephonic communication brought the assurance that the reports would be sent through in the afternoon. They did not arrive. We cannot, therefore, review the designs and the award on the same footing. But we cannot understand the award, and we cannot agree with it. The winning scheme may be the *cheapest* submitted, but a high price is paid for this cheapness. The plan violates not a few of the cardinal axioms in school planning, and it will be interesting, indeed, to learn how it fares at the hands of the education authorities in Whitehall. In the conditions certain requirements were set forth to the end that a Secondary School and Technical Institute for 300 children (150 boys and 150 girls) might be obtained at a cost of 6,000*l.* Competitors were, however, "at liberty to submit their own estimates of the cost, provided that they show clearly how much of the whole scheme can be carried out for 6,000*l.*, and yet be complete in itself and meet the requirements of the Board of Education." The site is irregular, with a frontage to Park-square of 108 ft. between adjoining buildings. There is a depth of about 350 ft., and on the left flank, some 180 ft. from the frontage line, there is a further space about 100 ft. by 70 ft., with a narrow frontage out to Church-street. To keep well up to the Park-square front, thus leaving a maximum area for playgrounds in rear, was apparently the problem. In Messrs. Spalding's design this is done, even to following the irregular existing frontage line; while in Messrs. Russell & Cooper's scheme the frontage is squared up by setting back a few feet, with much gain in dignity of elevation. We hold no brief for Messrs. Russell & Cooper, but their scheme stands out so far superior to all the others submitted that we are altogether at a loss to understand the assessor's award. It is a model of compact, convenient, and resourceful planning and design, adapted to the site in every way most cleverly, and it is withheld from expression by architectural fitness and dignity of expression. We can only suppose that the question of cost has weighed with the assessor to the exclusion of almost every other consideration. In Messrs. Spalding's design the six classrooms on the ground floor open directly out of the assembly-hall (64 ft. by 37 ft. 6 in.), three on either side. There is a very narrow gallery to the two sides and across the ends of the hall, with classrooms similarly disposed—three for twenty-five to the playground side, one for twenty-five and two for thirty to the fronts, and on the second floor there are three rooms corresponding to these latter, allocated to chemistry, physics, and cookery, except that a passage, 4 ft. wide and about 100 ft. long, badly lighted and planned as to stairs, is taken off the back of them. Two art-rooms, separated by the length of this passage, occur at the top of either staircase over the masters' common room and office respectively on the first floor, below which, again, on the ground floor, are the headmaster's room and the mistresses' common room. These latter are lighted into small and objectionable areas, and both have water-closets opening directly out of them, regard-

less of the fact that the "Head's" room would be used for interviews with parents and others. A passage against either flank wall of the site gives, past the changing and cloak rooms, access through to the playgrounds in rear, the boys on the left, the girls on the right. The cloak-room divisions form stalls 4 ft. wide, which would be the scene of much confusion and congestion. The entrances from the street are narrow, and have bicycle-rooms next them, into and out of which it would be almost impossible to negotiate a machine. The planning of the stairs is very bad, and their start from the ground floor could scarcely be worse. They are next the street, instead of next the playgrounds, and above they open out as "wells" some 14 ft. square. The assembly-hall has an open queen-post roof, and the lighting would be quite inadequate. The worktops are placed against the Church-street frontage, thus blocking any access there, besides being at some considerable distance from the school building.

In Messrs. Russell & Cooper's design few, if any, of the defects above noted are evident. The general disposition of the hall and classrooms is much the same, but there is a central entrance giving access to the headmaster's room, and office adjacent. The latrines and workshops are admirably planned into the irregular boundaries of site, and the playgrounds are made the most of. The arrangement of the second floor is incomparably superior to the winning one, and we should have thought that, even after getting both these schemes down to the same basis of cost, there would have been no question whatever as to the superior merits of Messrs. Russell & Cooper's scheme. Space does not admit our commenting further on the various designs, but it was observed that one competitor who had gone to the trouble of sending in two schemes—fifteen sheets in all—had apparently torn his name and address off them for some reason best known to himself, and which we will not endeavour to fathom.

THE ARCHITECTURAL ASSOCIATION: SPECIAL GENERAL MEETING.

A SPECIAL general meeting of the Architectural Association was held on Friday last week at No. 18, Tafton-street, S.W., Mr. E. Guy Dawber, President, in the chair, to consider the council's proposal to add the words "editor of the A.A. Journal" after the word "librarian" in by-laws 21 and 30, and substituting nine ordinary members in by-law 21 in place of ten.

The Chairman said that this slight amendment was proposed by the council as it felt that the post of editor of the A.A. Journal should be balloted for annually, as in the case of other officers, and, as it was not desirable to increase the number of ordinary members of the council, it was proposed that the editor should be an ex-officio member of the council. This will still bring the total of the council to seventeen members, as before. The council also feel that it is eminently desirable that the editor should always be a member of the council, in order to be *au fait* with the work and policy of the Association.

The Chairman accordingly moved to that effect, and the motion was agreed to *nem. con.*

The ordinary general meeting was then held, the minutes and nominations being read.

The following gentlemen were elected as members—i.e., Messrs. A. D. Leroy, J. A. Metham, D. Kibbler, E. S. Caldwell, H. C. Chatfield Clarke, J. E. Lee, F. G. Geary, C. W. Ferrier, and G. E. G. Leith.

New Premises Fund.

Mr. C. L. Fleming-Williams having been reinstated, the following further donations to the Building Fund were announced:—Messrs. E. B. P'Anson (second donation), 10*l.* 10*s.*; Ernest Newton (second donation), 3*l.* 5*s.*; P. H. Adams, 1*l.* 1*s.*; H. J. Rippon, 10*s.* 6*d.*

Porches and Approaches.

Mr. F. T. Baggally then read the following paper on "Porches and Approaches":—"In making the customary apology for the imperfections of this paper, I may say (and you will readily believe it) that my chief embarrassment has been the enormous number

and variety of examples that might be quoted, and the consequent impossibility of covering the ground at all adequately. I have failed to find satisfactory drawings or photographs of a few examples it would have been interesting to illustrate; but, again, the chief difficulty was to reduce the list to one that would not weary you. I am greatly indebted to Mr. Alan Potter, hon. secretary of the Architectural Association Lantern Slide Committee, for help in selecting slides, for getting some made, and, in two or three cases, for the original photographs.

Introduction.

In this room no apology can be needed for calling attention to the fact that, in many cases, nearly as many opportunities for architectural treatment are to be found in the surroundings, the accessories, and especially the approaches, of a building as in the building itself. It is true that in the middle of crowded towns land is too scarce and dear for devotion to such amenities; unless the building be a public one or a palace. But in the open country and the villages, and even in small towns and suburbs, the meanest cottage or villa has at least, or ought to have, its proper forecourt. And many a commonplace building, great and small, has been redeemed from insignificance, many a beautiful one has been raised to the first rank, merely by the treatment of the approaches, or even by the addition of a well-designed porch to attract the eye and concentrate the attention of the passer-by.

In this country, at any rate from the time of the Druids until the last few years, there has never been any attempt to form those grandiose and impressive approaches which most other nations, ancient and modern, have deemed appropriate in the case of especially important or sacred edifices. And we have no porches which will compare, for instance, with those of some of the French cathedrals on which the masons lavished so great a wealth of art and religious fervour. Our mediæval forefathers spent, however, art and money on porches and gateways with enough liberality to show that they regarded such features as of more than ordinary importance. And from the Tudor period down to the beginning of the last century, the art of contriving decent and dignified approaches to private houses was well understood both in England and Scotland, and almost universally cultivated. If people did not rise, and could not often be expected to rise, to the magnificence of Bacon's three princely courts, with their walls and turrets, terraces, and colonnades, architects (as is proved by existing plans), and the owners of a few great houses, strove to get within measurable distance of that ideal. And even the smaller houses, whether in town or country, were generally approached through at least some sort of enclosed forecourt of a formal and architectural character, with an outer gate on which a decent amount of art and money were spent.

The ideas and circumstances of the XIXth century led, however, to a deplorable change. Formal approaches almost disappeared with formal gardens in a vain and childish attempt to imitate the beauties of natural landscape. The stately gateway, the straight avenue, and the spacious forecourt gave way to a sort of glorified field-gate and a serpentine-road which seems to turn aside every few yards to avoid a laurel or a nettle, reveals, by carefully-arranged accidents, occasional glimpses of the surrounding scenery, and at last lands one, sideways and unexpectedly, at the door of a mansion, which, if the art were entirely successful, would seem to be situated in the midst of a wilderness. The bard utilitarian spirit of land and building speculation has dealt even more hardly with the forecourts of small suburban and roadside houses, which, except for a cheap gate and a bit of cast-iron railing, are left to be dealt with by tenants who have but a few years' interest at most in the property.

But as the love of beauty and appreciation of art grow and spread in the nation (as we all hope they are doing) we, as architects, are beginning to be called upon again to consider and to contrive those decent accessories and approaches without which a building, with even the smallest architectural pretension, is but a kernel without a shell, and, one with the greatest, a jewel without a

setting. From the point of view of this paper it is especially worthy of note that the most striking sign of the better spirit has been the scheming of a grand processional approach road to London's Royal palace. It is true that an untimely, and considering the occasion unlooked for, parsimony on the part of the public has shorn the work, for the present at any rate, of most of its architectural adornments. But the mere fact of its inception and execution is an encouragement to consider the question of architectural approaches generally.

Egypt.

Without attempting a strictly historical treatment of the subject, I may reasonably first call attention to the approaches to the great Egyptian temples as among the most notable examples of the grand manner.

In their case the spacious open courts which have a prominent place in almost every great architectural scheme, ancient or modern, were in the strictest sense forecourts, and are supposed to have been a development of the walled spaces or outer defences in front of the mouths of caves, which were naturally used by the original inhabitants of the Upper Nile valley for dwellings, tombs, and temples.

When the great temples of Thebes were built the original purpose of the forecourts may have been forgotten, but their varied usefulness as well as tradition secured their survival. They secured privacy for the temple proper, and space for ceremonies and processions, attended probably by large crowds of worshippers; and the porticos which flanked their walls internally were, in that climate, no doubt, a sufficient dwelling for the many servants and hangers-on of the establishment. In any case, a second, or even a third, forecourt was in several cases added by the pride or care of successive generations.

But the most striking feature of the approach to an Egyptian temple, a unique one in the history of architecture, was the pair of great towers which flanked and dwarfed the outer gate, and formed the front wall of the forecourt. We call them "Pylons," after Herodotus, and the proper Egyptian term seems to have been "Sebchet," which had much the same meaning—merely "door."

They were rather exaggerated walls than towers. Of little depth, but so high that they always overtopped the temple proper, sometimes by 100 per cent., and so wide that they usually well overlapped the side walls of the court. Their faces were smooth and slightly battered, and the main purpose of their peculiar form was evidently to provide a spacious and suitable field for the illuminated texts of the sacred scribes. Almost as certainly, I think, they represent the face of the cliff surrounding the narrow entrance to the original cave temple, which must have been used for the same purpose.

In front of the pylons were obelisks and colossal statues, usually seated. And, in some cases, it is said, the gate was approached through an avenue of sphinxes.

At the opposite or inner end of the nearly-square forecourt, between the court and sanctuary in the original arrangement, was either a deep open portico or an enclosed hall of close set columns, the most important feature, architecturally, of the whole group. In most cases, when a second court was added the arrangement of pylon, court, and hall (or portico) was repeated, and the famous hypostyle hall at Karnac was the hall of such an addition; behind it is the pylon of the original court. The whole of the approaches, therefore, to the Egyptian temple, when fully developed, were an avenue of sphinxes, a pair of pylons, a forecourt, a hypostyle hall, perhaps a second pair of pylons, a second court, and a deep portico or second hall of columns.

Chaldea and Assyria.

In Chaldea the temples were mere shrines elevated on steep terraced mounds, and approached by flights of steps or winding inclines. But, according to more recent discoveries, these were approached like the Egyptian sanctuaries, through one or two forecourts with more or less striking gateways. Several such gates are represented in the bas-reliefs in the British Museum, and usually consist of a square-headed opening

flanked by square crenellated towers as if for defence. In Assyria the Royal palaces were the principal buildings; but of the approaches to them we only know that, since they stood on mounds, they must have been reached by flights of steps, with inclines, probably, for the chariots. The main gateways seem to have had semicircular arches faced with glazed tile or faience, judging from the city gate discovered by M. Place. The responds of the arch were huge sculptured bulls with human heads, some of which have been removed to modern museums. There are two very fine ones in the British Museum.

These gates were sometimes pierced through towers, and sometimes flanked by smaller ones. The sumptuous style of the staircases leading up to them may probably be fairly estimated from the ruins of those to the Palace of Xerxes at Persepolis, a building of much later date, but the general style of which was largely based on the Assyrian palaces. Perhaps I may be excused for showing at this point a view of a Japanese temple which I found in a French journal, and which seems to me to exhibit the effectiveness of stairs and terrace approaches even when combined with grotesque architecture and an incomplete symmetry.

Greece.

Returning to the prehistoric styles further west, the approaches of the Mycenaean palaces differed again entirely from all those hitherto noticed. They were more like the approaches to a Norman castle. Indeed, the resemblance is striking if you forget the drawbridge and overlook questions of style. There may be nine-and-sixty ways of constructing tribal lays, but perhaps there is only one of constructing the approach to a tribal chief's fortress. The palace was built on a hill-top, and was only to be reached by a narrow road ascending the flank of the hill and exposing the right or unprotected side of assailants to the kind attentions of the defenders on the walls. There were several narrow gates to be passed, and they were carefully situated in internal angles of the wall exposed to a cross-fire of stones and darts. Utilitarianism of the sternest kind was alone considered until the main gate leading to the forecourt of the palace was reached. This, judging by remains, was more sumptuously treated, with internal and external porticos supported on columns (probably wooden columns).

These porticos may have served both as shelter for the guards on duty and as the court of justice of the king or chief, in accordance with the practice of semi-barbarous chieftains in the East in all ages. Greece is not, perhaps, strictly Oriental. But the Huns, at a later date, brought the practice with them, much further west, and all we know of the Mycenaean civilisation, including the plans and decorations of the palaces, suggest an Eastern origin.

The gateway on the Acropolis at Athens, the admiration of the ancient world, and called by them emphatically "the Propylea" (it is said the term was never used until modern times for any other gate) was undoubtedly merely a rebuilding, on a glorified and extended scale, of the gateway to the old palace of the kings of the Mycenaean period. The approach to the gates (the plural form of Propylea is said to have reference to the two gates, or two leaves of the gate, and not to the porticos) curiously enough, as it seems to us, remained the old narrow steep pathway winding round the bastion from the south. Whether, if war had not intervened to stop the work, the road would have been improved, too, it is impossible to say; but somehow it was hardly the kind of feat that one suspects would have appealed to the Athenians even if it had been safe. The genius of Greek art, however refined, seems to have been narrow. There is no clear evidence that it ever extended from the consideration of a single structure to a group. A little superstition or priestly jealousy was allowed, even at Athens, to cripple or to crowd the finest works; and each had to stand alone, neither leading up to anything else, or itself the crown of a comprehensive scheme. It is true that in many, perhaps in most, cases there was a wall and portico enclosing the court or "temenos" in which the temple, or several temples with subur-

dinate buildings, stood. But, in all cases with which we are fully acquainted, the form of the court, the position of the gate, and the situation and orientation of the various buildings seem to have been entirely fortuitous, or decided in each case separately, without reference to the rest.

In considering Greek approaches, unless we accept partial and inconclusive evidence, we can only admire the fine judgment and unweary industry of the artists in refining the proportions and the details of porticos such as those of the Parthenon and Theseum; wondering whether it was really worth while; feeling that at any rate such an effort is beyond us in the present day, and might even be rather absurd.

Rome.

Of the ambitious spirit of the Imperial Roman architects in designing and carrying out the most splendid schemes of approach, there is, on the other hand, ample evidence in history and in the ruins of some of them. Marble porticos, surrounding and leading up to spacious courts: and decorative arches, triumphal, memorial, or merely emphatic of an entrance or a particular point, were the chief materials with which they produced their effects. But they did not disdain on occasion a fine flight of steps; and, as their native temples were mostly raised on a high podium, that feature was common.

The completeness with which Roman work has, in almost all cases, been destroyed unfortunately leaves little for illustration except a few ruined arches, rows of columns, and some plans.

Triumphal arches were more often than not erected as entrance-gates; in many cases in the provinces as the main entrance to the city. Among the well-known examples, the arch at Rimini was the south-east gate of the town, on the Flaminian way. That at Berneventum was the eastern gate on the Apennian way. That at Orange, in France, was the northern gate of the town. Those at the naval station of Pola, in Istria, at Treves, on the Moselle, at Autun, and at Verona, were all city gates. The late "Arch of Hadrian," at Athens, was the gate of one of the quarters or suburbs of the town which he rebuilt. The fine arch of Trajan, at Ancona—so much finer in its erect simplicity than most of the over-enriched work of that emperor—was the entrance to the quays which he built. The arches at St. Chamas were the entrances to a bridge; and so on.

In Asia and North-Africa most, if not all, the Roman city gates were of a similar, though plain, architectural character.

In Asia the city gate was often but the end feature of a street lined on both sides with either marble colonnades or covered porticos, leading right through the town or up to its main feature. In Palmyra such a street seems to have existed before the great temple of the Sun, or before the latter became the great feature and main glory of the city. And, as the street did not run directly towards the temple, there was a bend to disguise when it was desired to make the one lead up to the other. This difficulty was overcome by the arch seen in the view, which is built on the wedge-shaped plan familiar in doors on a small scale to all practical planners, but never, I fancy, seen elsewhere on such a scale. Such streets are said to have existed from very early days—170 a.c., at any rate—in Asia; but we do not hear of them on any great scale in Europe, except in the case of Constantinople, where one led from the forum to the palace.

The triumphal and memorial arches erected in Rome itself seem to have been generally isolated monuments; but the arch of Trajan was the entrance to his forum, and the forum was the forecourt to the Ulpian basilica. The arch had a single opening, but was decorated with sculpture in the rich and heavy style which, it is suggested, was due to Trajan's Spanish taste. Some of the carving is now to be seen on the arch of Constantine.

The forum was nearly a square of 400 ft., and on two sides had a double portico and an immense semicircular recess or hemicycle. The basilica occupied the whole of a third side, and was what we should call "double-aisled," with a large apse to accommodate a magistrate's tribunal at each end. On the

further side of the basilica (from the forum) was the great column, which could be viewed from the galleries surrounding the small court in which it stood; and beyond that again the temple of Trajan.

The whole group of the arch, forum, and basilica, and the small court may reasonably be looked on, from the architectural standpoint, as the approaches to the temple of Trajan, the crowning feature of the most magnificent of Roman works; or the one, at least, which most forcibly struck the imagination of those who, in later times, saw it when partly ruined.

Another finely-conceived approach was created in Rome by that great building emperor, Trajan's successor, Hadrian. It led to his mausoleum, now called the Castle of St. Angelo, and took the form of a bridge over the Tiber leading from the stone quay on the city side right up to the gate of the mausoleum (the quay on the mausoleum side now hurries several arches of the bridge). There were, of course, as in the case of other ancient bridges, arched gateways at the ends, which, like the decorative parts of the mausoleum have disappeared; and if it were not for Bernini's angels the whole affair would now be very tame and uninteresting. The temptation to dwell on Roman approaches of the Classic period is great. They were so well conceived; but they are difficult to illustrate, and I will only mention one other example, that at Baalbec. I do so on account of its many curious and interesting peculiarities.

A flight of over fifty steps, 150 ft. wide, leads up to a front close on 240 ft. long, and consisting of an open portico of the Corinthian order, stopped at the ends by what are supposed to have been towers (towers open at the sides to the portico). Behind this broad porch is a hexagonal court, surrounded by a peristyle, and outside the peristyle deep recesses (an arrangement like an aisle with chapels outside it). Beyond this was the great forecourt of the temple, about 400 ft. square, also with its peristyle and recesses. The temple itself was raised on a podium reached by another flight of steps. The most singular feature is the hexagon court, and if you look at the plan of this with the long portico and two towers in front of it I think you must be struck by its resemblance to the plans of such buildings as the Minerva Medica, at Rome, and San Vitale, at Ravenna, both of which are, however, on a much smaller scale. The long portico with its towers, which was built by Antoninus Pius about 160 A.D., would probably be found to be neither singular nor original if we knew more about Syrian buildings. Herod's temple, erected nearly 180 years earlier, and several others, seem to have had similar porches. Another curious feature at Baalbec, one which is found in other more or less contemporary buildings in the east of the empire, but did not reach Italy until later, is the breaking-up of the entablature into an arch over the middle intercolumniation of the portico, the space being made especially wide for the purpose.

Persia.

Of the buildings of Rome's great rival, Persia, we know but little. Of courts and gates I have found one solitary plan. But the entrance to the palace itself under the Sassanian dynasty was too remarkable to be passed over. It consisted of a large and lofty hall, end-on to the front of the building, but recessed into it and vaulted with an elliptical barrel-vault, the major axis of the ellipse being vertical. There was no outer wall whatever at the front end, so that the appearance was something like that of a huge cave nearly as high as the wall. This entrance hall at Ctisophon was 163 ft. deep by 86 ft. wide and 105 ft. high. At Firouzbabad it was 90 ft. deep and 45 ft. wide, and two apartments not very much smaller opened into it on each side in the same cave-like way.

There is a curious superficial resemblance between the elevations of the front of the palace at Ctisophon and the front of Lincoln Cathedral. It is only superficial, for the great arch at Lincoln is quite shallow, and one can hardly suppose the resemblance anything but accidental.

* Dimensions from Mr. Spiers' paper in R.I.B.A. Transactions, 1891.

Early Christian.

In the first few centuries after the great revolution, when Christianity became the State religion of the Roman Empire, and the capital was removed to Byzantium, architecture, in both the east and the west of the empire, was almost wholly occupied with the building and rebuilding of churches. The last remnant of pagan worshippers were eventually scattered by a destruction of the temples as deliberate and as sweeping as was, say, the destruction of images by the reformers in this country. But before that happened the followers of the new religion were already divided on points of doctrine, and during several centuries, as the balance of authority or popularity swayed from one opinion to another, every church in turn was subject to attack, and was sometimes destroyed. In such circumstances it is not surprising that the churches assumed on the outside something of the forbidding aspect of a fortress. Among other things the entrance to every church was guarded by a broad narthex, or porch, and a spacious forecourt—sometimes, in this style, called an atrium. The latter was surrounded by a high wall with a portico or cloister on the inside, the main object being, without doubt, to provide a refuge for defence in times of need for those members of the congregation for whom there was no room in the church. If the particular doctrine professed by that congregation triumphed, the court was promptly filled again with penitents seeking admission or readmission. All the earlier examples of these courts have either disappeared or been rebuilt, and I can only show you the well-known one in front of the church of St. Ambrose, at Milan, which, though it used to be attributed to the IXth century, can hardly be earlier in its present form than the XIIth. It is not so square in plan as seems to have been usual; indeed, it is a double square. And it has cross-vaults and clustered piers.

The proper place for penitents in times of peace was the porch—or, as we call it when it extends across the whole width of the building, the narthex. Since religious revolutions were frequent, and the penitents on every occasion numerous, and since they were sometimes kept a year or two before being readmitted, one can readily understand the necessity for so much space. The narthex of "St. Laurence without the walls" at Rome is unquestionably made up mostly of materials of very early date. The church was built about 330, with a narthex at the other end. But the orientation was reversed in 578, when a new nave was built and the old narthex apparently built up and converted into a sacristy. It is not unlikely that four of the columns which are spirally fluted, and all the ionic caps and entablatures came from the old narthex. But they all seem too good even for the IVth century, and were probably, in any case, stolen originally from some classic building. The same is no doubt true of the materials, or the most part of them, making up the narthex of Civita Castellana Cathedral. The central arch is an effort beyond the architectural skill, and out of keeping with architectural style, of 1210 A.D., when the building was erected (as is recorded in two places upon it).

Medieval Italy.

But before the end of the XIIth century the spacious portico of the ancient world, which stretched across the whole width of a building, and was part of it, often the chief part, architecturally, was disappearing in Italy. Having given to the architecture of that country such approaches as the porticoes of the Pantheon, St. Vitale, S. Ambrogio, and last, but not least, St. Mark's, it had to give way, in deference to the almost universal poverty of the times, to the porch; a feature proportioned to the door and not to the building. I think it is in Street's "Brick and Marble Architecture in Italy" that attention is called to the fact that the porch is a feature confined to the north side of the Alps. And, though that is not strictly true, the porch has never flourished in Italy. There are plenty of those deeply-recessed doorways, of which it is always hard to say whether they should not properly be called porches. But the porch proper is rare, and, with two or three

exceptions, is only found in the form of a shallow arched hood tied with an iron rod and resting on two columns: which columns often stand on the backs of lions or griffons. This form lasted from the XIIth to the XVIIth century, with changes only in ornamental details. On examination a good many of those attributed in guide-books to the XIIth or even later. The two at Bergamo are of the XIVth. That on the south side of the church bears, according to Street, the date 1360, and the name of the mason. But some, such as the porches of Modena Cathedral, S. Zeno, at Verona, and others, may very well be work of the latter part of the XIIth century. The south porch at Ancona is possibly of that date, but the west one is almost certainly XIIIth century work. If you look closely at the photograph, too, you will see clear indications, at the springings of the arch, and in some wall shafts outside the porches, that it was once a triple porch, with three doors into the church. I think the irrational idea of putting the columns on lion backs must, though some critics will not have it, be borrowed from the East, where the fashion is ancient and persistent. The beast, whether lion or griffin, has often another beast or man in his paws, and they are said to represent supporters of the church, or of orthodoxy triumphing over saracens or heretics—a piece of symbolism which would not have seemed so childish to the ignorant and barbarous folk of the XIIth and XIIIth centuries as it does to us.

The most remarkable of Italian church porches is the gigantic one attached to the church of S. Antonio Piacenza, and called "Il Paradiso." The pinnacles and wheel-window are quaint and, I think, pretty. The size and the form of the structure are unique; but how it could acquire the name of "the paradise" is a puzzle. One can only suppose it was different when first built. The buttresses look as if they were additional. Not impossibly it was stuccoed and enriched with paintings. The only other Italian church porch that I know, and that is worth a passing reference, is at the west entrance to Ferrara Cathedral. Like the last, it is unique; but it is its beauty that makes it so. And it must owe its beauty almost certainly to some French mason who, at a later time, added to the regular XIIth or XIIIth century Italian porch an upper story which, as Street said, looks at first sight as if it had been transported from Northern Europe.

Medieval France.

However restricted one may find the subject of porches when dealing with Italy, the same cannot be said of medieval England and France; where churches and cathedrals afford an endless and varied series of examples, on which, it is the merest platitude to say, the artists concentrated their best work. This section of my subject is, however, so familiar to most of you that I do not propose to go into it at much length.

France claims attention first, on account of its superiority in the richness and number of first-rate examples: and also, I think, on account of its having been rather earlier in the field. The magnificent series of the great cathedral porches allied to those at Chartres and Amiens cannot be equalled or approached by any series of existing works of any age or country; either for richness, for beauty, or for a deliberate and spirited effort to lift the mind of the entering worshipper to higher things. It seems to me that their merit is enhanced by the fact that in outward appearance many of them fail to show as porches. Built between salient buttresses, and surrounded by galleries, parapets, and pinnacles, they are artfully confounded with, and form an integral part of, the front. Instead of projections we seem to see deeply-recessed doorways. This series, with its alternating shafts and statues in the jambs, and its sculptured tympanum and central shaft, probably owes its origin to the XIth or XIIth century portals, of which two famous ones in Southern France, at St. Gilles, and at Arles have survived as samples. In its later developments the coping of the gable parapet came down and joined the good mould at the bottom, and curving upwards ran up into a great finial. And the

space within and around it was filled with light flowing tracery or sculpture. Eventually, as at Tours and St. Riquier, this aspiring moulding was snubbed off, as it were, a little above the top member of the arch, leaving a curiously-shaped panel; and the flamboyant detail melted, almost imperceptibly, into the more classic forms of the François I. style without losing either its richness or its apparent complication.

These triple porches are the typical French Gothic portals, and the telling porch of the little church of St. Maclou, at Rouen, which everyone knows, and which, I think, everyone must admire, may perhaps be considered only a clever variation in plan on much the same theme. There are, of course, other

types; and if among the members of the cycle and camera clubs there are any students of Gothic left: or if they get tired of touring their own country, I can strongly recommend them to the village churches of France. They would find a tour there enrich their minds at no great loss to their pockets. At present, as I want to get on to English work, I will only mention one other French porch—an early one at the ruined church of St. Pierre, near Vezelay. It is a low building, three aisled, of the full width of the church, and almost as much projection. It is groined from slight piers internally, and its form reminds one of the Galilee, at Durham. I shall be glad if anyone can explain its purpose to me.

English Ecclesiastical Gothic.

Among English Gothic porches, none, of course, can touch the great western portico of Peterborough Cathedral. Indeed, notwithstanding its comparative plainness and simplicity, it is at least as much greater artistically as it is physically than the porches of Chartres. The architecture of the Middle Ages cannot show its equal in Europe, and one must always regret that the genius who conceived it is robbed of a just fame by our ignorance of his identity. Unfortunately, if we looked for other English Gothic porches that anyone could think of comparing with the French ones, we should be driven to rely on the Galilees of Ely and Lincoln. We could justly claim that they owe their beauty;



The Haarlem Gate, Amsterdam. (See page 223.)

not to the profusion and the intricacy of ornament on which the French examples largely depend; but to the more solid architectural qualities of restraint in design and an almost Greek refinement of details, especially of the mouldings (the French masons never touched the English in their mouldings). The difference is typical of that between French and English Gothic as a whole; perhaps of that between the characters of the two nations. We should have to confess, on the contrary, that the chief beauties of these two porches are almost lost to the casual observer by being hidden in somewhat dark interiors. That is possibly due to our climate suggesting more strongly an enclosed porch. But it seems typical, too, of our national tendency to seize on a slight practical advantage as an excuse for avoiding display. We call it common sense; but when it is not parsimony it is generally merely the nervousness of a touchy pride which fears criticism. Of our other cathedral porches the most worthy seem to me to be the triple porch at Salisbury, the south transept porch at York, and the south porch at Gloucester.

We can show no English examples richer in sculpture than the south porches of Canterbury and Gloucester cathedrals. And in those cases it is all modern restoration. But supposing it to have been originally equal to, or better than, the best French work; and admitting that at Gloucester it is placed and arranged with admirable taste and judgment: it can never have made these box-like structures worthy entrances to great cathedrals. At Canterbury the architectural lines and proportions are quite uninteresting, if not actually bad. And although at Gloucester the reverse is the case, and the work may justly claim our admiration as a very fine and typically English example, it does not rise much above the level of innumerable parish church porches all over the country. The grand three-story south porch of Burford Church, Oxfordshire, the south porch of Beccles Church, Suffolk, and the well-known south porch of St. Nicholas, King's Lynn, which all belong to much the same period (called in the guide-books the Perpendicular), must have been very nearly as rich and beautiful before their images were destroyed. The north porch of Thaxted Church, Essex, though less sumptuously ornamented, is better proportioned and more satisfying to one's architectural instincts than either.

The south porch of the same church is also interesting on account of its great projection which allows of entrance arches as well as windows in the sides. The south porch of Boxford Church, near Sudbury, is another very fine example of the same period, though only one story high. If one were seeking to classify late English porches, all these, except the Beccles example, might be distinguished by the cornice and parapet forming a low-pitched gable. Whether that means a rather earlier date or only another type does not, perhaps, much matter. But, in the eastern counties, with which I am best acquainted, most of the numerous porches that date from the latter half of the XVth century are finished at the top by horizontal lines. The south porch of Southwold Church is typical, and perhaps the finest example of a class which is very common all over the coast country of Norfolk and the north of Suffolk, and far inland on the borders of the two counties. These porches would be effective in any case on account of the fine proportions of the whole, and of every part. But they owe their richness to the peculiar form of decoration employed, which is produced by letting very thin flakes of black flint into the surface of flat stonework. All the panelling, the tracery, the letters and monograms are formed in this way. The flint flakes are chipped away from the back to form a knife-like edge, which can then be trimmed to shape, and the hollows in which they are set are so shallow as to be scarcely perceptible where the flakes have fallen out. But, owing to the contrast of colour, the effect, so long as they remain, is nearly equal to that of pierced work. The same decoration is applied to other parts of the buildings, particularly to plinths and parapets, and the spaces between clearstory windows; but that is another matter. Very beautiful two-story church porches of a somewhat earlier date are to be found at

Northleach, Gloucestershire, Leverington, Norfolk, and St. Margaret's, Leicester, among other places. The porches without an upper story are usually less effective. But there is a very fine one of the middle period at St. Mary's, Beverley, which is illustrated in Rickman, and some of the early XIIIth century ones, now ruined, such as those at West Walton, Norfolk, and Higham Ferris, Northampton, must have been exceedingly rich internally. The porch of the Temple Church in London is unique, to the best of my knowledge, and forms a class by itself. The typical late English church porch of the larger sort must be referred back for its type and origin to such Norman examples as the north porch of Southwell Minster.

But there is also among village churches a common class of wooden porch of late date which seems to have arisen from the addition of what one may call screen-work to the timber construction of the village carpenter—with the addition of a moulding or two on the arrises of the timbers. Such porches are usually so ruined that the existing in fair condition of a wooden porch of obviously earlier date is rather surprising. If I had not seen the north porch at Boxford myself, I should have been tempted to put it down to some restorer; the more, since it is such an imitation of a stone porch with vaulting and window tracery complete as one does not readily put to the credit (or discredit) of our forefathers. It is probably unique: it must be badly decayed; and it is to be hoped that some young man, with time for such things, will make a careful measured drawing of it at once before it is either pulled down or "restored."

There is one more English church porch that must be mentioned before leaving that branch of my subject, though it is not Gothic. It is the familiar porch of St. Mary's, Oxford. In the present condition of architectural taste I am tempted to characterize it as the most beautiful of all.

The precincts of all great ecclesiastical and conventual establishments were, of course, walled in; and the approaches guarded by gates or gatehouses, having more or less architectural character. A very large number of these remain, especially in our cathedral cities. But the diversity of their forms and characters rather bewilders anyone who tries to describe them, and entirely precludes classification. Between the grand, but heavy and forbidding, XIVth century gatehouse on the hill at Ely, which I suppose most of us know, and the light and gracious late structure at Worcester, with its pelling and its gallery of windows, there is almost every conceivable form, and every degree of ornamentation. Both these have level parapets, but gables are more common, and seem most appropriate when turned to the front. Occasionally they face the sides, and occasionally both front and sides. A large number have but one opening; or had but one originally (a second has sometimes been made in modern times). A few only had two openings, a larger one for wheeled traffic and a smaller for foot passengers (like the holes for the cat and the kitten which legend says Sir Isaac Newton made in his door). The Worcester gate is the only one I can remember with three. As seems natural and proper, the outside is usually plainer or sterner-looking than the other, though where there is a lodging over the gate, as there more often is than not, there is generally a window on the outside for a lookout. I have chosen the Workshop Abbey gate for illustration, partly as being more or less typical, but mainly on account of its gables, which make a good architectural group, and for the incidental interest of some remains of an old cross just outside the gate. Norwich possesses two gates which are of exceptional interest on account of their unusually rich and symmetrical design. The earlier is the Ethelbert gate, built about the last quarter of the XIIIth century, a really fine piece of work, but much spoiled by an incongruous and absurdly ugly modern parapet of flint inlay. The other, the Erpingham gate, built by Sir Thomas Erpingham, who figures in Shakspeare's "Henry V.," if less vigorous in design is almost as elaborately decorative and is not spoiled by any modern addition.

Medieval Cities and Castles.

Of an altogether different class, and

much more formidable, were the gates that guarded the approaches to the castles and cities of mediæval Europe. And of these, again, a much larger number remain even in this country than it is possible to refer to in a single paper. The earliest form of such gates in England is to be seen in the ruins of some of the Norman castles, which were built before any of the fortifications of towns; at any rate, before any that are now left. It consisted of a narrow gateway in a lofty tower, the front being occupied chiefly by two enormous turrets, circular on plan, flanking and appearing to crowd and threaten the gate; as, indeed, they were meant to do. The tower was, of course, crowned with machicolations and parapets. The base was battered to facilitate the attentions which the owner desired to pay to unwelcome visitors. And the gateway was further protected by an iron portcullis, and, except in very inaccessible situations, by a moat and drawbridge. This form of gate persisted in essential particulars in most city and castle gates; and later, in mansion gateways in England up to the reign of Elizabeth, and is to be found even in the XVIIth century.

As time went on the turrets became less important. They were made smaller, or placed further apart, and the circular form was less insisted on. In the Micklegate bar at York, built about 1300, the turrets are quite small, and the lower part is square. At Caernarvon Castle they are polygonal; at Alnwick Castle they are square; at Harstmonceux, the youngest of the English castles (1446), the turrets are fanciful; octagonal below and circular above, with smaller circular turrets standing up within the parapets.

There are few things more picturesque to be seen by the tourist in some of the unspoiled towns of the Continent than the old city gates. I do not envy the man with a brush, a pencil, or even a camera, who could see the Haarlem Gate at Amsterdam (see page 227) and leave it alone, however often he may have seen illustrations of it before. It may be that there is not really much in it in the way of architectural detail, but it groups splendidly; there is the most delicately-graduated light and shade, and there is colour, to say nothing of a bridge and water in the foreground. What more can a man want?

The bridge and the water *do* make a difference. I doubt if people would think so much of the gatehouse at the bridge-end at Prague, which we often see sketches of, if there were no bridge. Many of the old French and German towns, and especially the towns of Holland and Belgium, can boast gates which, in other respects, are as picturesque, but we rarely see drawings of them. Germany is especially rich in city gates, and has even some early Renaissance examples, which are, however, more or less heavy, coarse, and ugly. Our own charming little "Temple Bar" is possibly unknown to some of the younger men; it is worth a journey to Waltham to see.

[The remainder of Mr. Baggallay's paper and some notes of the discussion which followed, will be given next week.]

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

III.—THE RITZ HOTEL, PICCADILLY, W.

The growing desire for hotel life has in recent years found marked expression in many of the large buildings in the West-end of London. The latest, and in some respects the most important, example is the Ritz Hotel, now nearing completion, of which an inspection was made by a numerous body of members of the Architectural Association on Saturday afternoon, February 24, the occasion of the third spring visit. The party was conducted through the building by Mr. Bishop, who has supervised the entire erection and collaborated with the architects for the work, Messrs. Mewes & Davis.

The most interesting aspect of the building lies in the planning. The main frontage, of some 232 ft., suggests a proportionate depth of site, but when it is seen that the Green Park front is only 87 ft. and that the corresponding return in Arlington-street but 102 ft., the problem of scheming a hotel to conform to the London Building Act and at the same time to show financial justification is one of considerable difficulty.

Accommodation is made for 160 to 180 guests and their servants, in addition to a large hotel staff, and the whole is distributed over nine stories. The entrance to the hotel is placed on the Arlington street side, where the left revolving door will be erected. To the left is the main staircase, while immediately in front is a long corridor or lounge extending to a large restaurant at the other end of the site facing the park; windows and floors are arranged so that a view of the trees in the park may be obtained upon entering. About halfway in the length of this corridor on the left, a top-lighted winter garden is planned opposite to the Piccadilly entrance on the right. This latter entrance is intended to serve the banqueting-hall and private dining-room in the basement, and the restaurant and ladies' dining-room on the ground floor, and thus keeps the hotel and the outside business distinct.

A mezzanine or lower ground floor is wholly a service floor, containing kitchen, sculleries, pantries, and stores, while the remaining parts of the basement not used by diners are set apart for boiler-house, ventilating appliances, ice-making plant, water-pumping house, and staff dining-rooms.

In addition to the departments already named, the ground floor has provision for office, etc., passenger lifts, and six shops in the eastern half of the Piccadilly front.

The upper floors from the first to the sixth contain bed, sitting, and bath rooms and rooms for visiting servants. The principal rooms are arranged in suites extending throughout the north and west façades, so that the whole floor can be let as a single suite, without communication with the main corridor. These servants' rooms, although enjoying the sunny aspect and overlooking the inner court, are placed on the south side of the main corridor in juxtaposition to their respective suites of rooms. Small internal areas provide light and air to the bathrooms and passages. The seventh floor is occupied as staff bedrooms.

Our readers will be familiar with the buildings which formerly stood upon the site, notably Walsingham House and the Bath House Hotel. The new building has a considerably deeper basement, the foundations in certain cases reaching to 36 ft. below street level. Difficulties in drainage arose, so that it became necessary to carry an independent sewer from Arlington street into St. James's street, and the public sewer was entered near Park-lane.

Some interesting methods of construction were utilised to overcome difficulties. For instance, the south wall, adjoining Wimborne House, is carried upon girders cantilevered from an iron grillage foundation some 6 ft. inside the boundary line. This was done to avoid interference with the bases of the walls of Wimborne House. The construction is that of a steel-framed building faced with Portland stone, roofed with asphalt and Westmorland slates; the ground story is built in Norwegian granite. Generally speaking, no wall is more than one story in height, each being carried on a steel girder, so that a wall may at any time be removed for an alteration without affecting the structure above or below.

The introduction of an arcade upon the pavement of a great London street is a matter of importance and arose in quite a natural way. The promoters of the enterprise were desired by the London County Council to set back the new frontage line as part of the general widening of Piccadilly, but the loss of space ruined the financial aspect of the undertaking. The alternatives therefore resolved themselves into the Council acquiring the whole site or giving permission to build over the public footway. The latter was accepted, and the arcade became necessary. The simplicity and strength given to the treatment of the feature are suitable elements in the design. The flatness of the main façade is perhaps devoid of interest, but the strong and massive handling of the stonework is good. The character of the design throughout the building is modern French Renaissance, the desire for which, and, indeed, much other work involving matters of taste, is very prevalent. The interior has the walls of its main stairs, halls, and corridors finished with the popular "stucco" a stone-like rendering, on which artificial jointing is made. There is perhaps an idea of monotony in the effects,

which future gilding may relieve. The ground floor restaurant has interesting marbles upon the walls, but the lower dining-halls, although finished with ornamental plastering, require some colour. The spectator is bored by the perpetual use of the semi-elliptical arch, which is not the most constructive form, although providing easy escape from certain difficulties of internal proportions.

THE SURVEYORS' INSTITUTION.

An ordinary general meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, S.W., Mr. C. Bidwell, President, in the chair.

The Assimilation of the Practice of Quantity Surveyors.

After the usual preliminary business, a paper was read by Mr. H. J. Leaning, prepared by the late John Leaning, on "The Assimilation of the Practice of Quantity Surveyors." The Chairman, in calling on Mr. Leaning, expressed his own regret and the regret of the meeting that death had prevented the author from reading the paper himself.

The author stated that the importance of the work of the quantity surveyor, the multitude of new inventions connected with building, the specialisation of various branches of the building trade, the preternatural sharpening of the wits of the builder's estimating clerk, and the general rise in the public expectation of what an architect should know, all combined to accentuate the distinction between the architect and the quantity surveyor. There were a number of powerful reasons why the architect should not supply quantities for his own works, perhaps the strongest being that it tended to subvert that impartial treatment of the building owner and the contractor which should be the architect's leading principle, and which (as experience showed) was often seriously impaired by his assuming the position of quantity surveyor. A logical corollary to this proposition was that the quantity surveyor should not practise as an architect. The desire for uniformity in the practice of quantity surveyors throughout the Kingdom was not new, but the movement had hitherto made little progress. The movers in the direction of uniformity had hitherto been occupied mainly in the consideration of the legal relations of the quantity surveyor with the employer, the architect, and the builder; these relations had been pretty clearly settled by legal decisions, and might very well be left to the operation of the common law, but, whether this was so or not, any desirable change in these relations could be best effected by a consensus of opinion and united action by all the quantity surveyors of the Kingdom. The advocates of what had been called uniformity of practice appeared to adopt various views as to the degree and nature of the changes which might be desirable. The Report of the Committee on the Employment of Surveyors (Royal Institute of British Architects, 1872) dealt with the questions of uniformity of measurement, the making the quantities a part of the contract, the appointment of the surveyor, and the supply by the architect of quantities for his own works.

The respected Past-President of the Institution (Mr. Thomas Rickman), in a paper read (1890) before the Sheffield Society of Architects and Surveyors. "On the Present State of Questions Relating to Quantities," had also dealt with questions affecting the quantity surveyor, and Mr. Henry Blackburn and Mr. Henry Northcroft had, in Volume X. of the *Professional Notes*, advocated a combined effort for uniformity, and suggested the form it should take. There were four leading systems in England and Scotland (quantities in Ireland were, he believed, for the most part supplied by English surveyors)—viz., London, Manchester, Edinburgh, and Glasgow. London and the southern counties had no published code of practice. The Manchester Society of Architects published a "general statement of the methods recommended by the society to be used in taking quantities and measuring up works." Edinburgh, as the result of the united deliberations of their "ordained surveyors" and master builders, had published rules and regulations for the measurement

of excavation, masonry, brickwork, carpentry, joinery. In Glasgow, the representatives of the "measures" and the master builders had agreed upon regulations for the measurement of the following trades: Excavation, masonry, brickwork, carpentry ("wrightwork"), joinery ("wrightwork"), glazing, slating, tiling, plumbing, plastering, painting. The Masters' Association of Glasgow and its neighbourhood had also drawn up certain regulations as to the time which should be allowed for the completion of measurements. The architects and builders of Aberdeen had also published a set of suggestions for the measurement and billing of excavation, masonry, brickwork, carpentry, and joinery. Among the causes of diversity of practice were:—(1) The different systems of contracting, (2) the different modes of measurement, and (3) the different arrangement of the bills.

The Different Systems of Contracting.

In London and the southern counties the system of a single contractor for a building was the prevalent one. Quantities were almost always supplied, and might be a part of the contract or not. In the country, although the system of one contractor was the rule, he often contracted with other tradesmen, such as plasterer, slater, mason, plumber, etc., who did a part of the work, although as a rule the architect would not deal with the sub-contractor, and usually knew nothing of him. In Manchester the system of employing one contractor, or a contractor for each trade, or a contractor for several trades (not the whole) was in use. Quantities were nearly always supplied, and might be a part of the contract or not. In Edinburgh the system was similar to that of Manchester—either the groups of trades, as excavator, mason and bricklayer, carpenter and joiner, smith and founder, or in single trades. In Glasgow the system was similar to that in Edinburgh, but the quantities were practically a part of the contract, as the whole was first measured and priced and, after completion, re-measured and priced again at the rates of the original schedules.

Differing Modes of Measurement.

He had prepared a tabulated comparison of the different methods of measurement in London, Manchester, Edinburgh, and Glasgow, which showed the leading differences in the various localities; there were others, but these were sufficient to indicate the task of the reformer. In a paper it was only possible to allude to these in a general way. A few of these, as distinguished from London practice, were as follows:—The practice of making material pay for labour was common, as when the surveyor made no deduction for voids of less than an agreed superficial area. This custom was to be deprecated, net finished quantities of labour and material should be presented in the bill, and everything which had a value should be measured and stated in the bill. The various points of interest were:—

"The general use of the superficial yard instead of the superficial foot or the square of 100 ft.

The measurement of labour to openings and plumbings of angles and jambs.

The measurement of brickwork by the yard instead of the rod reduced.

The separation of various thicknesses of walling and the treatment of deductions.

The more elaborate measurement of stone walling, the reduction to a standard thickness, and the greater number of distinctions therein.

The measurement of stone and labour together by the lineal foot, with sketches.

The numbering of pieces of stone of various shapes, with sketches, instead of measuring the stone per foot cube or superficial, and the labour by the foot superficial or the foot run.

In Edinburgh and Glasgow the distinctions between sizes of stone, and the measurement of every hewn stone, first as rubble, and making no deduction.

The measurement of timbers by the superficial yard, stating their size and distance apart, instead of per foot cube.

Measuring timber and labour separately or per foot run, stating size and labour.

The separation of deals and battens used for carcassing from the timber sawn out of log.

Tiling by the superficial yard instead of the square, failure to deduct certain voids, measurement of cuttings as extra value instead of adding a quantity to the net superficial measurement.

Slatting by the yard, and different allowances for cutting.

The inclusion of grounds with lineal items of joinery.

The general measurement of joinery.

The specific description of various items of scaffolding.

The failure to deduct certain voids in the plastering, and measuring labour to hollows.

The treatment of structural metal work.
Measuring and billing lead per foot superficial and per foot run.
Measuring lead in sinks and cisterns per foot superficial, to include soldered angles.
Lead pipes, including branch joints, etc."

No doubt much of this practice was the result of local custom. In London units of measurement were mainly referable to the way the merchant charged for the material or the way the mechanic was paid for labour only. The components of concrete, sand, gravel, and lime were bought by the cubic yard; stone and terra-cotta by the cubic foot; timber by the load, from which the price per cubic foot was readily derived; deals and battens by the St. Petersburg standard, from which the price per superficial foot was easily calculated; flooring and rough boarding by the square of 100 ft.; lead by the hundredweight. Plasterers' and painters' labour was paid by the yard. Asphalt brick, and tile paving was laid by the yard, etc. On these ground the presentation of the items in their ordinary form was logical enough. Uniformity could only be obtained by taking broad views, ignoring unessential differences, and by the adoption of the principle of describing items in such a way as to be most readily priced by the majority. The author then suggested a few of the compromises which appeared to him to be reasonable, and which might be adopted as being as easy to price as the present. These were not intrinsically better, but they would be evidence that surveyors did not wish to impose their London system intact.

The measurement of the net quantity of labour and materials in every case, the deduction of all labour and materials at voids, and, consequently, the discontinuance of all allowances of superficial quantity of labour and materials to cover the cost of extra labour.

The avoidance by the quantity surveyor of responsibility which was not properly his, as, for instance, stating the nature of the soil.

The concentration in the preliminary bill of all general items when there was one contractor for the whole work.

The adoption of the yard as a superficial unit instead of the foot or the square.

The adoption of the lineal foot for all lineal measures.

Escalator.—Discontinuance of the allowance for slopes or batter, measuring instead strutting and planking, with the proviso "if required."

Bricklayer.—The uniform adoption of the superficial yard as the unit for all brickwork; all, except one-brick walls fair on both sides and half-brick partitions, to be reduced to one-and-a-half-brick thickness.

The measurement of all salient angles per foot run for plumbing.

The measurement of all salient angles of reveals of openings per foot run.

Mason.—The Scottish masons were a class of capable men, and their conclusions about the measurement of stonework were to be respected; a number of their distinctions as to size of stones were, he believed, the result of quarry regulations, but, in a building with much stone in its construction, the small stones would probably tend to balance the extra value of the larger ones.

He did not think the London practice in the measurement of masonry—*i.e.*, the stone per foot cube and the labours superficial and lineal—could be improved upon. By that system the surveyor had done what had to be done afterwards by the estimator when an item was presented in the bill with a sketch. Making the price of masonry include plain beds and joints and preliminary faces would, he thought, be a step in the right direction.

Rubble-walling.—The Scottish practice as to rubble-walling appeared to be reasonable, except in the measurement of all the worked stone, first as rubble and making no deduction for it. He inclined to the opinion that the London practice was simpler and just as easy to price, and, in respect of measuring, the net cubic quantity was superior to an imaginary one.

Tiler and Slater.—Instead of allowing superficial quantity for cutting, the items might be uniformly run and described by the lineal yard, such as "extra on ordinary tiling for hip and valley tiles, including all cutting and waste."

"Raking, cutting, and waste to hip and valley, one side measured, etc."

Carpenry.—Our measurement of carpentry was, he thought, susceptible of improvement.

The uniform adoption of finished sizes, clearer distinction as to fir framed in various ways, the distinction of fir sawn out of log from deals and battens, and the counting of all trimmings (often ignored) would be advantageous. He did not think the billing of timber could be made clearer by any other method than the cubic foot, nor by departing from the principle of categories, nor by distinguishing framing to hips and valleys and similar items, especially in consideration of the fact that a carpenter would readily make a sub-contract for the labour to the carcassing of a whole building at a uniform price per foot cube.

In some parts of the country timber was billed by the cubic foot followed by the description of the scantlings comprised by the total, as, for instance, "800 ft. cube fir framed in plates, floor joists, and bearers (in deal scantlings 4½ in. by 3 in., 6 in. by 2 in., 7 in. by 2 in., 5½ in. by 3 in., 7 in. by 2½ in.)."

Joinery and Ironmongery.—As in carpentry, he advocated the adoption of finished sizes and the substitution of the yard for the square: in other respects he did not think the London method of measuring joinery could be improved.

Plastering.—There was not much to reconcile between the systems. In Edinburgh and Glasgow, apparently, the lathing for plasterer was separated from the plaster float and set, and billed with the carpentry.

Founder and Smith.—The London practice of concentrating the structural metal work into a few totals appeared preferable to the billing joists by the foot run, and took far less time to price, and our general custom of reducing the metal articles to weight was a logical result of merchants' quotations.

Plumbing.—The distinctions of lead work in a well-prepared London bill and its method generally would not, he thought, be improved by the adoption of any of the provincial arrangements.

Glazier.—This appeared to be treated in a similar manner throughout the kingdom.

Painting.—This appeared to be similarly treated everywhere; the provincial method of measuring iron balustrades and sashes and frames over all was not, he thought, to be commended.

Billing.—Before comparing the various forms of bills of quantities, one naturally asked what were the characteristic merits of an ideal bill of quantities. They were, he thought, the following:—

1. Precision of description, which goes far to prevent extras, assists the pricing of items of variation, and preserves the building owner from legal difficulties.
2. Brevity, so far as consistent with clearness of description, because it saves the time of the estimator, who probably prices a large number of bills of quantities in the course of the year, and whose time is usually valuable.
3. Presentation of the items in the form easiest to price, and consequently saving the estimator the trouble of analysis.
4. A settled order of the items for facility of reference.

The degree of detail which the surveyor should adopt required judgment; the measurement of insignificant, almost valueless items—over-refinement in fact—was the temptation which beset the surveyor of exact mind. The difficulty of deciding when to stop was increased by the extraordinary claims made by some surveyors' and builders' clerks, who alleged imperfect descriptions. The expert estimator rejected many refinements as frivolous, and did not price them, but, if surveyors omitted them, was ready enough to make claims for their value. The only safety for the surveyor was a thorough knowledge of prices.

In London practice three documents were the rule—the drawings, the specification, and the bill of quantities, and as a rule the quantity of one kind of material and labour, as "1½-in. four-square-panel door," for instance, appeared in one item, irrespective of its position in the building; the specification settled that.

The preamble to each trade comprised sufficient information as to the materials and workmanship.

In other parts of the country the quantities and specification were often combined in one document. The work in each trade in one

part of the building was kept separate from that in another, under distinguishing headings, as basement, ground floor, first floor, etc., and the specification items relating to each trade were written in the preamble to that trade; the position of the work was fixed by the headings of the separate sections of the bills. The estimator was thus subjected to the trouble of pricing an item of the same kind in a number of different places, and if his tender was unsuccessful he had been involved in the reading of conditions which concerned him by little. In Scottish bills of quantities one saw such arrangements as the following:—Separate sections for the timbers and boarding of each roof or flat, the joinery of particular apartments, an oriel window in all trades except plumber, glazier, painter, etc. The result of these arrangements was to make the bill inordinately long. The majority of the items of a bill of quantities were of the same value, whether in one part of a building or another, and if one rejected the principle of combining quantities and specification the indication of position might as a rule be abandoned.

The practice of getting a separate tender for the work in each trade also contributed greatly to lengthen the bill of quantities, as a number of items must be inserted in the bill of each trade, which in the case of a tender by a single contractor were once for all included in the preliminary bill. In many of the bills the principle—pretty generally adopted in some bills—of ignoring anything under 6 in. in a total, and calling 6 in. or over in a total another foot, was unknown; we saw such items as 5 ft. 9 in., 6 ft. 6 in., 4 ft. 3 in., 3 ft. 2 in., etc.

In addition to these well-known leading systems there were architects all over the country adopting modifications or combinations of them all. A comparison of the relative advantages of a contract with one contractor for all trades and a separate contract for each trade was perhaps irrelevant; but one might say in passing that the London architect preferred the former, because the responsibility for the work was that of one man instead of a number of men, the conflict of interests of the various trades was avoided, the business of giving certificates and the supervision were less troublesome, and the sole contractor was usually a more substantial and responsible man than such as tendered for one trade. Moreover, the large firm commonly did better work than the small man, and was much more likely, once he had begun, to finish it.

Uniformity.

As to uniformity, he thought they would agree with him that settled and uniform practice was a great element of strength to any profession. The divided counsels of London, Manchester, Edinburgh, and Glasgow were sources of weakness to the quantity surveyors as a body. Unity of purpose and action would ensure a degree of influence and consideration far beyond anything to which their order had yet attained, and withal an extension of that good fellowship which was so essential to their efforts. The establishment of unvarying and uniform custom would, beside other advantages, furnish very strong arguments in defence of points of practice which might be questioned. The quantity surveyor had already done much to settle the mechanism of contracting and to smooth and improve the relations of the various parties to a contract. He would deserve well of posterity if he succeeded in reconciling the differences such as they were now considering. Some of the differences between methods of measurement were considerable, some were insignificant. Some of the methods of the London surveyor might probably be readily adopted by the provincial societies, and the London surveyor could certainly use some of theirs with advantage, such as the measurement of brickwork and other work by the yard, measuring labour to openings and reveals and angles and the like. There was a disposition to vaunt the superiority of the London quantities to a degree which was not warranted. The codes of measurement of Manchester, Edinburgh, and Glasgow were, in his opinion, very creditable performances.

The task of the reformer, its successful conduct and completion, would be tedious

and difficult. It would involve the investigation, reconciliation, and adjustment of the various modes of measurement, and the settlement of two forms of bill, one adapted to a contract with separate trades, the other to a contract with a sole contractor. Probably the customary local bill, if well done, was best understood by the local man, but there were few parts of the country where a London bill would be misunderstood, and in many cases it was welcomed. Radical alterations in billing would probably be resisted by builders accustomed to pricing items billed in a particular way—indeed, many of them would find it difficult to price an item presented in a new fashion. It should be remembered that in any attempt which might be made they had to conciliate not only the surveyors and architects concerned in the four competing systems, but also the builders of their districts, and, in the case of Edinburgh, the board of examiners of the Edinburgh, the board of examiners of the ordained surveyors would have to be convinced of the necessity of changes. It should also be remembered that the architect usually appointed the quantity surveyor, and that the concurrence of the architects would be not only valuable, but necessary.

Mr. H. T. Steward, in proposing a vote of thanks, associated himself with the President's remarks, and said that the subject of the paper was one of great interest to those members who practised that part of the profession. There was a difference, and always had been a difference, between bills of quantities for the engineers' and contractors' business and the architects' and builders' business. He had been largely connected with both, and he had found no difficulty in making the necessary differences, and he had not had any complaint of want of uniformity. He thought the same remarks would apply to what might be called the London system and the Midland and North Country system—that was for architects' and contractors' works. If there had been any strong desire on the part of the builders of England for a uniform system they would have heard of it—from the Master Builders' Association or from some other body—and if such a desire existed he would be one to attempt to meet such views. As surveyors, it was not for them to take the initiative. Mr. Leaning seemed to have suffered somewhat from what he called the preternatural sharpening of the wits of builders' estimating clerks and the extraordinary claims made by builders' clerks, who alleged imperfect descriptions. In his experience there were good and bad amongst such a large body as the builders' estimating clerks, and he had known, and did know, some estimating clerks for whom he had the greatest respect, and whom he should be more inclined to call surveyors than estimating clerks, and whom he would be glad to see members of the Institution if there were any means of admitting them. At the same time there were many others of the class at whose hands Mr. Leaning had no doubt suffered; but in his experience the ways and manners of these gentlemen were very much the same now as they were fifty years ago. No doubt accuracy and comprehensiveness of description in bills of quantities were the best means of preventing such claims. It was impossible to deal with all the different points made by Mr. Leaning, but he would refer to a few. As to the practice of making material pay for labour, he did not think that any of them would argue that that was a right principle, and as to the question of measuring by the superficial yard or superficial foot, he did not think it was of very much moment. It could not make much appreciable difference, but if the builders wished them to adopt the superficial yard or any other means, he should be glad to do so. As to the measurement of labour to openings, etc., the only argument in favour of not doing so was that it was not customary. He did not think it would be an unreasonable thing to do. Mr. Steward referred to other points in the paper, and in the course of his remarks he said it was not for a surveyor, in taking out quantities, to take any responsibility upon himself more than that which he was obliged to do in order to translate the drawings and specification into bills of quantities for the builder. If there was any liability, the extent of which was unknown, it was for the surveyor to express it

in words, and if the builder liked to speculate in the matter he was entitled to do so. The same remarks would apply to taking. As to making the price for masonry to include plain beds and joints and preliminary facing, he had set his face against it all his life, and he could give good reasons for doing so. He had devoted a good deal of time in studying Mr. Leaning's comparative statement showing the variations in the methods of measurement, and anyone taking interest in the matter could not do better than do the same. It could be seen at the Institution premises.

Mr. Howard Chatfield Clarke, in seconding the vote of thanks, said that the paper had helped them in many ways. It was not an architect's business to interfere in the matter of quantities, and he did not do it himself, and it was not a quantity surveyor's province to become an architect; there was room for both. He never made quantities part of the contract, but he made the drawings and specification connected with the contract. As to extras, on the minutest detail there were often claims for extras, and on some jobs quantities were taken floor by floor, and that was a good system both to builders and employers. He was glad that the paper had been read, as there was an idea about that the Institution had not done as much for quantity surveyors as it could; but he did not admit that.

Mr. E. J. Burr said that more progress had been made in the matter of uniformity of contract than some people realised. He knew north-country contractors who told him that the sets of quantities they liked were sets of London quantities. It was not necessary to level down to the north-country practice, which was not so good as the London practice, and if they adhered to the London practice they would convert the whole country to it. But it was a doubtful advantage to have a very close uniformity of practice; a little individuality was wanted. They did not want to be measuring machines, and they wanted to use their brains for the good of the profession. They wanted uniformity in essentials, and not in unessentials.

Mr. A. J. Gate said that the paper they had listened to was an excellent one, and in common with everyone else he was sorry the author had passed away. The paper was carefully thought out, and was by a man who knew what he was writing about, and he (the speaker) agreed with all of it. In the *Builder* for April 22, 1905, appeared a report of a meeting of the Quantity Surveyors' Association, at which Mr. A. G. Cross read a paper relating to matters affecting quantity surveyors, and at that meeting he (the speaker) made some remarks which might very well be read in connexion with Mr. Leaning's paper. Mr. Gate then read our report of his remarks on the occasion referred to. Proceeding, he said that what he said then he said now. Mr. Leaning's paper began at the wrong end; assimilation must be led up to by a reform of our London system. As an illustration of how the London system varied, he could refer to what Mr. Steward said was his practice in London after fifty years' experience. Mr. Steward said it was not the duty of the surveyor to save the builder from risk—that the builder must take all risks, but he (the speaker) with about forty years' experience, did not believe in that at all. He found out what a risky piece of work would cost, and he put in a money provision for the amount. In London there was no recognised and followed system of measurement, and that was a disgraceful fact. Forty years ago there was, and it was a good and thorough system, and it was followed by the best men of the profession. London surveyors generally were then brought up in that system, the money premium to learn which was from 200 to 300 guineas, and unless a young man had been fairly well educated no surveyor would take him into his office at all; but once in the office they were taught the system thoroughly. He need not tell them how and where, nowadays, most quantity surveyors came from and how they got into the profession. They did not learn their profession; they picked it up from textbooks, some of which had better never have been written. Who was to blame, and how was that state of affairs to be remedied? If they were going to assimilate they must level upwards. For thirty-five years that Institution had been the examining body in

England for surveyors, and during that time it had passed into its ranks hundreds, he might say thousands, of surveyors, some by examination, some not, and until the last two years there had been no other body for quantity surveyors at all. Two years ago the Quantity Surveyors' Association was established, and since that time quantities had received more attention in the Institution.

The Chairman said he must ask Mr. Gate to keep to the subject of the paper. They would not discuss the education of the quantity surveyor.

Mr. Gate said he could not properly discuss the subject without doing that. The Institution being the examining body, they must be held responsible, to some extent, for the present state of affairs. If they were to have a London system of quantities, where were they to look for it if not to the members of the Institution, and if their mode of doing work was not the London system, where was it to be found? Mr. Gate then gave instances of the system of some London quantity surveyors, and said he was not prepared to follow that way, and until these abuses were remedied they must not talk to the provinces about assimilation; they must work for an assimilation at home. The Institution was faced by four alternatives:—(1) Either the surveyors of the present day had not found the examinations good enough to prove them competent, and a large number of the members were not competent when they passed the examination, (2) or they had been passed into the Institution without examination although incompetent, and could not have passed a proper examination, (3) or, not having passed a proper examination, and having passed a proper examination, they were yet scamping their work by underselling the profession, and taking work at prices which made it impossible for them to do it properly at the price. The fourth alternative was even worse, and it was that there were men with F.S.I. after their names—which letters induced the innocent public to think those men were thoroughly competent—using those letters to obtain work which they did not do themselves but farmed out to incompetent men—a disgraceful system of sweating. Therefore, assimilation must begin by putting the London practice in order, and when the Institution moved in the matter they would find a useful ally in the Quantity Surveyors' Association.

Mr. C. J. Mann said it was desirable, if possible, to get uniformity, but it would be difficult to get it, and it would lead to a great deal of trouble in those cases where it would be necessary to lay alterations in their system before the builders. He thought the London methods were far more precise and suitable and satisfactory than the provincial methods; therefore, he should say that it would be for the provinces to assimilate their method to the London one rather than that the London system should be assimilated to the provincial one. He should be pleased to join with others in discussing some alteration in that direction. They should look forward to the gradual survival of the fittest in the matter.

Mr. G. Corderoy said he thought that textbooks had their uses, though it was a mistake to depend entirely upon them. As to the abused examination, he should like to say a word for it. It could not be regarded as a substitute for office training, but a stimulus, and a valuable stimulus to students properly framed. They could not keep out the man who was crammed, and that was the difficulty of all professional examinations. It was not likely that in a large profession like theirs all would be of equal ability and standing, but the great thing the Institution had to do was to look after character, and it was character which was the great safeguard for good and honest work. He did not think uniformity was of much importance, and they should suit themselves as far as possible to the locality where the bill of quantities was to be used. If they could adopt the metric system in connexion with quantities he thought it would be a great advantage, and the Institution would confer a blessing upon them if it could get the metric system adopted. The varieties of work were so great that to attempt a uniform standardisation, or to write a standard bill of quantities, was beyond the powers of one man or a body of

men; the document would require skilled interpretation, and would lead to many arbitrations. He differed altogether as to one part of the paper—i.e., the suggestion that the method of measurement should follow the practice of the merchants. Surveyors' methods of measurements had no reference to that at all, and all they were concerned with was the material after it left the merchant's hands and had got into the hands of the contractor.

The vote of thanks was then put to the meeting and heartily agreed to.

Mr Leaning, in reply, said he would deal with the points raised in the discussion in a written communication.

It was announced that the next meeting will be held on March 12, when Mr. W. Woodward will read a paper on "The Means of Locomotion and Transport in London"—a paper on the Report of the Royal Commission on London Traffic.

The meeting then terminated.

The following is Mr. Leaning's written reply as communicated to the Secretary of the Institution:—

"I gladly accept the opportunity offered by the President of replying to the points raised in the discussion on my father's paper, and need hardly say in doing so how much I appreciated the kind things that were said about him.

With all deference to those older members of the profession who spoke, I cannot help expressing my great surprise at their attitude on this question. Although this subject has been mooted for so long, there has never before been a discussion in this Institution on the subject. Now that we have had one it is clear that no progress is likely to be made towards the objects for which my father contended in his paper until the need for the reform is more generally felt.

The principal objections made are as follows:—

1. That if it were necessary, the builders would have long ago agitated for it.

2. That it would result in a sacrifice of individuality on the part of members of the profession.

3. That it is impossible to produce a standard code of measurement.

In reply to the first objection the London builders would be hardly likely to concern themselves in the matter so long as there was reasonable uniformity in the London method. The chief difficulties which arise through the want of uniformity occur when London bills are circulated in the provinces and *vice-versa*. I know an authentic case where a bill of stonework according to the London system was returned by the Yorkshire masons as being quite incomprehensible to them, and the whole of the work had to be done again according to the local custom.

Want of co-operation between the master builders seems hardly a sufficient reason for persistence in the chaotic methods now prevailing. After all, the builders themselves, not being surveyors, cannot dictate to us, and as they probably profit quite as much as they are inconvenienced by it, they are quite content to look on and wonder what it all means. The men who would be most likely to agitate are the builders' surveyors, whom Mr. Steward so justly commended, but who, as he stated, have little or no voice in the affairs of surveyors as a body. The fact that four provincial societies should have found it necessary to make the attempt is a strong argument in favour of such a course, and I think it is only because London is so heterogeneous that nothing has been done there.

The second objection is a very English one, and reminds one of the case of the farmers, among whom for this same reason co-operation of any kind has entirely failed. However pleasurable the exercise of one's individuality may be, this seems hardly the place for it, and it is surely a more praiseworthy thing to sacrifice one's peculiarities, when they can be shown to be such, for the sake of the general good.

If the replies to these two objections are valid the third objection should not stand in the way, for it seems to me merely a question of determination and work. When one sees what has been done in this direction in France, as in the *Série-des-Prix* of the various municipalities, I think it is mere confession of weakness to say that it is impossible to standardise our work. I

entirely agree with Mr. Gate that the differences in practice in the London system must be settled before anything can be done. A few of these were presented by Mr. Alfred Roods in Volume IX. of the "Notes," page 156, and they might be very usefully extended to the other trades, when I am sure the necessity for a London code would be evident to everybody, and I feel that if such a code is not taken in hand by our Standing Committee at an early date it will be done by some other body, and that, I think, will be a slur upon this Institution.

Until we ourselves agree it seems futile to expect to agree with our provincial fellows, but with such a code as is now suggested London surveyors would be fully prepared for a conference with the provincial societies.

The Institution has recently expressed itself anxious to advance the interests of quantity surveyors, and I venture to suggest that some report on this question might be issued by the Committee at an early date, as I feel convinced that the feeling in favour of such a movement is much more general than the discussion might lead one to suppose."

THE APPOINTMENT OF DISTRICT SURVEYORS.

On this subject the council of the Institute of Architects have addressed the following letter to the London County Council:—

"9, Conduit-street,
February 23, 1906.

TO THE CHAIRMAN AND MEMBERS OF THE LONDON COUNTY COUNCIL.

MY LORDS AND GENTLEMEN,—

The attention of the council of this Institute has been directed to the question of certain changes which are in contemplation by the London County Council with regard to the terms of appointment of district surveyors under the London Building Act.

From the report of the proceedings of the London County Council published in the public press it appears that the original proposal of the Building Act Committee involved, *inter alia*, a reduction in the number of surveyors and the substitution of fixed salaries in lieu of fees.

This proposal, it would appear, did not meet with general approval, and the matter was accordingly referred back.

As the subject is one of considerable importance not only to the architectural profession, but also to London generally as a city and community, the council of this Institute, having given the matter their careful attention, desire me to place before the members of your honourable Council certain views which appear to them worthy of consideration.

As you are probably aware, the Legislature, in dealing with the building laws of the metropolis, has by a long series of enactments extending from the time of Charles II. deliberately and uniformly provided that the administration of those laws should be in the hands of trained and experienced professional men, who in the pursuit of their craft as architects have acquired practical knowledge of the various changing problems which arise in designing and adapting buildings to the manifold conditions which have to be met in a city of such vast size and importance as London, especially in the more central and congested districts devoted to mercantile purposes, upon which its prosperity so largely depends.

Under such supervision was London rebuilt after the Great Fire; under such supervision has London grown and developed; and under such supervision is a large proportion of the building work of the metropolis carried out at the present time.

The council need hardly dwell on the importance which this Institute attaches to the preservation of this system, and the advantages which accrue to members of the profession in having the advice and co-operation of a colleague trained in his art and with a full knowledge of the statutes relating to it.

Such co-operation has worked well in the past, and in the opinion of this Institute to the advantage of the owners and occupiers of every class of buildings in London.

It is therefore with a full sense of responsibility that the council of this

Institute would urge upon the London County Council the desirability of preserving in its integrity a system which has obtained and endured through many reigns with the full sanction and authority of Parliament.

To this end they would suggest that the disability which has been imposed in the case of some of the later appointments should no longer be enforced, and that in future all surveyors acting under the provisions of the London Building Act should be practising architects.

I have the honour to be,
My Lords and Gentlemen,
Your most obedient servant,
W. J. Locke, Secretary."

Illustrations.

THE QUEEN VICTORIA MEMORIAL, LIVERPOOL.

THE Queen Victoria Memorial in Liverpool, which we illustrate to-day, stands at the junction of Lord-street, Castle-street, and James-street in that city.

Its general plan, as will be seen, is circular, with four semi-circular bays and four flights of steps. These steps lead to a circular platform, around which are four groups representing Education, Commerce, Agriculture, and Manufacture; and in the centre is a dome supported by sixteen Ionic columns. On the dome itself stands the figure of Fame. Round the base of this dome are four figures representing Justice, Peace, Charity, and Wisdom. Beneath the dome stands the statue of the late Queen, under a flat-domed ceiling of plain gold mosaic.

The whole of the masonry has been carried out in Portland stone by Messrs. W. Thornton & Sons under the direction of the architects, Professor Simpson and Messrs. Willink & Thicknesse. The sculpture, which is in bronze, is by Mr. C. J. Allen. The figures on the dome have been cast by Mr. A. B. Burton, of Thames Ditton; the central statue and the remaining groups by Messrs. J. W. Singer & Co., of Frome, and the lead vases, measuring 2 ft. 8 in. in diameter, have been made by Messrs. Thomas Easley.

The outer diameter of the circle is 113 ft., including pavement, and the height to the top of the wings of Fame 64 ft. The statue of the Queen is 14 ft. 6 in. high.

DESIGN FOR A SKEW BRIDGE.

THIS is the design which gained for its author, Mr. George Nott, of Leicester, the Grissell Medal of the Institute of Architects this year.

The Grissell prize consists of a gold medal and ten guineas, and we believe we are correct in saying that it was founded specially to promote the study of construction, though we observe that the Institute Calendar contains no statement on this point; mention is made of the objects of several other prizes, but not of the object of this one. It would be better if a word or two were inserted on this point in future issues of the Calendar.

Mr. Nott's design was unquestionably the best of those submitted, especially in regard to the fact that it combines good architectural design with constructional study.

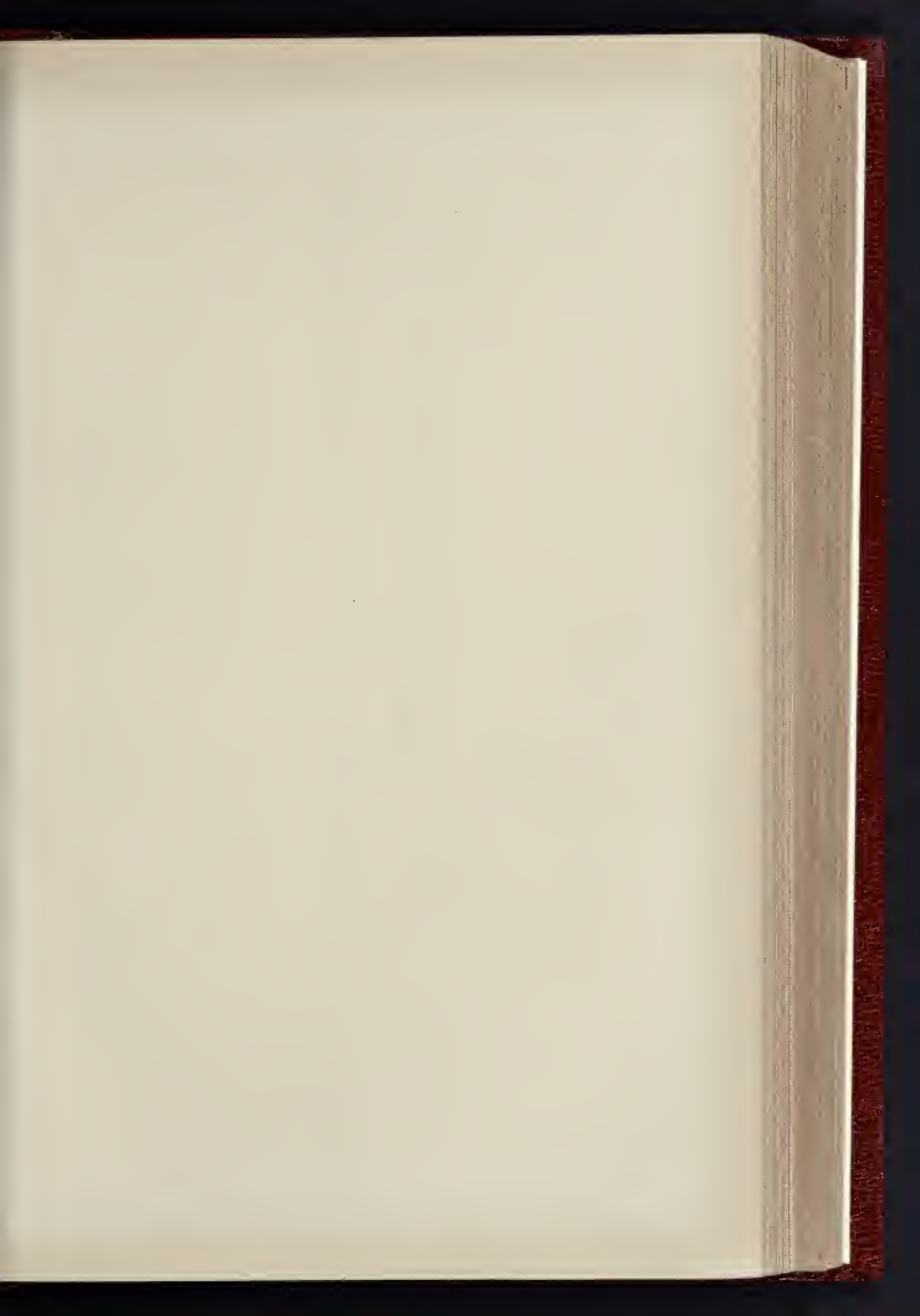
The author sends us the following notes in reference to his design:—

"The conditions of this competition leaving me an almost entirely free hand, my aim was to produce a scheme which should be quite simple and yet monumental in character.

The approaches seemed to demand almost as much consideration as the appearance from the river, and by placing the pavilions at right angles to the axis of road the chief architectural difficulty was overcome, the inequality of distance between the pavilions and pylons on either side being more or less unnoticeable both from the river and the approaches.

No great difficulty presented itself constructionally, with the exception of the determination of the external loading. The latest available information regarding the weight of a crowd was taken as the data for the first test, and that of modern haulage traffic for the second, the latter being a severe one.

It may be noted that, following the practice of some of our best bridge engineers, nothing was added to the actual dead weights of the above loads as an allowance for





THE QUEEN VICTORIA
PROFESSOR SIMPSON AND MESSRS. WILLINK & TAYLOR



A RALPH KEICHLEY, del. 1905.

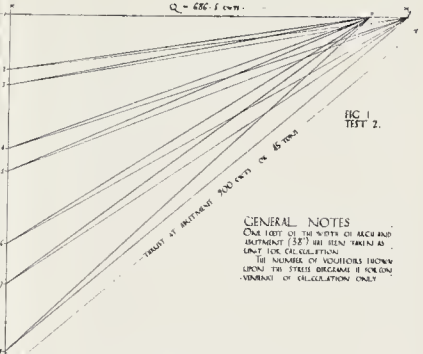
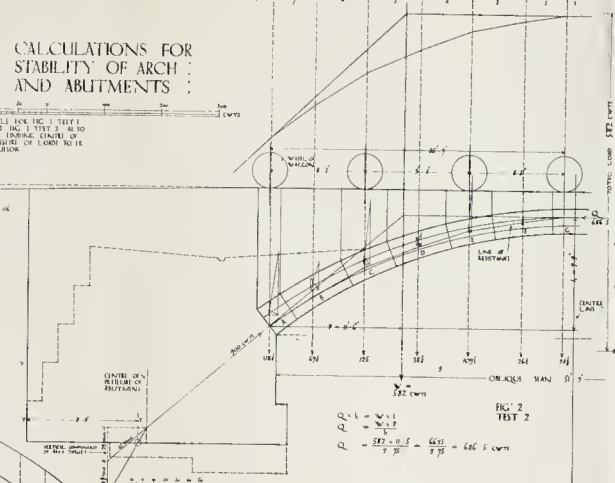
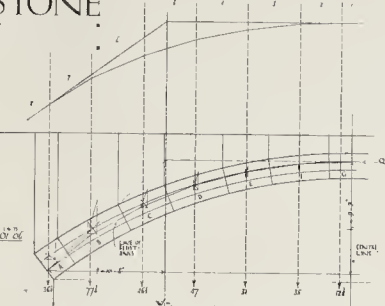
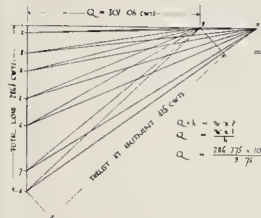
INK PHOTO SPRAGUE & CO. L^o 4 & 5 EAST HARDING STREET FETTER LANE E.C.

MONUMENT, LIVERPOOL.
ARCHITECTS: MR. C. J. ALLEN, SCULPTOR.



DESIGN FOR A STONE SKEW BRIDGE

CALCULATIONS FOR STABILITY OF ARCH AND ABUTMENTS



GENERAL NOTES
 ONE FOOT OF THE WIDTH OF ARCH AND ABUTMENT (3.7) HAS BEEN TAKEN AS UNIT FOR CALCULATION. IN NUMBER OF VERTICAL LINES FROM POINT TO POINT THROUGH ARCH AND ABUTMENT OF CALCULATION ONLY.

TEST NO. 1.

DATA & TABLE OF LOADS IN CWT'S ETC. TOTAL LOAD 2861 cwt.

NUMBER	A	B	C	D	E	F	G
WEIGHT OF CROWN	120	120	120	120	120	120	120
WEIGHT OF SPAN	24	48	72	96	120	144	168
WEIGHT OF ARCH	24	48	72	96	120	144	168
WEIGHT OF VERTICALS	20	40	60	80	100	120	140
TOTAL TO 14. VERTICALS	172	344	516	688	860	1032	1204

THE LINE OF RESISTANCE DUE TO THE ABOVE LOADS LIES ENTIRELY WITHIN THE ARCHES. THE ARCH IS THEREFORE STABLE AGAINST FAILURE BY ROTATION. FOR CALCULATING AND RECORDING RESULTS TO TEST NO. 2.

TEST NO. 2.

DATA
 THE FACTORIAL LOAD IN THE TEST IS THAT OF A CROWN UNDER A 30° TILTED LOAD. CONSIDERING THE ARCH AS A LEVER, THE POINT OF LEVER IS AT THE POINT OF LEVER. THE ARCH IS THEREFORE STABLE AGAINST FAILURE BY ROTATION. FOR CALCULATING AND RECORDING RESULTS TO TEST NO. 2.

TABLE OF LOADS IN CWT'S ETC. TOTAL LOAD 582 CWT.

NUMBER	A	B	C	D	E	F	G
WEIGHT OF ARCH	24	48	72	96	120	144	168
WEIGHT OF SPAN	24	48	72	96	120	144	168
WEIGHT OF VERTICALS	20	40	60	80	100	120	140
TOTAL TO 14. VERTICALS	172	344	516	688	860	1032	1204

THE LINE OF RESISTANCE DUE TO THE ABOVE LOADS LIES ENTIRELY WITHIN THE ARCHES. THE ARCH IS THEREFORE STABLE AGAINST FAILURE BY ROTATION.

STABILITY AGAINST FAILURE BY CREEPING:
 FROM TESTS MADE IN TEST NO. 2 THE TRUST BY ABUTMENT IS FOUND TO BE 25 TONS ACTING AT LOWER EXTREMS OF THE ARCHES. THE ARCHES ARE THEREFORE STABLE AGAINST FAILURE BY CREEPING.

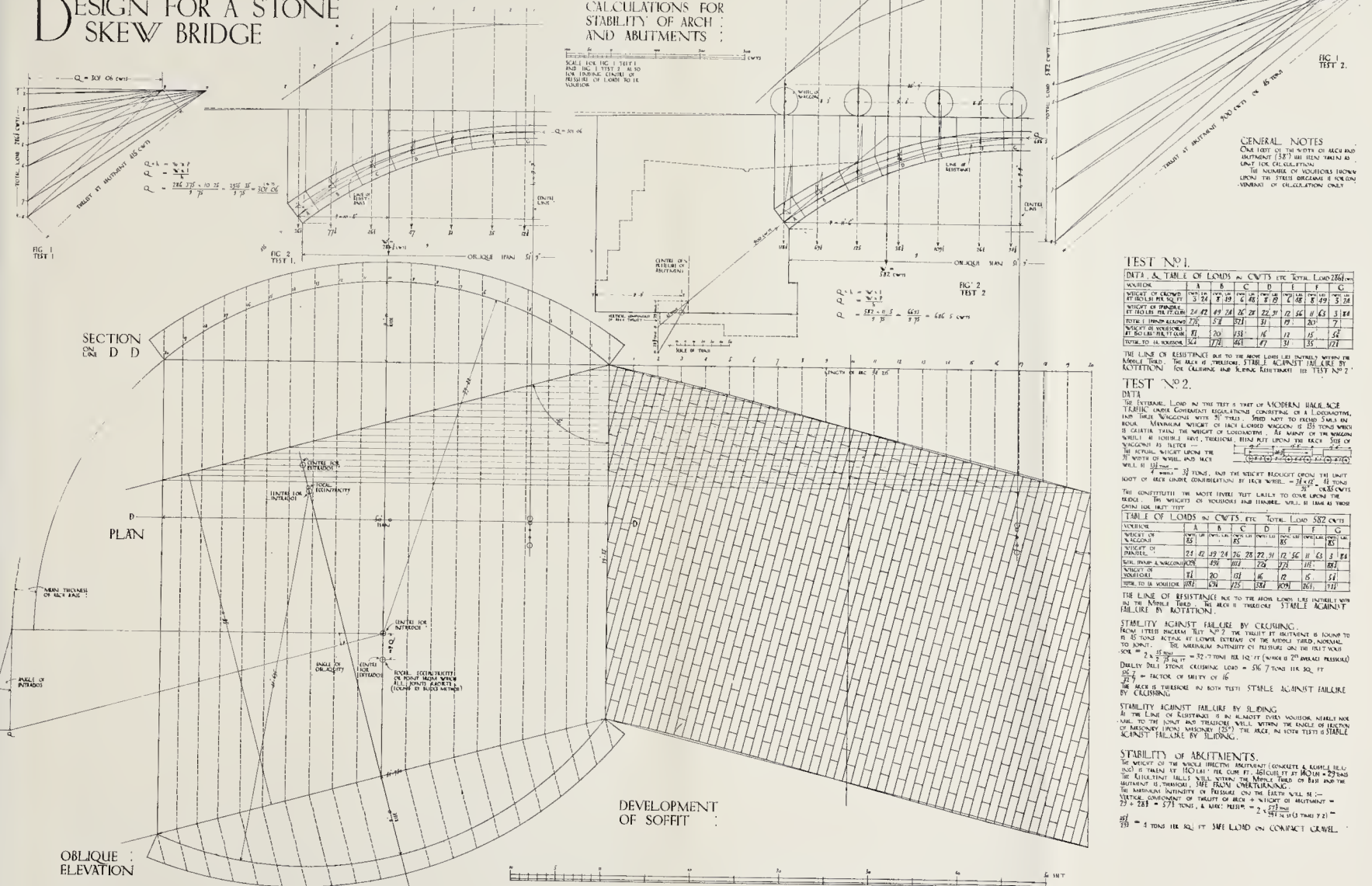
STABILITY AGAINST FAILURE BY SLIDING:
 AT THE LINE OF RESISTANCE IS IN A POINT OVER VERTICAL LINE OF ARCHES. THE ARCHES ARE THEREFORE STABLE AGAINST FAILURE BY SLIDING.

STABILITY OF ABUTMENTS:
 THE WEIGHT OF THE WHOLE BRIDGE ARCHES (CONCRETE & STONE) IS 2861 TONS. THE WEIGHT OF THE WHOLE BRIDGE ARCHES (CONCRETE & STONE) IS 2861 TONS. THE ARCHES ARE THEREFORE STABLE AGAINST FAILURE BY ROTATION.

SECTION ON LINE D D

PLAN

OBLIQUE ELEVATION

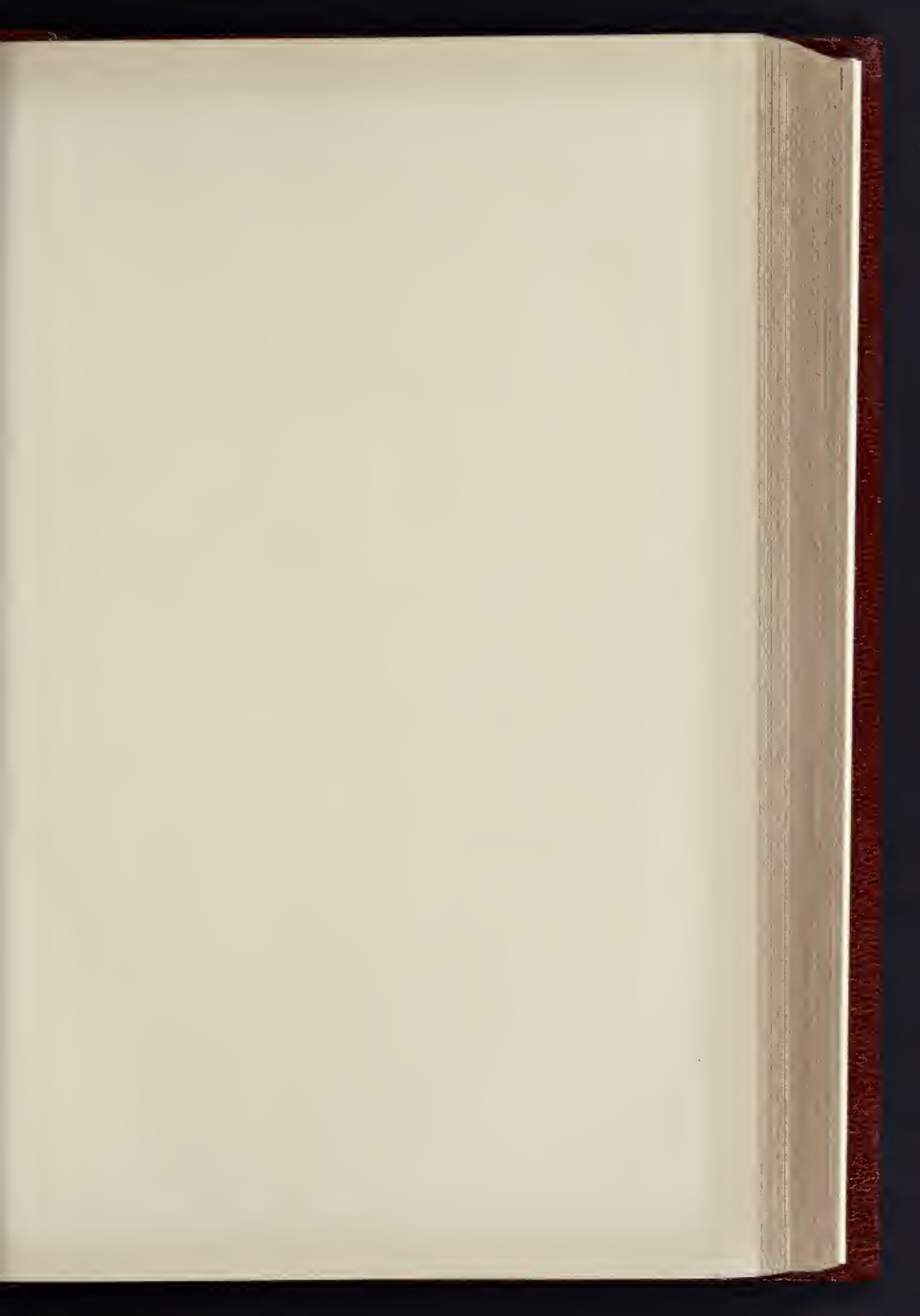


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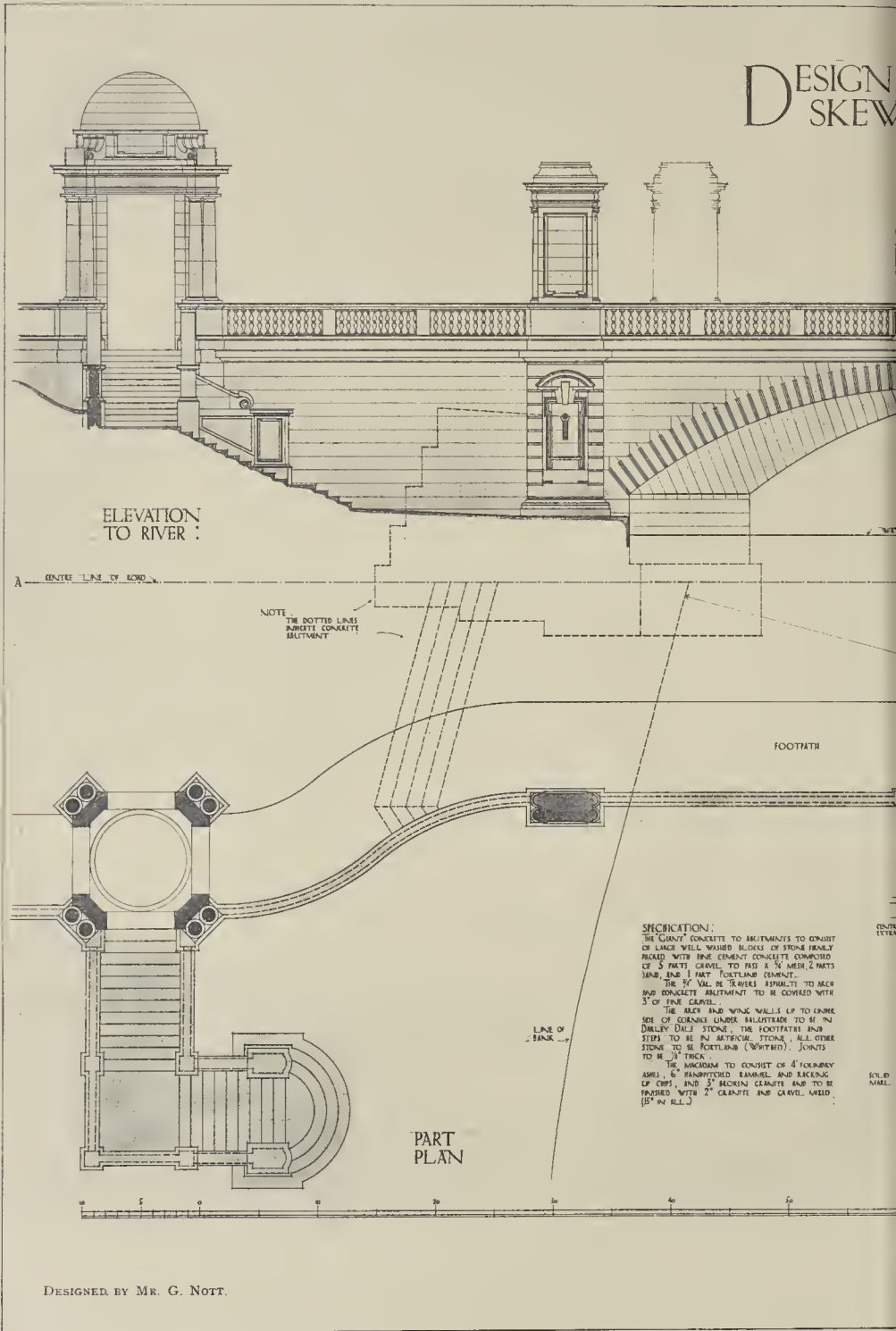
DESIGNED BY MR. G. NOTT.

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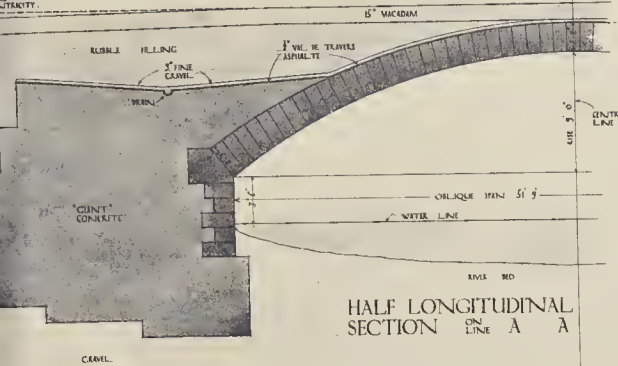
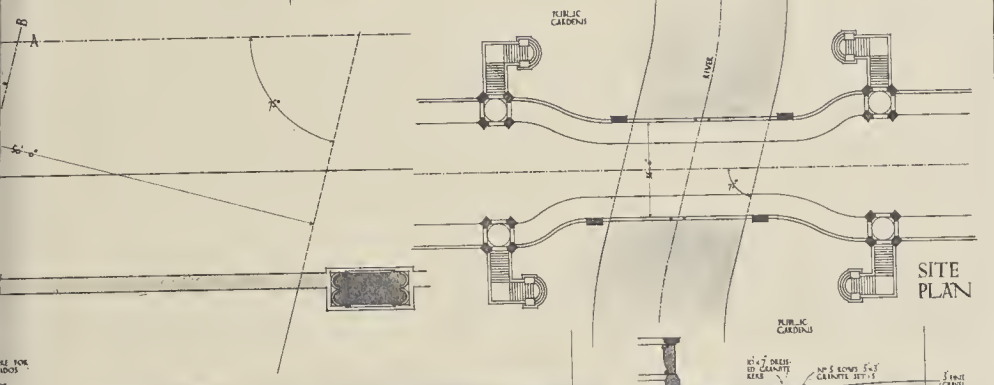


DESIGN SKETCH

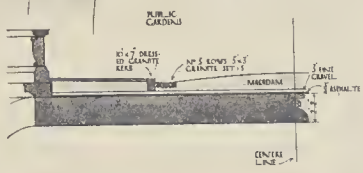


SPECIFICATION:
 THE "GRANT" CONCRETE TO BE USED IN ALL RETAINMENTS TO CONSIST OF LARGE WELLS-WASHED BLOCKS OF STONE HEAVILY READED WITH FINE CEMENT CONCRETE COMPOSED OF 5 PARTS GRAVEL TO 1 PART FINE CEMENT TO 2 PARTS SAND AND 1 PART PORTLAND CEMENT.
 THE 12" VALVE TRUNKS APARTS TO EACH AND CONCRETE RETAINMENT TO BE COVERED WITH 3" OF FINE GRAVEL.
 THE ARCH AND WALLS UP TO CORNER SET OF CORNICE UNDER BALUSTRADE TO BE IN DUNLEIGH DALL STONE, THE FOOTPATHS AND STEPS TO BE IN ARTIFICIAL STONE, ALL OTHER STONE TO BE PORTLAND (WHITE). JOINTS TO BE 1/4" THICK.
 THE WALKWAY TO CONSIST OF 4" COURSEY ASHES, 6" HANDMADE RAMMEL AND RAILING OF CURBS, AND 3" BLOCKS OF GRANITE AND TO BE FINISHED WITH 2" GRANITE AND GRAVEL MIXED. (SEE PLAN.)

A STONE IDGE :



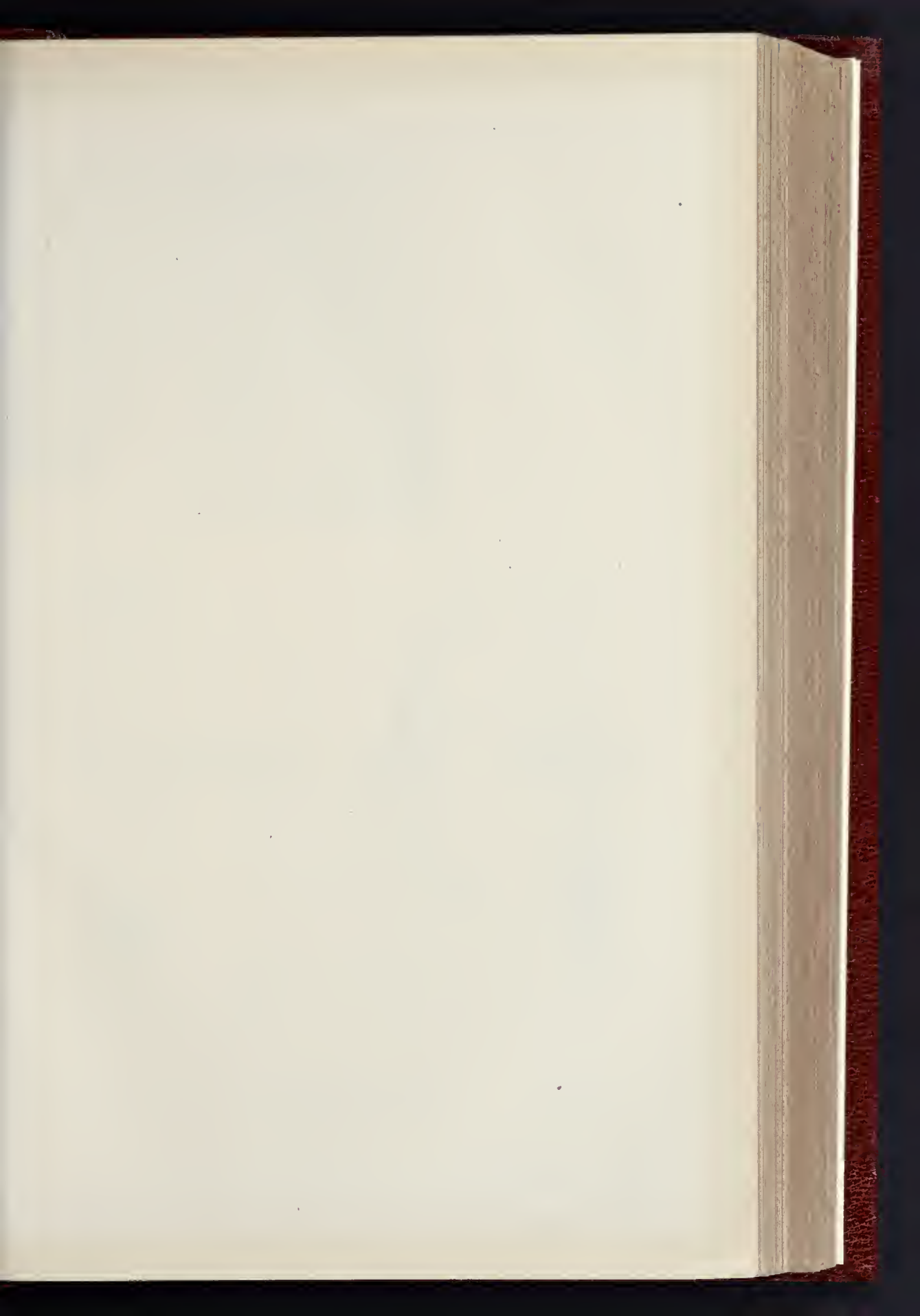
HALF LONGITUDINAL SECTION ON LINE A A



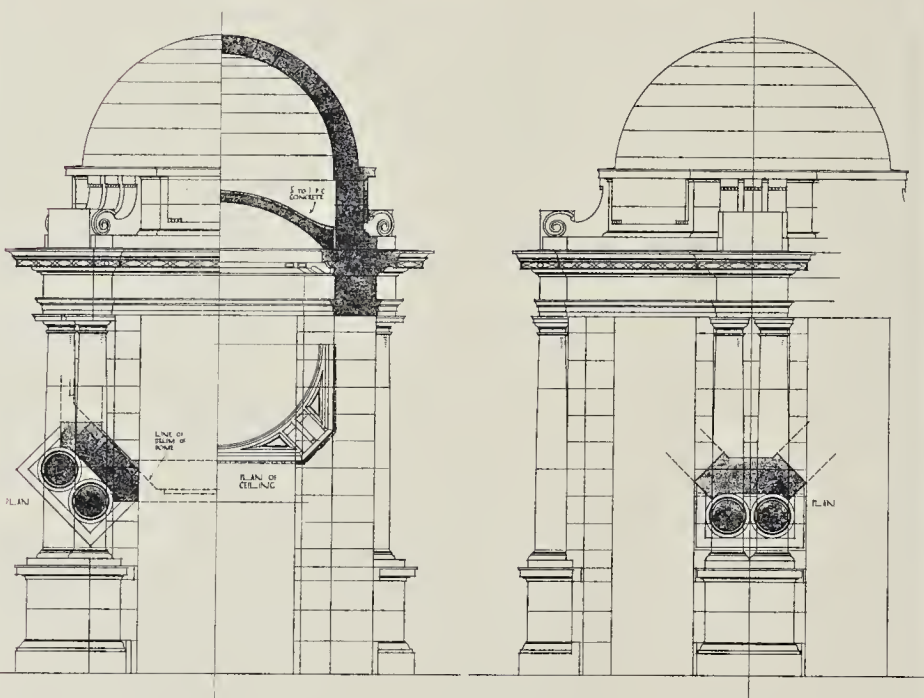
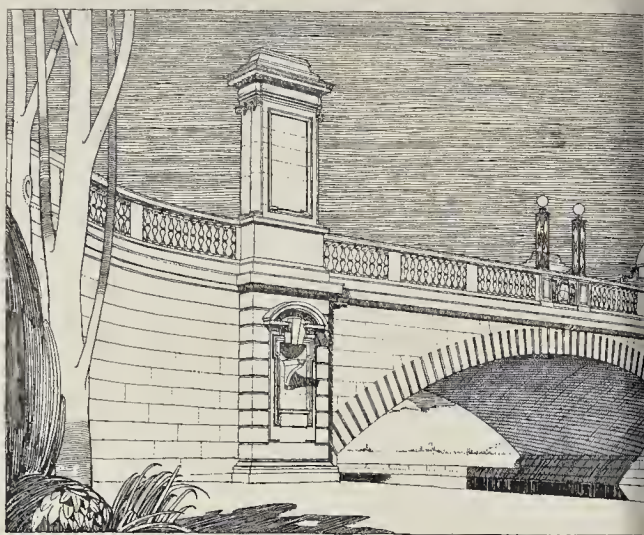
HALF CROSS SECTION ON LINE B B

UTILE DULCI.

INK PHOTO, SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE E2

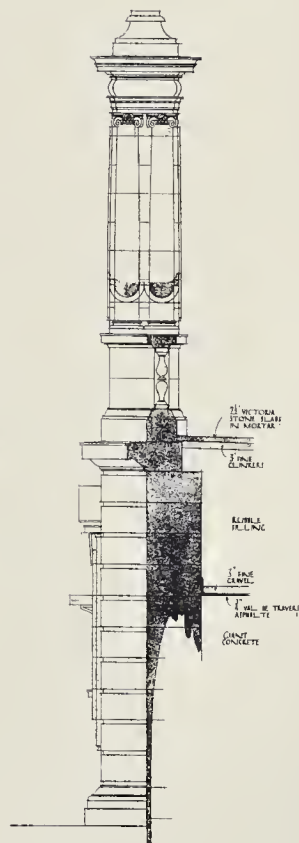
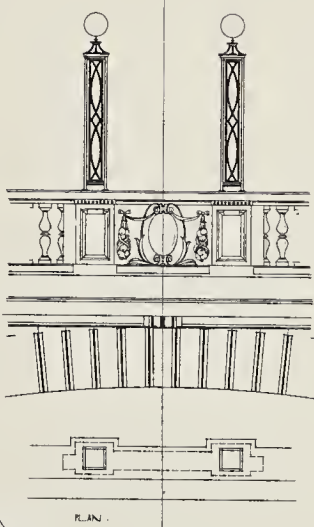
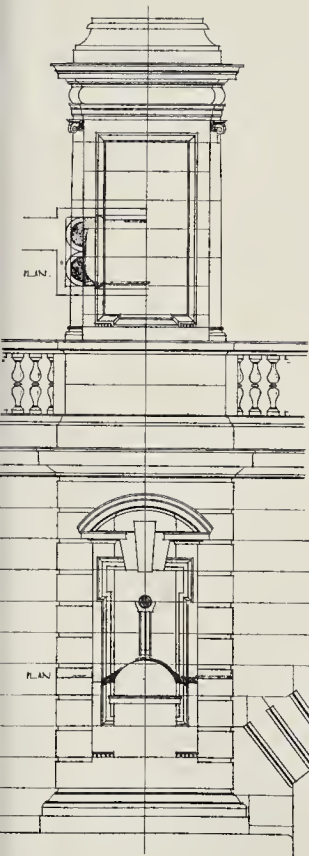


DESIGN FOR A STONE SKEW BRIDGE



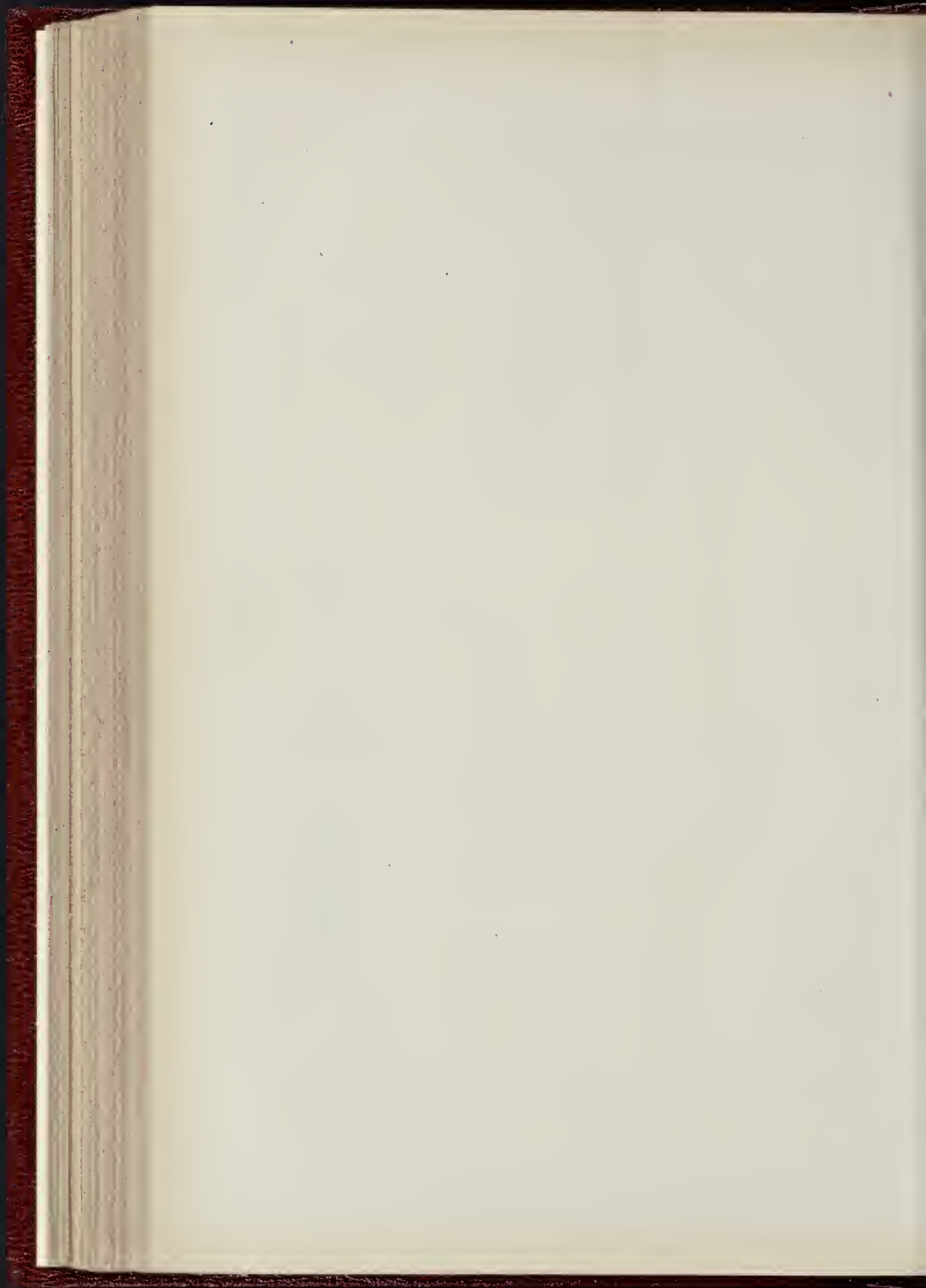
DETAILS OF
PAVILIONS

DESIGNED BY MR. G. NOTT.



DETAILS OF PIERS AND ARCH

UTILE DULCI.



ibration, as was at one time customary in assigning road bridges. The whole of the calculations involved are given as concisely as possible upon the drawings."

SOUND-PROOF PARTITIONS.

The construction of a partition which shall be both sound-proof and fire-proof and at the same time thin and inexpensive is a problem which many inventors have attempted to solve, but not always successfully. A report of tests made by Professor L. Norton, of the Massachusetts Institute of Technology, has recently reached us, and will be of interest to British architects, as one of the five partitions tested in America do not differ materially from certain kinds used in this country. The relative efficiency regards non-conductivity of sound is shown by a scale ranging from 50 to 100. The lowest place is given to the 2-in. solid partition of metal lath and plaster. The partitions of 1-in. "Keystone" plaster blocks and of 2-in. "National" terra-cotta blocks, both of which were plastered on both sides, are bracketed together, the index of efficiency being 40. Two-inch and 4-in. "National" partitions follow at 45 and 50, and the latter figure is also given to the 3-in. "Keystone." A double partition of 2-in. "Keystone" blocks with a 2-in. air-space between them had an efficiency of 60. The remaining tests showed the advantage obtained by the use of paper, felt, and "quilt." Two double partitions constructed of 2-in. steel studs (staggered in plan), and covered with metal lath and plaster on both sides, one partition having a sheathing of water-proof paper between the studs and the other a sheathing of felt and paper, had an efficiency of 75. Partitions made with steel channels and covered on both sides with felt, 4-in. "Sackett" plaster boards, and a thin coat of plaster ranged from 80 to 85; partitions made with steel studs (staggered on plan) and covered on both sides with Cabot's sheathing quilt, metal lath, and plaster had an efficiency of 85; and a similar partition with an additional layer of quilt placed between the studs attained the full number of marks, 100. Professor Norton says that "the insulating property of some of the partitions was so good that not even the blare of a cornet . . . could be heard through the partition except by careful listening within a few inches of the wall." If greater resistance to fire is required, the quilt can be used between double plaster blocks, as in the Conservatory of Music at Boston, Mass.

EFFLORESCENCE ON BRICKWORK.

MR. S. SMITH, the clerk of works of the Technical College, Glasgow, sends us the following communication relative to an examination of samples of efflorescence recently made at that college:—
Although generally attributed to the action of the mortar that has been used, the main cause of the efflorescence on brickwork is the presence of alkalies (soda and potash) in the clay from which the brick was made. In the higher grade clays, such as fire-clays, the felspar, which was the original form of the clay, has been so completely weathered that there is very little, if any, trace of alkalies. It is in the brick earths, from which the terra-cotta bricks are made, and the lower grade clays, in which the felspar has not been so completely weathered, that the alkalies are found.
At the New Technical College, Glasgow, the efflorescence was scraped from off two different brick walls and examined.
The first sample was taken from a dado wall in one of the staircases, which was faced with terra-cotta brickwork. When tested chemically, with the help of the spectroscope, it was found to consist of carbonate of sodium, with traces of carbonate of potassium and sulphate of calcium.
The second sample was taken from a wall in the basement, built with bricks made from composition of shale and clay. There was only one patch of efflorescence on this brickwork. The brick at this place showed signs of having been soaked with the water which had drained from the concrete of which the filling was composed. A chemical examination of the substance proved it to be largely composed of sulphate of calcium, with a

trace of carbonate present, probably as sodium carbonate, the spectroscope showing the presence of sodium.

The efflorescence on the terra-cotta brickwork would be caused by the carbon dioxide of the atmosphere acting upon the alkalies in the bricks, converting them into the carbonates of sodium or potassium, and the calcium sulphate present would be the product of a combination between the sulphur dioxide in the atmosphere with subsequent oxidation, and any deposit of lime that might have been left on the face of the brickwork by the moisture which had evaporated or drained from the mortar.

The efflorescence on the composition bricks can also be accounted for by the latter cause; the sulphur dioxide acting, as before, upon the deposit of lime left by the water from the concrete, had converted it into sulphate of calcium.

Where the brickwork is exposed to the rainfall, the efflorescence is washed off, and it will gradually get less as the alkalies present in the bricks are progressively removed. Where the brickwork, however, is in the interior of a building there is no rainfall to wash away the efflorescence, and to keep it from becoming unsightly it has to be washed with a plentiful supply of water.

As it is not always convenient to do this, the brickwork should be washed with a diluted solution of hydrochloric acid to clean off any dirt or lime which may have been left on, and which would help to form the sulphate of calcium. Wash again with clean water, then when dry give the brickwork a coat of raw linseed oil. The coat of oil will effectually prevent further action between the carbon dioxide and the alkalies, and thereby put a stop to the efflorescence."

CARPENTERS' HALL LECTURES: GREEK TEMPLES AND RUINS.

The second of the present series of spring lectures on matters connected with building, arranged for by the Worshipful Company of Carpenters, was delivered on Thursday last week in Carpenters' Hall, London Wall, by Mr. A. Evan Bernays, M.A., whose subject was "Greek Temples and Ruins." The Right Hon. Lord Addington presided.

The lecture consisted of a passing reference to a number of temples and ruins, some fine lantern slides of which were shown upon the screen. The first views shown were of Delphi and the Sacred Way leading up to the temple. The stones of the Sacred Way—some 2,000 years old—had grooves cut in them, said the lecturer, to prevent the feet from slipping, for Delphi is situated high among the rifted hills. In three special ways the religion of the Greeks showed itself at Delphi—i.e. (1) by mottoes carved on the temple was taught the lesson of self-control: "nothing in excess"; "know thyself"; (2) by predictions of the future; (3) by stories of the miraculous power of the gods. Little was left of the temple, but we could see something of the impressiveness of the site. When the ancient Greek went up to the temple he went for amusement as well as for worship, as the remains of the theatre showed. Whether there was a raised stage or not was a question on which thousands of pages had been written, but he did not intend to deal with that now. The theatre was open to the sky. Many popular books stated that the theatres were so skilfully built that every word spoken on the stage could be heard in the back rows, and this was certainly true, though the purity of the air had much to do with that. While at Delphi he made some experiments, and he found that every word spoken in the back rows of the theatre could be heard on the stage.

At Athens, the principal building was the Parthenon, and a question that might be asked was, how is it that the building lasted unharmed from the 6th century B.C. to the XVIIIth A.D.? It was the chief temple in the chief city of Greece, and Christianity marked its triumph over paganism by turning the building into a church, and it remained a Christian church until 1460, when it became a mosque. In the whole of the Parthenon there was scarcely a straight line, and it was "optical corrections" like that of the curvature of the stylobate which helped to make the beauty of the building what it is. The same tireless devotion to detail

which the mediæval mason gave to the elaboration of a cathedral was given by the masons of ancient Greece to their temples. The aim of the Athenians was perfect symmetry and perfect harmony—complete subordination of part to whole. Another building in Athens to which the lecturer drew special attention was the Theseum and the triglyph projections, which showed that the Greek temple was indebted for its design to the wooden temples made by the carpenters of a previous time.

Among other places visited by the lecturer were Ephesus, Pergamon, Halicarnassus, Rhodes, and Cos. Pergamon was situated high above the plain, about twenty miles inland from the coast of Asia Minor. The great altar of Zeus, on which 100 oxen could be sacrificed at once, was perhaps the largest altar in the ancient world. Another interesting ruin was the enormous theatre.

A little south of Miletus there stood a temple of Apollo, which Pausanias mentioned as ranking among the finest of all the temples in Ionia after the great temple of Artemis at Ephesus. It was called the oracle of the Branchidae, and the lecturer showed views of some of the remains.

In referring to some red and blue colouring which was still to be seen on a column, he said that it was curious that, while we were apt to imagine a typical Greek temple or Gothic cathedral as showing surfaces of plain stone or marble, the men who made them in each case used bright colour to bring out and emphasise the architectural features.

Some very interesting views of the volcanic island of Thera were shown, the island rising sheer out of the sea and being crowned with white stone and marble houses. There were some of the oldest traces of human habitation in the Ægean, and some stone beams where the construction was quite primitive, and clearly showed but a recent evolution from wood beams.

A hearty vote of thanks to the lecturer and the chairman brought the proceedings to a close.

THE BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION: ANNUAL DINNER.

The annual dinner of the Provident Institution of Builders' Foremen and Clerks of Works was held on Saturday last week at the King's Hall, Holborn Restaurant, Mr. Henry Holloway, J.P. (Messrs. Holloway Brothers), presiding. There were also present:—Messrs. C. Ansell, J. Carmichael, Scott Balfour, J. Bolding, C. Bussell, T. Costigan, F. L. Dove, F. Higgs, J. S. Gibson, T. Holloway, Spencer Green, J. Marsland, C. H. Mabey, D. W. McInnes, G. M. Nicholson, W. Phillips, W. Reason, J. P. (Mayor of Finsbury), Alex. Ritchie, E. H. Selby, H. B. Sanders, J. Beer, J. R. Cochran, F. Hann, J. Stapleton, and a large party of members and friends, the company numbering 644.

The loyal toasts having been honoured, The Chairman proposed the toast of "The Provident Institution of Builders' Foremen and Clerks of Works." He said that the fact of there being a record attendance that evening showed that the Institution, though an old one, was not by any means losing its popularity; in fact, he did not know of any other institution connected with the trade which seemed to be so popular as the Institution, and he hoped it would continue to be prosperous. It was a charity which must appeal to many of them very strongly, and when he remembered its objects he felt it ought to appeal, in the first place, to master builders. By its very title the Institution showed that it was possible to have harmonious union between clerks of works and general foremen, and master builders were delighted that it was so, and that it was possible to have these relations not only in the Institution, but also on the works. Another object the Institution had was to maintain the respectability of its members, and he supposed that was necessary in these degenerate days, though he believed, speaking generally, that the builders' foremen and clerks of works were as good a set of men as any to be found. The Institution also had an old age pension fund, and he was delighted to know that it was doing such

splendid work for members who had reached an age when they were no longer able to follow their calling in life, and who were then assisted in a substantial way. The Institution rendered assistance to the aged and infirm, made provision for widows and orphans, and gave temporary relief under special circumstances when assistance was needed. The pensions granted to members amounted to 17s. 6d. per week to a member who had passed the age for following his employment; of 7s. per week for a widow, with an allowance for orphans. These were the maximum allowances, and if the funds fell short the weekly payments had to be reduced; but at the present time, he was happy to say, the maximum amount was being paid to all pensioners on the funds. The amounts were not excessive, and yet the members of the Institution depended on outside help to continue them, for their own contributions were insufficient for the purpose. This was the only appeal they made, and on behalf of those members of the Institution who had passed work, he appealed to all those who could assist to give, and thus make happy the last days of those who had served them.

Mr. John Beer, secretary, whose name was coupled with the toast, responded, and in doing so he ably supported the chairman's appeal. When he became secretary the pensioners were paid 12s. 6d. per week, which amount was subsequently increased to 15s., and later on to 17s. 6d.; but he was anxious to make it 11. per week, and 10s. per week for widows.

Mr. F. Higgs, in proposing the toast of "The Architects and Surveyors," said that architects were the aristocrats of the craft, but there were many different kinds of architects. At one time he wished he had been an architect, but he had got to feel differently now, for if there was anything wrong with a building the architect was generally blamed. Shakespeare must have been thinking of architects when he wrote:—"The evil that men do lives after them."

Mr. J. S. Gibson, who responded for the architects, said he was rather amused to hear Mr. Higgs refer to architects as the aristocrats of the building world. It was rather amusing for an architect who usually had to put up with the little eccentricities of his client, and to act as a sort of buffer between the demands of a client, which were often onerous and difficult to fulfil, and the desires of a builder, which were always, of course, just and equitable. Speaking of what he called the different portions of the building world, i.e., the architect, the builder, the clerk of works, the builder's foreman, and the workmen, he said that they were all really part of one organisation. Each had to do his little, and the whole was fitted together, dovetailed, like some puzzle, and the result should be what was wanted. It was a matter of little moment whether they differentiated—whether one or the other did the greater or the lesser part; but it was the object of all to do their work well, to do it in such a manner that it would be a pride to them and a pleasure to those who came after them. Such gatherings as that tended to make them better comrades.

Mr. G. M. Nicholson, who replied for the surveyors, referred to the advantages of societies like that Institution. The best way to meet distress or misfortune in life was by co-operation. There was a certain percentage of people who every year met with misfortune, and by means of an institution like the Builders' Foremen's Institution the fortunate or helped to pay for the unfortunate, and it was the duty of everyone connected with the building trade to encourage a society of this kind in every way.

Mr. D. W. McInnes suitably proposed the toast of "The Builders and Contractors," and said that, so long as the Institution had the support of men like their chairman and others, the members of the society need have no fear that they would not be well looked after.

Mr. J. Carmichael responded, and said that as builders they ought to do all in their power to foster that spirit of comradeship between builders and their foremen and clerks of works, which was shown in the reception of the toast. A quality which was necessary nowadays was "gumption" and there was plenty of opportunity for showing

it on a large building work. In addition, if they had ability or capability and amiability, they would be pre-eminent in their work, and the result would be satisfactory to all parties concerned.

Mr. F. Hann, financial secretary, having appropriately proposed "The Governors, Trustees, Donors, Subscribers, and Visitors," and Mr. W. Reason, J.P., having replied,

Mr. T. Costigan, secretary of the Master Builders' Association, proposed the toast of "The Chairman," remarking that Mr. Holloway had filled every post of honour that his brother builders could confer upon him, and he and his partners were constantly giving assistance to deserving causes.

The toast was received with musical honours, and the Chairman briefly replied.

During the evening Mr. Hann read a long list of subscriptions and donations received or promised on behalf of the Institution, the total of which amounted to 502l., included in which was 25l. from Messrs. Holloway Brothers.

THE LONDON MASTER BUILDERS' ASSOCIATION.

The thirty-fourth annual general meeting of this Association was held on the 22nd ult. at Nos. 31 and 32, Bedford-street, Strand, when the annual report was presented. The following paragraphs occur in the report:—

"The membership is steadily increasing, but there are a number of firms who have not joined the Association. To remedy this, steps have been taken to make known to the whole of the building trade of London the objects and work of the organisation, and individual members are urged to take a personal interest in seconding the Council's effort in this direction. In consequence of the large and important element of organised labour incorporated in the General Election, it becomes more imperative than ever that employers should stand together for mutual protection.

No disputes of any moment have occurred during the last year, all differences between employers and workmen having been satisfactorily adjusted by the conciliation boards, whose operations your Council takes this opportunity of referring to in terms of the highest praise. Both employers and workmen have loyally abided by the boards' decisions, thus avoiding much possible trouble, and, at the same time, bringing about a better state of mutual sympathy and understanding.

Acting on instructions given at the last annual general meeting, your Council sent formal notices terminating the old rules to the various societies with whom the London Master Builders' Association had entered into agreements. The primary reason for this action was the necessity of making fresh and more satisfactory arrangements as to the winter working hours. Advantage, however, was taken of the opportunity offered by the conference to make the rules with all the trades as uniform as possible, and in this, your Council ventures to say, it has been distinctly successful. New rules were agreed with the bricklayers, carpenters and joiners, stonemasons, plumbers, and general smiths and fitters, but your Council failed to come to an agreement with the mill sawyers, and declined to enter into agreements with the labourers, painters, and crane drivers. Your Council urges upon all members of the London Master Builders' Association to carry out strictly the letter and intent of the new rules, and to regard them as serious contracts, the careful observance of which cannot fail to be advantageous to all concerned. The notice to the plasterers does not expire until March 3 next. A conference was held with their representatives in October last, with a view to a working arrangement as to winter hours pending subsequent consideration of the whole subject. This came to nothing, your Council considered that in the present depressed condition of trade there was no longer any justification for the preferential position which the plasterers obtained in 1900, and that they should accordingly be required to fall into line with the other trades in the matter of wages. A conference was held on January 1, 1906, with the representatives of the N.A.O.P., at which all the new rules were accepted except that relating to wages. Arbitration was offered as a solution of the difficulty, and the conference was adjourned to ascertain the wishes of the whole of the workmen on the point. The result of this was unfavourable to arbitration, but, at the request of the A.O.P., a further conference was held on February 9, when the alternative was placed before the workmen's representatives of accepting the proposed new rule or having no rules at all. They then agreed to again consult their members, and the final result is still awaited. Before dealing with the plasterers, your Council was careful to discuss the financial support of the members of the London Master Builders' Association, and to meet in conference the leading master plasterers of the metropolis with a view to an entire agreement with the course your Council was adopting.

Your Council has given its attention to all Bills affecting the building trade in Parliament. Together with the Institute of Builders, it opposed the London County Council London Building Acts (Amendment) Bill, 1905. Petitions were lodged in the Houses of Parliament, counsel and solicitors were engaged, and Mr. William Shepherd gave evidence. This proceeding entailed a heavy outlay, and it is hoped that, should it be necessary to do so in the future, some arrangement for joint representation may be come to with kindred societies to avoid the present excessive cost of Parliamentary opposition. The trade generally is under great obligations to Mr. Wm. Shepherd for his valuable services, and your Council desires to place on record its high appreciation of the able manner in which

that gentleman discharged his voluntary and onerous duties.

The financial position of the Association continues to improve year by year, though the marked depression in trade last year affected the income to a considerable extent. In addition, the resources were taxed by the heavy expenditure incurred in opposing the London County Council London Building Acts (Amendment) Bill, 1905, and by other necessary legal expenses. Further stock was purchased for the benefit of the reserve fund.

Your Council deeply regrets the loss by death of three esteemed and honoured past presidents in the persons of Mr. Benjamin Hamen, Col. Stanley G. Bird, C.B., and Mr. George James Lough.

In consequence of the lack of accommodation in the present offices, your Council has decided, in the interests of the Association, to acquire more suitable premises. The Institute of Builders and the Builders' Beneficial Institution will occupy the new offices conjointly with the Association.

The report was adopted, and the audited accounts and balance sheet were received.

The following gentlemen were then elected:—

As President, Mr. J. W. Jordan (Messrs. W. H. Jordan & Sons),
Senior President, Mr. F. L. Dove (Messrs. Dove Bros., Ltd.),
Junior Vice President, Mr. W. Lawrence (Messrs. E. Lawrence & Sons),
Treasurer, Mr. G. Rice (Messrs. Rice & Son),
Hon. Auditor, Mr. A. B. H. Colls (Messrs. Colls & Sons, Ltd.)

The following were elected members of the Executive Council—Mr. G. Appleton (Messrs. Tuttle & Appleton), Mr. F. Bywaters (Messrs. Bywaters & Sons, Ltd.), Mr. G. Milner, Mr. F. D. Riley (Messrs. Rider & Son), Mr. H. Shelburne (Messrs. J. Shelburne & Co.), Mr. Howell J. Williams, D.C.C. (Messrs. Howell J. Williams, Ltd.), Mr. W. Mitchell (Messrs. Mitchell, Ltd.), Mr. Leonard Horner (Messrs. Ashby & Horner).

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Sir E. Cornwall, M.P., Chairman, presiding.

Payment of District Surveyors by Salary.—The adjourned report of the Building Act Committee on the subject of the payment of district surveyors by salary was discussed at some length. The Committee, as we stated last week, had again submitted proposals similar to those discussed on January 30, and dealt with in our issues for December 16 and February 3. The Committee now recommended:—

(a) That as from and including April 1, 1906, all district surveyors be paid a fixed salary, by way of remuneration instead of fees; that the amount of salary to be paid to each of the present district surveyors be equal to the amount of the average of the fees received in his districts during the seven years ended December 31, 1905, as provided in sect. 139 of the London Building Act, 1894; and that the Building Act Committee do submit the necessary recommendations to give effect to this decision.

(b) That with regard to the existing and all future vacancies, the Building Act Committee do submit to the Council such recommendations, giving full particulars of their proposals in every case, as will be in general accord with the "model" scheme described in the report of the Building Act Committee, dated February 12, 1906.

Capt. Heuphill, in moving the adoption of the report, said that a mysterious document had been received by members on the subject, and that the solicitors, to whom it had been submitted, said that the statements contained in it were altogether inaccurate. As to the general question, in the surrounding districts surveyors were paid by salary, and not by fees, and if district surveyors were paid by salary their status would not be altered.

Mr. A. Smith said that no serious complaints had arisen in regard to the present system, and he was opposed to the proposed change. There was great risk that, instead of effecting an economy, a serious loss would result.

Mr. Phillimore said that the report of the Finance Committee was exaggerated in its fears. The upward tendency of fees was almost certain to continue, and if the proposals of the Committee were carried, there would be an additional margin in the future. There had been grievous defects in the past under this system, and, for the sake of proper control, he asked for a straight vote. He hoped they would not be misled by vested interests, and he was convinced that it was only by carrying the Committee's proposals that they could hope in the future to secure good work.

Col. Rotton said that the proposals had been very recently defeated by a large majority, and not one of the arguments then used had been met. He hoped the Council had before it the same proposals with a few trimmings to pass them off. He hoped the Council would not waste time in discussing the

matter, but would proceed to reaffirm its recent decision.

Mr. Howell J. Williams referred to the present commitments of the Council, and said he thought the Committee's recommendations, if carried, would result in a heavy cost to the Council. He had made inquiries, and he found that district surveyors were very ready to make abatements in their fees in special cases, and they were free to do so, but under the proposed arrangement he did not see how that could be done by the Council. He believed that, as a consequential step to the appointment of district surveyors, payment by salary was logically right, but the time was not ripe for that. Fresh legislation must be obtained before it could be done. The Building Act Committee was overwhelmed with work at the present time, and these proposals would lead to another department and staff—the District Surveyors' department—with highly-paid officials to supervise the district surveyors. All this was necessary only if they had no confidence in the men they appointed, but there was a keen sense of honour and integrity amongst architects and surveyors of London.

A member: And builders?
Mr. Williams: There might be a small class of jerry-builders in London, but they were in a small minority compared with the builders who had practically rebuilt London during the last thirty years. It was essential that the Council should maintain a class of district surveyors who would be in a practically independent, or quasi-independent, position. The public would not tolerate being harassed in the administration of the Act; the Act should be carried out in a spirit of sweet reasonableness, whereas the present proposals would lead to the Act being administered in a cast-iron way.

Sir Melville Beacheroff said he could not help feeling regret that the Chairman had again brought up this matter. He had heard no good reasons for the proposed changes. He understood that 52,000*l.* a year was collected under the present system, and he greatly doubted whether that sum would be collected under the proposed system; that amount might be regarded as the high-water mark, and London being much more built over than it was, it was probable that the fees would go down rather than up. They were far more likely to get experienced men under the present system than under that proposed. They could not ignore the views in the matter of such an important body as the Royal Institute of British Architects, whose circular letter on the subject they had received.*

Mr. Goodman said it was impossible to carry out the scheme as proposed. By clause 158 of the Act the Council was empowered to pay by salaries if they so decided, but, according to the terms of that clause, the Council would, if they agreed to put that into effect, have to pay more in the way of salaries than they contemplated. He believed that there would be no saving as was promised, but a loss of 25,000*l.* per annum. Again, if this scheme were carried, one part of the income of the surveyor would be by fees which the Council could not help paying, and another part by salary. It was quite time that the Act was altered. He thought they should have a report showing how much it had cost the Building Act cases during the last three years.

Lord Welby, chairman of the Finance Committee, said that the Finance Committee did not view the proposals of the Building Act Committee with favour. He thought that the amount surveyors would be entitled to according to clause 158 was more than the committee thought, and he believed that the proposals would cost the ratepayers a good deal. He moved that the recommendation be referred back for further consideration.

Mr. Torrance seconded.
Mr. Radford opposed the scheme, and also referred to the effect of clause 158, and to the prospect of the scheme costing a good deal more than the committee supposed. He thought that the proposals should go back, and that any future proposals should come up in the form of recommendations to go before Parliament.

Capt. Hemphill said that the point as to clause 158 had been submitted to the solicitor

for consideration, and he said there was nothing in the point. He thought that fees would go up rather than down. As to the circular letter from the Royal Institute of British Architects, the Council decided, in 1890, that it was undesirable that district surveyors should have private practice; there were great evils in such a system. The proposal of the Committee, if carried, would tend to efficiency of administration. Payment by fees was an obsolete system, and there would be no serious difficulties in carrying out what he proposed.

The Council then voted, with the following result:—For the amendment, fifty-nine; against, forty. The proposals were therefore referred back to the Committee.

Vauxhall Bridge.—Mr. Straus, chairman of the Bridges Committee, announced that the new Vauxhall Bridge would be opened for traffic in April.

Reconstruction of Tramways in Battersea.—The following recommendation of the Highways Committee was agreed to:—

"That the estimate of expenditure on capital account 19,600*l.*, submitted by the Finance Committee, representing the consideration upon which the Battersea Metropolitan Borough Council will be prepared to release the Council from its obligations as the successor of the South London Tramways Company to pave more than the usual tramway area governed by the provisions of the Tramways Act, 1870, in connection with the reconstruction of the borough of Battersea to be reconstructed for electrical traction, be approved."

Bridge Carrying Kingsland-road over the North London Railway.—The Bridges Committee recommended, and it was agreed, that an agreement be entered into with the North London Railway Company, providing for the reconstruction by the Council of the bridge carrying Kingsland-road over the Docks branch of the North London Railway in connection with the reconstruction for electrical traction of the first section of the electrical traction.

Railway Bridges.—They also reported that the bridge which carries the South-Eastern and Chatham Railway over Blackfriars-road is about to be reconstructed. The present headway of this bridge is 18 ft. 9 in., and it is proposed to reduce this to 18 ft. 3 in. The company does not intend in any other important respects to modify their present design of the bridge. The Committee were of opinion that, subject to the work being executed in such a manner as will not interfere in any way with the work of the Council's tramways, no objection need be raised to the company's proposals. The company had also submitted a plan showing the proposed reconstruction of the bridge carrying the company's lines over Alphen-street. The proposals were agreed to.

General Lines of Buildings in Fulham-road and Fulham Park-road.—The Building Act Committee reported as follows:—

"On May 3, 1904, we reported that a successful appeal had been made to the Tribunal of Appeal against the certificate of the architect of the Council, acting in the capacity of superintending architect of metropolitan buildings, defining the general line of buildings on the south side of Fulham-road, westward of Munster-road. We have now to report that on December 22, 1905, the superintending architect defined the general line of buildings on the western side of Fulham Park-road between Fulham-road and Langridge-road, and that an appeal was made against his certificate, and that on January 25, 1906, the Tribunal of Appeal reversed the certificate, and decided that there was no general line of buildings on the western side of the street leading from Fulham-road to the junction of Fulham Park-road and Fulham Park-road. The result of this decision is that, except in so far as the provisions of sect. 33 of the London Building Act, 1894, as to the prescribed distance may apply, there is nothing to prevent the erection of houses on the site in question close up to the public way. In order that the effect of these decisions of the Tribunal of Appeal, which enable the applicants to build very considerably in advance of the lines defined by the superintending architect, may be clearly understood, we have given instructions for a cartoon to be prepared and hung in the Council chamber."

The consideration of the matter was postponed.
London-street Site, Ratcliff-Bekebourne-buildings (second section).—The Housing of the Working Classes Committee recommended, and it was agreed, that expenditure on capital account not exceeding 500*l.* be sanctioned for the preparation of working drawings, specifications, and bills of quantities, and for the preliminary work in connexion with the erection of the second section of Bekebourne-buildings, in London-street, Ratcliff.

The Council adjourned shortly before eight o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Lines of Frontage and Projections.

Wandsworth.—A parish hall on the northern side of Waynflete-street, Earlsfield, and a house on the western side of Trammere-road, to abut upon Waynflete-street (Mr. F. E. Halford for the Rev. D. Tudor Craig).—Consent.

Hackney, Central.—Projecting shops in front of Nos. 210, 212, 214, and 216, Mare-street, Hackney (Messrs. Hodson & Whitehead for Messrs. H. & H. W. Rowlands).—Consent.

Kensington, North.—An iron and glass shelter in front of No. 11, Penbridge-square, Kensington (Messrs. S. Dowling & Sons, Limited).—Consent.

Brixton.—The retention of a wood, glass, and zinc roof at the side of No. 144, Coldharbour-lane, Brixton, abutting upon Eastlake-road (Mr. F. Karno).—Consent.

Fulham.—Buildings on the south side of Broughton-road, Fulham (Messrs. Badenoch & Bruce for the directors of Messrs. Loud & Western, Limited).—Consent.

Hammersmith.—A porch in front of the Baptist Chapel on the west side of the Bloemfontein-road, Hammersmith (Mr. R. N. Hewitt for the building committee of the chapel).—Consent.

Islington, South.—An addition (jointing chamber) in front of the Barnsbury Telephone Exchange, Barnsbury-grove, Islington (Mr. C. Elliott for the National Telephone Co., Limited).—Consent.

Paddington, North.—Re-erection of Nos. 95 to 103, Maida-vale, Paddington, with projecting porches and bay windows (Messrs. Bochmer & Gibbs for Mr. F. Britton).—Consent.

Strand.—A projecting clock in front of Nos. 127-130, Long-acre, Strand (Mr. E. R. Burch for Messrs. Morgan & Co., Limited).—Consent.

Westminster.—A projecting perch in front of No. 121, Victoria-street, Westminster (Messrs. Farebrother, Ellis, & Co. for Mr. V. S. Galsworthy and Mr. F. T. Galsworthy).—Consent.

Woolwich.—That the application of Mr. J. M. Peate, for an extension of the period within which the erection of a Welsh Congregational Chapel on the northern side of Willenhall-road, Woolwich, was required to be commenced, be granted.—Consent.

Wandsworth.—Buildings on the northern side of Mitcham-road, Tooting, to abut upon Ensham-street (Mr. H. J. Marten for the Council of the Metropolitan Borough of Wandsworth).—Consent.

Kensington, North.—Bay windows and porches to twenty-six houses on the south side of Oxford-gardens, Kensington (Messrs. Trant Brown & Humphreys for Messrs. Daley & Franklin).—Consent.

Woolwich.—That the application of Mr. O. Fleming on behalf of the Fire Brigade Committee of the Council for an extension of the periods within which the erection of a projecting pent roof to the fire brigade station on a site on the north-east side of Eltham-road, Lee, and western side of Meadow-complee-road, was required to be commenced and completed, be granted.—Consent.

St. George, Hanover-square.—A projecting sign in front of No. 45, New Bond-street, St. George, Hanover-square (Messrs. G. & F. Kent for Mr. E. Charvet).—Consent.

Strand.—The retention of an illuminated sign in front of No. 14, Hanover-court, Long-acre (Mr. J. P. Choate for Mr. F. H. Berry).—Consent.

Woolwich.—The re-erection of No. 4, George street, Woolwich (Mr. J. O. Cook for Messrs. J. Franking & Son).—Refused.

Islington, North.—A porch in front of St. Paul's Church, Kingsdown-road, Islington (Mr. A. B. Cook).—Refused.

Kennington.—An iron and glass covered way in front of St. Mark's Vicarage, Kennington-oval (Mr. W. Fitch for the Rev. J. Darlington).—Refused.

Marylebone, East.—An iron illuminated sign at the Queen's Hotel, No. 104, Oxford-street (Mr. T. Holland).—Refused.

St. George, Hanover-square.—The retention of a wood and glass showcase in front of No. 8, Grafton-street, St. George, Hanover-square (Messrs. F. Sage & Co. (1905), Limited).—Refused.

Hackney, South.—Additions to No. 17, Sutton-place, Hackney, to abut upon Urswick-road (Mr. W. Gibbons for Mr. A. Escott).—Refused.

Width of Way and Lines of Frontage.

Battersea.—The retention of a one-story building at the rear of No. 54, Winstead-street, Battersea, abutting upon Surrey-lane (Messrs. Greenfield & Cracknell for Mr. F. C. Greenfield).—Consent.

Camberwell, North.—Houses for persons of the working class on the north side of Beckett-street, the east side of Toulon-street, and the east and west sides of Baily-street, Wyncham-road, Camberwell (Mr. Oxtoby for the Council

* The letter is printed on another page.

of the Metropolitan Borough of Camberwell).—Consent.

Chelsea.—A deviation from the plan approved for the erection of artisans' dwellings on the north-eastern side of Pond-place, Chelsea, so far as relates to an alteration in the position of the forecourt fence at the corner of Pond-place and the roadway leading to Onslow-dwellings (Messrs. Joseph & Smithen for the Council of the Metropolitan Borough of Chelsea).—Refused.

Width of Way and Uniting Buildings.

Southwark, West.—An open shed on the north side of Summer-street, Southwark (Mr. F. Bailey for the City of London Electric Lighting Co., Limited).—Consent.

Lines of Frontage and Space at Rear.

Lewisham.—Four houses on the southern side of Tressillian-road, Brockley (Mr. H. J. Clanville).—Consent.

Formation of Streets.

Norwood.—That an order be issued to Mr. C. J. Bentley, sanctioning the formation or laying out of a new street for carriage traffic to lead from Eastmead-road to Chatsworth-road, West Dulwich, Lambeth (for Mr. L. S. Rogers and Messrs. A. & E. Rowberry).—Consent.

Lewisham.—That an order be issued to Mr. W. H. Collier sanctioning the formation or laying out of new streets for carriage traffic upon the Hilly-fields-park estate, Vicar's-hill, Lewisham (for the trustees of the Jerrard estate).—Consent.

Woolwich.—A deviation from the plan approved for the formation or laying out of a new street for carriage traffic to lead from Fernhill-street to Auber-street, North Woolwich, so far as relates to an alteration in the levels of the proposed street (Messrs. Tapp Jones & Son).—Consent.

Wandsworth.—That an order be issued to Messrs. Bryant & Son, sanctioning the formation or laying out of new streets for carriage traffic out of Waverley-road and Nuthurst-avenue, Brixton (for Mrs. A. A. Coffee and the Westminster Investment Society, Limited).—Consent.

Fulham.—A deviation from the plan approved for the formation or laying out of a new street for carriage traffic, to lead from Fulham Palace-road to Colehill-lane, Fulham, and in connexion therewith, the erection of buildings so far as relates to the substitution for the two blocks of residential flats, marked Nos. 1 and 2 on the approved plan, of four shops (Mr. A. Blackford).—Consent.

Lewisham.—A building at the rear of No. 363, High-street, Lewisham (The Magneto Motor Cycle and Electrical Engineering Company).—Consent.

Alteration of Buildings.

Kensington, South.—Removal of a fence at the rear of No. 2, Kelson-place, Kensington, and also to the closing of openings in the rear wall of such building (Mr. G. E. Bucknill).—Consent.

Strand.—An infringement of the provisions of section 77 of the Act, so far as relates to the uniting of No. 43, Focadilly, with a building on the eastern side of Albany-court-yard (Mr. G. D. Martin).—Refused.

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

ARCHITECTURAL SOCIETIES.

GLASGOW INSTITUTE OF ARCHITECTS.—The usual quarterly meeting of the Glasgow Institute of Architects was held on the 21st ult. Mr. William B. White, Glasgow, was elected a member of the Institute. It was intimated that, in addition to the prize of 2l. 2s. given by the Institute, gained by Mr. William Ralston, a second prize of 1l. 1s. had been awarded to Mr. Thomas A. McAdam in the competition for the Institute's prize in the Technical College. Messrs. Crawford and Lindsay were appointed adjudicators for the School of Art prizes. A draft letter regarding the subject of the number of apprentices employed in architectural offices was submitted, and it was agreed that the letter should be issued to the members of the Institute.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society on Thursday, the 22nd ult., Mr. A. W. Waddington delivered a lecture on "Domestic Architecture: Some First Principles"; Mr. R. A. Smithson in the chair. The lecturer commenced by indicating his impression of the exact position of the various claimants to the title of domestic architecture. The first is the work of the average building draughtsman, whose idea of a home is that of a convenient hoddly resting-place and shelter, and nothing more. A more exclusive, or, rather, inclusive, claimant is the work of a true architect. The third claimant is an intermediate one, falling between two stools, inasmuch as it is not in healthy contact with building materials and not in reach of artistic touchstones. It is because the vast

hulk of modern houses show this unsatisfactory stage of development that a discussion of first principles is necessary. The ideal architect is the philosopher among the builders, and a philosopher is one who is genuinely in love with ideas—i.e., vital first principles. Amongst the main first principles of this sort are those of "the one and the many," from which principles of harmony and variation, subordination and individuality are evolved. The dangers of exaggerated unity are monotony and slavishness; those of exaggerated diversity are restlessness and licence. The special problem of to-day is how to obtain unity without monotony. The lecturer's excuse for an insistence upon the obvious in theory was that it was obviously forgotten in practice. Turning to illustrations of this main first principle of the interplay of subordination and freedom in architecture, the two great types are found in Greek and Gothic. Modern work reaches neither the obedience to perfect law shown in the one, nor yet the perfect liberty of the other. A house is a group of units—rectangles necessitated by rooms and other divisions. In the relation of these units natural inequality suggests the needful diversity; true scale and proportion, and, above all, simplicity of main lines, tends to unity. In detail the roof is the first consideration, as giving dominant boundaries, vertically and horizontally; the windows, as the eyes of the building, are the next consideration, as giving brightness and interest. To attain unity the main rectangle of the block should never be confused by subordinate parts; equality between natural divisions is usually bad; proportions should be subtle, and not too obvious in value. The unit of subdivision (as in window-panes) should be carefully selected, and not changed without reason; hips or gables are not interchangeable on equal terms. Changes of method were changes of key, varieties of materials, and of colours also, and should be kept to a minimum. On the other hand, a variation of minor features gives interest, and symmetry, as in gables, gains by contrast with unsymmetry elsewhere. But counsels of perfection, if of use at all, are useful as items of good taste, and good taste is a trained capacity to grasp first principles—first in feeling, then in thought. In attaining good taste sympathy with the individual artistic value of materials is requisite, and co-operation between mind and matter, sufficient not only to make a physical arrangement, but a mental creation of beautiful form.

NOTTINGHAM ARCHITECTURAL SOCIETY.—The annual dinner of the Nottingham Architectural Society was held at the George Hotel on the 23rd ult., the President (Mr. A. W. Brewill) presiding, being supported by the Mayor of Nottingham (Councillor A. Cleaver), Alderman Sir John Turney (chairman of the Works and Ways Committee), Dr. Boobyer (Medical Officer of Health), Messrs. W. D. Pratt (Vice-President), A. N. Bromley, E. R. Sutton, A. Marshall, R. Evans, jun., A. E. Heazell, F. Booker, W. B. Starr, H. W. Lockton (Newark), A. W. Bradshaw, and W. B. Savidge (hon. secretary). Mr. E. R. Sutton, in proposing the toast of "The Mayor and Corporation of the City of Nottingham," said architects, however, had a grievance—first, that the Corporation did not recognise them as a Society, and it would be an advantage if they would confer with them on such questions as the positions of the different statues and with regard to the Castle gateway, its rebuilding or restoration. They as architects came in closer contact with the Works and Ways Committee than any other committee, and he was voicing the feelings of the architects when he said that, from the chairman to the lowest official, they were always ready to give them any assistance and help in the many difficult problems which from time to time were placed before them.—The Mayor replied.—Sir John Turney proposed "The Architectural Society," saying he realised that the men who followed the profession of architecture had great responsibilities; how great they did not all realise. The welfare of a city, its sanitary conditions and arrangements, depended very much upon how the architects advised their clients and insisted upon the work being carried out. After thirty years' experience he came to the conclusion that the architects and builders of

Nottingham did their work a little better than it was done in most towns. It was important that there should be a very strong desire that everything an architect touched should be beautiful, should be useful, and should be good. Without those three elements they could understand that a city might be built up in a short or a long time, and when it was done not be a thing to please or to command the admiration of the people who visited the city. He hoped that the gentlemen connected with the Architectural Society would do all they possibly could to assist the officials of the Corporation in making the town better to live in and more beautiful to look at.—The President responded, remarking with regret that architectural work in Nottingham had been very quiet, and he was very sorry to say that in the present year he did not see very much prospect of there being any improvement. But, at any rate, he could assure the Mayor that the education of architects during the last few years had very much improved. The last two years had been important years for the Royal Institute of British Architects, and a sub-committee had been appointed, of which he was a member, to draw up a Bill to be laid before Parliament for the registration of architects. They felt that all gentlemen who desired to become members of the architectural profession should do so only by being qualified by examination. As was the case in the movement for the proper qualification of doctors, the opposition had come from the leading men in their profession, while the great body of the younger men were in favour of it. The question had not been before them at the last election of the council as the great issue, and he appealed to architects at the next election not to vote for the men who were well known, but were against registration, but for those anxious to secure the registration. In conclusion, Mr. Brewill acknowledged the kindness and courtesy Sir John Turney had always extended to the architects in the city, and suggested that the Corporation should throw open important works that were to be carried out to competition among Nottingham architects, for the city would gain, getting a very carefully thought-out building at a very much less cost. Another grievance was the tendency to take the valuation of buildings and land out of the hands of the architects and place it in the hands of the estate agents. He contended that the architect and estate agent should act conjointly.—The Vice-President proposed the "Master Builders' Association," and, in replying, Mr. F. H. Fish said the relations between the builders and the men were in a perfectly satisfactory state now, the difficulties had been settled, and they only regretted that there was not more work.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held on Wednesday, February 21, when the Hon. Treasurer (Mr. R. H. Forster) occupied the chair. Mr. Andrew Oliver gave an interesting address dealing with the memories and associations connected with the old buildings of the Strand and Whitehall. Of the old Royal palaces and stately mansions of the nobility which once lined the river bank there are but few traces now remaining, the Banqueting House at Whitehall, the water-gate of Buckingham House, the Chapel of the Savoy, and the water-gate of Essex House, at the end of Essex-street, still exist, and, with the names of the streets which cover the sites of the demolished buildings, serve to recall the historic associations of this ancient thoroughfare of the Strand. The lecture was well illustrated by fine photographic reproductions of old maps, prints, and engravings from Mr. Oliver's extensive collection of old London views, which were exhibited by lantern light. Many of these old prints are very rare. Mr. Emmanuel Green, Mr. S. W. Kershaw, Rev. W. S. Sach-Szyrma, Mr. Compton, and others took part in the discussion which followed.

SOCIETY OF PAINTER-ETCHERS.—The twenty-fourth annual exhibition of this Society, opened this week at the gallery of the Society of Painters in Water-Colours, is one of the best they have ever held. We defer detailed notice of it till next week, in order to do better justice to its contents, our space being unusually crowded this week.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—Through the courtesy of Mr. A. P. Trotter, the electrical adviser to the Board of Trade, who was, however, unfortunately prevented through indisposition from receiving them as intended, the members were enabled to pay an evening visit to the Electrical Standards Laboratory, Whitehall, on February 19. The standard ampere balance and standard 100-volt voltmeter were shown, the former measuring to sixty-five parts in a million and the latter to eighty-four parts in a million. By means of other balances and shunts currents up to 10,000 amperes can be measured, and there are other voltmeters which register up to 12,000 volts. Smaller currents and pressures are measured by potentiometers. In a very small room, which is kept at a constant temperature by an automatic device, the standard ohm and other important resistance coils were seen, and the process shown for the comparison of ohms to the exactitude of one part in a million. The testing of meters was explained in the verification-room, and a number of different types of meters were on view undergoing the exhaustive test for official approval of "construction and pattern." Outside in the area is a battery-room, a rheostat for controlling 10,000 amperes, and a dynamo and booster-room. Other small dynamos were seen in the repair shops, as also a rotary converter for one, two, or three-phase transformers. Before the members dispersed, their thanks to Mr. C. W. S. Crawley and Mr. J. Rennie, who had kindly shown them round, were cordially expressed. Mr. Trotter is giving a paper on "Acceleration and Accelerometers" before the Institution on March 2, and on March 10 the Institution's annual conversation takes place at the Westminster Palace Hotel, when one of the special features of the evening will be an exhibition of engineering and scientific models, specimens, etc.

BOOKS RECEIVED.

ELECTRICITY METERS. By Henry J. Solomon. (Chas. Griffin & Co. 16s.)
THE RESTORATION OF THE GILD SYSTEM. By Arthur J. Pentz. (Swan Sonnenschein & Co. 3s. 6d.)

TRADE CATALOGUES.

The Weber Steel-Concrete Chimney Company send us a little pamphlet containing a brief description of the Weber chimney, and several photographic views of such chimneys under construction and completed in the United States. The method of construction is illustrated by a view on the first page showing the vertical bars of the reinforcement and two rings of moulds in position for deposition of the concrete, which, being composed entirely of Portland cement and sand, would be more correctly termed cement mortar. The valuable properties of reinforced cement and concrete in respect of resistance to atmospheric action, heat, and the products of combustion are well known, and, owing to its capacity for resisting tension, the material lends itself to the design of chimneys on much smaller areas than would be required for brick or brick-lined steel chimneys of the same height and diameter. As the weight of these chimneys is relatively light, they are particularly suitable for places where the soil has low bearing power, and even on more stable ground the cost of foundations is reduced by the smaller pressures involved. The monolithic character of the work, the smoothness and airtightness of the flue, and the rapidity with which construction can be conducted are other points worthy of note. We quite agree with the suggestion in the pamphlet that elegant and graceful outlines may be obtained by the employment of reinforced cement, but it can scarcely be admitted that the light grey colour of cement adds to the artistic effect of any structure.

Messrs. R. Waygood & Co. send us a new 8 pp. catalogue they have issued on the subject of lifts and cranes. This publication contains typical illustrations of the hydraulic, electric, and hand lifts manufactured by the firm, and appears to be one of those auxiliary circulars intended to awaken the desire on the part of recipients to obtain the complete general catalogue, in which more

complete particulars are given of lifting and hoisting machinery. The views here presented are certainly calculated to arouse the interest of intending purchasers.

Messrs. M'Tear & Co. (Belfast) have sent us an account of their asphalt roofing felts, etc., with illustrations of light bow-string and other roofs, and a detailed price-list. We have received from Messrs. Adamsez (Scotswood-on-Tyne) illustrations of Adams's patent lavatory and "Kratör" sink and bowl. The lavatory, which would have been all the better without the ornamentation, is hinged at one end to a plate attached to the wall, and can be swung out as required; it is designed for fixing over a bath or water-closet, and the waste water is discharged into the fitting below. The "Kratör" sink is a shallow, rectangular sink with a circular bowl at one end fitted with a plug and chain, and will probably prove useful in small houses.

An illustrated sheet has been sent to us by the Falcon Brass Works, containing sections and elevation of Fratwell's patent adjustable junction and tee-pieces for lead and iron waste and soil pipes. The junction is cleverly designed so that the branch may enter at various angles, and at the same time the joint allows for expansion and contraction. Screwed sockets and special holder-bats are also shown for use with screwed wrought-iron tubing.

Messrs. E. Busby & Co. have sent us particulars of their valve fittings for public baths. These are of the combination type, and can be operated inside or outside the bathroom. They are specially made to facilitate repairs to the seatings, and it is a distinct advantage that the parts are interchangeable. The valves are also made with a connexion for a shower fitting.

Messrs. Alfred Walker & Sons (Leeds) have sent us a twenty-four-page catalogue containing a long list of buildings and premises in which their concrete pavings and floors and artificial stone have been used. Four pages only are devoted to illustrations and descriptions, and at least one of the illustrations might with advantage have been omitted, as the iron joists shown in it are of an obsolete type. The pavings are made with an aggregate of either crushed granite or slag.

A small catalogue from Messrs. G. Tucker & Son (Loughborough) contains coloured illustrations of the moulded and ornamental bricks, ridge-tiles, chimney-pots, etc., manufactured by the firm. There is a good selection of moulded bricks in 3-in. and 4½-in. sizes.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—VIII.

SIMPLE METHODS OF PROVING CALCULATIONS.

AMONG the various methods of testing the accuracy of calculations involving addition, multiplication, and division, the following are the most expeditious, although it should be recognised that they do not serve to detect errors of working which are mutually counteractive.

To Prove Addition.

Rule.—Add together the individual figures of each addend, and add together the individual figures of each sum. Then, adding together the last obtained sums and also the individual figures of their sum, the result is an *index number*, which is also the sum of the individual figures in the sum of the addends.

Example (1): Prove the accuracy of the sum $(867,213 + 123,841 + 32,642 + 843,845 + 65,738 + 47,314 + 1,237,492) = 3,318,083$.

Adding the individual figures of each addend and of the sum of each addend, we get

$(8 + 6 + 7 + 2 + 1 + 3) = 27$, and $(2 + 7) = 9$
 $(1 + 2 + 9 + 8 + 4 + 1) = 19$, and $(1 + 9) = 10$
 $(3 + 2 + 6 + 4 + 2) = 17$, and $(1 + 7) = 8$
 $(9 + 4 + 3 + 8 + 4 + 5) = 33$, and $(3 + 3) = 6$
 $(6 + 5 + 7 + 3 + 6) = 27$, and $(2 + 7) = 9$
 $(4 + 7 + 3 + 1 + 4) = 19$, and $(1 + 9) = 10$
 $(1 + 2 + 3 + 7 + 4 + 9 + 2) = 28$, and $(2 + 8) = 10$

Adding together the last obtained sums, we have $(9 + 10 + 8 + 6 + 9 + 10 + 10) = 62$, and $(6 + 2) = 8$, which is the *index number*.

Adding the individual figures in the sum of the addends we have

$(3 + 3 + 1 + 8 + 0 + 8 + 3) = 26$, and $(2 + 6) = 8$.

As this result agrees with the index number found before, we may presume the addition has been correctly performed.

Example (2): Prove the accuracy of the sum $(345 + 136 + 427 + 286) = 1,194$.

Proceeding as before, we have
 $(3 + 4 + 5) = 12$, and $(1 + 2) = 3$
 $(4 + 3 + 6) = 13$, and $(1 + 6) = 7$
 $(4 + 2 + 7) = 13$, and $(1 + 3) = 4$
 $(2 + 8 + 6) = 16$, and $(1 + 6) = 7$

The sum of $(3 + 1 + 4 + 7) = 15$, and $(1 + 5) = 6$, which is the *index number*.
 As the individual figures of the sum of the addends $(1 + 1 + 9 + 4) = 15$, and $(1 + 5) = 6$, we have evidence that the addition is correct.

Example (3): Prove the accuracy of the sum $(227,443 + 45,864 + 22,621 + 9,574) = 304,738$.

Here we have
 $(2 + 2 + 6 + 4 + 4 + 3) = 21$, and $(2 + 1) = 3$
 $(4 + 5 + 8 + 6) = 23$, and $(2 + 3) = 5$
 $(2 + 2 + 6 + 2 + 1) = 13$, and $(1 + 3) = 4$
 $(6 + 8 + 7 + 4) = 25$, and $(2 + 5) = 7$

Then, as $(3 + 5 + 4 + 10) = 22$, the *index number* is 4.

Similarly $(3 + 0 + 4 + 7 + 0 + 8) = 31$, and $(3 + 1) = 4$.

To Prove Multiplication.

Rule (1).—The sum of the individual figures in the product of any number multiplied by 9, or by any multiple of 9, will give the *index number 9* when the individual figures of the sum are added together.

Example (1): Prove the accuracy of the product $(786,957 \times 9) = 7,082,613$.

Here $(7 + 0 + 8 + 2 + 6 + 1 + 3) = 27$, and $(2 + 7) = 9$, the *index number*.

Example (2): Prove the accuracy of the product $(643,323 \times 63) = 40,655,664$. (In this example the multiplier = 9×7 .)

Here $(4 + 0 + 6 + 5 + 5 + 6 + 6 + 4) = 39$, and $(3 + 6) = 9$, the *index number*.

Example (3): Prove the accuracy of the product $(327,865 \times 43,927) = 15,057,855,835$. (In this example the multiplier = $9 \times 5,103$.)

Here $(1 + 5 + 0 + 5 + 4 + 7 + 8 + 5 + 5 + 8 + 5 + 5) = 54$, and $(5 + 4) = 9$, the *index number*.

Rule (2).—The sum of the individual figures of any multiple of any number which is a multiple of 9, or the sum of whose individual figures is 9 or a multiple of 9, gives the *index number 9* when the individual figures of the sum are added together.

Example (4): Prove the accuracy of the product $(452,516 \times 5,234) = 2,311,522,688$. (In this example the multiplicand = $9 \times 132,544$; the sum of its individual figures being $(1 + 3 + 7 + 2 + 8 + 9 + 6) = 36$, and $(3 + 6) = 9$.)

Here the sum of the figures in the multiple is $(7 + 2 + 1 + 1 + 8 + 2 + 2 + 6 + 8 + 8) = 45$, and $(4 + 5) = 9$, the *index number*.

Example (5): Prove the accuracy of the product $(45,927 \times 522) = 23,972,894$. (In this example the multiplicand = $9 \times 5,103$; the sum of its individual figures being $(4 + 5 + 9 + 2 + 7) = 27$, and $(2 + 7) = 9$.)

Here the sum of the figures in the product or multiple is

$(2 + 3 + 9 + 7 + 3 + 8 + 9 + 4) = 45$, and $(4 + 5) = 9$, the *index number*.

Rule (3).—Divide by 9 the multiplicand and the multiplier, and divide by 9 the product of the remainders so obtained; then the final remainder should be the same as that obtained by dividing by 9 the product of the multiplicand and the multiplier.

Example (6): Prove the accuracy of the product $(84,362 \times 7,538) = 635,920,756$.

Here the multiplicand 84,362 divided by 9 gives 5 as remainder, and the multiplier 7,538 divided by 9 gives 5 as remainder.

Then the product of the remainders (5×5) divided by 9 gives 7 as the final remainder.

Next, dividing by 9 the product of the multiplicand and multiplier $(635,920,756 \div 9)$, we get 7 as remainder. As the remainders are equal it is assumed the multiplication has been correctly performed.

Example (7): Prove the accuracy of the product $(303 \times 54) = 16,362$.

Here the multiplicand 303 divided by 9 = 3675 + 9, gives 3 as remainder, and the multiplier 54 divided by 9 = 545 + 9, gives 5 as remainder.

Then the product of the remainders (3×5) divided by 9 gives 6 as the final remainder.

Next, dividing by 9 the product of the multiplicand and multiplier and expressing the fraction decimally, $292,875 \div 9$ gives 6 as the remainder.

Hence the product may be taken as correct.

As mentioned above, certain errors in multiplication are not invariably detected by means of the foregoing rules. For instance, two of the digits in the product may be in wrong order, or an equal amount may have been added to one digit and subtracted from another digit, or a cipher may have been inserted or omitted in error.

In example (6), if the first two figures of the product were incorrectly written to give 365,920,756, or if the individual products were incorrectly added to produce 635,820,766, or if an additional cipher were carelessly included, making the product read 6,359,200,756, the division by 9 would still

give 7 as remainder. But with ordinary care no errors are to be anticipated such as would leave the two remainders in agreement, and it would almost invariably be the case in practice that accidental errors of the kind would lead to an evident discrepancy between the remainders, and so point to the inaccuracy of the calculated product.

Rule (4).—Multiplication may also be proved by employing 11 as a test divisor in the same way that 9 is employed under rule (3).

The convenience of this test depends upon the principle that the remainder obtained after dividing any given number by 11 is the same as the difference between the sum of the individual figures in the odd places and of those in the even places of the product, commencing in each case at the right hand (a); or if the difference is more than 11, is the same as the remainder given after division of the difference by 11 (b). If the sum of the figures in the even places of the number should be greater than the sum of the figures in the odd places, then the latter must be increased by 11, or some multiple of 11, in order that the remainder shall be positive (c).

This explanation will be more readily understood by the following illustrations which are lettered to agree with the reference letters in the text above:—

- (a) $165,678 \div 11$ gives 4 as remainder, and $(8 + 6 + 6) - (7 + 5 + 4) = 4$,
 (b) $463,709 \div 11$ gives 4 as remainder, and $(9 + 7 + 4) - (0 + 3 + 4) = 11 = 4$,
 (c) $435,061 \div 11$ gives 9 as remainder, and $(1 + 0 + 3) + 22 - (8 + 5 + 4) = 9$.

Example (8): Taking the same figures as in example (6) prove the accuracy of the product $84,362 \times 7,538 = 635,297,556$.

Here the multiplicand 84,362 divided by 11 gives 3 as remainder, and the multiplier 7,538 divided by 11 gives 3 as remainder.

Then the product of the remainders $(3 \times 3) = 9$, which is the final remainder.

The difference between the sum of the figures in the odd and even places of the product commencing at the right hand is $(7 + 7 + 2 + 3 + 6) - (5 + 0 + 9 + 3) = (26 - 17) = 9$, which agrees with the final remainder ascertained.

Example (9): Taking the same figures as in example (7) prove the accuracy of the product $364 \times 544 = 198,256$.

Using decimal fractions, the multiplicand 3675 divided by 11 gives 1 as remainder, and the multiplier 544 divided by 11 gives 6 as remainder.

Then the product of the remainders $(1 \times 6) = 6$, which is the final remainder.

Next, taking the difference between the sum of the figures in the odd and even places of the product (-0.275) , we have $(5 + 8 + 0 - 2) - (7 + 2 + 0) = 15 - 9 = 6$, which agrees with the final remainder ascertained.

As in the case of rules (1), (2), and (3), test division by 11 will not reveal mutually counteractive errors.

Note.—A rough check upon the substantial accuracy of multiplication that may be sometimes applied with advantage in practical work is to multiply together numbers that are approximately equal in value to the actual numbers.

An approximate proof of the product $(1,087 \times 713) = 1,416,731$ is given by taking $2 \times 7 = 14$, and adding the five ciphers required to give 1,400,000, the test result.

Again, to test the product $(4\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}) = 19,444$, the approximation $(5 \times 2 \times 2) = 20$ shows that the original working cannot be far wrong.

Tests of this kind are useful to busy men in checking the practical accuracy of calculations made by assistants or pupils, who are apt to repose too much faith in the infallibility of their calculated results, and therefore do not think it possible that they may have placed a decimal point in the wrong position, or inadvertently misplaced some line of figures, so as to lead to serious error. Those with more extended experience know that accidental slips will occur occasionally, and so upset the accuracy of calculations that in other respects are most carefully and correctly worked.

To Prove Division.
Rule (1).—Divide by 9 the quotient and the divisor, and divide by 9 the product of the remainders so obtained; then the final remainder should be the same as that obtained after division of the dividend by 9.

Example (1): Prove the accuracy of the quotient $(64,875 \div 375) = 173$.

Here the quotient 173 divided by 9 gives 2 as remainder, and the divisor 375 divided by 9 gives 6 as remainder.

Then the product of the remainders (2×6) divided by 9 gives 3 as the final remainder.

Next, dividing the dividend $(64,875)$ by 9 we get 3 as remainder. Hence the quotient can be taken as correct.

Rule (2).—In cases where division leaves a remainder, divide by 9 the integer of the quotient and the divisor, and to the product of the remainders so obtained add the remainder left after division of the original remainder by 9; divide the sum of these quantities by 9, and the final remainder should be equal to that obtained from the division of the dividend by 9.

Example (2): Prove the accuracy of the quotient $(843,657 \div 4,235) = 199,537$.

Here the integer of the quotient 199 divided by 9 gives 1 as remainder, the divisor 4,235 divided by 9 gives 5 as remainder, and the original remainder 892 divided by 9 gives 1 as remainder.

Then the product of the remainders (5×1) plus 1 = 6.

Next, dividing the dividend 843,657 by 9, we get 6 as remainder. As the two results agree the quotient 199,537 is taken as correct.

Rule (3).—Division may also be proved by employing 11 as a test divisor in the same way that 9 is employed under rules (1) and (2).

Example (3): Taking the same figures as in example (1) prove the accuracy of the quotient $(64,875 \div 375) = 173$.

Here the quotient 173 divided by 11 gives 8 as remainder, and the divisor 375 divided by 11 gives 1 as remainder.

Then the product of the remainders $(8 \times 1) = 8$, which is the final remainder.

Next, the difference between the sum of the figures in the odd and even places of the dividend is $(5 + 8 + 6) - (7 + 4) = 19 - 11 = 8$ as before, showing the correctness of the quotient.

Example (4): Taking the figures in example (2) prove the accuracy of the quotient: $843,657 \div 4,235 = 199,537$.

Here the integer of the quotient 199 divided by 11 gives 1 as remainder, the divisor 4,235 divided by 11 gives 0 as remainder, and the dividend 892 divided by 11 gives 1 as remainder.

Then the product of the remainders (0×1) plus 1 = 1. Taking the difference between the sum of the figures in the odd and even places of the dividend, we get $(7 + 6 + 4) - (5 + 3 + 8) = 1$.

So the quotient 199,537 may be taken as correct.

Example (5): As the product of the remainders in the preceding examples are so small as to obviate the necessity for division by 11, we take in this example some larger figures.

Prove the accuracy of the quotient $(6,467,280 \div 4,230) = 1,536$.

Here the quotient 1,536 divided by 11 gives 7 as remainder, and the divisor 4,230 divided by 11 gives 6 as remainder.

Then the product of the remainders $(7 \times 6) + 11$ gives 9 as the final remainder.

Next, the difference between the sum of the figures in the odd and even places of the dividend, with the addition of 11 to the odd figures to give a positive result is $(0 + 2 + 9 + 6 + 1) - (8 + 7 + 4) = 9$.

Hence, the quotient may be taken as correct.

The inaccuracies that cannot be detected by this method are similar to those previously mentioned in connexion with rules (1) to (4) for proving multiplication.

WESTMINSTER CITY COUNCIL.

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

District Railway Sub-Station, Compensation for Use of Subsoil.—The Works Committee reported having considered a letter from Messrs. Baxter & Co., on behalf of the Metropolitan District Railway, with reference to the compensation to be paid for the use of the sub-soil of Villiers-street for the construction of the Charing-Cross sub-station, stating that at the time the negotiations were opened with the City Council the company believed that the City Council were the owners of the subsoil, but that it now appeared that the subsoil was vested in the Metropolitan Council, who had insisted upon the whole of the £7,000 awarded by the arbitrator. In order to end the matter the company were prepared, without prejudice, to make a payment to the City Council of 2000, for any rights they might have in the sub-station site, the Council to accept in part payment the sum of 1000 deposited with them. In commenting on this letter the Committee stated that it was not the practice of Parliament when giving power to use the subsoil of a street for a station to allow compensation to the local authority, and although the subsoil of a public street was vested in the local authority for certain purposes, the Metropolitan Council in the present case had certain rights in the land. On the recommendation of the Committee it was agreed to accept the offer, the company to insert in their Bill before Parliament a clause authorising the arrangement.

Projecting Clock in the Strand.—The Council consented to the erection of a projecting clock at 125, Strand, the offices of the *Observer*.

Piccadilly Widening.—The Improvements Committee submitted a report dealing with this matter, in the course of which they dealt with a letter received from the London County Council enclosing a plan showing the extent of the widening and the sites of the pillars of the new arcade under

the Ritz Hotel. It appeared that certain of the pillars stood on land acquired by the London County Council from the Building and Vendor Company, Ltd., and that other pillars were on the site of the old roadway or pavement. The company desired that the City Council should undertake, by signing the plan, not to interfere with any of the pillars there shown. On the recommendation of the Committee the City Engineer was authorised to sign the plan.

OBITUARY.

M. DUTERT.—We regret to have to record the death, a few days ago, at the age of sixty, of M. Charles Louis Ferdinand Dutert, "Architecte Honoraire des Bâtiments Civils" under the French Government, and Honorary Inspector of Instruction in Drawing. M. Dutert was a pupil of Hippolyte Lebas and of M. Guinon, and obtained the Grand Prix de Rome in 1869. His name came prominently before the public in connexion with the immense Galerie des Machines for the 1889 Paris Exhibition, built from his design in co-operation with M. Contamin, a manufacturing engineer. M. Dutert was also the designer of the new galleries of the Natural History Museum, one of the most remarkable assemblages of buildings erected during recent years in Paris.

MR. KING.—The death, on February 24, at Borecandle, Prior-road, Harrow, is announced of Mr. Zephaniah King, aged 71 years. Mr. King was senior partner of the firm of Messrs. Zephaniah King & Son, of No. 171, Victoria-street, Westminster. He was elected an Associate in 1881, and in 1887 a Fellow, of the Royal Institute of British Architects; he served as an honorary auditor of the Institute for the session 1899-1900. Mr. King was elected a member of the Architectural Association in 1864; in March, 1902, he was elected a member of the Council of the Architects' Benevolent Society, and retired by rotation in March of the next following year.

MR. GODMAN.—Mr. Ernest Godman died on February 15, at Sunnyside, Banstead, Surrey. Mr. Godman was Architect and Secretary of the Committee for the Survey of the Memorials of Greater London. He was the author of a work upon Norman and Medieval architecture in Essex, and wrote additions to the Hon. Walter C. Poyss's illustrated account of the church of St. Dunstan, Stepney, which was brought out by the Essex House Press some fifteen months ago.

GENERAL BUILDING NEWS.

BATH ABBEY RESTORATION.—At the Bath Guildhall recently a decision was come to as to the completion of the restoration of Bath Abbey. The executive committee reported upon the experiments which Mr. T. G. Jackson, R.C., had conducted with a view to enabling them to advise upon the question whether there should be pinnacles on the tower. They supported Mr. Jackson's opinion that the tower was intended to have spires, and recommended that four pinnacles be erected on the tower with two to correspond at the east end. Colonel Clutterbuck (treasurer) reported that the four tower pinnacles would cost £3981, the two at the east end 5561, and in addition there was general repair work necessary to the amount of 1900. On the motion of the Right Hon. Bath and Wells, it was resolved that Mr. Jackson's proposed pinnacles, with the addition of metal flags, should be adopted for the tower, and also as the model for proportionately smaller pinnacles for the east end.

CHURCH RESTORATION, DAUNTSBY, WILTS.—The work of restoration which has been proceeding at the ancient Parish Church at Dauntsby has just been completed. The nave and two aisle roofs, and also the roof of the Danby Chapel, have been renewed, and the floors repaved with York stone. The walls and porch have been renovated and a new pulpit erected in the same style as the old oak pews, which have been retained and restored. The cost had amounted to 8000, and Mr. H. Brakspear, architect, had charge of the work.

CATHOLIC CHURCH, PORTOBELLO, N.B.—The new Catholic church in Brighton-place, Portobello, was a sanctuary and nave with apsidal end, measuring 112 ft. long, including the aisle, with chapels on each side. The design is by Mr. J. T. Walford, architect. At the west end, fronting Brighton-place, is a baptistry with groined roof. In the north aisle is a sacristy and four confessionals. The exterior is of Auchenheath stone with facings of rubble Winchester stone, and the interior treated with decoration of angels. Cathedral glass is used throughout, and there is a scheme of electric light. The tower reaches 112 ft. high—its cross raised 152 ft. from the street.

PAMPILL CHURCH, DORSET.—The foundation-

one of this church has just been laid. The architect is Mr. C. E. Ponting, F.S.A., the diocesan architect, of Marlborough, and the work of construction has been placed in the hands of Messrs. Lockings Bros., of Newbury, Berks. The church will be cruciform, and built in the late Decorated style. It will be 93 ft. long by 26 ft. wide, and consist of a nave, chancel, north and south aisles, and a western tower 40 ft. high. The space under the tower will be occupied by the family pew, to which there will be a private entrance on the north side of the tower. The north transept will be used by the school children, who will have a separate entrance, whilst the south transept will form the vestry with organ loft over it. The main entrance to the building will be by a porch on the south side, which faces St. Andrew's Green. Seating accommodation will be provided for 193 persons. The roof will be of open timber work covered with dark tiles, the timber being oak, and the flooring will be of wood blocks. The seats will be also of open oak work, and it is expected the chancel will be paved with marble. The eight large tracery windows of the nave and transepts, filled with leaded glass, will be supplemented by a six-light window at the back of the family pew in the tower wall, whilst the window at the east end of the chancel will be a five-light one and extend nearly the whole width.

CHURCH IMPROVEMENT, GALLANDER, N.B.—A meeting of the congregation of the United Free Church was recently held to hear the report of the special committee upon the proposals of the leacons' court for the improvement of the church buildings. The report stated that the committee were unanimously agreed in recommending in its main features the plans and proposals prepared by Messrs. Glegg, and Watson, architects, Glasgow. The alterations which it was decided to carry out include the transferring of the organ from the north to the south side of the chancel, the enlargement of the chancel eastwards to the extent of 3 ft., and the altering of the position of the new vestry.

VESTRY AND ORGAN, DOWLAIS CHURCH.—Since the enlargement, some years ago, of St. John's Parish Church, Dowlais, it had been felt that the old organ was inadequate to the needs of the present congregation of worshippers. A contract was, therefore, entered into with Messrs. Norman & Beard to erect a three-manual instrument to specifications prepared by Mr. Harry Evans, Dowlais, and Mr. W. J. Watkins. It became necessary to enlarge the old organ-chamber, the work being entrusted to Mr. Enoch Williams, builder, Dowlais. A new vestry has been added on the north side of the chancel, the architect of the whole of the alterations being Mr. E. M. Bruce-Young, Cardiff.

SHEFFIELD.—Alderman Glegg, the Chairman of the Sheffield Education Committee, presided on the 12th ult. at the opening of the new school at Newhall for defective children. The new building has been specially designed by the architect, Mr. A. F. Watson (Messrs. Holmes & Watson), to embrace a department for the instruction of boys, and comprises on the ground floor three class-rooms, each accommodating twenty children, a hall, in which exercises or marching will be taught, and private rooms for the teachers. An area of ten superficial feet is allowed for each child. The upper floor will be utilised as a cookery and manual training centre, and a department being for upwards of forty scholars. The manual department is fitted up with wood and other stores, as well as with cupboards for the pupils' work, while the cookery classroom has pantry and scullery accommodation.

SCHOOL, WARRINGTON.—The foundation-stone of the new "Beaumont" Council school in Orford-avenue, Warrington, was laid on the 9th ult. The school buildings are situated on a site of about 2½ acres, and have been arranged in five blocks. There will be a two-story building, which will give accommodation for 360 girls on the ground floor and 360 boys on the first floor. In another building accommodation will be provided for 360 infants, and there will also be a cookery and manual instruction block. Large covered play-sheds have been arranged in each yard, and running along the entire length of one side of the site a garden for nature study has been provided. The building will be heated with hot water on the low-pressure principle, with radiators. The work is being carried out from the designs and instructions of Mr. S. J. Sibley, architect, Warrington. The builder is Mr. C. W. Davenport, of Stockton Heath, and Mr. Henry Hallward is superintending the work. The cost of the building will amount to nearly 16,000.

HOSPITAL FOR SICK CHILDREN, GREAT OXFORD-STREET.—The top floor of the south wing of this hospital, erected in 1890, has recently been converted into an isolation department for infectious cases. The old timber roof has been removed, and a new steel roof, with an asphalt flat laid thereon, has been added. This new roof is formed of two layers of "Mack" slabs—having an air space between—over a steel work, and the asphalt is laid directly on the slabs. The flat is enclosed on three sides with a wrought-iron railing, 6 ft. high, and on the north side by a brick

wall. The flat is to be used for the open air treatment of consumptive patients. The accommodation provided consists of four single bed wards, one ward for two beds, two nurses' rooms, kitchen, and sanitary annexe. The partitions have been formed with "Mack" slabs, the asphaltting has been executed by the Val de Travers Asphalt Company, the doors by the Gilmour Door Company, Ltd., and the porter and Engineering Company. The additions, including the joinery—which is constructed throughout in teak—have been executed by the Works Department of the Hospital, under the management of Mr. James McKay. The architect is Mr. Charles E. Barry.

RECEPTION HOUSE, PARKICK, N.B.—The reception house at Knightswood Hospital was opened on the 13th ult. The building is of one story, and is designed in such a manner that from a central administrative department three radiates four different houses, which can be occupied by four different families. Each house has a living-room, two bedrooms, and a bathroom, having an independent entrance door and "flag" ground. One of the houses, instead of having two bedrooms has one dormitory, and this house can be utilised, if required, for the accommodation of men only. The administrative department is placed in the centre of the building and from the central kitchen an entrance is provided to each house with a sliding shutter for the service of food to the inmates. The administrative department consists of a large kitchen, with sculleries and all necessary store-rooms, while at the back three apartments are provided for the accommodation of nurses and servants. A special entrance is provided from the main road to this department. Heating is partly by hot-water pipes and radiators. Electric light is fitted throughout. The whole cost of the work will be about 2,500. The buildings were designed by Messrs. H. & D. Barclay, Glasgow, and the work carried out under the superintendence of Mr. John Bryce, master of works.

PROPOSED WATT MEMORIAL, GREENOCK.—A meeting of the committee in charge of the Watt Memorial Fund at Greenock met on the 8th ult., and resolved to proceed with the erection of a building upon the site of James Watt's birthplace, at the corner of William-street and Dalrymple-street. Mr. Colin MacCulloch, acting secretary, submitted the report of the sub-committee, which embraced proceedings since the beginning of the movement. It was stated that the Greenock Corporation had unanimously agreed to place the site of Watt's birthplace at the disposal of the committee, the members of which called in Mr. David Barclay, of Messrs. H. & D. Barclay, Glasgow, the architect of Greenock Municipal Buildings, who prepared four sets of plans. Provost Denholm, in explanation of these plans, stated that the committee had unanimously agreed to recommend plan No. 3, which showed a building in the old Scots style of architecture, at an estimated cost of 6,500. On the motion of ex-Bailie Macrae, seconded by Mr. John Rankin, the report was adopted, and it was remitted with full power to the committee to carry out.

PROPOSED EXTENSION OF THE INFECTIOUS DISEASES HOSPITAL, LINCOLN.—Mr. J. Spencer Low, M.B., Local Government Board Inspector, held an inquiry recently at the Guildhall, Lincoln, into the application of the City Council for sanction to borrow the sum of 2,200, for the extension of the Infectious Diseases Hospital. Mr. W. T. Page, jun., the Deputy-Town Clerk, stated that it was proposed to build two public wards, for the accommodation of eight beds each, and two private wards of one bed each. At the request of the Inspector, the Surveyor produced the plans, and explained the nature of the proposed extension, stating that the new block would be practically on the same lines as the present one. The buildings would be of brick and York stone.

NEW HALL, BALGONIE, N.B.—The new hall which has been presented to the inhabitants of Coaltown of Balgonie and district by Mr. C. E. Balfour of Balgonie, M.P., was opened on the 14th ult. The structure, which stands in the village of Coaltown, is designed after the English Renaissance style, and is constructed of terraced cotta brick, with green slates and projecting roofs, having large boards at the gables. The heating is done on the low-pressure steam system by means of radiators, the boiler being in a sunk fireproof chamber. The cost has been about 3,000. Messrs. Gillespie & Scott, St. Andrews, were the architects of the hall, and the following were the contractors:—Mason and brick work, Messrs. Wilkie & Gibb, Leven; joiner work, Mr. John Mitchell, Coaltown of Balgonie; slater work, Mr. Thomas Black, St. Andrews; plumber work, Mr. William Spittal, Markinch; plaster work, Mr. Thomas Davidson, Markinch; painter work, Mrs. Allan, Markinch; heating, Messrs. A. L. Peacock & Co., Dundee; gates and railings, Mr. David Houston, Cupar; laying out of the grounds, Mr. Archibald Douglas, Cupar; furnishings, Mr. David Grievie and Mr. M'Nab, Markinch.

GIRLS' SECONDARY SCHOOL, FOLKESTONE.—Pelliam House, Bouverie-road East, Folkestone, has just been opened as a secondary school for girls. The necessary alterations and repairs were carried out by Mr. S. Binfield, according to the plans, and under the direction, of Mr. W. H. Robinson, Architect to the Kent Education Committee. In all there are six classrooms, providing accommodation for 150 students.

HOSPITAL, EXPRESSION, BIRMINGHAM.—The Queen's Hospital at Birmingham is to be enlarged at a cost of 30,000. Plans have been prepared by Messrs. Even Harper & Bro. for a three-story structure, which will afford accommodation for sixty beds. The plan shows buildings running north and south from Bath-row, with projections to the south at either end. On the ground floor will be a physician's room near the entrance, and now to the rear residential quarters for the superintendent of the hospital, which at present the institution does not possess; a students' day-room, cloak-room for lady students, and a new chapel, 36 ft. by 16 ft. On the first floor is shown a male ward 120 ft. by 24 ft., with room for thirty beds, but this will be divided into two wards. Associated with them will be three bathrooms, a clinical room, two small wards for special cases, a ward kitchen, and store. At the front, over the entrance, will be an open balcony. On the second floor the front portion is appropriated to a children's ward, with six beds, and a women's ward, with twenty-four. A covered glass corridor running behind the out-patient departments will form the means of communication between the older portion of the hospital and the new. The consulting-rooms on either side of the out-patient hall are deficient in space, and to remedy this it is proposed to add upon each side a lean-to structure, providing an additional dressing or examination-room to each consulting-room. The nurses' home is also to be enlarged by the provision of fourteen additional bedrooms, a nurses' recreation-room, and a sitting-room for the lady superintendent.

WORKHOUSE LAUNDRY, TRANMERE.—The laundry erected at the Tranmere Workhouse by the Birkenhead Guardians was opened a short time ago. The plant consists of boiler-house, engine-room, wash-house, and ironing room, separated from one another by drying closets (common to which are receiving, delivery, or dispatch rooms), and adjoining a small wash-house for special purposes. There is a chimney 120 ft. high on the roof of the boiler, and for the sake of security the foundations were carried down to the solid rock 18 ft. below the surface. The buildings are of common brick with red brick dressings, but inside the laundry is lined with white glazed bricks of second quality. The floors are granolithic and of wood. Light and ventilation have been carefully attended to, the windows containing opening casements top and bottom, and exhaust ventilating fans being placed in the roofs and driven at a high speed by steam power. Mr. Edmund Kirby was the architect of the work.

PROPOSED MISSION HALL, PORTOBELLO, EDINBURGH.—A new mission hall is to be erected in connexion with St. Mark's Church, Portobello, Mr. Edward C. H. Maidman, architect, of Edinburgh, has prepared the plans for the proposed work.

STAINED GLASS AND DECORATION.
BUCKRELL CHURCH, HONITON.—A memorial tablet has recently been placed in this church to the memory of the late vicar. The plate is of brass richly decorated and enamelled, surmounted with repoussé silver figures representing angels, supporting a gold chalice, while at each corner of the brass are massive solid silver and enamelled studs. The whole is set in a moulded black marble frame and supported by carved Devonshire marble corbels, each bearing a sacred monogram. The design is by Mr. John Medland, architect, and the work was executed by Messrs. Keith & Co.

CHRIST CHURCH, SOUTHGATE.—The new side chapel, at Christ Church, Southgate, has been entirely redecorated by Messrs. Percy Bacon & Brothers; the roof in colours and emblems; the walls diapered; and five pictures in oils painted by Mr. Percy Bacon himself. The subjects of these pictures are "The Annunciation," "Nativity," "Epiphany," "Presentation," and the "Doctors in the Temple."

WINDOW, CATHOLIC CHURCH, SHEPHERD'S BUSH.—The east window of the Catholic Church of the Holy Ghost and St. Stephen, Shepherd's Bush, has just been filled with stained glass. The window is formed of four large quatrefoils with spandrels. In the upper portions are angels bearing a scroll. In the lower portions are ten figures of saints with their respective emblems. The glass is rich and deep in colour—to suit the unusually strong light. The window was designed and executed by Mr. E. Stanley Watkins, of Ealing.

SANITARY AND ENGINEERING NEWS.
WATERWORKS, EAST COWES.—The newly-constructed waterworks at East Cowes were opened on the 22nd ult. The water-tower is

brick built, starting with walls 2 ft. thick, and tied together at every floor with circular arches and steel girders. The tank, which rests on a floor of steel girders 12 in. deep, is 21 ft. square and 11 ft. deep. The cost, including plant, and building, is 6,000l. Mr. W. Brown was the District Council's consulting engineer.

NEWCASTLE QUAY-WALL EXTENSION.—The Newcastle Corporation have decided that the City Engineer shall carry out the extensions of the quay wall, and not let the work on contract.

VENTILATION OF THE SIMPSON TUNNEL.—So far as can be judged the ventilation of the Simpson tunnel, which is now practically complete, ought to be satisfactory as regards hygienic conditions and the comfort of passengers. When the ventilating apparatus has been installed in full it will consist of a pair of stout canvas curtains at each entrance, the material secured to iron frames mounted on rollers and operated by electric motors, and powerful fans at each end of the tunnel driven by turbines. The curtains will have to be raised each time a train enters or leaves the tunnel, and their object is to prevent any interference with the positive action of the air-propelling machinery. The fans at the north entrance will force in about 2,430 cubic feet of fresh air per second, and those at the south entrance with a similar capacity will act as exhaust fans, thus materially aiding the movement of air along the underground route. As there will be no disturbing causes such as those which make the ventilation of London tube railways so difficult, it is probable that the results will come up to the expectations of the engineers and that the temperature will not exceed reasonable limits.

FOREIGN.

FRANCE.—It is announced that Mr. Hayes, a rich American living in Paris, has offered to the city a statue of Benjamin Franklin, which is to be set up in April.—Fourteen fine Gobelin tapestries are shortly to be exhibited at Versailles; they are works executed in the reign of Louis XIV. from the designs of Lebrun and Van der Meulen. Among the subjects are, the Duke of Anjou proclaimed King of Spain, the departure of Turenne for the war, the siege of Douai, etc.

—The Municipality of Bordeaux has under consideration a large scheme for an increase to the water supply of the city, at an estimated cost of 4½ million francs.—The ancient theatre of Orange, well known as one of the finest remains of Roman architecture in France, is threatened with a complete "restoration," which would probably be as deplorable in its results as all the works of this kind that have been undertaken in France for some years past. It is proposed to lay out half a million francs on this work.

The jury in the competition opened by the Municipality of Marseilles for the reconstruction of the insanitary neighbourhood in the rear of the Bourse, has awarded the first premium to MM. Hélarard and Ramasso, architects who hold scholarships in Marseilles at the Ecole des Beaux-Arts at Paris, and the second to M. Tony Garnier, a Government architect and former Prix de Rome.—There is again talk of rebuilding the Mairie of the Eighth Arrondissement on its present site in the Rue d'Anjou. The work will be entrusted to M. Nénot. The cost is estimated at 2 million francs.—The death is announced, at the age of sixty, of M. Ernest Paugny, architect, of Marseilles, and a member of the Société Centrale.—The death is announced, at Avignon, at the age of eighty-two, of an able artist, Pierre Grivolos, Director of the Art-schools of that town. He was known as a painter of flowers, rural scenes, and of the landscape of Provence. He had presented to the Museum at Avignon a considerable number of his pictures.—The death is announced of M. Auguste Fleury, the oldest architect of Rouen, at the age of eighty-two.—When the budget for Fine Arts comes under discussion in Parliament, the question is to be considered of building four popular theatres in Paris, one in the centre and the others in three of the outlying arrondissements, such as Montmartre, La Villette, Les Gobelins, or Grenelle. The cost of the whole scheme is estimated at nearly 4,000,000 francs.

—Mme. Bartholdi, the widow of the late sculptor, has founded a prize to be awarded annually, at the Old Salon, to an artist who has executed any work remarkable for qualities of invention and imagination, in any walk of art. The prize will be awarded this year for the first time.—It is probable that the monument to Carpeaux will be erected in the square of the Louvre, behind the Gambetta monument.—Work is shortly to be commenced for the enlargement of the Mairie of the IInd arrondissement of Paris, in the Rue de la Banque.—A new district hospital is to be built at Raincy.—The Curator of the Palace of Fontainebleau has restored several of the ancient apartments, among them that formerly occupied by Pope Pius II., and those of the Princesse Hortense and of the sisters of Napoleon.—An international exhibition of Women's Art ("Arts de la Femme") is to be held at Marseilles in the course of the

present year.—M. Gervais, architect, of Bordeaux, has been appointed architect to the Department of the Gironde.—The Municipality of Nancy has voted a sum of nearly 2,000,000 francs for various works of street improvement and building, including the erection of a district school of art.—The Municipal Council of Agen have opened a competition for the building of a new theatre on the site of the existing theatre, which is to be demolished.—M. Durel, an architect, originally of Lyons, was murdered in a railway carriage a few days ago. He had designed the Kursaal and various hotels at Geneva, and the monument erected there to the French inhabitants who fell in the war of 1870. The death is announced of M. Henri Hamel, art critic, and editor of the *Journal des Artistes*. He devoted himself in the first instance to painting and lithography, and was a pupil of Gérôme and of Maillart; he subsequently devoted himself to literature and started successively the *Monde Moderne*, the *Revue des Beaux-Arts*, and the *Revue Parisienne*. He was the author of two books—"Art et Critique" and "Causerie sur l'Art et les Artistes."

SOUTH AFRICA.—Messrs. Willis & Hutchison, Solicitors, have secured the contract for building the Odzani power station and other buildings in connexion therewith.—The Transvaal Public Works Department has accepted Mr. J. J. Kirkness's tender for the erection of additional stories to the new Government buildings in Pretoria at a cost of 2,429l.

MISCELLANEOUS.

THE INSTITUTE OF ARCHITECTS.—The Registration Sub-Committee, consisting of the President, Sir Aston Webb, R.A., Mr. Edwin T. Hall, Mr. T. E. Colcutt, Mr. John Slater, Mr. J. S. Gibson, Mr. A. W. S. Cross, Mr. W. H. Seth-Smith, and Mr. George Hubbard, and appointed by the Registration Committee "to take evidence for and against the principle of Registration, and to suggest the course of procedure to be adopted at the general meeting when the present scheme of registration comes up for discussion," desire to state for the information of members that they have held twelve meetings and taken the *visa* *vice* evidence of twenty-one architects practising in and against the principle of Registration, and in London and the provinces, a verbatim report of which has been preserved, and they hope soon to be in a position to report to the Registration Committee.

CHURCH OF ST. PAUL, BALL'S POND, ISLINGTON.—In terms of the Act 29-30 Vict. c. 111 the Ecclesiastical Commissioners have agreed to appropriate out of their common fund a grant of 850l. in supplement of a benefaction of the same amount which has been paid to them in favour of St. Paul's Church. The total sum of 1,300l. is to be applied to the provision of a parsonage or house of residence for the vicarage, according to plans and a specification to be approved by the Commissioners. The church, which stands at the junction of Essex and Ball's Pond roads, was built of brick with stone dressings and window tracery in 1826-7 after Sir Charles Barry's designs in the late Gothic style then in vogue.

WESLEYAN CHAPEL COMMITTEE'S REPORT.—The fifty-first annual report of the Committee which was recently issued, setting out the progress during the period under review 483 new or enlarged buildings were completed at an aggregate cost of 692,533l., the list including 133 new churches having a total capacity for 43,000 persons, 34 ministers' houses, 55 school-rooms, 203 improvements and extensions, and 58 organs. The building is in progress of 27 out of the 60 new churches for 16,700 sittings, sanctioned during the twelve months by the Committee. Mission halls have been erected at Hull, Bootle, and Plumstead, together with the Garrett Memorial hall, the headquarters of the Wesleyan mission in Liverpool; new central halls will shortly be built in Sheffield, Wigan, Paisley, Manchester, Sydenham, Stepping, and Great Queen-street, London. During the past fifty years the value of the chapel property belonging to the Connexion has increased by 10,000,000l., and an amount of 2,863,509l. has been paid off as debt upon Wesleyan trust property.

GALLERY OF BRITISH ART, MILLBANK.—Hogarth's "A Family Group" has become the property of the Gallery in terms of the late Mrs. Anne Sealy's will, and will be removed from the collection in Trafalgar-square. Recent additions to the Gallery at Millbank consist of a series of fifty drawings and sketches by Alfred Stevens, purchased by the trustees, G. F. Watts's "Echo," presented by Mrs. Watts; the late H. H. Attwood's bas-relief, "Hero and Leander," bequeathed by the artist; and Mr. Sargent's "Portrait of Miss Ellen Terry as Lady Macbeth," presented to the Gallery by Mr. J. J. Duxey.

THE MUNICIPAL YEAR BOOK.—The Municipal Year Book of the United Kingdom for 1905 has just been issued by Edward Lloyd (Salisbury-square). The work, which is edited by Mr. Robert Donald, is crowded with useful and, so far as we have been able to test it, reliable information

relating to the cities and towns of the country, all of which is clearly arranged and printed. A brief general review is given of the work of each local authority in alphabetical order, under the name of the city, town, or district, and the chief sections into which the book is divided are as follows:—(1) London Municipal Government (County Council, City Corporation, Borough Councils, Water Board, Asylums Board, etc., etc.); (2) Municipal Government in England and Wales (general summaries of the work of the Municipal Corporations, Urban District Councils, and Rural District Councils); (3) Municipal Government in Scotland (general summaries of the work of the principal Scotch cities and towns); (4) Local Government in Ireland (general summaries of the work of the principal Irish cities and towns); (5) Water supply; (6) Gas supply; (7) Tramways; (8) Electricity supply; (9) Housing of the working classes; (10) Markets and slaughter-houses; (11) Telephones; (12) Baths and wash-houses; (13) Education; (14) Libraries; (15) Amusements; (16) Refuse and sewage disposal; (17) Local taxation, and the Municipal Corporation trading. There is also a directory of the principal societies and organisations connected with the various branches of local government. We have pleasure in drawing attention to a most useful guide to municipal work.

STREETS IMPROVEMENT, NEWCASTLE.—A special meeting of the Town and Streets Committee of the Newcastle Corporation, held on the 19th ult., at the Town Hall, Newcastle, to consider a scheme proposed by the City Engineer (Mr. C. R. S. Kirkpatrick) for making a further extension of Market-street to Trafalgar-square. The City Engineer said that the scheme as sanctioned by Parliament could be improved upon in many respects. The levels of the main street would be very irregular, and the gradient of the cross streets would in some cases be very steep. The façades of the new street would never have more than the appearance of a succession of street ends. To cope with these difficulties he (the City Engineer) had prepared a scheme which, although it would cause further delay and expenditure, would in the end give satisfaction in the matter of gradients, frontages, and land available for sale. Market-street extension by this scheme would have one uniform gradient of 1 in 79 from Elgin-street to Trafalgar-street. The difficulties with cross streets would be avoided, and instead of a succession of street-ends there would be excellent frontages with a good depth of site that would make the land marketable. After going into details of the widths and gradients of the proposed new streets, with the length of the building-frontages of each, the report stated that the extra land required to be purchased represented an area of 12,400 sq. yds., which, together with that already purchased, made an area of 21,550 sq. yds. From this area, 7,100 sq. yds. would be required for streets, leaving a balance of 14,450 sq. yds., to which must be added 3,600 sq. yds. absorbed from streets which would be abolished, making a total of 18,050 yds. for re-sale. The land already purchased had cost about 183,000l., and it was estimated that the land required would cost about 248,000l., and that the sale of the land would realise 601,820l., which, after deducting 22,000l. for street formation, and 25,000l. for other expenses, would leave a profit of 183,820l. After consideration it was agreed to make a survey of the lands in question on March 5.

STREETS COMPTON ST. GERMAN'S.—The St. Germans Rural District Council have appointed Mr. H. A. Hoslings their surveyor. There were ninety-nine applicants for the post.

SLATE TRADE.—There is an improvement in the Carnarvonshire district. It was found that prices in the January list for 24 by 12 and 24 by 11 were too low, so an advance has been made in those sizes. The wet weather has caused falls of rock in some of the deeper quarries; these, with the increasing cost of working, are turning the attention of quarry owners to the slate properties on the south side of the valley, which have long been thought of by the workmen. The men have accepted the reduction in wages, and work is being carried on smoothly in all the quarries.

THE COCKBURN ASSOCIATION AND THE AMENITY OF EDINBURGH.—The annual report by the Council of the Cockburn Association alludes to the proposal to convert the Royal High School into a National Gallery and Art School, and expresses the view that it will be a source of satisfaction to many that the proposal has been dropped. In the matter of the raising of the parapet of the Dean Bridge, the Association made a representation on the subject to the Town Council. The proposal was dropped, and the Council hope that the raising of the parapet of the Dean Bridge in the shape of a project to run tramways over the bridge. Apart from the question of overhead posts and wires, which would have disqualified the bridge, the chief objection to the proposal to convert the Royal High School into a National Gallery and Art School was the widening of the bridge, and it is felt that that could not be done without detracting

to present graceful lines upon which the bridge is constructed, and thereby destroying one of the city's greatest works. It was with regret that the Council recorded the demolition of a part of the historic Flodden wall in connexion with the building of a new school in Drummond-street. The amount destroyed is not of very great extent, and the best portion of the wall, it is stated, still remains untouched. The attention of the School Board having been drawn to the matter, a brass tablet recording the history of the wall has been fixed upon the remaining portion of the wall at the entrance to the school. The Council drew attention to the tablets displayed by Messrs. W. & R. Chambers when adding to their premises in Byres Close. The new building has been designed as far as possible to be in harmony with its surroundings. Otherwise the view of the Old Town from Princess-street would have been seriously damaged. The new headquarters of the Queen's Rifle Volunteer Brigade in Forrest-road is quoted as a successful example of an effort to harmonise the architecture of a new building with the general character of its surroundings. The North British and Mercantile Insurance Company buildings in Princess-street and the new branch of the British Iron Bank in George-street are also referred to as interesting considerations to the dignity of their respective surroundings.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual dinner of Bristol Master Builders' Association took place on the 20th ult. at the Royal Hotel, the President (Mr. E. I. Neale) being in the chair. The Royal toast was responded to by the Chairman, Mr. A. N. Jones (President Bristol Chained Timber Importers' Association) submitted "Our Civic Rulers," and Alderman Parsons, in replying, said Bristol was a city with great traditions, and he claimed that the civic rulers desired to do their duty earnestly and faithfully in accordance with those traditions. He pointed out the expenditure on Avondale Dock, large sums of money had been spent in providing adequate facilities for the old city docks.—Councillor E. M. Dyer said he felt surprised that the masters builders were so passive, for he thought that the citizens were called upon to pay too much for work which the Corporation could do out, and which, to his way of thinking, should be put up to public competition. The timber trade was developing at Portishead, and he hoped that it would prove a great success.—Mr. Frank N. Cowlin submitted "The Trade and Commerce of Bristol." He coupled with the toast the name of the President of the Bristol Chamber of Commerce. The President of the Chamber of Commerce (Mr. S. Humphries) said that in Bristol they had to compete against rival ports, and if dues were reasonably lowered, there was no reason why Bristol should not supply the whole of the great district of the Midlands. The railway rates from Bristol were better than those which existed at Liverpool, and the slight decrease was not to dominate the district he had alluded to.—The Mayor of Bath (Mr. C. Bryan Oliver) proposed "The National and South-Western Federations of Master Builders of Great Britain." He remarked that the Federations had done an enormous amount of good, but the object was to double the preventing strikes. They had been established not for coercive, but for protective, purposes.—Mr. E. W. Wooster (Bath), President of the South-Western Federation, responded, and alluded to the position which the organisation held. He claimed that it had raised the standard of their industry to a degree more commensurate with the importance of the work done. The influence of these bodies had been felt, he agreed with the proposer of the toast, in dealing with trade disputes with the workpeople, in arriving at amicable understandings, and so preventing strikes.—Mr. A. Dowling (ex-President), who followed, claimed that the West of England Federation did not exist to tyrannise. It enabled them to make their voices heard in regard to conditions of tendering and contracting in a way that would be impossible for a single member or even the association of a single town. They were also united to the National Federation, and participated in, as well as assisted in, accumulating funds for the good of their object was to act equitably.—Mr. R. F. Wilkins gave "Architects, Engineers, and Surveyors," and Mr. Frank W. Wills, Mr. A. P. I. Cotterell, and Mr. Peter Addie (City Surveyor and Valuer) responded.—Mr. George Humphries (Treasurer), proposed the toast of "Kindred Associations." Mr. G. H. Perrin (Architect) responded.

The Visitors were duly honoured, on the proposition of Mr. E. Walters, and acknowledged by Mr. W. Webb (President, Bath Association). Mr. W. H. Brown proposed "The Bristol Master Builders' Association."—The President said he desired to thank the members of the Bristol Association for the very hearty manner in which they had supported him during his two years of office as President. It was very gratifying to know that their Association was increasing in numbers, although his friend the Treasurer (Mr. George Humphries) reminded him that their

expenses were increasing. He was sorry that during his term of office the building trade had been in a depressed state, but he thought that there were indications of better prospects. He was pleased to say that the membership between the builders and their workmen was most satisfactory, and the Association had decided not to ask for a reduction of wages, believing that better and more prosperous times were ahead.—Mr. R. F. Ridd was inducted as the new President, and the chain and badge of office placed upon his shoulders.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—A meeting of this Society was held last week in the Technical College, the President (Mr. Colin Sinclair) in the chair, when Professor Charles Gourlay delivered a lecture on Salonica, illustrated by lantern slides, also by drawings and photographs, some of which were taken by the lecturer. Professor Gourlay said that the modern town of Salonica was first known in history as Therna, but Cassander changed its name to Thessalonica after the name of and in honour of his wife. After touching upon the many historical associations, both sacred and classical, connected with the city and describing its beautiful situation, the lecturer referred to its ancient walls, white tower, and sculptured Roman arch. Then in considerable detail he described in the following order the Early Christian and Byzantine churches, now mosques, which still remain in a remarkably well preserved state in this modern Turkish town. The Church of St. George, with its circular nave and beautiful mosaic decoration of the interior of its dome, which is the greatest and best work in Byzantine mosaic now in existence; the Mosque of Eski Djouma (formerly a three-aisled basilican church); the Church of St. Demetrius, one of the best preserved and most finely proportioned of five-aisled basilicas of the Early Christian period; the Church of St. Sophia, with its interesting plan and dome at the crossing, which is decorated internally with a very beautiful mosaic, the subject being the Ascension; lastly, the later examples: St. Elias, with its triapsal plan; St. Bardias, having the typical Greek cross plan; the Holy Apostles, with its one central and four smaller domes, showing thus in its pristine form that which became a universal feature of the Russian churches; and St. Pantelimon, a small but interesting church now restored.

PROPOSED ART SCHOOL FOR EDINBURGH.—The Lord Provost's Committee of Edinburgh Town Council discussed on the 21st ult. the proposal to found an art school in the city. It is understood that the Government are willing to contribute a certain sum towards this object on the understanding or undertaking that a considerable contribution is made by the city. It was stated that the Government were prepared, in the event of Edinburgh not doing something, to hand the sum over to Glasgow. Ultimately it was agreed to remit the matter to a sub-committee to consider as to the attitude to be taken up by the city.—*Glasgow Herald.*

PHOTOGRAPHIC SURVEY AND RECORD OF STREETS.—The annual meeting will be held in the lecture Hall, Public Library, Kingston-upon-Thames, at 3.30 p.m., on Saturday, March 10. The President, Viscount Midleton, will give an address, and the report of the Council and the accounts of the year ended December 31, 1905, will be submitted. The meeting is open, not only to members and contributors to the Survey, but to all interested in its work and aims. Arrangements have been made for an exhibition consisting of a representative selection from the 2,000 prints already in the Survey collection, in the Art Gallery, Public Library, Kingston-upon-Thames. This will be open on the day of meeting until 9 p.m., and again during the following fortnight until dusk. A short lecture, illustrated by lantern slides, will be given on each Saturday evening at 8 p.m.

BRITISH FIRE PREVENTION COMMITTEE.—The Committee completed a further series of important fire tests last week, their investigations terminating late on Saturday. Two concrete floors were under test for the purpose of classification as affording "Full Protection" (Class B) against fire, this necessitating a fire test of four hours at temperatures reaching between 1,800 and 2,000 deg. F., followed by the application of water from a steam fire engine for five minutes (two branches), the floors being loaded with 2½ cwt. per ft. super. The one floor was of brick concrete reinforced with expanded metal lathing, supported by encaased ordinary girders. The other floor was of clinker concrete reinforced with small joists, supported by encaased broad flange girders. In both, "Ferrocrete" cement was used and the period allowed for the setting and drying was almost the same. Both floors obtained classification as affording "Full Protection." By the last-named floor test the Fire Prevention Committee again prove, among other matters, the superiority of clinker concrete versus Thames ballast concrete as a fire resistant, a floor of almost identical design of Thames ballast concrete having failed last autumn. Two fire tests with roller shutters (Kinneer type) were also completed by the Fire Prevention Committee, one with double shutters for a four-hour test, and one with

a single shutter for a two and a half hour test, followed by the application of water. Both attained classification as "Fully Protective" (Class B and Class A respectively); both were of thin steel plate under ½ in. thick, and both had, prior to the final application of water, been subjected to streams of water fifty minutes before the conclusion of the tests—i.e., they had this additional test applied beyond what was necessary for classification.

Legal.

WEST-END ANCIENT-LIGHT CASE.

In the Chancery Division, on the 1st inst., Mr. Justice Joyce concluded the hearing of the case of Fryzer v. Windus and Others—an action by the plaintiff, Mr. Alfred Fryzer, against the defendants, Mr. James Windus, Mr. W. S. Hoare, and Messrs. E. Lawrence & Sons, builders, for an injunction to restrain the defendants, their servants and agents, from erecting or continuing the erection of new buildings so as to cause a nuisance to the plaintiff or his premises, and from injuring darkening or obstructing the access of light to and through a skylight and certain windows in the plaintiff's premises as the same were formerly enjoyed, and an order to pull down so much of the buildings as were higher than the old buildings which formerly stood on the site. There was also a claim for damages. The statement of claim alleged that the height of the defendants' old buildings was 48 ft. from the ground level and 23 ft. from the party wall, and that defendants had erected on the site a new building consisting of shops, warehouses, and tenements, the rear walls of which were about 60 ft. in height, and only about 10 ft. from the party wall. Plaintiff alleged that the effect on this was to cause a substantial decrease of light coming to the lights and windows in question, and was such as to render his house uncomfortable according to the ordinary notions of mankind. There was also a claim for trespass in connexion with the party wall.

The defendants did not admit that any of the plaintiff's lights were ancient. They also said that the walls of the old buildings they had demolished were dark and unsightly, and no light could be reflected from them, whereas the walls complained of of the new buildings were faced with white glazed bricks, which afforded a considerable amount of light to plaintiff's premises. They further denied that their new buildings had or would cause any nuisance to the plaintiff as alleged, and that they would in any appreciable extent affect the plaintiff's light or interfere with the comfortable enjoyment by the plaintiff or his tenants of the premises.

Mr. Hughes, K.C., and Mr. Crossfield appeared for the plaintiff, and Mr. Younger, K.C., and Mr. E. Ford for the defendants.

Mr. Hughes, in opening the case, said it raised two points, the important one being the question of ancient lights, and the other a minor question about a party wall. The plaintiff was the lessee of a building named Cavendish-chambers, which was in a street recently called Duke-street, but was now called Hallam-street. It was a large building, and the plaintiff was the leaseholder, his term being seven years from Christmas, 1904. The rental of the plaintiff's building was 300l. a year, and it was let out by him as residential chambers. The windows affected were nine in number. The defendants, Windus and Hoare, had an agreement for a lease of certain buildings in Great Portland-street, being at the back of the plaintiff's premises. Defendants had pulled the premises down and had rebuilt them. Both the defendants' buildings were erected under one contract.

Mr. Younger said that so far as he could see the building complained of was that of Mr. Hoare and not that of Mr. Windus.

Mr. Hughes said that for all practical purposes defendants were partners in the matter.

Mr. Younger said he appeared for all the defendants, but he did not admit that statement of his learned friend. He had got to make his case against each defendant.

Mr. Hughes: Oh, yes. So far as regards an injunction no difficulty arises, but on the question of damages there might be some difficulty about severance of damages.

Continuing, the learned counsel said that the writ was issued in May last, when the defendants' buildings had not gone very far. On June 20, 1905, a motion was made for an *interim* injunction, but by consent no order was made on the motion, although it was agreed that plaintiff was not to be prejudiced by the building having gone on since the date of the motion. It was said by the defendants that the plaintiff's lights were not ancient, but he could prove they were. The windows in question were by no means too well lighted before the defendants' buildings were put up, and the result of what had been taken away was to render the rooms gloomy and uncomfortable. He should call evidence to show that the effect of what had been done was to substantially diminish the letting value of the

plaintiff's property. The other point with regard to the party wall arose in this way. The building owners, wanting to interfere with the party wall between the two properties, gave the usual notice, and a Mr. James Naylor acted for the plaintiff, and a Mr. White for the defendants, and an award was made as to the alteration that might be made in the party wall. In point of fact, the party wall was raised higher than the award allowed.

His lordship: What do defendants say about that?

Mr. Hughes said that they declined to pull it down, and set up the contention that they were entitled to another award. When the plaintiff's architect complained, he defendants' architect said he should go to a third surveyor to see if he was entitled to keep the wall as it was.

Mr. Younger said the plaintiff pleaded that the party wall was a trespass and an interference with the light. The defendants said there was no ground for saying that the wall interfered with the light, and so far as trespass was concerned the case was in the hands of a third surveyor. He thought that so far as trespass was concerned it was very trivial.

Mr. James Naylor, A.R.I.B.A., examined by Mr. Hughes, said he practised at No. 19, Hanover-square, and was Assistant District Surveyor for Marylebone. He was called in to advise on this matter on February 21, 1905. He had carefully examined and measured the buildings, and had prepared the drawings counsel had made use of. He had inspected the interior of the plaintiff's building on the question of light. The windows "A" and "B" lighted the rear room on the first floor, which was unoccupied at present. "C" lighted the staircase, "D" a water-closet and bathroom, "E" a sitting-room, "F" a water-closet on the ground floor, "K" a bedroom on the ground floor, "M" the studio, and "N" a sitting-room. There was a room just behind the studio which got its side light from the skylight in the studio. He went into all the rooms before the defendants' buildings were completed, and had been into the several rooms since the defendants' buildings were completed. The room lighted by the two windows "A" and "B" was now uncomfortably dark; so much so that a gentleman could not see to shave in it except on a bright summer day. Before the defendants' buildings were put up the light was none too good, but now it was very much worse. The staircase light was important. Since the defendants' building had been put up it had made the hall distinctly gloomy and the staircase badly lighted.

The witness was then examined as to the other windows and lights said to have been affected by the defendants' buildings, and gave evidence to the effect that the light was now substantially less than it was before. He considered that owing to the defendants' buildings the depreciation in the letting value of the plaintiff's building would be about 35 per cent. As to the party wall, the piece put on not sanctioned by the award was shown on the model.

His lordship said here that some arrangement ought to be come to on that part of the case.

Mr. Younger said that his clients would pull that part of the wall down.

His lordship: Therefore it is not necessary to go into that part of the case. I should have thought that for a small sum the plaintiff might allow it to remain up.

The witness, in cross-examination by Mr. Younger, said that his view was that the light to all the windows in question had been damaged by what the defendants had done. An artist was still in occupation of the studio. The glass in the roof was slightly obscured by a coating of dust. It was a well-lighted room before the defendants' buildings were erected. It was now an extremely gloomy room, perfectly useless as a studio and practically useless for residential purposes. He thought the result of the defendants' operations had been to depreciate the letting value of the plaintiff's rooms by 35 per cent. He thought the rental value of the studio was reduced by 50 per cent.

The rent of the studio is 100l. a year?—Yes. Therefore, according to you the present value of it is 50l. a year?—Yes; it can never again be used as a studio.

Mr. E. A. Cruning, F.R.I.B.A., examined by Mr. Hughes, said he had not known either the plaintiff's or the defendants' buildings before. He had examined the plans and models and, had visited the buildings on May 29, 1905, and February 9 last. Both were fine days. When he went in May last defendants' buildings were not completed. In his opinion the defendants' buildings had very materially affected the light coming to plaintiff's windows on the ground and first floors.

In their present condition are the living rooms comfortable according to the ordinary notions of mankind in respect of light?—No, I do not think they are.

Are they in such a condition of light that a man could carry on his ordinary occupation there as beneficially as before?—Certainly not.

Examination continued.

One-third of the light falling on the floor of the

ante-room at the back of the studio had been taken away now.

In answer to his lordship, witness said he understood that the studio had been a good one, and had been used for the purpose of painting portraits.

Cross-examined by Mr. Younger. He had no knowledge of the premises prior to his first visit in May last year.

Evidence was also given on behalf of the plaintiff by Mr. John Slater, F.R.I.B.A., Mr. G. R. Crickmay, F.R.I.B.A., and Mr. C. H. Giddy, of Messrs. Ciddy & Giddy.

At the close of the plaintiff's case Professor Boreford Pite, F.R.I.B.A., was the first witness called for the defence. He said he had visited the premises in question first in May of last year and afterwards in February of this. The opinion he formed was that the defendants' buildings had not caused a serious or material obstruction of light to the plaintiff's windows, and sufficient light was left for the quiet, comfortable use and occupation of the premises. He was confirmed in his opinion by his subsequent examinations of the premises. At the present time the unobstructed light to the windows "A" and "B" was 49½ degrees. In his opinion the studio was a well-lighted room. Defendants' premises had not in his opinion appreciably affected the light of the studio. With regard to the other rooms they were all sufficiently lighted, many of them being exceedingly well-lighted for bedrooms. He had made the usual tests in the rooms, and found that he could read small print in all parts of the rooms.

Cross-examination.

He held the opinion that a bedroom could be too well-lighted.

The following experts also gave evidence in support of the defendants' case—Mr. Matthews, F.R.I.B.A., Mr. Howard Chatfield Clarke, F.R.I.B.A., and Mr. W. H. White, F.R.I.B.A.

At the conclusion of the addresses of counsel his lordship reserved judgment.

ACTION BY CIVIL ENGINEER FOR FEES.

On the 22nd ult. the hearing was concluded of the case of Walton v. Garland and others before Mr. Justice A. T. Lawrence and others before Mr. Justice A. T. Lawrence and a special jury, an action brought by Mr. J. B. Walton, a civil engineer, of Hythe, Kent, against Mr. J. F. H. Garland (since deceased) and then represented by his executors and Mr. Joseph Rowlands, of Birmingham, to recover a sum of money for services rendered to the defendants and for money paid at their request.

The defendants denied that they employed the plaintiff, and they further said that they had paid him all that was due. Third parties were represented in the case, viz., the Great Western Railway Company and a Mr. L. R. Walker.

Mr. Hugo Young, K.C., and Mr. W. H. Waleley appeared for the plaintiff; Mr. Montague Lush, K.C., and Mr. Horace Rowlands for the defendants; Mr. J. A. Simon for the Great Western Railway Company; and Mr. Coles Preedy for Mr. Walker.

Mr. Young, in opening the case, said that the claim was made by the plaintiff, an engineer, for services rendered in connexion with the making of a new line in Wales called the North Pembroke-shire and Fishguard Railway, and which constituted a through route to Ireland. The line was now under the control of the Great Western Railway Company and would be very soon opened. There was, apparently, no question as to the plaintiff being entitled to be paid; the point was, who was to pay him? The amount he was entitled to could not be determined by the jury; that would have to be got elsewhere. The jury would have to say whether the plaintiff was not right in trying to fix the responsibility on the gentlemen with whom he contracted, leaving them to be indemnified by anybody upon whose shoulders liability ought ultimately to fall. The learned counsel then narrated in detail the various steps taken to complete certain lines in the locality, and said that in 1902 the company entered into a contract with a Mr. O'Kell to make a line from Roseshub to Fishguard, the consideration being that he should receive the whole of the shares of the company, the latter undertaking to invite public subscription for the same. This contract was assigned by Mr. O'Kell to Mr. Rowlands and Mr. Garland. In 1902 the idea entered the heads of Messrs. Rowlands and Garland of extending the local railway to Fishguard, to have a pier and harbour at Fishguard, making the through route to Ireland. The details of the various schemes which were subsequently presented to Parliament were explained, and it was stated that in October, 1905, the plaintiff was employed by the defendants to do certain work. Plaintiff was paid an amount of money under that contract, but the present claim was in respect of extra work for which he was entitled to be remunerated, as the whole original idea of the scheme was altered, and he had so much additional work to do.

After a great deal of evidence had been given, the whole matter was referred to the official referee, Mr. Edward Pollock.

ACTION BY DECORATIVE ARTIST AGAINST BUILDERS.

The case of De Jong v. James Johnson & Sons, Ltd., came before Mr. Justice Lawrence in the King's Bench Division on the 24th ult., an action by Mr. Felix De Jong, a decorative artist, to recover from the defendants, and to deconstructive work done in connexion with the erection of the Alhambra Theatre of Varieties, Cateshead. The total bill was 1,277l., but 500l. had been received.

Mr. E. F. Lever, who appeared for the plaintiff, said the question for his lordship was, whether in suing the defendants plaintiff was suing the proper persons. There were three people concerned in the erection of the theatre. There was the theatre company, the building owners, Mr. James Johnson, the original builder, who undertook to do the whole of the work, and James Johnson & Sons, Ltd., which was a company formed for the purpose of carrying on his business. The defendants said that the plaintiff should have sued the theatre company, who were the building owners, but he contended that it was the present defendants who were liable. In May, 1904, when the theatre was to be erected, his client got into communication with Mr. Stewart Mould, who was the architect, and who, it was plaintiff's contention, was acting for Mr. Johnson with reference to the sub-contract for work which was done by the plaintiff. He believed that the sub-contractor always looked to the builder for payment, and therefore, as in this case, the builder was liable. Mr. Mould had given a certificate for 500l., representing a part of the work done, and this was sent to Mr. Johnson with a request for payment, and James Johnson & Sons, Ltd., sent the cheque.

The plaintiff gave evidence that Mr. Mould told him that the amount to be paid him for his work was a provisional sum to be included in the builders' contract.

Mr. Garland, who represented the defendants, said his contention was that right through Mr. Mould was acting on behalf of the theatre company and not for the defendants, and he did not think Mr. Mould had any authority to give any undertaking.

In the result, his lordship, in giving judgment, said the conclusion he had arrived at was that Mr. Johnson, sen., was greatly interested in the theatre company, and he was the person who had the money and was financing that company. The present defendants had not made themselves liable, and therefore he gave judgment for the defendants with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

3,268 of 1905.—J. N. RUSSELL: *Method of and means for Heating Buildings by the Circulation of Steam or Vapour.*

This relates to an installation for heating a building by the circulation of steam or vapour, and consists in the combination of a vacuum-creating device to which the outlets of the several heating units are connected, with devices provided upon the inlets to the respective heating units adapted to be manually adjusted without dismantling the valve so as to permit of the maximum opening of said inlets being instantly varied.

6,529 of 1905.—A. ROBERTSON: *Sliding Sashes for Windows.*

This relates to a sliding sash for windows sliding in an outer frame and operated by racks and pinions, and consists in the provision of channels in said sash with ratchet-teeth at the bottoms of said channels, and of loose bars located in said channels and provided on the underside with corresponding ratchet-teeth to those in the channels, so that when the loose bars are moved the ratchet-teeth over-ride and press the rail against the water-tight packing on the outer frame.

9,079 of 1905.—THE PREFECTOR WINDOW COMPANY, LTD., and T. F. CAUNT: *Casement Windows.*

This relates to a casement window in which the casement revolves on vertical axes, and which has a U-shaped moulding at the top and bottom, and L-shaped mouldings at the sides.

10,458 of 1905.—F. D. ROBINSON: *Louvre Ventilator for Top, Bottom, or side of Window Sash or Casement.*

This relates to a detachable window or like ventilator, and is characterised by a frame provided with a series of louvre bars formed in one with the frame or attached thereto either rigidly or pivotally, a gauze or perforated zinc backing to said bars and frame, means such as grooves for the reception of the sash cords when used as a top ventilator, and means such as bevelled top and bottom edges to fit the window sill and under edge of bottom rail or sash when used as a bottom ventilator.

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

28 of 1905.—G. G. BRODIE and A. B. COLEMAN: Kitchen or Cooking Ranges.

This relates to a kitchen or cooking-range, consisting of the combination with a fixed upper socket made in one piece with the rising falling hinged bottom of the fire-box of a then or cooking-range, of a pivoted catching two arms or projections, one of which is attached to the fixed tubular socket, and is introduced upon by the lifting bar which is introduced into the socket, while the other arm or projection normally engages with one of the teeth fixed rack on the front of the range.

182 of 1905.—G. GLOSSOP, T. EARNshaw, and J. CLOUGH: Fixings of Cement Blocks or Bricks.

This relates to a compound cement block or brick, having an exterior metal plate which is secured to the block by means of wires or rods on to which the cement is poured or otherwise formed.

348 of 1905.—S. WARREN and C. ELOCK: Window Stays and Fasteners.

This relates to a fastener for window sashes, consisting of a slotted plate attached to the upper sash of the window, a frame slotted to be attached to the sash and a bar, having at one end a tightening screw to run in the slot of a plate attached to the sill or other part of the frame, and having its opposite end pivoted at an angle plate, one limb of which is furnished with a tightening screw to run in the slot of the plate attached to the sash.

621 of 1905.—C. A. LOWE: Means for Arresting Dust and Other Floating Particles.

This relates to means for arresting or intercepting dust and other floating particles, and comprises a series of fabric frames so disposed as to arrest dust or floating particles drawn or blown into contact therewith, said frames being slid into position in the casing whereby they are capable of being readily removed to be cleansed.

363 of 1905.—H. LORD: Fasteners for Window Sashes.

This relates to a fastener for window sashes, and consists of a plate attached to the lower bar of the upper sash of the window. This plate can be secured to the bar of the window by screws any other convenient means. To this plate is hinged another plate which is so arranged as to be capable when both sashes are in their closed positions of swivelling over on top of the upper sash to the lower sash. This swivelling plate is provided with a slot. Then there is attached a screw or otherwise to the top bar of the lower sash a plate which is provided with an upwardly-projecting rotatable pin. This pin has a flat end, which can be passed through the slot in the swivelling-plate, and then given a quarter turn, which locks the swivelling-plate to the plate of the lower sash, and thus holds both sashes in their closed positions.

317 of 1905.—O. A. OSMOND: Apparatus for Calculating the Dimensions of Framework, and the Like.

This relates to an apparatus for calculating the dimensions of framework and the like, and consists of a measuring tool, a pair of pivotally-connected arms, each including a bottom and top member spaced apart, said top members being provided with longitudinal slots in combination with longitudinally slotted third member adjustable in the spaces between the bottom and the top members of the pivoted arms, and means for securing said arms and third member in adjusted position.

409 of 1905.—V. F. FEENY: Farm Gates, Road Gates, and the Like.

This relates to farm gates, road gates, and the like, and consists in the combination of an oscillating lever provided with a slotted link perpendicular thereto, a single faced cam plate bearing which a roller fitted hinge pin bears, and adjustable connections on each side of the plate from each end of the lever to opposite sides of spring held rotatable drums.

8,952 of 1905.—W. H. COULTER and J. B. COULTER: Machines for Dressing and Performing Similar Operations upon Stone, Marble, Granite, and the Like.

This relates to a machine for dressing and performing similar operations upon stone, marble, granite, and the like, and consists of means for moving the belt forks for bringing about the operation of the movement of the table, said means comprising adjustable dog brackets provided with loose collars or anti-friction bows adapted to actuate through the intervention of an adjustable stud, and system of levers connected to the aid shaft.

1,444 of 1905.—F. KAEBERLE: An Electro-magnetically Operated Heat Supply Valve for Heating and Ventilation.

This relates to an electro-magnetically operated heat supply valve, and consists in the construction employed wherein the electro-magnet adapted to operate the valve is situated outside the chamber containing the valve and the armature connected to the latter, the arrangement being such that

the lines of force due to said electro-magnet act directly on said armature through the wall or partition by which the electro-magnet is separated from the valve chamber.

22,845 of 1905.—J. SOSS: Window Sash Balances. This relates to a sash balancing device, and consists of a rack plate adapted to be secured to the side of a sash, a plate adapted to be secured to a window frame, adjacent to the side of the sash, said plate being provided near its upper end with an outwardly directed bracket and at its lower end with an outwardly directed bearing provided on its upper end with ratchet-teeth, a clutch-head mounted on said bearing and provided with ratchet-teeth which correspond with those on the bearing, said clutch-head being also provided with an upwardly directed spindle and with radially arranged holes, a tube passing through said bracket, and on the lower end of which fits the spindle of the clutch-head, said tube being provided with a worm gear which operates in connexion with the rack on the sash, means for forcing the tube in the direction of the sash, and a spiral spring plate in said tube, one end of which is secured to the upper end of said tube and the other end to the spindle of the clutch-head.

10,604 of 1905.—E. E. MAWLE: Pipe Attachment for Improving Connections of Branch Pipes to Main Pipes in Water and Other Pipes. This relates to a pipe attachment for improving the flow of water or other liquids to and from main to branch pipes, and consists in the arrangement and construction of an internal deflecting lip which is cast solid on to a saddle which can be screwed over branch pipe and bolted on to an existing main pipe.

15,164 of 1905.—P. HABAY: Railway Sleepers Composed of Cement Concrete in Conjunction with Metal.

This relates to the construction of railway sleepers composed of cement concrete, in conjunction with metal, and consists in providing the metallic framework and cement concrete with means for securing the chairs to support the rails thereon and to prevent the movement of the sleeper on the road.

SOME RECENT SALES OF PROPERTY:

Table listing real estate sales with columns for location, date, and price. Includes entries like 'February 10.—By LEOPOLD FARMER & SONS, Clapton—102, 104, 108, and 110, Millsfields-rd., (s.), l., yr. 130, ... £1,726' and 'By GARBETT, WHITE, & POLAND, Regent-street—40, Conduit-st., (s.), area 2,675 ft., Corporation base, gr. St. 158, yr. 450, ... 14,500'.

Table listing various properties and their values. Includes entries like 'By PROTHEROE & MORRIS (at Leytonstone), Walthamstow—Higham Hill-rd., two freehold building sites ... £100' and 'February 22.—By H. J. BURS & SONS, Highgate—Salisbury-rd., l.g. rents 18s., reversion in 44 yrs. ... 400'.

MEETINGS.

FRIDAY, MARCH 2. Royal Institution.—Dr. R. Caton, F.R.C.P., on "Hippocrates and the Newly-Discovered Health Temple at Cos," 9 p.m. Junior Institution of Engineers (Westminster Palace Hall).—(1) Paper on "Acceleration and Accelerometers" by Mr. A. P. Trotter, B.A., Electrical Adviser to the Board of Trade. (2) Paper on "Gas Engine Indicators" by Mr. L. F. de Poyre, C.E., Stud. Inst. C.E. 8 p.m. SATURDAY, MARCH 3. Royal Institution.—Professor J. J. Thomson, M.A., on "The Corpuscular Theory of Matter," I. 3 p.m. MONDAY, MARCH 5. Royal Institute of British Architects.—(1) A special general meeting to elect the Royal Gold Medalist for the current year. The Chairman to move:—"That, subject to His Majesty's sanction, the Royal Gold Medal for the promotion of Architecture be presented this year to Sir Lawrence Alma-Tadema, R.A., F.R.S.A." (2) The ninth general meeting (business) to receive the report o

the scrutineers on the election of twenty-eight candidates for Fellowship, and to proceed with the election of candidates for Associateship. (3) Mr. A. Saxon Snell will call attention to the terms of the Henry Saxon Snell Bequest, and ask what steps have been taken by the Council to formulate a scheme for the proposed scholarship or prize, and he will move a resolution. 8 p.m. Society of Engineers.—Mr. R. G. Allanson-Winn, B.A., on "Submerged Chain Cable Groynes." 7.30 p.m. Liverpool Architectural Society.—Mr. C. Spooner on "Church Filigings." Illustrated by lantern slides. 8 p.m.

TUESDAY, MARCH 8.

Institute of Sanitary Engineers (Students' Lecture).—Professor Adams on "Supervision of Works in Progress." 7 p.m. Institution of Civil Engineers.—(1) Papers to be further discussed—"A Plan for Better Country Roads," by Mr. G. R. Jebb, and "Country Roads for Modern Traffic," by Mr. J. E. Blackwell, B.A. (2, time permitting), "The Widnes and Runcorn Transporter Bridge," by Mr. J. J. Webster. 8 p.m.

WEDNESDAY, MARCH 9.

Royal Archaeological Institute.—Mr. Ambrose P. Boyson on "Low Set Openings in Danish and other Scandinavian Churches," with lantern illustrations. 4 p.m. Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m. Northern Architectural Association.—Annual meeting. 7.30 p.m. Society of Arts.—Mr. J. C. Dollman, A.R.W.S., on "Art in Painting and Photography." Mr. David Murray, R.A., will preside. 8 p.m. Edinburgh Architectural Association.—Mr. R. S. Lorimer on "Scottish Gardens and Garden Architecture." 8 p.m.

THURSDAY, MARCH 9.

Carpenters' Company, London Walk (Free Lectures on Matters Connected with Building).—Mr. O. Gerald Stone, B.E., on "Stair Turbines—Land and Marine." 8 p.m. Institution of Electrical Engineers.—Mr. A. Ryan on "A New Single-Phase Commutator Motor." 8 p.m.

FRIDAY, MARCH 9.

Architectural Association.—Mr. Gilbert H. Lovegrove on "The A.A. Camera and Ceiling Club Excursions," illustrated by lantern views. 7.30 p.m. Institution of Civil Engineers (Students' Meeting).—Mr. R. Freeman on "The Design of a Two-Hinged Spandrel-Braced Steel Arch." 8 p.m.

SATURDAY, MARCH 10.

Architectural Association.—Spring visit to the Royal London Friendly Society's Building and Tollard Royal Hotel, Southampton row, W.C. 2 p.m. Junior Institution of Engineers.—Conversations. Mr. C. Alfred Smith, B.Sc., on "The Evolution of the Man-of-War," illustrated by lantern slides. 8 p.m. Royal Institution.—Professor J. Thomson, M.A., on "The Corpuscular Theory of Matter." II. 3 p.m. Edinburgh Architectural Association.—Visits to Edinburgh Castle and addition to City Chambers.

TERMS OF SUBSCRIPTION.

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PRICES CURRENT OF MATERIALS.

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

Table with columns for material names and prices. Includes sections for BRICKS, &c., GLAZED BRICKS, and HARD STOCKS.

BRICKS, &c. (continued).

Table listing various types of bricks and their prices per yard or per ton.

STONE.

Table listing different types of stone and their prices per cubic foot or per ton.

Table listing various types of wood and their prices per cubic foot or per ton.

SLATES.

Table listing different grades of slates and their prices per 1000 or per square.

TILES.

Table listing various types of roof tiles and their prices per 1000 or per square.

WOOD.

Table listing different types of wood and their prices per standard unit.

WOOD (continued).

Table listing various types of building wood and their prices per load or per standard unit.

Table listing different types of wood and their prices per standard unit.

Table listing various types of wood and their prices per standard unit.

Table listing different types of wood and their prices per standard unit.

Table listing various types of metal and their prices per ton.

Table listing different types of metal and their prices per ton.

Table with columns: LEAD, &c. Per ton, in London. Includes items like Sheet, English, 3lb. and up, 12 s. 0. d., Pipe in coils, 19 0 0, etc.

Table with columns: ENGLISH SHEET GLASS IN CHATES. Includes items like 2d. per ft. delivered, 3d., 4d., etc.

Table with columns: OILS, &c. Per gallon. Includes items like Linseed Oil in pipes, 0 1 10, etc.

Table with columns: VARNISHES, &c. Per gallon. Includes items like Pale Oak Varnish, 0 8 0, etc.

TO CORRESPONDENTS. J. S. C. (drawings received).—H. & P. (received). We cannot undertake to return rejected communications...

TENDERS. Communications for insertion under this heading should be addressed to 'The Editor,' and must reach us not later than 10 a.m. on Thursday, F.N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner...

AYLESBURY.—For the erection of a pair of villas, Ting-road Aylesbury, for Messrs. Jones & Coeks. Mr. Fred Taylor, architect, Aylesbury.—G. & F. Cannon ... £1,150; Webster & Cannon ... £1,098; Mayne & Son ... 1,100

AYLESBURY.—For the erection and completion of grammar school, master's house, playing sheds, and fences, etc., in Walton-road, Aylesbury, for the Governors. Mr. Fred Taylor, architect, Aylesbury, London.—Messrs. W. T. Farthing & Son, 49, Strand, London:—J. Mead ... £9,130; G. Darlington ... £8,010; Dennis & Co. ... 8,931; A. Faulks ... 7,950; Myrpe & Son ... 8,640; Wallis & Son ... 7,867; H. Cleaver ... 8,750; Lawrence & Son ... 7,844; F. Gough ... 8,394; Hunt & Son ... 7,822; Jackman & Son ... 8,185; G. T. Cannon ... 7,765; W. J. Bloxham ... 8,150; Webster & Cannon ... 7,498; T. Stinson ... 8,069; G. H. Gibson ... 7,463; Henson & Son ... 8,050; Hacksley Bros., Wellingtonborough? ... 7,228; Honour & Son ... 8,044

BARNOLDSWICK.—For street works, part of long-field lane, for the Urban District Council. Mr. W. Bennett, Surveyor, Town Hall, Barnoldswick. Quantities by Surveyor.—W. Armstrong £210 16 8; E. S. Smith, Barnolds? ... 196 4 11; wick? ... £155 0 0; W. Sagar ... 186 13 9; W. J. Mc Donald ... 184 11 2

BECKENHAM (Kent).—For the erection of a private residence at Hayes-lane, Beckenham. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington, Kent.—T. Graham ... £4,668; J. E. Arnaud & Son £4,284; Perry Bros. ... 4,494; J. Dethick ... 4,197; T. Crosley & Son ... 4,388; Somerford & Son ... 4,190; Hudson Bros. ... 4,330; T. W. Grady ... 4,155

BEXLEY HEATH (Kent).—For the erection of a small villa. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington, Kent.—A. Peakes? ... £415 7

BRADFORD.—For erecting chapel and schools, Shearbridge-road, for the trustees of the late Mr. Charles chapel. Mr. R. H. Parkinson, architect and surveyor, Queensgate-chambers, Bradford.—Mason and Joiners: J. Moulson & Son, Ltd., Bradford? ... £5,556 14 5; Plasterers: A. Marsden & Son, Bradford? ... 12 0; Tiler: T. Thornton, Shipley? ... 12 0; Painter: J. O. Calvert, Bradford? ... 12 0

BUCKINGHAM.—For additions to the National Schools, Lillingstone Lovell, for the Managers. Mr. Fred Taylor, architect, Aylesbury.—J. T. Marshall ... £292 0 0

CANWELL (Staffs).—For further alterations and additions to the Hall, for Mr. Philip S. Foster. Mr. C. M. C. Armstrong, architect, 5, High-street, Warwick.—G. Hodges ... £2,619; W. J. Whittall & Son, W. & J. Webb ... 2,521; Birmingham? ... £2,371

CASTLEREA (Co. Roscommon).—For constructing houses, water pipes, and water course (Ballagherreen Electric Lighting Works), for the Rural District Council. Mr. Christopher Mulvaney, engineer, Athlone.—McKea & Mc Nally ... £1,063 3 4; B. Alldredge, Co. Sligo ... £1,130 0 0; J. Regan? ... 894 0 0

CHELLENHAM.—For erecting new school buildings to accommodate 1,100 children, for the Naunton Park district, for the Education Committee. Messrs. Chatters & Smithson, architects, 17, Regent-street, Cheltenham.—Months: W. T. Bloxham ... £15,797; Pethick Bros. ... 15,744; Wilkins & Son ... 15,238; J. Gutteridge ... 15,200; Lane & Son ... 14,900; Long & Son ... 14,633; H. Smith ... 14,440; E. Walters & Sons ... 14,500; R. Skemp ... 14,475; Estcourt & Sons ... 14,250; Channon & Son ... 14,157; Billings & Son ... 14,157; W. Jones ... 13,998; L. Jones ... 13,985; Bowes & Co. ... 13,969; Parnell & Son ... 13,725; Dallow & Sons ... 13,477; Collins & Godfrey ... 13,150; T. Culbert ... 13,088; Eastwood ... 12,855; C. Wright ... 12,777; W. Crane, Nottingham? ... 12,687

CHISLEHURST (Kent).—For the erection of a motor garage at private residence. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington.—T. Rider & Son ... £515; R. Lowe ... £536; T. Knight ... 575; T. D. Grady? ... 519

CHISLEHURST (Kent).—For the execution of certain decorative repairs to private residence. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington.—Waring? ... £502 10

CRAYFORD (Kent).—For the execution of certain decorative repairs to business premises. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington, Kent.—H. Dume ... £310 0; Ellingham & Son £204 11; W. & A. Smith ... 238 15; T. Knight ... 247 0

DORKING.—For alterations and additions to 'Westcott Hall,' for Mr. C. J. Willis. Mr. A. W. Vennor, architect, Redhill.—K. & S. ... £1,568; Curmins & Sons, King & Apted ... 1,519; Ltd., Dorking? ... £1,475; A. B. Wiles? ... 1,150

DARWEN (Lancashire).—For the erection of a Carnegie free library, for the Darwen Corporation. Messrs. Haywood & Harrison, architects, Accrington and Lytham. Quantities by the architects:—Higson & Sons ... £12,150 0 0; S. Wilson ... 11,963 10 0; J. Whitaker & Sons ... 11,947 10 0; J. C. & F. Woods ... 11,838 19 2; J. C. & F. Woods ... 11,680 0 0; Hannibal Ramsbottom ... 11,550 0 0; S. Butterworth & Sons ... 11,522 0 0; T. Lightbound ... 11,405 11 0; T. Cottam ... 10,990 0 0; Lloyd & Millward ... 10,298 0 0; R. Shorrock, Darwen? ... 10,730 0 0

GUSTON.—For erecting the Duke of York's Royal Military School at Guston, near Dover, for the Commissioners of H.M. Works and Public Buildings:—T. L. Fearon ... £154,395; J. Shelbourne & Co. ... £124,200; R. & G. Brasley 134,500; E. Miskin, Ltd. ... 119,884; W. F. Blay ... 135,500; T. J. Hawkins & Co. ... 132,900; Co. ... 118,350; F. & H. F. Higgs 130,900; G. E. Wallis & G. Browning ... 129,800; Sons, Ltd. ... 118,240; J. Mowlam & Co., Ltd. ... 129,500; W. Mess & Sons, Ltd. ... 117,300; J. & M. Patrick ... 129,000; J. E. Johnson & D. Davies & Sons ... 117,250; Higgs & Hill, Ltd. ... 128,400; G. H. Dennis & Son ... 116,400; J. H. Kingler & W. Willett ... 115,500; Sons ... 127,593; J. J. Wiso ... 115,000; W. King & Son ... 127,474; C. Gray Hill ... 114,990; W. Pattinson & Martin, Walls, & Sons, Ltd. ... 126,558; Co., Ltd. ... 114,000; Holloway Bros., (London), Ltd. ... 126,300; T. J. Denne ... 112,900; C. Wall, Ltd. ... 111,515; A. Hudson & Co. ... 107,739

HIGHWORTH (Wilts).—For alterations, etc., at the Fox Inn, for Messrs. T. & J. Arkell. Messrs. Drew & Sons, architects, Regent-circus, Swindon.—P. Chick, Highworth? ... £109

INGATESTONE.—For erecting an engine house, constructing small covered service reservoir and other works, for the Chelmsford Rural District Council. Mr. J. Dewhurst, Engineer, Avenue Chambers, Market-road, Chelmsford.—F. C. Thomp? ... £1,888 12 0; Chat & Sons £1,508 0 0; son ... 1,888 12 0; P. Green, In-gatestone? ... 1,497 10 0; G. Double ... 1,820 8 0; Executors of J. Jackson ... 1,789 0 0; H. Sharrow ... 1,750 0 0; J. Arundell ... 1,422 0 3; S. Redhouse, sen. ... 1,068 2 4

ISLEWORTH.—For making-up part of Alexandra-road for Heston and Isleworth Urban District Council. Mr. P. G. Parkman, Engineer and Surveyor, Council House, Hounslow. Quantities by Engineer and Surveyor.—T. Chapman ... £186 15 11

KING'S LYNN.—For pulling down and rebuilding Nos. 43 and 44, High-street, King's Lynn. Messrs. A. R. Calvert & W. R. Gleave, architects, Nottingham.—G. Hopsell & Son, Nottingham? ... £2,050 [Lowest of nine tenders.]

LEVENSHULME.—For erecting a new elementary school at Erwood-road, for Lancashire Education Committee. Mr. Henry Lither, County Architect, 16, Ribblesdale-place, Preston.—A. & E. Gakes ... £13,158 15 7; J. & J. Parish ... 12,506 12 0; J. Briggs ... 11,714 0 0; T. & W. Meadows ... 11,540 0 0; Young, Tinker, & Young ... 11,355 0 0; R. Cardy ... 11,234 0 0; Normanton & Sons ... 11,282 0 0; J. Ramsbottom ... 11,250 0 0; S. Robinson & Sons ... 11,225 0 0; J. Chapman & Son ... 11,150 0 0; Burgess & Galt ... 11,100 0 0; R. Noll & Sons ... 11,098 0 0; W. A. Peters & Sons ... 10,959 0 0; Gerrard & Son ... 10,757 0 0; J. Tinline, Bury? ... 10,750 0 0

LITTLE BRGMLEY.—For erecting a new school and teacher's house at Little Bromley, near Ardleigh, for Essex Education Committee. Mr. F. Whitmore, County Architect, Duke-street, Chelmsford.—Saunders & Son, Dedham, Colchester? ... £925

IGNDGN.—For reconstructing the swing-bridge carrying Gill Gravel-works for the London County Council.—J. Westwood & Co., Ltd. ... £19,946 12 3; A. Findlay & Co., Ltd. ... 18,903 6 10; J. Cochran & Sons ... 17,538 18 6; J. Butler & Co.'s Trustees ... 16,992 0 0; Muirhead, Greig, & Mathews ... 16,889 7 7; A. Handyside & Co., Ltd. ... 16,794 9 0; Cleveland Bridge and Engineering Co., Ltd. ... 16,790 11 11; Gray's Steel Constructional Co., Ltd. ... 16,786 0 0; Ltd. ... 16,284 8 0; Heenan & Froude, Ltd. ... 15,228 12 1; A. Thorne, London? ... 14,573 0 0 [The estimate, comparable with the above tenders, is £15,622 17 3.]

[Mr. A. Thorne to submit to the undermentioned firms (or to such other persons or firms as may be approved by the engineer under the contract) the undermentioned portions of the work—the manufacture of the metal work to the Horsely Co., Ltd., the Cleveland Bridge and Engineering Co., Ltd., A. Handyside & Co., A. Findlay & Co., the Phoenix Foundry Co., Dorman, Long, & Co., or Joseph Westwood & Co.; the manufacture of the electrical equipment to Crompton & Co., Ltd., the Bush Electrical Engineering Co., Ltd., or R. W. Blackwell & Co., Ltd.]

TENDERS.—Continued on page 247.

List of Contracts, etc.

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered.
*DESIGNS FOR ALTERATION OF BUILDINGS TO SHOPS	J. H. Batten	25s.	No date.

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Form of Tender, etc., applied by	Tenders to be delivered.
Sewage Works, Hatley, Wentworth	Rotherham R.D.C.	J. Platts, Surveyor, High-street, Rotherham	Mar. 6
Cartage Works	Staines R.D.C.	Surveyor, London-road, Ashford, Middlesex	do.
Removing and Refitting Cornish Boilers	King's Norton, etc., U.D.C.	Surveyor's Office, 25, Valentine-road, King's Heath	do.
Seats for Chapel at Workhouse, Gravelly-hill	Aston Guardians	C. Whitwell & Son, Architects, 23, Temple-row, Birmingham	do.
Alterations, etc., at Witton Hall, Witton	do.	J. North, Clerk, Union Offices, Vauxhall-road, Birmingham	do.
273 lineal yds. of Red Deal Fencing, etc., Bilton Estate	Telamouth U.D.C.	C. F. Gething, Surveyor, Town Hall, Teignmouth	do.
Remaking Streets, Bangor	Bangor U.D.C.	Surveyor's Office, Town Hall, Bangor	do.
Whinstone Slag, etc.	Sunderland R.D.C.	T. Young, Surveyor, 17, John-street, Sunderland	do.
Copper Boiler, Heating Apparatus, etc., at Laundry, Runninghill	Saddleworth Guardians	Master of Workhouse, Ruaninghill, Dobcross	do.
*WORKS AND MATERIALS	Willesden U.D.C.	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
Street Works, Victoria-street, Falsworth	Falsworth U.D.C.	Surveyor's Office, Town Hall, Falsworth	do.
Making-up Leighton-road, Bush Hill Park	Enfield U.D.C.	R. Collins, Surveyor, Public Offices, Enfield	Mar. 7
Stone etc.	Northampton R.D.C.	W. Tomalin, Clerk, 14, Guildhall-road, Northampton	do.
Cattle Market, St. Columa Major, Cornwall	Cattle Market Co., Ltd.	Office of Company, Fore-street, St. Columa	do.
Rag Warehouse, Parkfield Mills, Fountain-street, Morley	J. Brunitt & Son	T. A. Budgey & S. B. Birds, Architects, Queen-street, Morley	do.
School Desks	Manchester Education Comm.	Offices in Deansgate, Manchester	do.
Mixed and Infants' School, Blansburgh	Glamorgan County Council	T. M. Franklin, Clerk, Westgate-street, Cardiff	do.
Improvements at Lisacarian Council School	do.	do.	do.
Teachers' Rooms, etc., Port Talbot School	do.	do.	do.
Alterations, etc., to Brethrd Council School	do.	do.	do.
Alterations, etc., to Troedrihlwyrch School	do.	do.	do.
Stores, etc.	do.	do.	do.
Road Metal, Cartage, etc.	Birmingham Gas Department	G. H. Barber, City Gas Offices, Council House, Birmingham	Mar. 8
50 tons of Cast-iron Pipes, etc., Newbury	Durham County Council	Surveyor, Shire Hall, Durham	do.
Filters and Tank, etc., to Brethrd Manor House, Breinton	Leicestershire Middle Ward Com.	J. & A. Leslie & Reid, C.E., 724, George-street, Edinburgh	do.
Roadmaking, Kerbing, Paving, etc.	Hackney Borough Council	do.	do.
Limestone Channelling, Kerbing and Paving, Compton, Gifford	Plymouth St. Mary R.D.C.	Norman Scorgie, Borough Engineer, Town Hall, Hackney	do.
Paving and Flagging	Leeds Highways Committee	M. W. Wickett, Surveyor, Ridgway, Plympton	do.
Sewering and Paving of Backsow-street, Waterloo	Cowpen U.D.C.	City Engineer's Office, Municipal-buildings, Leeds	do.
Granite and Stone	Chorlton, etc., Workho. Comm.	R. Grives, Surveyor, Seaford-street, Waterloo, W. Yorks.	do.
Building Materials, etc.	Caine & Co. Ltd.	J. Macdonald, Poor Law Offices, New Bridge-st., Manchester	Mar. 9
Stores and Materials	Cardiff Guardians	A. J. Harris, Clerk, Queen's-chambers, Cardiff	do.
Vertical Cross-Compound Condensing Engine	Huddersfield Corporation	H. C. Marks, City Engineer, 36, Fisher-street, Carlisle	do.
One 750 Kilowatt Traction Generator, etc.	do.	E. F. Campbell, Engineer, Town Hall, Huddersfield	do.
Granite	Market Harborough R.D.C.	W. H. Blount, Surveyor, Laughton, Rugby	do.
Cartage of Stone	Atcham R.D.C.	T. Fortune, Surveyor, Pontesbury, Shrewsbury	do.
Additions to Golf Club House, Ogden	do.	J. F. Walsh & G. Nicholls, Architects, Museum-chambers, Halifax	do.
Converting Cottages at King's Cross, Halifax, into Shops	Castor R.D.C.	Jackson & Fox, Architects, Halifax	do.
Materials	Salford Guardians	A. Newiman, Clerk, Hadleigh, Suffolk	do.
Alterations at Union Infirmary, Hope, Eccles	do.	H. Lord, Architect, 42, Deansgate, Manchester	Mar. 10
Laying Drains, etc., at Union Infirmary, Hope, Eccles	Riccall R.D.C.	E. Townend, Clerk, 1, Abbey-place, Selby	do.
Road Materials	Cambs. County Council	Groome & Bostington, Architects, Palace-chambers, Hereford	do.
Alterations, etc., to Breinton Manor House, Breinton	Stafford R.D.C.	J. Papworth, Land-in-charge, Camb.	do.
Carting Materials	do.	W. Morgan, 4, Martin-street, Stafford	do.
Carting Stone, etc.	Clown R.D.C.	do.	do.
Slag	Bakewell Guardians	J. T. Pears, Surveyor, Hollin Hill, Clown, Chesterfield	do.
Broken Slag for Roads	do.	E. M. Longdon, Architect, Town Hall, Bakewell	do.
Extension of Boardroom, etc., Bakewell	do.	do.	do.
Steam Boiler and Heating Apparatus	Kiveton Park R.D.C.	C. F. L. Horstall & Son, Architects, Lord-st.-chambers, Halifax	do.
Additions to Bookhouse, Paper Mills	Eastbourne Town Council	R. F. Evans, Surveyor, Kiveton Park Station, Sheffield	do.
Broken Slag for Roads	Eccles Corporation	Borough Surveyor, Town Hall, Eastbourne	do.
Materials	Kent Bridges, etc., Committee	T. T. Pictou, Borough Surveyor, Town Hall, Eccles	do.
Materials	Hoylake & West Kirby U.D.C.	Engineer and Surveyor, West Borough chambers, Maidstone	do.
Annual Contracts	The Committee	Engineer and Surveyor, Town Hall, Hoylake	do.
*COMPLETION OF TRANSEPTS, etc., CHURCH, S.W. DIST.	Gainsborough U.D.C.	Rowland, Plumbe, & Harvey, Arcus, 13, Fitzroy-st., W.	do.
Materials	Colne Corporation	Engineer and Surveyor, Council Offices, Gainsborough	do.
Granite and Slag	Lichfield R.D.C.	O. O. Rawstron, Borough Surveyor, Town Hall, Colne	Mar. 12
Carting, Tools, Oils	do.	do.	do.
Sewage Outfall Works, Fleckney	Market Harborough R.D.C.	Everard, Son, & Pick, Engineer, 6, Millstone-lane, Leicester	do.
Business Premises, South-street, Elgin	Darby Town Council	R. B. Pratt, Architects, Town and County Bnk.-buildings, Elgin	do.
Sewage Works	Edinburgh Corporation	P. C. Hart, C.E., 134, St. Vincent-street, Glasgow	do.
Materials, Electricity Supply Department	Leads Tramway Committee	Engineer's Office, 5, Dever-place, Edinburgh	do.
Stones and Sand	King's Norton, etc., U.D.C.	J. B. Hamilton, Tramways Office, City-square, Leeds	do.
Furniture and Fittings for Libraries, Selly Oak, etc.	Morley Highways Committee	E. Decker, Clerk, 10, Newhall-street, Birmingham	do.
Private Street Works	Erith U.D.C.	W. F. Putnam, Borough Engineer, Town Hall, Morley	do.
Materials	Halifax Education Committee	C. H. Fry, Clerk, Council Offices, Erith	do.
Ornate, Kerb, and Gutter	Leeds Education Committee	H. Hard, C.E., Town Surveyor, Broadstairs	do.
Furniture at Lee Mount Infants' and Salterhebble Schools	Leeds Middle Ward Dsk. Com.	Halifax Education Committee	do.
*ERECT, SECONDARY SCH. at SILDOWN, POOLE, DORSET	Leeds Education Committee	Leeds Education Committee	do.
Jobbing Repairs, Workhouse, etc.	Leeds Education Committee	Leeds Education Committee	do.
Whinstone Metal, Gravel, Sand from Danduff Quarry	Leeds Education Committee	Leeds Education Committee	do.
Granite and Granite Chippings	Leeds Education Committee	Leeds Education Committee	do.
Slag for Roads	Leeds Education Committee	Leeds Education Committee	do.
Infant School, High-street, Over Hulton	Leeds Education Committee	Leeds Education Committee	do.
Making Back Passage Leading from Hewitt-street	Leeds Education Committee	Leeds Education Committee	do.
Service Reservoir (500,000 Gallons)	Leeds Education Committee	Leeds Education Committee	do.
*CONSTRUCT OF ROADS, etc., FITHLIANGER EST., EALING	Leeds Education Committee	Leeds Education Committee	do.
Materials	Leeds Education Committee	Leeds Education Committee	do.
Road Material and Cartage	Leeds Education Committee	Leeds Education Committee	do.
Whinstone Metal	Leeds Education Committee	Leeds Education Committee	do.
*NEW POST OFFICE at WAREINGTON	Leeds Education Committee	Leeds Education Committee	do.
*WORKS AND MATERIALS	Leeds Education Committee	Leeds Education Committee	do.
*EXTERNAL PAINT, AND REPAIRS, NORWOOD SCHOOLS	Leeds Education Committee	Leeds Education Committee	do.
Cleaning, Painting, etc., Police-stations	Leeds Education Committee	Leeds Education Committee	do.
Materials	Leeds Education Committee	Leeds Education Committee	do.
Effluent Conduit	Leeds Education Committee	Leeds Education Committee	do.
Mission House and Home, Newport	Leeds Education Committee	Leeds Education Committee	do.
Materials and Work	Leeds Education Committee	Leeds Education Committee	do.
*EXTENSION OF SLIPPER BATHS, FINELE ROAD	Leeds Education Committee	Leeds Education Committee	do.
Paving, etc., Playgrounds of Thaxted School	Leeds Education Committee	Leeds Education Committee	do.
Farm Dwelling-house at Smitrack, Enze	Leeds Education Committee	Leeds Education Committee	do.
Farm Dwelling-house at Muir of Holme, Bathwa	Leeds Education Committee	Leeds Education Committee	do.
Farm Dwelling-house at Ryergrigs, Ballic	Leeds Education Committee	Leeds Education Committee	do.
Painting Iron Bridges, Thirlmere Aqueduct	Leeds Education Committee	Leeds Education Committee	do.
Boys' School, Georgetown	Leeds Education Committee	Leeds Education Committee	do.
	Manchester Corporation	Secretary, Wat'works Offices, Town Hall, Manchester	do.
	Merthyr Tydfil Educatn. Com.	J. L. Smith, Architect, Central-chambers, High-st., Merthyr	do.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., applied by, and Tenders to be delivered. Includes entries for Waterworks, Billingham, etc.; Making-up Private Streets; and various school and public building projects.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Lists positions such as Surveyor's Assistant, Examiner's Patent Office, and Supervisor of Road-making.

AUCTION SALES.

Table with 3 columns: Nature and Place of Sale, By whom Offered, and Date of Sale. Lists various real estate and business property sales, including surplus builder's plant and freehold buildings.

* Those with an asterisk are advertised in this number: Competitions, iv.; Contracts, iv, vi, viii, x.; Public Appointments, xx.; Auction Sales, xxxiv.

TENDERS.—Continued from page 245.

Table listing tenders for erecting a new sorting office at Peckham, S.E., for the Commissioners of H.M. Works and Public Buildings. Lists names and amounts.

Table listing tenders from the LONDON BOARD OF EDUCATION. Includes tenders for heating apparatus, swimming baths, and fire-guards for special schools.

Table listing tenders for decorative repairs at Redcliffe-gardens, S.W., and for the erection of married couples' quarters at Fulham Palace. Also includes tenders for cottages at Malpas and a residence at Meadvale.

Table listing tenders for erecting a residence at Hanslergrove, Mr. H. G. Frad, architect, Bank-chambers, Teddington. Quantities not supplied. Lists names and amounts.

NEWBURY (Berks).—New scheme of outfall drainage and construction of bacteria filter. The London and Suburban Sanitary Survey Association, Connaught-mans, Westminster:—
 W. N. F. Kelland .. £247
 T. C. Ranger .. £23
 Victoria Sanitary Engineering Co. 785
 A. H. Houghton, Donnington* £674

NOTTINGHAM.—For business premises, Nos. 43 and 45, Clumber-street, Nottingham. Messrs. A. R. Calvert & W. R. Gleave, architects, Nottingham:—
 J. Wright, Nottingham* £987
 [Lowest of ten tenders.]

ORPINGTON (Kent).—For the erection of a private house, Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington:—
 T. Knight £1,119
 J. Smith, 1,097
 Somerford & Son, 1,077
 W. Owen 998
 Podger & Son £1,014
 W. Owen 998
 Killick & Co.* 995

ORPINGTON.—For the erection of a pair of semi-detached villas in High-street, Orpington, Kent. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington:—
 W. Owen* £660

ORPINGTON (Kent).—For the erection of two houses and shop premises, "Aynscomb Angle," Orpington. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington:—
 A. Pannett* £630

PARKSTONE.—For additions and alterations to Sandeoties School, Parkstone, for the Church Corporation, Ltd., London. Mr. Walter Andrew, architect, Parkstone. Quantities by the architect:—
 Miller & Sons £2,019 10 0
 Burt & Vlek .. 2,806 10 0
 Brown & Son 2,800 0 0
 Jenkins & Sons 2,744 0 0
 A. & F. Wilson 2,734 14 4
 A. J. Colborne £2,888 8 6
 Baker & Co. 2,576 11 8

PARKSTONE.—For the erection of a bungalow at Sandbanks, Parkstone-on-sea, Dorset, for Mr. Stewart King. Mr. Walter Andrew, architect, Parkstone:—
 Miller & Sons .. £1,890 0 0
 Jenkins & Sons .. 1,825 0 0
 Burt & Vlek .. 1,833 10 0
 A. & F. Wilson .. 1,445 0 0
 Baker & Pearce, £1,294 0
 Chunchen & Co., Parkstone* .. 1,216 0

PEPPERHINT.—For rebuilding Peppermint (County) Bridge, for the Main Roads and Bridges Committee of the County Palatine of Lancaster. Mr. W. Compton Hall, M.Inst.C.E., County Bridgemaister, Preston:—
 H. E. Buckley £517 12 5

PRESTON.—For widening Reedyford South (County) Bridge, on the main road from Nelson to Barrowford, for the Main Roads and Bridges Committee of the County Palatine of Lancaster. Mr. W. Compton Hall, M.Inst.C.E., County Bridgemaister, Preston:—
 J. Strachan £384 13 3

REDHILL.—For the erection of residence on Redstone Park, for Mr. J. R. A. Campbell. Mr. A. W. Venner, architect, Redhill:—
 Drowley & Co. £1,150
 C. Parsons 965
 T. Bashford 938
 J. Waycott 874
 A. B. Wiles 840
 E. Worsell, Redhill* 787

REEDYFORD.—For widening Reedyford (Hundred) Bridge, on the main road from Nelson to Barrowford, for the Main Roads and Bridges Committee of the County Palatine of Lancaster. Mr. W. Compton Hall, M.Inst.C.E., County Bridgemaister, Preston:—
 J. Strachan £1,750 0 4

STOCKPORT.—For the completion of Cheshergate Council schools, for the Education Committee, Messrs. Cheers & Smith, architects, Bucknurd and London:—
 J. Ridyard, Ashton-under-Lyne* £10,051

SWINDON.—For the erection of the Ferndale-road Council schools for the Corporation. Messrs. Nicholls & Stockwell, architects, 25, Regent-circus, Swindon. Quantities by Messrs. Drew & Sons, 23, Regent-circus, Swindon:—
 Jenkins & Sons £14,887 0 0
 W. Jones 14,400 0 0
 J. Long & Sons 14,123 0 0
 A. J. Colborne 12,996 5 11
 Annett & Son 12,960 0 0
 R. J. Leighfield 12,735 2 8
 T. Gubbert 12,700 0 0
 J. G. Norman 12,157 9 0
 H. & C. Spackman, Hunt-street* 12,029 18 4

SWINDON.—For erecting houses and shop in Princess-street, for Mr. W. J. Carpenter. Messrs. Drew & Sons, architects, Regent-circus, Swindon:—
 A. J. Colborne .. £598 7 6
 H. & C. Spackman .. 585 0 0
 J. G. Norman .. £252 0 0
 R. J. Leighfield .. 450 0 0
 Tydeman Bros.* .. 444 10 0
 [All of Swindon.]

SWINDON.—For making-up back road, rear of Deburgh-street (even), Swindon Estate, for Mr. James Morrison, J.P. Messrs. Drew & Sons, surveyors, Swindon:—
 Tydeman Bros., Swindon* £115 0 0
 [Three tenders received.]

THIRSK.—For Lambert Memorial Hospital extension scheme. Mr. T. Stoes, architect, Westgate, Thirsk:—
 Builder: W. Jackson, Thirsk £368 0 0
 Joiner: M. Westwick, Thirsk 135 0 0
 Plumber: T. Ames, Thirsk 53 9 0
 Painter: J. Butterford, Thirsk 16 0 0
 Heating: T. Ames, Thirsk 32 7 8
 Electric Bells: E. Tumber, Thirsk 3 8 0
 Electric Light: E. Tumber, Thirsk 10 4 0
 Slater: Baynes & Beck, Elton 39 17 0

TILBURY.—For pulling down existing mortuary, and erecting a new building containing mortuary, post-mortem rooms, for Orsett Rural District Council. Mr. S. A. Bill-Wills, Surveyor, Council Offices, 2, Orsett road, Orsett. Quantities by Surveyor:—
 H. P. Carter .. £400
 F. E. Smith .. 380 18 0
 O. W. Cooke .. 375 16 0
 W. O. Thomp .. 852 13 0
 O. B. Ross .. 334 17 4
 Brand & Sons .. 331 7 9
 W. T. Green .. 315 11 0
 W. B. Hyde .. 313 10 0
 Mundy & Co. 309 9 5
 E. & A. Willmot £299 0 0
 Eaby & Chivers 295 2 6
 H. Pillbury .. 295 7 10
 Elvy & Son .. 294 0 0
 W. White .. 281 0 0
 Pavitt & Sons 252 11 3
 R. J. Mead .. 252 11 3
 Little Thurlrock (Essex)* 232 1 0

WALPOLE ST. ANDREW (Norfolk).—For alterations and additions to house and barn, for Mr. William Wing. Messrs. Walker & Walker, architects, Wisbech and Terrington St. Clement:—
 J. T. Jewson £625
 C. Fryer 612
 G. J. West 600
 J. S. Johnson 550
 J. W. Wilkinson 532
 P. Bone £500
 G. Helman 499
 Emmerston & Son .. 485
 F. S. Flood* 455

WATFORD.—For alterations to Yew Croft, Bushey Heath, Watford. Mr. Fred Taylor, architect, Aylesbury:—
 D. Cook & Son, Leighton Buzzard £588 0 0

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The Builder.

VOL. XC.—No. 3292.

MARCH 10, 1906.

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(Ashpötel Prize Drawing.)	
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2. View from South-East.	
3. Porch.	
4. Chancel Screen.	

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The Church of Southwold.



THE story of the church of Southwold and of the present noble building can be briefly told. There was a small church here, probably occupying part of the

same site, long before the great fabric of the XVth century was begun. The abbot and convent of Bury St. Edmunds were lords of the manor; but the prior and monks of the Cluniac house of Thetford, in right of their cell of Wangford in the adjoining parish, held the advowson of Reydon parish church, of which Southwold (then a small place of little importance) was merely a hamlet. A great contest arose between these two religious houses about the erection of a chapel here, to serve for the fisher folk; but at last, about 1202, an agreement was come to whereby the priory of Thetford, in conjunction with their cell at Wangford, undertook to build a chapel at Southwold, on ground given by the Abbey of St. Edmunds, for daily service by a resident chaplain, who was to be subordinate to the church of St. Margaret, Reydon. This original church or chapel of Southwold was destroyed by fire about 1430. During certain works in the year 1758, the foundations of the old building were laid bare, and were found to measure 72 ft. from east to west.

Just about the time when the old chapel was burnt out, the mouth of the

Blythe was becoming of greater importance as supplying quays and a port for the wool trade. The once important town and harbour of Dunwich, a few miles to the south, was being rapidly absorbed by sea encroachments, and other small ports along this coast line were being silted up. Southwold, on the north side of the Blythe, and Walberswick on the south, were gradually growing into places of repute. Although Southwold did not obtain its first charter of incorporation until 1490, traders and merchants began to settle there far earlier in the century, and the harbour dues and fisheries brought in a small local revenue.

Here then was a great opportunity for the traders and inhabitants spending no inconsiderable share of their growing wealth in the erection of a stately house of worship, and one of the four great churches of this immediate neighbourhood (the others being Covehithe, Blythburgh, and Walberswick) was begun and finished through the generous gifts of the people. It is improbable that either the monks of Thetford or of St. Edmunds played any important part in the matter.

The date or dates of the new erection of the XVth century are not a matter of guesswork. A deed dated 1458, whereby the prior of Wangford gave land for the enlargement of the churchyard of "the new chapel lately erected," shows that the inhabitants did not lose much time in setting about the reconstruction of their old place of worship on the present grand scale. Various bequests for the making of seats, the candle-beam, and other furniture, in 1461 and years immediately

following, show that the body of the church was by that time completed. Other bequests, about 1470, for the bells, point to the finishing of the tower ere that date. The fine porch seems to have been the crowning of the work, for there were bequests towards its erection or completion in 1488 and 1489.

The new church, which was dedicated to St. Edmund, consisted then as now of chancel with side chapels, clearstoried nave of seven bays, north and south aisles, south porch, and western tower.

There has been a good deal of diversity in the measurements of this large church, as usually cited. The following have been recently taken for this article:—Chancel, 44 ft. 10 in. by 19 ft. 2 in.; nave, 79 ft. by 19 ft. 9 in.; south aisle, with chapel, 98 ft. 4 in. by 15 ft. 7 in.; north aisle, with chapel, 104 ft. 3 in. by 16 ft.; tower, 16 ft. 1 in. east and west, by 14 ft. north and south; and porch, 12 ft. 11 in. north and south, by 11 ft. 7 in. east and west. The width of the walling of the tower arch is 3 ft. 6 in., thus giving a total interior length of 143 ft. 5 in.; the total width is 56 ft. 2 in. The space between the arches of the nave arcades is the same on each side, namely, 10 ft. 8 in.; this is the case with all the arches saving the two adjoining the tower, which have a width of 11 ft. 9 in.

It will be noticed from these measurements that this church is not on an entirely regular plan, although at first sight both sides seem uniform. Though not separated by any long interval of time, the construction of the aisles was not carried on simultaneously. It may

be fairly concluded that the north side of the church came after the south, for the parapet of the north aisle was left in an unfinished state until the restoration of 1867-8. On the north side the walling of the aisle is divided by the buttresses into eight bays; its extension eastwards comes to within 18 ft. (outside) of the east wall of the chancel. On the south side there are seven bays to the aisle, there being 24 ft. beyond it of chancel walling. The difference in length on the north side is accounted for by provision being made for a two-staged sacristry, the upper part of which is now used for the organ. All the side windows of the church are of three lights with good tracery, but east and west windows are of four lights. The great east window is now also of four lights. The original window was blown in during the great storm of 1696, when 200 coasting vessels, with most of their crews, were wrecked on the east coast. It was repaired with wooden mullions. The present mullions and tracery date from 1867-8; and so also do two or three of the south aisle windows, which had been repaired with wood or partly blocked up with brick.

The south porch (see lithograph) is a really noble example of the later flush-work of East Anglia; the scheme of the free-stone and flint panelling being richly carried out, particularly in the battlements and buttresses. There is a handsome canopied niche between the two two-light south windows of the parvise. There is a stone vaulted roof to the parvise.

The continuous stretch of clearstory windows, eighteen on each side, with the flat-topped pinnacles rising between, give a peculiar grace to the building. In the centre of the long line of the lead-covered high-pitched roof rises a sanctus-bell turret of some little size, and of no particular beauty. In fact, it has rather a clumsy appearance, and it would be much improved if it had greater height and was of a more fleche-like character. Much of the line of clearstory, with its parapets, was renewed in 1867-8, and this sanctus-bell turret was reconstructed. In a fine volume of drawings of Suffolk churches, made by Mr. Isaac Johnson, of Woodbridge (now in private hands), an exterior of Southwold, taken about 1800, shows a turret of a more ornamental and crocketed description.

The massive west tower, which rises to over 100 ft. in height, has a particularly fine appearance on the west side. The west doorway is of good design, with griffins in the spandrels, and lions as the terminals of the squared hoodmould. The hollows of the mouldings in the jambs and soffit of the arch are ornamented with a variety of figures. On each side of the west window there is a canopied image niche. Over the window is a bold inscription in crowned capital letters, formed in freestone and flint, which runs as follows: *St. Edmund ora p. nobis*. The large double bell-chamber windows are of unwonted construction, and would seem overweighted were it not for the particularly substantial general character of the tower; they are divided down the centre by narrow buttresses, which reach from the coping to the first string course, and there terminate. There is a

quatrefoil band round the top of the tower, but no regular parapet. The summit of the tower, as well as the parapet of the north aisle up to 1866-7, seems to have been left in an unfinished state.

The interior of the church is of fine proportions, but must have been much more impressive when the great even stretch from tower to east window was broken up by the left and great Rood on the top of the rood screen. The single hammer-beam roof extends unbrokenly from end to end. It is on the old lines, but only contains a few of the original timbers. Mr. Phipson, who restored the church in 1866-7, took off the whole of the roof and reframed it; only two of the entire series of carved spandrels below the hammer-beams are old.

It was a common practice, in old days, in many parts of England, of which there are several examples in Suffolk, to more highly ornament the bay of the church roof immediately over the Rood. Southwold afforded a singularly beautiful instance of this custom, extending over twenty panels. These panels had blue grounds spangled with gilded stars, and in each is a gold-crowned angel clad in a pink robe; the wings of the angels were alternately green above and red below, and *vice versa*. The angels all hold either symbols of the Passion or inscribed scrolls with words from the *Benedictus*. Those on the north side bore:—(1) The pillar of scourging and Judas' lantern; (2) scroll, *Benedict's domin's*; (3) scroll, *Deus israel*; (4) spear and reed with hyssop; (5) palm branch; (6) scroll, *Quia visitavit*; (7) scroll, *Fecit redemptioe*; (8) hammer and three nails; (9) Latin cross; and (10) scroll un-inscribed. On the south side the angels bore:—(1) Pincer; (2) scroll, *Et ceteris*; (3) scroll, *Cornu salutis*; (4) reed sceptre; (5) crown of thorns; (6) scroll, *Nobis in*; (7) scroll, *Domo david*; (8) rod and scourge; (9) Peter's sword, with Malchus' ear on edge; and (10) scroll, *Pueri sui*. Beneath these southern angels are the words *Te D'um c'fitemur*, and beneath those on the north *Te D'um laudam*. This description is taken from a careful survey of the roof before 1866-7. Mr. Phipson found the painted panels so decayed that it was decided to remove them all, and to supply new wood and painting in facsimile, as far as possible, of the old. The work has been done well, and most visitors seem to think that they are looking up to XVth century painting. Had the work been undertaken a quarter of a century later, it would have probably been found possible to retain much, if not most, of the original.

The rood screen, with its extensions across the aisles, is on the whole the most interesting and valuable in Suffolk, and indeed in East Anglia at large, with the possible exception of Ranworth, Norfolk. The tracery and woodwork are good of their kind, particularly in the centre portion. But the chief merit and value of this screen lies in its painting and decoration. There is remarkable delicacy and finish in the gesso-work painting and gilding of the upper portion of the screen work, though the art displayed in the figure painting of the solid lower panels makes the greatest impression. It was at one time confidently stated, when the question of chestnut

versus oak was much discussed, that the panels were of chestnut wood, but it is now generally admitted that it is close-grained oak.

The twelve panels of the central portion of the screen are occupied by twelve Apostles, though St. Paul displaces one of the original twelve (in this case St. Matthew), as is sometimes the case. They occur in the following order, beginning at the north end:—(1) St. Philip, with basket of bread; (2) St. Matthias, leaning on a sword, with letter M on hilt, to distinguish him from St. Paul; (3) St. James the Less, with fuller's bat; (4) St. Andrew, with saltire cross; (5) St. Thomas, with spear; (6) St. Peter, with the two keys (Doorway); (7) St. Paul, with uplifted sword; (8) St. John, with chalice and serpent; (9) St. James the Great, with pilgrim's staff, wallet and scallop shell; (10) St. Bartholomew, with knife; (11) St. Simon, with an oar; and (12) St. Jude, with a boat. It may be noted that the Apostles are so arranged as to give St. Peter and St. Paul the posts of honour or of most observation, namely, one on each side of the entrance.

On the panels of the screen at the end of the south aisle, beyond which was the Lady Chapel, are representations of Old Testament prophets, three of which are recognisable, namely, Baruch, with knotted staff and wallet; David, with harp; and Moses. The names of others of the prophets can be deciphered, whilst the enriched backgrounds and diapered dresses are in some instances in fair preservation. The full list of prophets was Baruch, Hosea, Nahum, Jeremiah, Elijah, Moses, Daniel, Amos, Isaiah, Joubah, Ezekiel, and Samson.

The twelve panels of the screen that shut off the chapel of the Holy Trinity from the north aisle, beginning from the north end, bear:—(1) An angel, holding the triangular Trinity shield; (2) St. Gabriel, with sceptre and shield bearing the monogram of the Blessed Virgin; (3) an angel, bearing a shield of the Blessed Sacrament (three chalices and wafers); (4) Virtues, figure with crown in right hand and censer in left; (5) Powers, figure holding the Devil by a chain, scourging and trampling on him; (6) Principalities, figure with sceptre standing in a citadel; (7) Dominions, figure holding chalice and host in right hand, orb and cross in left, with a church below the feet; (8) Thrones, figure holding a tower; (9) Seraphim, golden figure standing on a wheel, holding a scroll bearing Sc's (sanctus) thrice repeated; (10) Cherubim, figure standing on a wheel, hands folded on breast; (11) Archangels, figure with sword and scales (St. Michael); and (12) Angels, crowned figure in golden alb and green stole, holding small nude figures representing souls in a white cloth. It will thus be seen that the whole conception was to figure the nine orders of the Heavenly Hierarchy, and the emblems of the Holy Trinity, the Blessed Virgin, and the Blessed Sacrament were added to bring the number up to twelve. Similar figures are to be found, though treated somewhat differently, on the richly-painted screen of Barton Turf, Norfolk. It is clear that this screen was the special gift of some merchant of the town. The *orate* of a memorial inscription of a donor or donors can still be read. In Martin's

church notes of the year 1750, the inscription on this screen is given as *orate pro animabus Johis Gudman et atarinc uxoris ejus*. This must be the same inscription described in "Gardner's history" (1754) as being "on the east of the pulpit by the north isle," but the name is there spelt "Gueman." In 1848, the words *Ora pro anima Johis Gudman* could be read on one of these panels, so that it would appear there were several others. There can now be seen below each of these panels a monogram or merchant's mark, which seems to be formed by the letters A. A. T.

There is no one who has made so close a study of the East Anglian screens as Mr. G. E. Fox, F.S.A., and it may be well here to quote some of the words he used when describing this Southwold painting to the members of the Royal Archeological Institute, when visiting his church in 1899. After noting how much the figures on the northern and southern screens had suffered from time and evil treatment, he added:—"The less interesting figures of the chancel screen are more perfect, but have lost in genuineness from the restoration of the heads (circa 1850) by the late Mr. George Richmond, R.A., the well-known portrait painter, father of the present Sir W. Richmond, who formerly resided in the neighbourhood. Yet, in spite of time and willful destruction and restoration, a great deal of the beauty of the original work remains. Notice the delicate gesso-work with which the architectural mouldings and the backgrounds of the figures of the Apostles are covered. In the panels, the figures being first drawn, the gesso or plaster was thickly applied to the ground and worked up to the outline of the figure. Then the plaster, whose setting had been retarded by mixture with certain well-known ingredients, such as honey, received the impressions of the different diapers by means of wooden stamps. On the flat face mullions of the chancel screen are seen, here and there, little flat-backed niches impressed in the gesso, with delicately outlined and shaded figures in black upon the gold which covers everything. The little figures had originally a tiny piece of glass over them, the arrangement being meant to imitate enamel."

It is usual to assign all beautiful painting and decoration of this character in East Anglia to the Flemings, who are supposed to have been beckoned across the water to ply their crafts wherever England's church lovers required the execution of specially skilful work. Quite recently an otherwise able writer on East Anglia has asserted that the Southwold painting is "indubitably of Flemish origin." The actual craftsmen who did the painting and exquisite decoration of this screen have not so far been identified, but Mr. Fox and others have supplied us with strings of obviously English names of men of Norwich and other parts of this district, from the days of Edward III. to Henry VIII., who were "payntours," "pictours," or "staignors," employed in church work. Thus Thomas of Yarmouth and Edmund of Bradwell were the craftsmen employed at high wages to do the tabernacle work and painting at the collegiate church of Mettingham, Suffolk, at the beginning of the XVth century.

To this we can add an instance yet nearer to Southwold, not hitherto cited. In 1498, William Rede and William Sharft (purely English names) received large sums for painting the rood screen and the roof of the once noble church of Walberswick, only a mile from Southwold.

The pulpit on the north side of the nave is a fine piece of wood carving, coeval with the fabric of the church. It is in good preservation, and the rich colouring has been reproduced with much taste.

The richly-carved stall work, immediately within the screen, is original, and only slightly repaired. There are four stalls, with misericords, and three returned stalls facing east on each side.

On the south side of the altar is a stone sedilia bench, 7 ft. 6 in. long, the seat 1 ft. 7½ in. high and 1 ft. 3 in. deep. It is covered by a handsome projecting groined canopy, without any divisions, at a height of 7 ft. This is an effective but most unusual arrangement.

The octagonal font, at the west end, is a fine one; it stands 54 in. high, and the bowl has a diameter of 36 in. It was originally a "Seven Sacraments" font,

but the carvings were broken off during the previous iconoclastic visitation of 1643. Dowsing, the notorious Puritan visitor, enters in his diary, under Southwold, April 8:—"We brake down one hundred and thirty superstitious pictures (glass), and four crosses on the four corners of the vestry; and gave orders to take down thirteen cherubims, and to take down twenty angels, and to take down the cover of the font."

In the vestry is a fine chest 5 ft. long, with two knights tilting on the front panel. It is somewhat older than the church, being of the time of Henry V. (1413-22). There is another massive chest, much decayed, with coved top, in the parvise.

The rood loft staircase is in the wall of the north aisle. In the upper doorway now stands a wooden figure of a "Jack of the Clock," which used to be over a small gallery within the tower. It was worked by the clock machinery to strike the hours within the building. The style of armour shows its date to be circa 1500.

A remarkable feature of the church is the absence of old monuments. Doubtless various brasses have disappeared.



"Jack of the Clock," in Southwold Church.

The interesting brass plate to James Petre, the royalist minister of Southwold, described in "Gardner's History" (1754), was subsequently purloined. It turned up in a neighbouring iron foundry in 1850, and was replaced within the chancel. He died in 1700, aged eighty-one. About the same time a XVth century brass plate was found on the top of a vestry cupboard, inscribed:—*Orate pro animabus Johannis Bischoep et Helene uxoris sue et omnium fidelium defunctorum*. By an error of judgment this plate was affixed to the screen of the south aisle, where it still remains. Its presence there makes visitors believe that John and Helen Bishop were the donors of the screen.

Out the south side of the large churchyard a group of three graves, each with its headstone, often attracts attention. They are to the memory of Thomas Gardner, an antiquary of some note, who published a valuable and now very rare history of Dunwich, Blythburgh, and Southwold in 1754, and his two wives. He long outlived his two partners, the one dying in 1729, and the other in 1759. The middle stone bears the following inscription, said to have been written by the antiquary shortly before his death:—

"IN MEMORY OF
THOMAS GARDNER, Salt Officer,
Who died March 30th, 1769, aged 79.
Between Honour and Virtue here doth lie
The remains of old antiquary."

THE PUBLIC, THE LONDON COUNTY COUNCIL AND THE DISTRICT SURVEYORS.

FOR a second time the Building Act Committee of the London County Council has brought up a recommendation that from April 1 next all district surveyors should be paid a salary by way of remuneration instead of fees, and for a second time the recommendation has been referred back. On January 13 last, in criticising the Committee's Report, we propounded this question, "Is there not rather a strong probability that the ratepayer will find himself called upon to share with the building-owner a burden which hitherto the building-owner alone has had to bear?" and, at the meeting of the Council on February 27 Lord Welby is reported to have said that the Finance Committee did not look with very great favour on the scheme of the Building Act Committee, fearing that its adoption might involve a charge on the rates. The amendment to refer the recommendation back was last week again carried, apparently on financial grounds, and by the increased majority of 59 votes to 40.

If we may judge from the correspondence which has appeared not only in our own columns but in the press at large, there appears still to exist a good deal of misapprehension as to the 50,000*l.* per annum which, in round figures, is the sum involved in the present discussion. The Building Act Committee, in their search for paper "profits," appear to have lighted upon a disused section in a ten-year-old Act of Parliament which they have thought good enough to enable them to divert an annual income of 50,000*l.*, earned by professional men, into the devouring, but decidedly unprofes-

sional, coffers of the London County Council. The persons who at present receive this 50,000*l.* per annum are the district surveyors, while the persons who pay this 50,000*l.* per annum are the building-owners (not the ratepayers) of London. The distinction between "building-owner" and "ratepayer" is an important one, which, though frequently lost sight of in the course of the present controversy, cannot be too much insisted on. It must not be supposed that every owner of a building in London is a "building-owner"; not at all; in the technical sense the phrase means any person, be he freeholder, leaseholder, or tenant on agreement, who sets out to make structural alterations to a house or premises, or to erect a new building within the boundaries of the County of London. The building-owner's relations with the district surveyor may perhaps best be realised by a simple illustration:—

I want to make an addition to my house in London; my architect prepares plans and obtains an estimate from a builder; a building contract is completed; I notify my neighbours on each side; I then become a "building-owner"; my builder before commencing the work gives notice to the district surveyor, who is an independent person acting by the authority of an Act of Parliament. The surveyor's duty is to see that the building operations are carried out in accordance with the London Building Acts; and, for this purpose, he visits and inspects the works from time to time. That he should be an independent and incorruptible man is as much to my interest as it is to the public advantage; and therefore, when the works are finished and my builder sends in his account, the last item that I quarrel with in that account is the amount of the fee, regulated by statute, which is paid to the district surveyor. Now, unless I have wanted to do something unusual—such as, for example, to project a bay window beyond the main front of my neighbours in the street, neither I myself nor my architect nor my builder will have had any communication whatsoever with the London County Council, nor will any official from Spring-gardens have crossed my threshold.

It will be evident from this illustration that the service performed for the building-owner by the district surveyor is not to be compared with the police service or the fire-brigade service, but is in the nature of a professional service rendered by a professionally trained man to a personal building-owner, and is paid for by that owner. The fire-brigade service, on the other hand, is one maintained at the expense of the ratepayers (with the assistance of the fire insurance offices) for the benefit of the community at large. Under the scheme recommended by the Building Act Committee it was proposed that an unwieldy and complicated service should be set up and maintained at the ratepayers' risk, whereby the Council hoped to make a profit—a ratepayers' speculation—out of fees taken from building-owners engaged in enterprises from which the ratepayer was not to get any benefit, whilst the building-owner would probably be making large profits. For example, on the occasion of a Royal procession the Council would have, at the ratepayers' cost, to pay for the services of the addi-

tional assistance required by the district surveyors in inspecting the construction of the large stands which on these occasions are erected along the line of route, to the great profit and advantage of the owners of the same stands. Hitherto the owner has paid the fees for this service to the district surveyor, who has had not only to inspect the stands but himself pay for any necessary assistance. We are not speaking of the licences granted by the Borough Councils for the erection of the stands, but of the work of supervision, for the cost of which the ratepayer is not now responsible; and we fail to see why the ratepayer should be called upon to put his hand in his pocket for the benefit of a building-owner engaged in a profitable undertaking, who is perfectly willing to pay for the work of supervision.

As we have said, it is these financial objections to the scheme which appear to have carried the majority of the Council in their decision to refer the recommendation back. The letter which the Royal Institute of British Architects has caused to be sent to the Chairman and members of the London County Council was printed in our issue of last week, and approaches the question from an even higher standpoint, and is, moreover, in accordance with the views we have consistently advocated in these columns. We note with approval that in the last paragraph of that letter the suggestion is made, "that the disability which has been imposed in the case of some of the later appointments should no longer be enforced, and that in future all surveyors acting under the provisions of the London Building Act should be practising architects."

That this was the intention of the Legislature is clear, as a reference to sect. 144 of the Act of 1894 will show; that section provides that, "If any building or structure be executed, or any work done to, in, or upon any building or structure by or under the superintendence of any district surveyor acting professionally, or on his own private account, that surveyor shall not survey such building or structure for the purpose of this Act, or act as district surveyor in respect thereof or in any matter connected therewith, but it shall be his duty to give notice to the Council, who shall then appoint some other district surveyor to act in respect of the matter." In face of this section it would appear difficult to justify the compulsory subscription by candidates for the office of district surveyor of the following declaration amongst others:—"That he will not during his continuance in office (except in the discharge of the duties thereof) carry on business as an architect, surveyor, or builder, or directly or indirectly, as a partner or otherwise, be interested in such business." The result is that whereas Parliament has said that a district surveyor shall not carry on private practice within the area of his own district, the London County Council has made it impossible for a district surveyor, appointed under these conditions, to carry on private practice anywhere; and there are not a few who will be disposed to agree with the learned counsel who recently expressed a strong opinion as to the legality of this restriction, "as well might the Council require the district

urveyors to go about wearing white hats."

At first sight it might seem as if the question was one primarily for candidates for the office of district surveyor, but this is not so. To bear the responsibility of approving "the construction of every public building, including the walls, roofs, floors, galleries, and staircases," to issue certificates as to safety of cutting away chimney-breasts, to supervise the details of steel construction, to settle means of access to roof in case of fire, to survey and report as to dangerous structures and to certify as to safety of sky-signs, there is required a man who has had something more than the experience of a clerk in a surveyor's office, whose outlook is somewhat wider than is to be obtained from a desk at Spring-gardens, and whose technical education has been founded on something broader than the reading of a couple of Acts of Parliament together with the text-books required to pass the statutory examination under the London Building Acts.

It is really no answer to point to the undoubted fact that no exception can be taken to the persons who have recently been appointed under the disabling conditions; in the struggle for existence you will find here and there a man who has received a liberal professional education, who has commenced practice as an architect fired with a high ambition and a noble ideal, and who ultimately finds himself occupying, not without a struggle, the seat at an official table and having to deal with the intricacies and details of statutory forms and notices; but supply quickly lowers itself to the standard of demand. Say to the young architects:—"We do not want for this work of supervision men who may become Presidents of the Institute and Royal Gold Medallists, what we require is a man who, armed with his cloth-bound copy of the Statute, will search out 'irregularities' and have them rectified, who will take a text-book with him to test the strength of a structure alleged to be dangerous, and who, having learned his business on a stool in a district office, knows all the 'forms and notices' by heart and will regulate his steps *pari passu* with the machine at Spring-gardens." Say this persistently for a little longer, and in a few years you will get plenty of candidates for the office, and they will be men admirably fitted for police building-inspectors' duties, but eminently unqualified to act in any professional capacity where self-reliance, strength, and judgment are required. Already there is a noticeable tendency for men to come up for the statutory examination and to neglect the wider reading and study which are required in the examinations for membership of the Royal Institute of British Architects. *And it is the building-public who will suffer by this lowering of the standard of qualification for the public service.*

But, it may be asked, is not the building-public to pay less for this inferior service than under the conditions contemplated by Parliament? The answer to this question is that the building-public are to pay neither more nor less than the fees laid down by Parliament for a service which is not to be of the standard hitherto obtaining, but of such a standard

as shall satisfy the requirements of the London County Council, a standard which is sufficiently indicated in the aforementioned "Conditions of Appointment."

We should hope, therefore, that the majority of the Council will see the wisdom of adopting the suggestions of the Royal Institute of British Architects, and of reverting to the high traditions of a service which has proved itself efficient in the past, and to which no exception has been taken either by professional or public opinion.

NOTES.

TWO PAPERS read by Mr. Allanson-Winn—one before the Civil and Mechanical Engineers' Society and the other before the Society of Engineers—have served the purpose of eliciting useful discussion as to the advisability of supplementing ordinary groyning by some form of submerged groyne carried considerably beyond low-water mark. The author has devoted himself with much persistence during recent years to the advocacy of his "deep sea erosion" theory, and although the two recent papers are not identical as to subject matter and treatment, they both emphasise the contention that the continual waste of material below low-water level is one of the chief causes of the landward advance of the sea towards many coast lines. Various sections of the East Coast were exhibited at the meetings in support of this view, and it certainly is a reasonable argument that the friable material frequently extending from the visible shore into deep water should be regarded as invisible shore, and as such ought to be protected just as much as the exposed portion. Submerged groynes in themselves are no novelty, having been applied to some extent at various places for the purpose of collecting material to fill up swills beyond low-water mark. But Mr. Allanson-Winn would like to see such works carried into the sea to distances of from 100 ft. to 300 ft. or more, according to local conditions. The task of building concrete groynes or of constructing pile groynes in deep water would evidently be most costly, and the author's proposal is that a groyne, consisting of a chain cable with an attachment of bushes, or other suitable material, would form a flexible obstruction useful for arresting and collecting travelling material. Groynes made in this way have been tried at Bray, near Dublin, under extremely unfavourable circumstances, and so far the results of the experiment are inconclusive as to the efficiency of the construction, and as the groynes were not carried for a sufficient distance seawards, they have not thrown any light upon the accuracy of the theory that beneficial effects would follow the attempt to build up beach material upon the permanently submerged portion of a shore where movement of material takes place below the surface of the water.

British Canals and Waterways.

NOW THAT the paper read by Mr. J. A. Sauer "On Waterways in Great Britain," together with an abstract of the discussion and correspondence, has been issued

in pamphlet form by the Institution of Civil Engineers, quite a useful collection of opinion is available on the subject, and it seems a pity that this should not be obtainable by members of the outside public who are interested in the important question involved. However, there will be no lack of data relative to our canals and inland waterways when the new Royal Commission once gets to work. The terms of the reference to that body give ample scope for the most searching inquiry, the expression of views as to the benefits to be derived from an efficient canal system, and the expediency of placing such a system under properly organised public control. The Government must be congratulated upon having taken action, and also upon the *personnel* of the Commission which represents all interests involved, and ought to result in recommendations calculated to assist Parliament in removing the obstacles now standing in the way of inland navigation—a means of transport which contributes so largely to the prosperity of various Continental countries.

Winchester Cathedral.

IT IS reassuring to learn that the alarmist rumours which arose last week after the fall of a stone from the choir vaulting of Winchester Cathedral were based (as usual) upon gross exaggeration of the facts. The actual incident was in itself trifling, and was the result of the underpinning works now in progress. Still, it is the fact that the more closely the condition of the walls and foundations is examined, the more serious appears to be the task before the cathedral authorities. It was once hoped that the insecure portions of the fabric were only those in the south wall of the presbytery and the east wall of the south transept. Unfortunately, the whole of the north wall is now found to require attention. This means that a further sum of 10,000*l.* will have to be provided for underpinning and other works, but does not involve any new problem or constructional difficulty, and as the instability of the north wall actually exists it is rather fortunate than otherwise that it has been unmistakably demonstrated at the present juncture.

Sale of Real Property.

WE have recently commented on two cases on the sale of real property, when the vendors, after it was discovered there had been a misdescription of the property, endeavoured to rescind the contract under the conditions of sale, but in one of which the Court held this could only be done on payment of certain costs and expenses incurred by the purchaser; and in the other in which the purchaser was unwilling to rescind except on the payment of damages, when the Court held the purchaser to be entitled to compensation. The latest case on this subject is *Quinion v. Horne*, where certain freeholds had been sold by auction. The conditions of sale were in an ordinary form, and contained a clause that if the purchaser should make any objection or requisition either as to the title, the form of conveyance, or other assurance, or any matter appearing in the particulars, conditions, or abstract, "which the vendor shall be unable or unwilling to

comply with," the vendor should be at liberty to annul the sale. The abstract disclosed the fact that the property had been vested in a certain lady for life with ultimate trusts depending upon her having children or not. The purchasers required to know the date and place of birth of any of the children, but the vendors refused to comply, and claimed to rescind the contract. There was no difficulty in giving the desired information, and the Court held that the requisition was reasonable, and decreed specific performance of the contract. Intending purchasers must often have been struck with the arbitrary nature of the above condition of sale, and it is satisfactory to find that the Courts will only give effect to it when it is not exercised in an arbitrary and unreasonable manner.

Automatic Railway Couplings.

IN a letter to the *Times* Mr. Richard Bell makes one of his periodical and not unreasonable criticisms upon the inaction of railway companies with regard to the adoption of automatic couplings. Judging by the terms of a resolution adopted at the International Railway Congress of Washington, British railway companies appear to think that the system used in Great Britain and Ireland is at present satisfactory as regards rapidity of handling and the safety of employees. This hopeful view is not supported by the subsequent recommendations of the Railway Clearing House as the mouthpiece of the railway companies, the Association of Private Owners of Railway Rolling Stock, and the Mining Association of Great Britain. The expense urged by the companies for the non-adoption of a uniform system of automatic couplings is that trials have been and are still being made, but that the satisfactory coupling has not yet been found. It is quite correct that the Board of Trade are not prepared to recommend any particular form of coupling apparatus, but equally correct that the Department have not made any perceptible effort to exercise the powers conferred by the Act of 1900 to "hold such inquiries and make such experiments as they think expedient" with the object of finding a safe and reliable coupling. If this important department could be persuaded to take action there is little doubt that the annual sacrifice of life and limb exacted by the existing shunting system could be reduced very materially, with concurrent advantages to the railway companies in the conduct of traffic.

Scientific Sewage Disposal.

THE scientific disposal of waste products really dates from the Report of the Royal Commission of 1844 which led to the development of the theory that disease was bred by heaps of decomposing organic matter. Although we now know that this theory was not correct, yet it did good by laying emphasis on the function of such material as a carrier of disease, and by stimulating the great reforms in this country upon which other nations have modelled their own sanitary systems. In the December number of the *Technology Quarterly* Mr. C. E. A. Winslow, a well-known American chemist, discusses the historical development and present status of the problem of the scientific disposal of city sewage, comparing disposal by

dilution, on land, by intermittent filtration, the septic tank, the contact bed, and the sprinkling filter. All these systems originated in Great Britain, and of the last Mr. Winslow says that it will treat sewage at much higher rates than other processes, giving a very satisfactory effluent, and that the body of the beds is cheaper to construct. The only difficulties to be encountered in America are the distribution of the sewage and the possible bad effect on the beds of severe winter weather. Experiments are now being conducted at Boston (U.S.A.) with this form of filter, and Mr. Winslow considers that if the difficulties mentioned can be got over the sprinkling filter will furnish the best treatment of sewage known.

Concrete-Steel Floors.

In a paper read before the American Society of Civil Engineers, Mr. John S. Sewell briefly reviews the various formulae evolved during the past few years for the design of concrete-steel structures, and adds one more to previously existing equations of this kind. Mr. Sewell's new formula for the moment of resistance (M) of a beam is $M = h d A T$ where A = total sectional area of steel, d = depth of the centre of gravity of the steel below the upper surface of the beam, H = a constant, T = unit stress in the steel. This is a very simple equation, and in the present state of knowledge probably quite as reliable as the more complicated expressions put forward by some engineers. Among the general deductions stated in this paper are:—(1) That all floor beams and slabs should have, in addition to horizontal reinforcement, web members securely attached thereto, and arranged in accordance with the distribution of shearing stress; (2) that the bond of that portion of each web member passing through the concrete in compression should be sufficient to permit the strength of the member in question to be fully developed, and that the attachment of the member to the horizontal reinforcement should be equally strong; (3) that clips should be employed to hold the horizontal bars at the proper distance above the centring, and that these bars should be of circular or rounded section, so that the concrete may readily flow beneath them; and (4) that as the reinforced concrete beams and joists of a floor system act as continuous girders, whether intended or not, reinforcement ought to be used at the points of contrary flexure to avoid the risk of unsightly and sometimes dangerous cracks. These suggestions are all good, even if not particularly novel.

The International Exhibition.

THE sculpture remains the same at the New Gallery; the paintings have disappeared to make way for a heterogeneous collection of studies and sketches. Those who wish to realise what the ultra-modern or "progressive" class of artists are bringing art to may find it instructive to turn into the South Room, where the numbers commence, and study the kind of things they find there, and ask themselves what art is coming to. As far as the contents of this room are concerned it would appear that the object of art is to represent, in the coarsest

and most brutal spirit, whatever is most base, ugly, and vulgar in human life and society, and we can conscientiously say that we have never been in any exhibition room the contents of which seemed so repulsive. In the other two rooms much clever work is scattered about, though here too beauty or artistic finish seem to be the last qualities sought for. And we must say that we are tired of hearing Menzel called a great artist. He was a supremely clever artist; nothing could be cleverer than the succession of small portraits shown here, with the heads only coloured; but cleverness is different from greatness. We have never seen anything of Menzel's which showed either beauty of composition or beauty of sentiment; and without those qualities in art there is no true greatness.

The Carfax Gallery.

THE Carfax Gallery seems to be the chosen home of sketchiness in art; a character which is certainly kept up in the present exhibition of bronzes by Mr. C. Ricketts and drawings by Mr. Ludwig von Hofmann. In regard to figures it would appear from one or two examples that Mr. Hofmann can draw figures when he takes the trouble to do so; but some of the figure-subjects exhibited, as in "The Grooms of Diomed," are careless in drawing to a degree, in fact not modelled at all, and the absurd "Tarantella" is a kind of scrawl that any one might produce without having studied figure-drawing. The best of the figure subjects is "The Narrow Way," a line of nude boys following each other down a plank to bathe; a good picture might be worked out of this, which as a mere sketch (for it is nothing more) is interesting and original. On the other hand, some of the landscape studies, though they also are little more than sketches, are very powerful and original; we may notice especially "Out of Bounds," a hill scene; "The Troubled Water," a pool among dark rocks with the surf of the sea seen outside, and "The Sullen Rock," a composition which tells powerfully from the other side of the room, though it will not bear looking into. Mr. Ricketts's sculpture sketches we should regard with interest as terra-cotta or plaster models, suggestions for sculpture groups; one or two of them—"The Tragic Man" for instance, and the "Medea," are fine and pathetic in feeling, though the "Medea" is rather exaggerated for sculpture, which should preserve a certain repose even in tragic subjects. But they are not things which justify their being put into such a material as bronze; they are too rough in line and too unfinished for that. Bronze demands severe work; it is not a material that will tolerate sketchiness.

The Modern Gallery.

THE collection of water-colours by Miss Edith and Miss Gertrude Martineau, at the Modern Gallery, if it does not reach the highest type of excellence, contains at all events a great deal of interesting and conscientious work. Neither of these artists is content to slur over anything or to depend upon roughly indicated effects. In Miss E. Martineau's "His Dinnerhour" and "A Crop of Flowers" (35, 39) the figure and the landscape are treated with equal care. Miss E.

artean is perhaps stronger in figures than in landscape; two portraits (77 and 78)—the latter especially—are admirable, as so the characteristic study "An English school-girl" (81) and that of the child "Empty!" (177). "Sandhills at Littlehampton," next to this, is one of the best landscapes in the collection. Among Miss G. Martineau's landscapes may be mentioned particularly "A May Sketch of Glen Ennisk" (26); "Highland cottages near Aviemore" (43); "Birch trees, Loch-an-Eilan" (60); "Autumn evening near Aviemore" (109); and "Late Afternoon near Loch-an-Eilan" (144), a subject entirely trees and tre-trems, making a remarkable little picture. Among Miss E. Martineau's drawings are some excellent flower-studies.

At the Goupil Gallery there is a collection of M. Le Sidaner's pictures under the title "Venise du Crépuscule à la Nuit," a convenient and suitable title for a painter who only paints things as if seen through a mist. There are seven finished pictures; the remainder are small studies in oil and pencil, mostly for these pictures. The best of the pictures is "Le Petit Canal," an effect in twilight in a small cul-de-sac canal, with a bit of crimson light in a window at the further end. The effect of the ruffled water in the uncertain light is very well given, and

there is a unity of effect about the whole thing. "Le Palais Ducal" is seen at night in a large picture, with the flare of two large outside lights reflected in the water; it is effective but rather stogy. "L'Horloge, Place St. Marc," is a good composition showing part of the square, with the clock face, as seen from one of the porches of the Dnomo: the manner in which the texture and colour of the dark marble column in the foreground are got by repeated touches of all kinds of mingled colours forms a curious study in manipulation. "Le Palais Gris," relieved by one little bit of warm-tinted evening sky in the background, is a capital study of effect. The picture of the "Bridge of Sighs" is not good; far too woolly in texture, and the architectural details are made havoc of. M. Le Sidaner has invented an effect and a handling of his own, but so far he is a mannerist and can only do one thing. If he could get out of that groove he might show whether there is more in him than a painter of scenic effects. We suspect there is, but we have not had it yet.

Messrs. JEFFREY & Co. have been making a little exhibition at their West-end

Rooms in Mortimer-street of some of the new designs for wall-papers either prepared in their house or made for them by Mr. Lewis Day and other decorative

artists. In this instance the two best designs we saw were those to which no well-known artist's name was attached, two called "The Portland Decoration" and "Rose and Smilax"; the latter is a floral design, naturalistic in the smaller detail but strictly conventional and geometric in general arrangement, and is very successful. There are others, such as "Laburnum," which are far too naturalistic to come under the head of decorative design in the true sense of the word; one that we object to still more is a trellis with flowers apparently woven in and out of it; but we have no doubt there are plenty of people who will think this is a "sweet" idea for decorating the walls of their rooms. We give an illustration of the "Portland" design, which is produced in a good many different colours and looks well in all. The "Bethune" frieze and "Jura" filling is also a good and effective design, the main wall space treated with alternating broad and narrow vertical strips of foliage design, well contrasted by a frieze in which vesica-shaped panels containing a bold flower ornament are connected by undulating bands with a simple decoration.

LETTER FROM PARIS.

The monument to Alfred de Musset presented to Paris by M. Osiris, and of which we published an illustration in our issue of October 29, 1904, has just been inaugurated. It is the work, as will be remembered, of M. Mercié, and has been set up at the angle of the Rue de Richelieu and the Place du Théâtre Français, where it is not, however, seen to the best advantage. It has no architectural setting, and seems rather to have got by accident into this busy corner; it wants the grass and foliage of a park or garden to set it off properly, instead of a crowded street, where the figure of Musset in the everyday dress of 1840 seems rather an anachronism.

The discussion of the budget for art gives rise, every year, to sharp discussions in the Chamber of Deputies, and numerous proposals and Ministerial promises, which never come to anything. This year the subject of the School of Decorative Art has again come up for discussion, and the Government has undertaken, with the co-operation of the Municipality, to build a large school of decorative art on the site of the former Hôtel Dieu. Probably a similar promise will be made again next year, without any commencement being made of the work. The eternal question of the Louvre has also been again discussed, without the Government being able to say when the Colonial Offices will be removed from a position in which this occupation of the buildings is a constant source of risk of fire to the national art collection. It has constantly been proposed to transfer the Colonial Department to the Rue Oudinot, but the force of inertia seems always to prevail. It is the same with the question of the Conservatoire of Music, which it has long been proposed to rebuild on the site of the Caserne de la Nouvelle France. This will also probably turn up again in next year's budget, with other important schemes which the Government is obliged to defer for want of money being voted for them. The only chance seems to be that, since the separation of Church and State, the funds which used to go to keeping up the Diocesan buildings may be turned to account in the cause of art.

The Académie des Beaux-Arts has just profited by the liberality of the nephew of the late M. Henner, who, in memory of the eminent painter's former residence in Rome, has presented to the Institut de France a "rente" of 9,000 francs, which is to found three scholarships for painter students at the Villa Medici. This generous gift of M. Jules Henner is a worthy complement to the presentation of his uncle's pictures which he has already made to the Municipality of



The "Portland" Decoration: New Wall-paper by Messrs. Jeffrey & Co.

Paris. These are now hung at the Petit Palais, and the new Salle Henner will shortly be opened to the public. In its coming session the Council intend to vote a considerable sum to enable M. Girault to finally complete his beautiful building. The intended scheme includes, besides modifications and improvements in the plan, a considerable amount of decorative work. The exterior façade and the garden of the interior court are to be decorated with statues, and the large gallery parallel with the Avenue Nicolas II. is to be decorated with paintings, the cupola especially, on the paintings for which M. Pénard is now at work.

The Municipality have awarded the Lheureux Prize for this year to M. Formigé. This prize, founded in 1900 by the widow of the late M. Lheureux, the architect, was to go alternately to a sculptor and an architect, and has already been awarded to MM. Dalou, Mercié, Barrias, Girault, and Pascal. It is the entire life's work of M. Formigé, rather than his recent Paris Crematorium, which the Conseil d'Architecture of the Municipality has wisely chosen to recognise.

M. Nénot has just completed, in the Place du Panthéon, the architectural pedestal for M. Rodin's figure, "Le Penseur" which will be shortly inaugurated. The monument to the memory of Fulgère, at Pere Lachaise, was inaugurated on Sunday last. The main feature in this monument is a figure carved in stone, by M. Marqueste, symbolising "Inspiration." A subscription has been set on foot to raise a monument to Gambetta on the place named after him.

The Hôtel de Lauzun, which the Municipality have given up to Baron Pichou, grandson of the former proprietor, at the price of 300,000 francs, has been classed among the "Monuments Historiques." By this arrangement the considerable works of repair and restoration which the building requires will be carried out under the control of the Government. M. Juste Lisch, Inspector-General of Monuments Historiques, will be the architect in charge, and the restoration of the paintings has been confided to the competent hands of M. Chas. Lameire. The house is connected with the history of the "Grande Mademoiselle," daughter of the Duc d'Orléans and cousin of Louis XIV.

The death is announced, at the age of sixty-three, of the painter Adrien Moreau, who had considerable celebrity at one time for his genre painting and his scenes of the time of Louis XV., in which he exhibited a great deal of learning in representing the costumes and manners of the day. He was educated in the atelier of Pils. Among his principal works "Le Kermesse au Moine Age" (1876); "Le Mémot" (1878); "The Rehearsal of the Tragedy of 'Mitrane' before Cardinal Richelieu" (1879); "La Duchesse de Longueville à Dieppe" (1885); "La Mascarade au XVIIème Siècle" (1887); "Tabarin" (1889). From 1890 to 1900 he worked on a series of pictures of the history of Josephine and Napoleon. He worked in water colour also, and was one of the founders of the Société des Aquarellistes, whose exhibition is just now open at the Georges Petit Gallery.

The death is also announced, at the age of seventy-seven, of the sculptor Charles Auguste de Bourg, a former pupil of Rodin. Among his principal works are "Danaë"; "Saint Jacques"; "Enfant jouant avec une Sauterelle"; "Le Travail"; "Dante"; and portrait busts of Lady Wallace and of Emile de Girardin. Sir Richard Wallace commissioned de Bourg to design the small public drinking-fountains which he presented to the city of Paris.

ROYAL ACADEMY LECTURES.—Sir W. Richmond commenced, on Thursday last week, a series of three lectures on "The Development of Sculpture," but as they cannot all be reported in this week's issue (the concluding one having been given on Thursday last), we prefer to give the report of the three together in our next issue, instead of separating them.

WESLEYAN SCHOOL, GRAVESEND.—The school portion of the new Wesleyan premises in Milton-road, Gravesend, was opened recently. The new suite of rooms consists of a schoolroom with three classrooms. The roof is of pitch-pine. The electric-lighting scheme was carried out by Mr. Warner, the builder being Mr. Tong, and the architect Messrs. J. Morley & Son.

THE SOCIETY OF PAINTER-ETCHERS.

The exhibition of the Society of Painter-Etchers is one of the best we remember, not merely because the work is nearly all good—it usually is that—but because by far the larger part of it is genuine etching showing the quality and manner of work peculiar to that art, and which nothing else can imitate or replace; there are very few either of what we call the smudge type of etchings, or of those laboriously finished and shaded-up productions which want all the characteristic freedom of etching, and are really only engravings under another name. The real object of etching is to produce line drawing under more free conditions for the hand, and with a better and more subtle tone, than can be attained in any other form of line drawing.

Hence one of the great objects is to know how to make the most of your line; to bring out the essential points in the composition with it, and to know how to leave out and where to leave off. Some of the most successful etchings ever made, and some of the best in this exhibition, are remarkable for the large amount of blank paper they show; not indeed the raw blank which would be left in a pen-drawing on the same lines, but with the tone which the method of printing and the surface of the copper gives. A fine example is Sir C. Holroyd's "Fondamenta della Zattera" (71), where the stonework jointing of the paved quay in the foreground is all boldly lined out with no other surface work, and the water beyond left a blank space; by which treatment the contrast between solid masonry and light-reflecting water is conspicuously indicated in exactly the manner suitable to the conditions of etching. All these Venetian subjects by Sir C. Holroyd, which hang together at one of the angles of the room, are in fact excellent, and are well worth the consideration of the visitor; Nos. 73 and 75 especially, besides the one already mentioned. Mr. W. L. Wyllie, in "Torpedo Boats Manoeuvring" (31), has ventured to work up the sea surface completely in close lining giving the modelling of the waves, and it is very ably and conscientiously done, as one might expect, but the result is not very satisfactory; one feels that it is an attempt at something which cannot really be well done with line. In Miss Ethel Stewart's fine etching, "Evening Tide at Bridgewater" (14), we have another good example of the faculty of leaving out; the river bank on the right was probably really dark, rather than light in the actual scene, but it suited the composition, and the method employed, to leave it white, and the picture would have lost freedom and effect by any attempt to work it up into realism. Etching, as far as landscape goes at least, is not an imitation so much as a translation of Nature, and it is in that very fact that much of its interest lies. Where some otherwise good works in the exhibition rather fail through want of letting alone sufficiently, is in the sky. Why scrawl lines across the sky, as in Miss Constance Pott's otherwise excellent work, "Mill, Flanders" (39), and some others? This kind of treatment does not at all convey the idea of sky, and adds nothing to the picture in any other sense. Rembrandt's very materialistic rain-marks in the "Three Trees" have given excuse and precedent for a good deal of sky-scrawling which were better omitted.

Mr. Malcom Osborne shows picturesque composition and an effective management of light and dark in his two Wiltshire scenes "Norton Bavant" and "Rye Hill Farm" (9 and 11). Of Mr. Percy Robertson's contributions the best, "The Admiralty Pier, Dover" (25), seems to show French influence, reminding one of M. Bèjot's manner of working, though on a different and more ambitious class of subject. Mr. Oliver Hall is admirable in all his contributions, except that etching does not lend itself very well to such a subject as "Storm Clearing on Sinah Warren" (25), another illustration of the difficulty of dealing with sky effects in etching; "Pine Trees on the Edge of the Moor" (24) and "The Fallen Tree" (23), with its suggestion of a ship-building yard in the background, are among the best things in the exhibition. M. Bèjot's "Pont St. Louis, Paris" (53) shows this etcher of Paris scenes at his best; in spite of its general freedom of style, the middle distance houses are very carefully lined in so that one can follow out the make-up of the streets. His "Pont

Neuf" (58), on the other hand, fails a little in effect through want of any making out of the masonry construction of the bridge, which is close to the foreground, and should appear as something more than a mass of shadow. Mr. Haig shows more freedom and force than usual in his "Cloisters of St. Jeronymos, Bedel" (88), which we prefer to the Santiago Cathedral drawing (98), because it is less laboriously finished; in other words, more of an etching and less of engraving. However, Mr. Haig's preference is for this highly finished architectural work, and it evidently has its demand, and is excellent in its way; but it is not what etching is essentially meant for. Mr. Arthur Evershed shows his usual delicacy of treatment of picturesque little subjects, of which "Barn by the Road-side" (103) is perfect in its way. Then we come to quite another use of the etching needle in M. Hellen's portrait of "Miss K." (108); this is a full-face portrait, and one of the best of his well-known works of this class, in which he has made the most of the fine curving lines of the large hat on which much of the pictorial effect of the work depends. Miss Kemp-Welch's "Barges Unloading on the Deben, Suffolk" (114) is an excellent piece of real etching, in which every line tells. A still better example of the power of leaving out is shown in Mr. E. W. Charlton's small etching, "Regatta Day" (127), where nearly all the work is concentrated on the low line of coast buildings which goes straight across the middle of the picture, leaving sky and water nearly untouched; the small black hull of a steamer in the middle distance just serves, as it were, to suggest the water in an unmistakable manner. This is an excellent example of a kind of subject dear to many etchers and specially suited to the conditions of their craft—subjects in which there are concentrated darks opposed to large spaces of light. One is reminded by it how often and admirably Mr. Frank Short, one of our finest and characteristic etchers, has chosen subjects that can be treated in this way, and we regret not to see his name in the catalogue of the present exhibition. "The Painted Lady" (126), showing the prow and figure-head of a ship in dock, is another good work by Mr. Charlton. A ship scene of another kind gives the opportunity to Mr. Frank Brangwyn for one of the most powerful works in the exhibition, "Breaking up the *Hannibal*" (134); the great old round tub-like ship, heeled partly over on the ground, fills nearly the whole picture, her massive framing, bolts, cat-head and stem being drawn with an evident delight in their picturesque suggestiveness. The same artist's "A Butcher's Shop" (179) is, however, an exaggeration of what is called "force," and is altogether too violent in effect.

Figures are not among the best class of subjects for etching, except merely as portraits of the head only; but Mrs. Merritt has made a pleasing composition of her two angels on each side of "The Narrow Way" (186). Mr. W. Monk is a large contributor; "The Last of St. James's Hall" (197) has historic as well as artistic interest; "The Little Shop with the Dial" and "The Well House (193, 195) are very good; in regard to "The Penny Steamer" (185), if that is meant for Waterloo Bridge in the background, it is wrong in the proportion of the arches, which are too narrow for their height, or too high for their width, whichever way one likes to put it. Mr. C. O. Murray has made an interesting and successful attempt, in "Misty Morning, Venice" (198), at using etching to represent an effect of fog, and showing the Scuola church as little more than a silhouette in the mist; he contributes also an interesting view of the temples at Paestum. Miss Adeline S. Illingworth claims recognition for her effective treatment of architectural subjects; her "Tour du Choeur, Chartres" (211) is a piece of work in which freedom of style is combined with architectural truth, and she also exhibits good illustrations of Barton-street and Smith-square (208, 209). In connexion with these we may mention a good work of the same class by Mr. Sydney Lee, "The Cathedral Precincts" (220), illustrating what may be called the poetry of a back street. Mr. Alfred East shows two characteristic Italian effects in black and white, in "Villa d'Este" (219) and "The Aviano" (222), the latter an aquatint; the element is the same



Entrance Gate, Alnwick Castle.

in both—masses of dark trees against a faint sky light; his "Longpré" (228) is however the finest thing he exhibits here. Among architectural subjects Mr. Walter Burgess exhibits "Bishop Edyndon's Chantry, Winchester" (260), and "Bishop Langton's Chantry" (273) in the same cathedral; but these, though very carefully and conscientiously finished, hardly rise artistically above the level of what may be termed "architectural drawings," good as such, but not of artistic interest in the higher sense.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At a special general meeting of the Royal Institute of British Architects, held on Monday at No. 9, Conduit-street, Regent-street. Mr. Henry T. Hare, Vice-President, in the chair, the Chairman, having announced that the meeting was convened pursuant to by-law for the purpose of electing the Royal Gold Medallist for the current year, moved, in accordance with notice, that Sir Lawrence Alma-Tadema, R.A., be elected for the honour. Whereupon it was resolved, *nem. con.*, that, subject to His Majesty's gracious sanction, the Royal Gold Medal for the promotion of architecture be awarded this year to Sir Lawrence Alma-Tadema, R.A., Hon. Fellow.

This concluded the business of the special meeting.

The ninth general meeting (business) of the session then followed, and the minutes were taken as read.

The hon. secretary, Mr. Graham, announced the decease of Zephaniah King, elected Associate 1881, Fellow 1887, and a vote of sympathy and condolence was passed to his widow and family.

On the motion of the hon. secretary, a vote of thanks was passed to the givers of various donations to the library, especial mention being made of Mr. Sydney Snirkle, from whom had been received his seventeenth annual donation of 5*l.* to the Library Fund.

The secretary announced that the ballot for the election of candidates to Fellowship had resulted in the election of the following:—

- | | |
|-----------------|----------------|
| Matthew Garbutt | H. A. Satchell |
| F. W. Marshall | H. Sirt |
| G. Ransome | A. Sykes |
- The following were elected by show of hands under by-law 9 as Associates:—
- | | |
|-------------------------------------|------------------------------------|
| A. W. Addison (Cambridge) | W. P. Marr (Kingsbridge, S. Devon) |
| A. D. Aitken (Airdrie, N.B.) | D. Mitchell |
| J. H. De Caynoth Balfour | H. A. Mason |
| J. Boyle (Bolton) | G. Morland |
| J. R. Brithwaite (Leeds) | H. Stanley Morran (Auckland, N.Z.) |
| S. Bridges | A. R. Myers (Edinburgh) |
| A. E. Bullock | A. C. Nolley |
| M. Bunney | D. Mary O'Connor, B.A., B.E. |
| J. Cocker (Ayrincham, Reading) | A. J. Pesto |
| E. J. Dixon | S. C. Ransey |
| B. Drummond | W. H. Riley (Leicester) |
| P. Dyer (Manchester) | H. Ryle |
| T. Speirs Fraser (Dumfries-shire) | D. A. Shaw |
| W. Curtis Green | J. H. Shearor |
| R. L. Hampshire | P. M. Stratton |
| G. Hanson (Hullfav) | J. R. Sykes |
| C. H. Holden | P. Turner (Bradford) |
| A. Hunter (Colwyn Bay) | M. O. Type, F.S.I., Birmingham |
| A. Hay Lamont (Edinburgh) | R. F. Wheatly, B.A. |
| L. W. Crandall Lorden (Hythe, Kent) | E. C. M. Willmet |
| W. K. McDermott | L. S. Wood, B.Sc. |
| | H. E. Woodsend (Nottingham) |

OLD WHITEHALL.—In the course of the demolition of some of the old houses in Craig's-court, Whitehall, a subterranean passage has been discovered. It extends nearly 30 ft., and runs north to south to within a short distance of the Army Pay office in Craig's-court. There was no entrance to the passage from the houses lately demolished, and at some period both had been bricked up. Tradition says that a subterranean passage existed from No. 2, Craig's-court to the Royal Palace at Whitehall, and that Nell Gwynne at one time resided at 2, Craig's-court. The housebreakers have also discovered a carved water-tank. When reaching the ground floors the workmen cut into three stages of flooring, resting on three sets of rafters.

THE ARCHITECTURAL ASSOCIATION: PORCHES AND APPROACHES.

The following is the conclusion of the paper on "Porches and Approaches" read by Mr. F. T. Baggallay at the meeting of the Architectural Association on the 23rd ult., the first part of which appeared last week:—

English Domestic Gothic.

In the last twenty years of the XVth century, when the feudal castle gave way in England to what is not inappropriately called the castellated mansion, the general form of the great gate-tower was still retained; but it was pierced with large windows, and the turrets and machicolations and battlements became attenuated and merely ornamental. A type was thus developed which persisted for more than a century. The turrets, two at first, soon became four for the sake of symmetry. They were almost always octagonal in plan, and straight from top to bottom, except for a slight oversail at first where the machicolations used to be. And as time went on they became thinner and thinner, and the space between them wider and wider. Such gate-towers are always striking features; but the earlier examples, before the turrets had become too attenuated, and especially several in the eastern counties which are built of red brick and terra-cotta and have the added advantage of colour, seem to me the most handsome. The Oxburgh Hall gateway seems to be the earliest of these. The date is generally given as 1422, but, according to the present owner, it was not finished until 1489. The moat and bridge and its height (80 ft.) give it an advantage over all rivals, unless the more ornamental character of some of the detail in the Layer Marney gateway (built in 1500) be held to equalise matters. In point of date the "Deanery tower" at Hadleigh is between the two (1495). In appearance it suffers from too much neatness and hardness of line, and must, I think, have been trimmed up, rubbed down, and

pointed in modern times. It is certainly not so picturesque as the ruin of the Nether Hall gate, now standing neglected in a farmyard. The familiar gatehouse at Hampton Court, also of brick, is a little later in date (1515-1520).

Most of the stone gatehouses of this type, where they belonged to private mansions, seem to have been either pulled down or greatly altered subsequently. There is an example, though rather a poor one, perhaps never completed, at Montacute Abbey, and a very fine one at Knole, near Sevenoaks; where, however, the turrets are square in plan. The best, and by far the richest, examples remaining are some of the great gatehouses to the courts of the Cambridge colleges. The great gate at Trinity, begun in 1555, and the outer gates of Christ's and St. John's colleges, began soon after 1505 and 1510 respectively, are the best. The last two are notable for the fine decorative use made of the arms of Lady Margaret Beaufort Countess of Richmond, who founded them. The three gates to the great quadrangle at Trinity are all said to owe their present form to Ralph Symmons, who had been one of the architects or designers of the second court of St. John's, and was employed, in 1604, by Dr. Nevile, an energetic master of Trinity, to improve his college buildings. But it is unlikely that Symmons much altered the great gate; and King Edward's gate, at the end of the chapel, is said to be an old one which he merely took down and rebuilt on another site. So that the third, or Queen's gate, alone can be properly dated so late as the beginning of the XVIIth century. There is, however, another example of the type in the brick gatehouse of Abbot's Hospital, at Guildford, built in 1619.

The Oxford colleges did not accept the type, but continued to build plain, square, or rectangular entrance-towers with only one stair turret; in general outline more like contemporary church towers, but distinguished by great oriel windows over the arch (instead of belfry windows at the summit). The best of these is the Founder's Tower, at Magdalen. The only Oxford example I can call to mind of a gatehouse with more than one turret is the sumptuous Tom Tower, at Christchurch, as it was originally built by Cardinal Wolsey.

The cases in which a porch was added to a domestic building of the late Gothic period, either in addition to, or instead of, a gatehouse, are rare. And I do not know of any, except the oft-drawn porch at Compton-Wyngate, that is worth notice.

English Renaissance.

The freedom of thought and action, which the reign of Queen Elizabeth brought to the nation, led, among so many other great changes, to a revolt against the prison-like gloom of the old mansion, the small windows and the enclosed courtyards. People called for light and air and an extended view. They built enormous windows, and in the end they left out the buildings on the entrance side of the courtyard, or reduced them to a screen or even a balustrade; and if any gatehouse was erected at all it was an isolated structure. But before that step was taken the porch seems to have anticipated its coming importance, and even in the earliest Elizabethan mansions was strongly emphasised. The well-known porch at Kirby, attributed to Thorpe on what seem fairly good grounds, is an example. It has been greatly admired and severely criticised. To eyes that are educated in the niceties of architectural detail and propriety it is an unfortunate bit of honest English building, tricked out in a coarse parody of Italian details, put on in the wrong way, and in the wrong places. One is apt to find in it a parallel to the finely-made savage monarch, who, according to report, gets hold of a suit of slip-shod European clothes, puts his legs into the arms of the coat, and his arms into the legs of the trousers, wears the hat round one ankle, and puts a saucapan on his head. Perhaps architects, like men of every trade and profession, are liable to take rather a narrow view, and allow the technicalities of their trade to become too much the masters of their judgment. Yet, as architects, we cannot help feeling that the few porches of this date in which Italian detail is absent (of which that of Montacute House is an

instance) are distinctly pleasanter than either the Kirby example or the porches, say, at Audley End, where the Classic orders are used with a good deal more knowledge and discretion.

The many porches, too, built at the end of the XVIIth century and beginning of the XVIIIth—such as those of Ragdale Old Hall, St. Catherine's, Bath, and the Corsham Almshouses—in which a little classic detail is applied as a sort of spice in the lower part round the door—are quite charming. So are many of the half-timber porches of this and the end of the Gothic periods—such as those at Park Hall and Moreton Old Hall, and the porch of the Old Guildhall, at Lavenham. English porches of a later date, though the detail may be unimpeachably correct, are apt to be formal, unimaginative, and uninteresting. The Westwood porch is a not unfavourable example. The same criticism may, with some show of justice, be applied to the great porticos which may be found in every town, and which are built in imitation of the porticos of Roman temples. But the lofty and serene majesty of such a composition, when it is proportioned and detailed with care and knowledge, makes it peculiarly suited to the approach of a great public building, and one would be sorry to lose it in such situations.

When the enclosed courtyard of the late mediæval mansion was opened out by the omission of the buildings on the side of the gate-tower, and the place of the latter was supplied by a gatehouse, either entirely isolated or forming part of a low screen or connecting corridor, the gatehouse assumed a greater variety of form. The Tixall, Burton Agnes, and Charlecote gatehouses still have angle turrets; but at Charlecote the proportions have already become broader and lower; and at Old Todington and in a variety of other instances the turrets were omitted, and the gatehouse was but one story high with a tendency to dissolve into a gateway flanked by small lodges. This is actually the form of the curious and rather ugly example at Westwood, Gloucestershire. The gatehouse was replaced in some cases by an arched gateway of ornamental character, such as that at Cold Aston Manor, or the curious, elaborate, rather pleasing gateway at Caius College, Cambridge, called the Gate of Honour. Later examples of such gates are to be seen in the old Somerset House gateway now in the Embankment Gardens, London, and the gate to Queen's College, Oxford. Sometimes there was a gatehouse and screen to the main courtyard as well as an architectural gate-arch or gate-piers to an outer court, as at Rushton. Gate-piers became in the end far more general than the arch, and are usually joined by more or less elaborate, and often very beautiful, wrought-iron gates and grillwork, rising at the top into a light gable of scrolls and foliage, among which the arms or monogram of the owner are generally introduced. The arms are also frequently to be seen on the outer face of the piers, the finials of which are generally the crest, a vase, or a ball. The balls are said by some people to be properly the gruesome emblem of a lord of a manor; since they represent the heads formerly exhibited at their gates by those who had the power of life and death. Some of the best of the innumerable examples of both piers and ironwork are to be seen at Cambridge, at the entrances to the colleges from the Backs. There are many good examples, too, even in the heart of London. The gateway to Staple-inn from Chancery-lane and several of the piers on the west side of Lincoln's-inn-fields are examples which occur to me.

I have already spoken twice of the great charm of an approach over a bridge. This, too, is to be seen to perfection in the back approaches to the Cambridge Colleges, particularly at Clare and St. John's, where you advance, between handsome balustrades, in the one case towards a vista of courtyards seen through arched gateways, and in the other to the stately gate-piers and iron gate at the bridge-end. I have attributed the charm of bridges in part to the water; but the confinement of the approach between the parapets or balustrades of the bridge has perhaps as much, or more, to do with the matter. Many an old house is approached by a bridge over a moat which is now dry—

Speke Hall is an example—and the absence of the water does not entirely do away with the charm; indeed, it seems to leave the greater part. In connection with bridge approaches generally I cannot resist showing a view of a little Japanese shrine at Osaka erected in the water and reached by a characteristic wooden bridge.

Italian Renaissance.

Bridges, however, can only be made part of an architect's scheme by such fortunate accidents of situation as are rare. We want other suggestions. And we may find them, as abundantly as anywhere, in the works of the Italian Renaissance architects. They favoured small projecting porches as little as their predecessors, and were not very successful with them. That of the Miracoli Church at Brescia is the most favourable example I know, but it owes a good deal of its charm to the fact that its lines are of the simplest; and the delicate carving, with which the lower part is covered, is in such low relief that it is almost lost in the bright Italian sunlight. The porch of the hospital at Venice, a Renaissance version of the old semi-circular hood on two legs, is florid and tasteless. By instinct and tradition the Italians seem to have preferred something that did not break the front of the building, and, if not content with a mere doorway, generally either recessed the porch within the front or built a portico that covered it. The little portico of the Pazzi Chapel at Florence, which is chiefly celebrated in guide-books for its barrel-vault of Della Robbia ware, illustrates these ideas, and also the delicate beauty of cinquecento detail. The upper story, with its imitation of wooden panelling, may be open to technical criticism both on that ground and because it looks too heavy for the columns. But one would gladly commit graver errors to produce so good a result. The arch rising in the middle above the entablature deserves a note. It reminds one of some of the late Roman porticos in Syria and the narthex at Civita Vecchia, and may be borrowed direct or by tradition from late classical work. One wonders whether it was possibly the germ from which the great arched recess in the portico of St. Andrea at Mantua grew, or whether Alberti borrowed the idea of the latter from the Mahomedan mosques, or possessed some tradition of such entrances as that to the palace at Ctesiphon. There seem to me to be great possibilities and suggestiveness in these great arches rising almost to the height of a building and deeply recessed into it. Broad, deeply-recessed porches are the rule in the Venetian palaces, where they are necessary to form a landing-stage, since the water comes up to the front wall of the building. But the similar porch in the garden front of the Villa Medici at Rome was a matter of choice. Here there is again the arch rising above the entablature over the middle opening; and further suggestiveness in the arrangement of the steps and balustrades; which rise from either side to a landing bowed out in front to hold a small fountain.

The broad and deep "loggia" which forms the porch to some Italian villas is a feature common to all countries where shade from the sun is necessary, and modern "piazas" and verandahs probably owe little or nothing to Italy, where it is commonly better designed than elsewhere. The one at Arezzo is a characteristic example, especially in the great projection of the eaves, the generally light and open treatment, and the freedom of the architectural detail. There is sometimes an upper story, still lighter and more open.

The Italians have never given up the enclosed courtyard plan (unless they have done so recently); partly no doubt because peace and security were so long strangers to the country; partly because the difference between their climate and ours, if not very great, is sufficient to make an enclosure, which on most days seems cold and gloomy here, for more than half the year in Italy a cool and shady retreat from glare and heat. As a consequence, the entry to an Italian palace, or even a house of any pretension, is most frequently through a vaulted corridor to the courtyard in the first place. Plenty of such entrances, of course, are still to be

seen in this country. We even built a very pretentious one to Somerset House not much more than a century ago. But here they more often repel the passer-by, by their suggestion of darkness and dirt, than invite him by their shade. In Italy the reverse is the case, and there are few more pleasing features of the great Italian palaces than the dark entrance which frames a picture of a brilliantly-lit courtyard. The entrance to the Farnese Palace at Rome, of which Mr. Potter has obtained such an excellent photograph, is a good instance of this. The view of the entrance to the Doge's Palace at Venice (which is also from one of Mr. Potter's photographs) is perhaps less striking in one way owing to the light coming in from the side. But the view of the giant's staircase beyond more than balances the loss of the dark shadow.

Outside Staircases.

The giant's staircase is, as you know, the main entrance to the palace, and is strictly in accordance with Italian tradition. From a very early date, what we should call the ground floor was, in Italian palaces and public buildings, a basement devoted to cellars and offices; and the state entrance to the building was by a grand flight of stairs, in rare instances direct from the street, more often from the courtyard. There are XIVth century examples of the former arrangement at Perugia and Todi in the entrance to the town hall in each case. There is also a stairway entrance, probably of rather later date, direct from the street to the principal floor of a small house at Viterbo, which is a favourite subject for a sketch. That and the rather similar stair entrance from the courtyard in the Bargello at Florence are guarded by gates halfway up the stairs, a feature that suggests exciting moments in the history of the building. External stair entrances in the courtyards are common in the older palaces; but, though generally picturesque, are not often architecturally important or especially well planned. But in the later Renaissance palaces the stair approaches are generally laid out with great care and ingenuity and with an obvious and successful intention to make the most of them. Mr. Lewis has lent me two illustrations from the *British Architect*, which are reproductions from Piranesi's

great work, and show what he thought might be made of stair approaches. The works actually executed naturally fall a good deal short of such ideals, but they are well worth the most careful study.

I believe the only examples we have in England of external staircases to upper-floor entrances—such as those at Wanstead House and Kedleston Hall—were built in the XVIIIth century in imitation of the Italian palaces. German castles and public buildings of the Renaissance Period were however generally entered like the Italian ones at the first-floor level. Unfortunately the men who designed the means of access wanted the finesse of the Italians. The planning is crude, and the architectural detail is coarse, and sometimes grotesque. But the unrestrained freedom of ignorance, combined with an abundance of native wit and wild fancy, produced results which are frequently pleasing and suggestive of possibilities to the architect in search of ideas. The rathouses at Halberstadt, Lemgo, Lübeck, Heilbronn, Molsheim, and Görlitz, and the castles at Trausnitz and Hartenfels all have external stair approaches that are worth studying.

Steps and Balustrades.

Such external staircases, I think, must be distinguished in our minds from the flights of steps which lead up to first-floor entrances in some few modern public buildings, such as University College. Such flights are probably borrowed direct from the Roman temples. And they must be distinguished, too, from the short flights and long terraces with their balustrades which form such an important feature of the approaches to the palaces and great houses of the later Renaissance in all European countries. The tendency of the latter is to breadth, of the others to concentration. The value of such terraces is recognised by everyone when they are used on a great scale, and no doubt is due to the long horizontal lines of regular ornament afforded by the balustrades broken at regular intervals by piers, perhaps with vases on them, and at longer but still regular intervals by the steps. But I do not think it is fully recognised how great an effect may be produced by a single flight of such

steps and a little bit of balustrade when treated in a broad way. I have put on the wall a photograph of a very commonplace house, Draycott Manor, which seems to me to have been redeemed from ugliness by such simple means.

Courts and Screens.

But a great public building, a great church, or even a great house, calls for a more spacious approach with a more imposing architectural setting than a terrace and a balustrade. A courtyard of liberal dimensions and an architectural screen are, in fact, essential in such a case. The screen should be high enough and close enough to give the sense, as well as the reality, of enclosure, without either dwarfing the main building or shutting out light and air. The most satisfactory approach on the whole to any building in the world is the great square before St. Peter's at Rome, with its double screens sweeping round in two great semi-circles at the sides. The only reproach it is possible to level at it is that it is too vast for the eye to take in as a whole. I rather suspect that Vanbrugh must have had those semi-circular screens in his mind when he contrived the front of Blenheim with its two quadrants; and the plan of the courtyard at Seaton Delaval Hall, enclosed on three sides by screens which terminate in little pavilions and leave the front open, has also some suggestion in it of the same origin. The architecture of the Seaton Delaval screen is heavy, like all Vanbrugh's work, and not well suited to such a feature. The best screen enclosing a courtyard that we have in London is the one in front of the Admiralty in Whitehall. It was even better before it was altered. The plan of using the screen to close the fourth side of the courtyard, the other three sides of which are formed by the building, is typically English, derived of course from the late Elizabethan house plan.

Conclusion.

I should like to have commented on a number of other branches of the subject and particular instances. I have neglected altogether the vast and prolific field of Mahomedan architecture; to say nothing of the Native Indian, Russian, and Chinese, from which some apt and curious illustrations



Entrance Gate Charlecote, Stratford-on-Avon.

might be drawn; and I have dealt very superficially even with French and German work. I meant to have noticed some approaches which are beautiful, as it seems, by accident, and others that are curious or eccentric. I should like to have called attention to some successful modern work. But the paper is already far too long, and all that must, for the present at least, be left unwritten."

Mr. Walter Millard, in moving a vote of thanks, said he felt as though he had been taken headlong through the whole history of architecture. In an hour and a half they had gone through some 4,000 years, at any rate; and still, as Mr. Baggally said, there was much left unnoticed. As to the objects of these inclosed approaches, shown in the earliest examples, it was a commonplace to say that they were based on utility to start with; whatever architecture resulted was got out of the feature after the requirements of utility had been satisfied. What we called the architecture was what the useful man did out of his head after he had schemed what was really wanted. Regarding the "Paradise" example referred to by Mr. Baggally, he thought that this was a medieval term for a special enclosure. And, as to the porches at Chartres, he preferred the north porch to the other; the north porch did not have its gables separated by pinnacles running up between them. It was pleasing to have a review of porches in our own country, not only of church porches, but of domestic examples also. There was a tendency to think that nearly all our medieval work was church work. We read in books that Gothic architecture was church architecture, and so on, but, he supposed, there was nearly as much secular work done in proportion to church work—then as now, and there was no essential distinction between the two.

Mr. A. Needham Wilson, in seconding the vote of thanks, said they had had a most interesting and instructive evening, and Mr. Baggally must have taken an enormous amount of pains in the preparation of his paper. If anything, he had covered too large a field for consideration in one evening, but he had given a great deal of matter for thought. He did not altogether agree with Mr. Millard that the origin of these approaches was a utilitarian one. In many instances they arose, he thought, from the fact that there existed a wish to add dignity to buildings. There was one instance of this in our own country which had perhaps been overlooked, and that was in the extraordinary "pagan temple" at Avebury, in Wiltshire, which consisted of nothing more than huge lumps of stone set upright in the ground, much anterior in date to Stonehenge. The temple formerly had miles of approach to it, flanked by such stones set up in the ground, which could have served no other purpose than to lend processional dignity to the approach to the temple. Another instance occurred in Norfolk, in the Fen district, where there was a very striking church tower standing bare almost, above the flat land, and where the road going in the direction of the village appeared to have been purposely diverted in order to give a vista of this church tower at the end of it. There was no reason apparently why the road should not have gone straight, except in order to give a good view of the tower. He was interested to see the arch at Khorasah, for they were taught in the old days that the Romans invented the arch. Could Mr. Baggally tell them whether the arch was constructed with voussiors? Mr. Baggally dwelt in a most interesting way on the advantage given to approaches by bridges. He (the speaker) might mention the extremely interesting and clever manner in which Mr. Lutyens had dealt with that in his most interesting house at Sonning. He had no water, but he obtained it by providing a circular pool, over which he put a bridge, approached by steps, for no other reason than to give dignity to his entrance. Architects now appreciated the necessity of dignity in the approaches to their buildings, though in a 1,000-ft. house the problem was generally a difficult one, but even then they were glad to win the client from a love of the serpentine walks, which Mr. Baggally condemned, to an appreciation of the quiet

dignity of the straight flagged path and nicely-kept green lawns on either side.

Mr. Francis Hooper said he hoped that Mr. Baggally would treat the subject as illustrated by Indian architecture at some future date, for he had given that evening a most interesting and suggestive discourse. Mr. Baggally had not, he thought, used the word "mystery," or referred to that element of mystery which a screened approach secured. An archway afforded a limited view of the prospect beyond, and provided the necessity for coming suddenly upon a building or a view which had been framed or concealed, and so enhanced one's appreciation of what lay beyond. One saw that in the case of the south-west gateway at Canterbury, for if one approached the cathedral that way one saw it suddenly and almost with surprise. The framing of the view at Canterbury was enchanting, and this element of mystery was provided by such screened gateways as were found at York, Chester, and elsewhere.

Mr. H. Gregory Collins, in supporting the vote of thanks, referred to the papers read before the Association this session, and congratulated the Committee on providing such excellent papers as those read by Mr. Gotch, Dr. West, and Mr. Baggally. After hearing Mr. Baggally's paper, one felt quite travelled, especially as they had seen such a fine collection of illustrations. As to the approach to Buckingham Palace, he did not think it would be a success architecturally. The memorial to Queen Victoria would soon rise in the centre bed opposite the palace, which looked so pleasant in summer, and the palace would be quite appreciated. Besides, he did not quite appreciate the idea of the planning; a procession would not be able to go straight up to the palace, but would have to bend and turn. The porch of the Guildhall at Exeter was not mentioned by Mr. Baggally: it is in the High-street, on columns, with superstructure of half-timber work. Exeter had another interesting gateway—i.e., at the entrance to the old Rougemont Castle, built in red sandstone. There were many instances in London of porches which one might see. As a recessed porch he thought the one at New Scotland Yard might be followed, though it might look a little cramped by the steps taking up almost the entire room in the porch itself; it might have looked better with more landing space at the bottom and at the top. Another example was the porch of St. Michael's Church, at Chiswick, which was a good example of modern work. In the matter of screens and porches, there was a great deal to learn. He always admired the little lodges at Hyde Park, and especially the lodge from the inner ring to Regent's Park.

The Chairman then put the vote of thanks to Mr. Baggally for his scholarly and charming paper, adding his personal thanks for a most enjoyable evening.

The vote of thanks having been very heartily agreed to,

Mr. Baggally, in reply, said it seemed to be a reproach that he had travelled too far that evening, whereas he expected to be criticised for leaving out this and that. And it really was as he anticipated, for those who had spoken had referred to examples which he had omitted. He agreed with Mr. Millard that it all started in utility—was not that what all their work started in? The making it into architecture came afterwards. Mr. Wilson took him rather out of his depth when he spoke about Avebury, for he did not know that it was determined that there had been even a temple there. Probably Mr. Wilson was right, but he was not aware that anyone professed to know exactly what those stones, etc., were. After all, if the long lines of stones were approaches for ceremonial purposes, did not they start in use? The ceremony was the thing; not the approach. As to whether the arch illustrated in the book by M. Place was built in voussiors, there seemed to be no question that it was arranged in voussior fashion, and he thought he recollected seeing in books illustrations of similar arches built in the voussior plan in the Assyrian period. He appreciated Mr. Hooper's remarks about screened approaches; he had overlooked the point. He did not quite agree with Mr. Collins, who seemed to object to the possible breaking of a procession

round the statue in the processional road leading to Buckingham Palace. He (the speaker) rather thought it was an improvement not to have an unbroken line. But to have it going round something. If the road were long and straight it would be less interesting than if it were broken in the middle. That was one of the great objections he had to the way in which our streets were managed in London. Everything was given up to a straight line for the traffic and one never got a nice break in a cross road where one might put up a statue.

The Chairman announced that at the next meeting on March 9 the paper would be by Mr. Gilbert H. Lovegrove on "The A.A. Camera and Cycling Club Excursions," illustrated with lantern views, Mr. A. Vye-Parminter being unable to contribute his promised paper.

THE MEASUREMENT AND FLOW OF WATER.

On the 20th ult. a meeting of the Institute of Sanitary Engineers was held at the City and Guilds of London Institute, Finsbury, E.C., when the Presidential address, by Professor E. G. Coker, M.A., D.Sc., was read. The title of the address was "The Measurement and Flow of Water," and in the course of his remarks the President said that the manner in which water flows and the circumstances which influence its movement were only fully investigated by Osborne Reynolds in 1885, although forty years before Sir G. Stokes discussed the matter and pointed out the general causes which make water change the character of its motion from direct or stream line to eddying or sinuous flow. The unrestricted flow of water from a small circular orifice in a tank was essentially direct, each drop of water moved at the same velocity as any other in its neighbourhood, and a colour band when introduced remained in general unbroken. If, however, the water was caused to move through a pipe the motion was essentially changed; the principal part of the flow occurred about the centre of the pipe, and died down to nothing at the sides. That liquids do not slide over solid surfaces in contact with them was abundantly clear from the experiments of Whetham, who had shown that even with tubes of capillary bore there was no slipping at the boundary of the tube, and other examples might be given of similar results in the case of the hull of a ship moving through the water. In practical cases the motion of water was rarely direct, and consequently the eddies which arise make the resistance to flow much greater than if these eddies were absent. Observations of the mean velocity of the water and of the head lost in friction showed that while the motion remained direct the head lost was proportional to the velocity simply, but with eddy motion the resistance increased very much more. The effect of temperature on the resistance to flow was an appreciable one, and was much more marked for direct motion than for sinuous motion. The increased resistance due to bends had lately been the subject of much research by Williams and Alexander, and their results brought out very interesting facts that the bend of least resistance was one having a mean radius of about two and a half times the diameter of the pipe, and that the resistance of the bend was about three and a half times that of a straight pipe of the same length. The need for the automatic measurement of small quantities of water had led to the invention of a large variety of meters of varying degrees of excellence. For very large flows weir measurements were usually adopted. In some cases the weir method was not convenient, especially when it was required to measure the discharge of a pipe without the loss of the pressure head, and in such cases a form of meter, invented by Herschel, had been used with very great success. The name of "Venturi" had been given to it, in honour of the Italian philosopher who first investigated the flow through cones, rather more than a hundred years ago. The meter was extremely simple in construction, consisting of a short cone inserted in the pipe line at a convenient point, with its narrow end pointing down stream, and merging into a short parallel neck connected to a long cone, which swells uniformly until it reaches

the diameter of the main again. The arrangement therefore involved a sharp constriction of the pipe, causing a comparatively high velocity through the neck, which gradually falls back to the normal velocity in the down-stream cone. The high velocity of the liquid through the neck was accompanied by a considerable fall of pressure, in some cases below that of the atmosphere. Experiment shows that the flow through the meter per second was very accurately expressed by $\frac{1}{2}$ the formula $a = \sqrt{h}$, where the head h was taken as the difference between the water columns attached to the meter, at the point where the water enters, and at the throat respectively, while the constant c was calculated from the dimensions of the meter and the gravitation constant. The accuracy of the formula for large flows had been tested by the inventor for discharges through a 1-ft. pipe, and also a 9-ft. pipe, and it was found to agree remarkably well with independent measurements of the discharge. Experiments on small flows in a pipe of about $\frac{1}{4}$ in. diameter showed similar results. Usually the meter was used in conjunction with a recorder in which there was a meter for sewage connected by pipes to two water columns containing floats. Besides its application to the measurement of the discharge of water main pipe lines, the Venturi meter had been used for many other purposes. One interesting application was for the measurement of sewage, and at the present time meters for this work are in use in several countries.

THE SANITARY INSPECTORS' ASSOCIATION:

RURAL HOUSING AND BUILDING BY-LAWS.

On Saturday, March 3, at Carpenters' Hall, London Wall, E.C., Mr. T. C. Barralet, Surveyor to the Rural District Council of Godstone, addressed the members of the South-Eastern Centre of the Sanitary Inspectors' Association on the subject of "Rural Housing and Building By-laws." He said that since Mr. Justice Grantham's famous case with the Chislehurst District Council the subject had assumed a magnitude in the eyes of the public only second to the great political questions of the day. Sanitary inspectors, from the very nature of their occupation, were the best qualified to express an intelligent opinion upon the subject, and, as an old inspector, he wished to treat the question mainly in regard to those aspects in which it affected the daily work and duties of inspectors, rather than from the sentimental, financial, or aesthetic standpoint. There was no doubt that we had been faced for some time with a peculiar phenomenon in our rural districts. Side by side with a steady diminution of population we had the anomaly that there were not enough houses for the people to live in. On the other hand, the last census returns indicated that the number of persons per house was less than ten years before—proving that conditions were not getting worse, but, taking the country as a whole, were rather better. Nevertheless, it could not be denied that in many rural districts overcrowding to an outrageous extent existed, insanitary cottages were the rule rather than the exception, and local authorities persistently neglected their statutory duties in enforcing the provisions of the Public Health Acts. It was equally patent that the ordinary laws of supply and demand would not stimulate building in purely agricultural districts, for the sufficient reason that a wage of 14s. or 15s. a week did not allow an adequate margin to pay a reasonable return on the outlay of capital involved in building the cheapest cottage. Low wages meant low rent, which, in turn, meant low interest. When they heard of country cottages being let at 1s. 6d. or 2s. a week, that sum frequently represented a return of perhaps 2 or 3 per cent. on the cost of the cottage. The rent, in fact, represented the amount of discount the labourer was able to afford from his wages, and had no relation to the cost or size of the dwelling he inhabited. That was especially so in the case of cottages attached to farms. Such dwellings were, to all intents, an appanage of a farm as much as the stables and cow-sheds. The occupants were not "tenants" in the sense of town-dwellers. Tied cottages were really a grant in aid of wages, and they were

really the bane of most rural sanitary inspectors. As a rule no claim could be made on the owner as the cottages were included in the tenant's lease. A vast improvement would be effected in this class of rural dwellings if landowners could be induced to retain cottages in their own hands instead of farming them out. From a financial point of view there were few inducements to a builder or owner to erect dwellings in rural districts; the rustic labourer's requirements were simpler, but his dwelling probably cost a good deal more to build than that of his town brother. He was not content with a two or three roomed tenement, and wanted a good garden, an outdoor wash-house, and an interior accommodation, which in towns would command a rental of 7s. or 8s. a week, for less than half that sum. True, the price of land and labour was cheaper, but the extra cost of materials and carting more than counterbalanced those advantages. Clearly, then, little help could be expected from private enterprise to make good the acknowledged shortage, except it be in the form of philanthropy. It would be generally admitted that it was to the best interests of the State that a large proportion of its citizens should be born and reared to rural pursuits, and that everything which tended to discourage the provision of healthy homes was to be deplored. Political economists of one school told them that to nationalise the land would stimulate rural life. Others recommended small holdings and peasant proprietorship, while others, again, advocated municipal action. Of late years there had been a pretty unanimous chorus from landowners and architects that the building by-laws adopted by rural district councils were the great stumbling-block to the provision of proper cottage accommodation, and it was to the examination of this plea in relation to the work of sanitary inspectors that he invited attention. Rural England received its sanitary charter in 1875, but no powers were conferred then to make building by-laws in any rural district. But by sect. 157 of that Act the Local Government Board might give such powers, and for the guidance of the local authorities a model series of by-laws was issued by the Local Government Board in 1877. Having passed in review these by-laws, Mr. Barralet remarked that it would generally be conceded that those by-laws were sound and reasonable from a health officer's point of view, and were calculated to secure the erection of healthy dwellings. The work of the sanitary inspector was, without doubt, materially assisted in places where they had been enforced. They did not prevent any "jerry-building," but confined it to narrow limits, and, although they contained many anomalies, they had done much for the improvement of all classes of buildings in the country. Up to a few years ago little complaint was heard of the hardships inflicted by the building regulations in rural districts, but, since they had become more universal, a vigorous agitation had arisen, having for its object their total abolition, or whittling them down to such an extent that they would have no control over structure above foundation, and would merely enforce what were called sanitary regulations. It must be confessed that many rural districts had taken advantage of their position to enforce requirements which were quite out of place in a rural, and of questionable utility in an urban, district, such as rooms 9 ft. in height, and party-walls being carried above the roofs. The Local Government Board were much quicker to yield to pressure than was usually supposed, and in 1901 they issued their Rural Model By-laws, with a recommendation to rural councils to adopt them for those parts of their district to which they appeared suitable. This latter model had much to recommend it. It insured at least a solid foundation, a damp course, and efficient drainage. The walls and roofs might be of any material, no concrete was required over site, the windows might be of any size and fixed, brick floors might be laid upon bare earth on a damp site, and the walls built of the most porous materials. For a detached house with plenty of land such by-laws might be sufficient. It would, of course, be possible to build a very damp and insanitary house complying with those regulations, but there was at least the satisfaction that it had a foundation, and a damp course and drains. From a sanitary inspector's point of view his work was likely

to be largely increased if the rural model were adopted generally in place of the urban model. Dealing with the opponents of by-laws, Mr. Barralet said that imagination failed to picture the evils of "jerry-building," and slum creation which would occur in some districts termed "rural" if Lord Hylton's measure of last session had become law. The policy of the Local Government Board was, without doubt, in the direction of weakening rather than strengthening the hands of local authorities in dealing with buildings, and almost every objector who appealed to them received a sympathetic hearing. The Board had clearly been convinced that the building by-laws acted as a deterrent upon cottage building in country districts, but his own experience did not confirm that assumption. Over a large part of the country there were no regulations of any kind, and yet the house famine was just as pronounced in those parts as in the others, so that the absence of any check did not stimulate building. The district which he represented comprised fourteen parishes in the south-east of Surrey. Up to a year ago the urban model was in force in eight of those parishes, and the remainder were without by-laws. Yet nine-tenths of the building took place in the parishes with the regulations. He was of opinion that building by-laws were necessary all over the country, and that they should be essentially the same for urban and rural districts. Mr. Barralet then proceeded to deal with the administration of the by-laws in detail, and at the conclusion of his paper there was some discussion.

CARPENTERS' HALL LECTURES:

THE RELATION OF ARCHITECTURE TO HISTORY.

The third of the present series of lectures on matters connected with building was delivered on the 1st inst. at Carpenters' Hall, London-wall, by the Right Hon. James Bryce, M.P., F.R.S., on "The Relation of Architecture to History," the chair being occupied by the Right Hon. Lord Tweedmouth, P.C.

The lecturer said that architecture was one of the very oldest of the arts, and also one of the most necessary. It had a scientific side and a practical side; it was needed for the purposes of our life; it could be carried out by the methods of science, and yet it had also got a side which belonged to imagination and taste. It existed not merely for practice, it existed for beauty, delight, and it had, perhaps more than any other art, the interest of combining the two elements of beauty and utility in everything it did and in every step of its advance. Architecture, as embodied in the works it produced, became a part of the life of every nation—a part of its practical life, a part of its intellectual and æsthetic life. The architect studied it for a practical end, in order that he might erect buildings which were needed for some immediate practical purpose; but he would understand better the principles upon which he worked if he had a general view of the relation which his science and art bore to life—that was to say, if he understood how the practical element and the æsthetic element were both to be blended to give satisfaction to practical needs and to the demands of taste and feeling; and he would better understand the styles of art—the lines which the development of a building ought to follow, the harmony of its parts, the appropriateness of every part to a general end—if, in studying the models which the past had bequeathed to us, he understood what were the causes which formed and moulded the invention and the taste of those who had gone before us. No architect could understand even the buildings and styles of our own time, much less those of the past, unless he understood the causes at work in the past, which gave to every building its particular style.

The causes which had affected the development of architectural styles had been of many kinds. A good deal was due to materials; where wood, for instance, was the common material, that gave a certain character to the architecture. Different kinds of stone, or the absence of stone and the use of brick, had also made great differences in the styles of architecture, as also did climate and light. But with those particular causes of the development of different styles in building he was not then concerned; he was, however,

intending to deal with other causes which influenced architecture—i.e., the needs of each particular people at each particular time; their taste, and the circumstances which existed at any given epoch. These were the fancies which determined the form which buildings took: the needs, the tastes, the resources of each successive age and people were expressed in their buildings. They were the permanent evidence of what a people were. No evidence was so good as that of a building. Tradition might err, records might be falsified, but a building told its own story; it was incontestable evidence of what existed at the time it was produced. It had been the practice in recent years to restore buildings, which constantly meant the destruction of the original character of the building and the substitution of something which the modern restorer thought was better than what the ancient architect did. We did not desire that buildings should fall into ruin—that was the very end one sought to avoid—but we desired to preserve the truth of a building.

The subject of the relation of history to architecture had two aspects. They might look at it from the side of the light that history threw on buildings, and from the way in which buildings illustrated history. Mr. Bryce then proceeded to give a few instances in which history explained the features of a building—that was to say, where they would be puzzled by the features which a building presented if they did not know the history of the times when it was produced. Mr. Bryce then dealt with the uniformity of the style of the Greek temples from the very earliest temples down to the Greek or Roman temples of the IIIrd or IVth centuries, and said that after eight or nine centuries it was remarkable that there should be the same type of temple prevailing over the whole Greek—afterwards the Greco-Roman—world. What a contrast that was to the changing styles of mediæval Europe from the Xth to the XVIIth centuries. The explanation of this contrast was easily obtained from history. The Greek temples were all beautiful externally and plain and uninteresting inside, and that pointed to worship, such as there was, outside; and that kind of worship was continuous and uniform from the time when we first get our light on Greek architecture down to the Greco-Roman period. The early style became sacred, and it never occurred to any architect to deviate from it. That was one reason, but there was another: the Greeks were pre-eminent for their taste and creative power amongst the nations of antiquity: they were immeasurably superior to any of the people, except the Egyptians, with whom they came in contact, and with the fall of Egypt at the time of the Persian conquest the Greeks stood alone. That being so, there was no influence to come to them from outside, as the other nations had not a creative power or artistic taste. The Greeks remained pre-eminent, preserving all their ancient forms, because they did not receive any impulse from others. On the other hand, there was much in mediæval Europe to bring about change and differences.

Again, as anyone who travelled in the Eastern world could see, dull uniformity was the characteristic of the buildings of worship of the orthodox Eastern Church; but in the Western world there was a great diversity in the forms of the churches. What was the explanation of that? It was, he believed, due to the fact that the orthodox church of the East became petrified, so to speak, at a comparatively early period; there was a stagnation of its intellectual and æsthetic powers, which prevented its growth in the way in which the Western world was developing during the same centuries. As the literature and art, thought and theology, were petrified, so also was its architecture, and there were not those creative minds working in the Eastern world that there were in the West. The historian of Eastern architecture would not be able to explain this dull uniformity if he did not know the history of the Eastern church. Even outside the orthodox Eastern church—in the churches of Armenia, for instance—people build to-day in the way they did in the IIIrd century. Constantinople was the centre, and it set the type, invention and development being checked and ultimately paralysed.

Another illustration Mr. Bryce gave was the castle architecture of our own country. Whoever studied the castle architecture of our own country must have been struck with the difference between the buildings of defence in the different parts of the United Kingdom. In England we had large and splendid examples, often with a great deal of architectural beauty, and their erection cost a great deal of time and money—such castles, for instance, as Conway and Carnarvon, Rutland and Peubroke, Bodiam in Sussex, and the castles of Northumberland, although they were a little ruder. Across the border, the castles of Scotland, though fine, were ruder and simpler than the English ones, and in the western parts they were bare, rough towers. In Ireland this was more evidenced; as a rule they were still ruder—except those built as the result of the Anglo-Norman invasion—and this was true also of the castles on the western coast of Scotland. An architectural traveller who knew nothing of the history of Great Britain and Ireland might be puzzled by this contrast, but as soon as he understood the history of the country he would realise the cause. There was plenty of money in mediæval England, and the great lords found it worth while to build fine castles for themselves and their retainers. The same was true, to some extent, in eastern Scotland, where the great lords built in a comparatively beautiful and sumptuous style; but in western Scotland and Ireland the chiefs were poor, or lords of small clans, and with no means of building castles that would do more than supply the absolutely irreducible minimum of comfort and convenience to themselves and their vassals. When one understood the social and economic conditions prevailing from the XIIIth to the XVIth centuries, one understood why there should be these differences in the castles of the country.

Then as to how architecture illustrates—i.e., where the historian, who knew the history of the country, was able to learn and confirm his views and illustrate his conclusions from the facts which architecture supplied. One of the great values of the study of architecture was that it went back to the ages from which we had little or nothing in the way of records. The art of building considerably ante-dated written records. Written history was comparatively modern, though, of course, architecture was modern relatively to the progress of the human race. Even in Egypt, the country in which were the oldest architectural remains, it was evident that they had civilised history before the great buildings we admire were produced.

Architectural products of primeval, pre-historic times were the most valuable evidence of the social and economical state of the nation. Take Egypt; anyone looking at the gigantic piles erected there—the great Temple of Karnac, the Pyramids—would see that the country which produced such works must have been a wealthy country in which there was a settled order and government, and where there was a large command of slave labour. Again, take Mexico. When the Spaniards conquered Mexico they arrested its civilisation, and it was a great misfortune that they did, for it would have been curious to see how that civilisation developed independently of the influences of the world. The Mexicans were just beginning architecture in the proper sense of the word. The Mexicans had come some way with decoration, but very little in the way of creating proper stone buildings of a well-marked architectural style, but there were evidences that they had gone some way towards becoming an artistic people—i.e., in the great taste they showed in the figures they carved. Primitive man could not produce a fine temple or a distinct architectural style, but he could produce decoration, and could advance to a considerable degree of skill and taste in the production of such work. Architecture showed that the artistic faculty in man proceeded on the same path as the literary faculty. In Crete, for instance, that held true; there was a great deal of skill, grace, and beauty in the decorations before there was architecture in the grand style. The architecture of a country was the best evidence of its state of society—whether it was rich or poor, or peaceful or troubled; if troubled, its build-

ings would be chiefly of defence. The diffusion of different types and styles over different local areas was an exceedingly interesting branch of the subject, because it was the branch in which history was best illustrated in architecture. The map of modern Europe was different from the map of mediæval Europe, but the political divisions of four to ten centuries ago are written unmistakably in the buildings of the different local areas over Western Europe, and those buildings also show what was the influence that one nation exercised on another during the mediæval period.

Mr. Bryce proceeded to give one or two illustrations, and in speaking of Indian architecture he said that anyone who went to India and saw the extraordinary diversity of styles in that country would be unable to explain that, unless he had the lamp of history to light his path, and it was a melancholy reflection that Englishmen were not leaving India much architecture of permanent value. If by some catastrophe we were to quit India and leave her to her own devices for 500 years, what traces would remain of English occupation? He thought the embankments, the railway cuttings, and the tunnels would be the chief remains. In speaking of mediæval Europe, he said there was great similarity in the different types of building of the same age, but all with distinctive features, and that was exactly what history told us; there was one religious head or faith, one great ecclesiastical power, but there were different influences co-existing and ennobling the nations to acquire different characteristics. There was a diversity in unity and a unity in diversity; there were political divisions, which we do not notice now, which were written in the buildings of Europe. In France, for instance, there were four or five different types of architecture with great similarity, but all with distinctive features, and the same remark applied to Italy. In England there was not so marked a difference between the styles in different parts of the country as was to be seen in France, and the broad, salient feature about England was how largely she was influenced by France in her architecture.

As to the way buildings illustrated the needs of any age, the great fact in the Middle Ages in Europe was the ecclesiastical power, which dominated everything else, and religion occupied a larger part in men's thought than it does to-day. Therefore the great buildings which had come down to us from the Middle Ages were mostly ecclesiastical buildings, and we saw recorded in them—in their size, splendour, and beauty—the immense passion which the people threw into their religion and the money they spent to produce noble structures. A curious little instance belonged to our own time. The XIXth century had been the great age since the end of the XVth century of church building and restoration. That was due to two concurrent influences; one was the extraordinary development of wealth and population, which made more churches necessary, and the other was the influence of the romantic movement—the same influence that we saw in Ruskin and Walter Scott—which took people back to the Middle Ages and gave them an interest in architecture and art, and made them willing to spend money on building churches and in making them sumptuous and beautiful. When the New Zealander came ten centuries hence to reconstruct the history of England from its ruins, he would be struck by the number of churches belonging to the XIXth century, and if all other records were gone, he would find the evidence of buildings valuable for the purpose. Besides churches, there were many places in which we found fine town halls, and such great municipal buildings were a witness of the truth of the force and volume of the municipal life of the time.

Architectural history embodied, as hardly anything else did, the life of the people. It gave a new interest to travel, and made it far more profitable and suggestive. Nothing set one thinking more than to study the architecture of a city and what the life of it must have been as revealed by the buildings that remained. It set one thinking, and there was a reason for everything in the world if one could but find it, and the essence of all profitable travel was to make one ask the reason for what one saw, and nothing did that more than the study of

architectural history. Architecture was one of these branches of art which suggested to us the immense influence and power of emotion, as well as intellect in the development of mankind. It was emotion which was the motive power of man; it was religious emotion which had produced most of the great art of the world, and it was religious emotion that drove man on in the path of artistic creation.

A vote of thanks to the lecturer and the Chairman brought the proceedings to a close.

THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Sir E. Cornwall, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 9,088*l.* for various purposes; Camberwell Borough Council 1,163*l.* and 2,500*l.* for housing purposes; Hammersmith Guardians 12,400*l.* for poor law purposes; and Lewisham Borough Council 4,737*l.* for street works, etc.

Improvement, King's-road, Chelsea.—The estimate of expenditure on capital account of 4,814*l.*, submitted by the Finance Committee, in respect of the King's-road, Chelsea, near Church-street, improvement was approved.

Streatham High-road.—It was agreed that the amount of the Council's contribution towards the cost of widening Streatham High-road, between Mount Ephraim-road and the Tate Library, executed by the Wandsworth Metropolitan Borough Council, be 4,070*l.* 15*s.* 1*d.*

Northern Low-level Sewer—Diversion at East London Railway.—It was agreed—

(a) That the estimate of expenditure on capital account of 10,390*l.* submitted by the Finance Committee in respect of the reconstruction of the northern low-level sewer where it crosses the East London Railway at Shadwell be approved. (b) That the estimate of expenditure on maintenance account of 2,000*l.*, submitted by the Finance Committee, in respect of the diversion of the northern low-level sewer at the East London Railway, Shadwell, be approved. (c) That the offer, amounting to 11,235*l.* 15*s.*, of W. Kennedy, Ltd., be accepted for the reconstruction of that portion of the northern low-level sewer where it crosses the East London Railway at Shadwell.

Indication of Houses of Historical Interest.—The Local Government, Records, and Museums Committee reported as follows:—

"On October 25, 1904, we informed the Council that the Duke of Bedford, the Duke of Bedford had affixed memorial tablets at his own expense to certain houses on his estate. We have since been informed that His Grace has affixed tablets to the undermentioned additional houses:—Nos. 10 & 102, Great Russell-street (Topham Beauclerk and Lady Diana Beauclerk); No. 54 Gower-street (Sir Samuel Romilly); No. 31, Bloomsbury-square (Sir Anthony Panizzi); and No. 67, Euston-square (Lord Leighton). The tablet in memory of Sir Anthony Panizzi was affixed as a result of a suggestion made by Mr. J. T. Taylor, a member of the Council. We propose that a list of the tablets affixed by the Duke of Bedford shall be included in the volume, 'Indication of Houses of Historical Interest.' We have made inquiries with a view to the commemoration of the residence in London of Sir Edwin Landseer, but we regret that we are unable to recommend the Council to take any action in the matter, as it appears that the only two houses in London in which Landseer resided have been demolished."

Main Drainage Extension—Appointment of Arbitrator.—The following recommendation of the Main Drainage Committee was agreed to:—

"That the seal of the Council be affixed to the appointment (in duplicate) of Mr. Edward Augustus Grining as sole arbitrator in the matter of the claim of Mr. W. J. Lough in respect of alleged damage to Nos 167 to 173 (odd numbers), Eastfield-street, Bow, by reason of the construction of section No. 1 of the northern low-level sewer No. 2."

Tooting Common—Formation of a Bathing Lake.—Permission was given to Wandsworth Metropolitan Borough Council to form at its own expense a bathing lake with an area of not less than 30,000 sq. ft. on a site on Tooting Common immediately adjoining the western side of the London, Brighton, and South Coast Railway between Tooting Bec-road and Bedford Hill-road, subject to all work being executed to the satisfaction of the Council.

Displacement of Population, 1905.—The Parliamentary Committee reported that they had before them a return, prepared by the statistical officer, showing the probable dis-

placement of population in London to the extent of 6,809 persons through the proposed acquisition of 1,727 houses in connexion with the various Bills deposited in the present session of Parliament. The Housing of the Working Classes Act, 1903, requires rehousing accommodation to be provided where as many as thirty persons of the labouring class are displaced under any Bill in the Administrative County of London. Prior to that Act the limit below which rehousing was not required was twenty houses in any metropolitan borough.

The Council adjourned soon after seven o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Lines of Frontage and Projections.

Clapham.—Buildings between Nos. 65 and 69, South-side, Clapham Common, Clapham (Messrs. Homer & Lucas).—Consent.

Hackney, Central.—Projecting pilasters to Nos. 231, 233, 235, and 237, Mare-street, Hackney (Mr. C. G. Smith for Mr. W. Frith).—Consent.

Hammersmith.—Buildings on the northern side of Uxbridge-road, westward of Providence-place (Mr. J. E. Richardson for the Home Counties Land Company, Limited).—Consent.

Lewisham.—The retention of a one-story shop in front of No. 5, Brownhill-road, Catford (Messrs. Norfolk & Prior for Mr. J. Alder).—Consent.

Lewisham.—That the application of Messrs. W. D. Church & Son for an extension of the period within which the erection of a porch in front of the proposed church on the south-eastern side of Torrion-road, Lewisham, was required to be completed, be granted.—Consent.

Marylebone, West.—Bath-room additions and a covered way on the south-west side of Grove-road, St. Marylebone, eastward of the Regent's Canal (Mr. J. P. Waddington for the St. Marylebone Metropolitan Borough Council).—Consent.

Newington, West.—Houses on the north-western side of De Laune-street, Kennington (Messrs. Briant & Son).—Consent.

Paddington, South.—A projecting sign in front of No. 1, Burwood-news, Burwood-place, Edgware-road, Paddington (Messrs. Allen & Mannoch, Limited, for the London and Parisian Motor Company, Limited).—Consent.

St. George, Hanover-square.—Bringing forward of the frontages of No. 1, Hamilton-place, abutting upon Piccadilly (Messrs. W. H. Romaine-Walker & Besant).—Consent.

Strand.—A deviation from the plans approved for the erection of two iron-and-glass shelters to the Royal Institute of Painters in Water Colours and Princes Restaurant on the south side of Piccadilly, so far as relates to the affixing of the name of the premises to both sides of the shelter in front of Princes Restaurant (Mr. W. Emden).—Consent.

Wandsworth.—Five blocks of cottages and shops (section "B"). Franciscan-road, Tottenham (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Wandsworth.—The retention of a porch in front of Spencer House, No. 27, Wimbledon Park-road, Wandsworth (Messrs. Boyton, Sons, & Trevor).—Consent.

Wandsworth.—A building on the western side of Beaumont-road, Wandsworth (Mr. A. J. Hardwick).—Consent.

Hampstead.—A building at the rear of No. 9, Fawley-road, Hampstead, to abut upon Honeybourne-road (Mr. C. G. Durrant for Dr. G. Elam).—Refused.

Marylebone, West.—Raising projecting one-story shops in front of Nos. 168 and 170, Edgware-road, St. Marylebone (Mr. J. W. Stevens for Mr. E. S. Burns).—Refused.

Width of Way.

Islington, South.—Retention of a building at the rear of No. 35, Thornhill-road, Islington, with a forecourt boundary at less than the prescribed distance from the centre of the roadway of the southern arm of Barnsbury-square (Messrs. F. J. Bedle & Meyers for Mr. T. Heath).—Consent.

Width of Way and Lines of Frontage.

Kensington, South.—Retention of an iron-and-glass covered way at the entrance to No. 3, Douro-place, Victoria-road, Kensington (Miss F. A. Lee).—Consent.

Strand.—A projecting chimney-stack at No. 13, Golden-square, to abut upon Lower James-street (Mr. W. Woodward for Messrs. Rye & Eyre).—Consent.

Hammersmith.—A building at the rear of No. 243, Uxbridge-road, Hammersmith, at less than

the prescribed distance from the centre of the roadway of a news leading out of the east side of Askew-crescent (Messrs. Prickett & Ellis for Miss S. Axton).—Consent.

Woolwich.—Buildings abutting upon the western side of Godfrey-street, the southern side of Godfrey-hill, and the eastern side of Lower Wood-street, Woolwich (Messrs. G. A. Wilkinson & Son).—Consent.

Strand.—A wood-and-glass showcase at No. 224, Regent-street, to abut upon Argyle-place. (Messrs. F. Sage & Co. (1905), Limited, for Messrs. T. & J. Perry).—Refused.

Paddington, South.—A one-story addition in front of No. 4, Hyde Park Gardens-news, Paddington (Messrs. G. Trollope & Sons and Colls & Sons, Limited, for Mr. J. G. Griffiths).—Refused.

Formation of Streets.

Lewisham.—That an order be issued to Messrs. Norfolk & Prior, sanctioning the formation or laying out of a new street for carriage traffic out of the east side of Ravensbourne-park, Catford (for Mr. A. E. Rudd).—Consent.

Norwood.—That the Council do not accede to the request of Messrs. R. Ellis & Son, on behalf of Mr. R. A. Sanders, for permission to build over the land marked "reserved" on plan approved for the formation or laying out of five new streets for carriage traffic on the Sanders estate, on the south-east side of Coldebour-lane, Brixton).—Refused.

Space at Rear.

Peckham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to a building erected on the north-east side of Hall-road, Peckham, abutting upon Hichisson-road (Mr. C. Farley).—Consent.

Space at Rear and Alteration of Buildings.

Bow and Bromley.—A two-story factory building over a part of the space at the rear of Nos. 47 and 49, Norman-road, Bow (Mr. A. P. Stokes for Messrs. C. J. Russell).—Consent.

Southwark, West.—Buildings on a part of the space at the rear of No. 6, Nelson-square, Blackfriars-road, Southwark (Mr. R. C. Murray for Messrs. Sidney Straker & Squire).—Consent.

Height of Buildings.

Lincolns.—A building on the site of Nos. 13, 15, and 17, Dod-street, Lincolns (Messrs. H. Herman, Limited).—Consent.

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

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The ninth meeting of the session was held at No. 18, Tufton-street, S.W., on Wednesday, February 23rd, Mr. E. W. M. Wonnacott being in the chair, when Mr. E. C. M. Willmott read a paper on "The Architecture of Shop-fronts."

In the course of his paper, Mr. Willmott said: "A shop-front as we see it in the streets to-day makes no pretence at art or the expression of art. It has been accepted by even the best among us as a purely utilitarian necessity engendered of a present-day commercialism—a commercialism which I hope to show presently is only binding itself to its own advancement.

Of course, we are always ready to depreciate the fact that it is unseemly and unarchitectural for a stone building of massive proportions apparently to be supported upon a brass and mahogany slip of an inch or two diameter, but what are we to do? We lament the state of affairs, and promptly blame the clients who will insist upon large expanses of glass as a commercial necessity.

Surely our art has become stagnant and purposeless when we find it not equal to the task of adapting itself to modern conditions and requirements. The difficulties are, no doubt, very great, but they are not insurmountable, and I rejoice to find that a small move is now being made in the right direction. I will endeavour to prove that there are great possibilities of artistic treatment even in a shop-front. Conditions of life and commerce have so changed as to render useless and ineffective such charming old Georgian or Early Victorian fronts as we sometimes see in Soho and other quarters of London.

The shopkeeper, in those times, was limited both in his ideas and ambitions, so making it possible for the designer to do full and complete justice to those proportions which are so essential between the shop-front itself and the building overhead. Gradually the shopkeeper found it necessary to make his shop-front the medium whereby he could advertise and display the special goods which

be sold and attract the public. And this power to attract is the keynote which the designer must study to satisfy his clients' commercial instincts.

I propose to deal, firstly, with the single shop-front as being the most common problem. There should be perfect harmony between the shell and its contents, and a front that would be suitable for a jeweller is flagrantly out of place when setting forth the charms of a new costume. With the art of window-dressing improved and improving, we architects must fall into line and provide a shop-front which shall be not only artistic and suitable, but educationally instructive to the window-dresser.

A notable and praiseworthy tendency in many of our later fronts is to set back the actual line of the framework 2, 3, 4, or even 5 ft. from the frontage line. This has many advantages. It creates a standing-place where an intending customer can admire the goods without being jostled by passers-by. Again, if set back deeply enough it does away with any need for sun-blinds. The idea has many possibilities; the sides of the lobby, or loggia, can be occupied by show-cases, and in one or two examples I have seen an additional showcase in the centre.

Considering this setting back in relation to the building above, we now get a building over a void, and not, as it seemed before, on a framework of wood and glass. I should deprecate the use of the sham arch, and think that the only natural treatment for a shop-front opening is a square treatment of beam and posts, even showing the girder supporting the wall over boldly and frankly. Galvanise or otherwise protect it, and then do as one ingenious architect did, use it instead of the sham fascia, and let the name of the shopowner be bolted on in metal letters.

Now treat the stanchions in the same way, dress the bareness of girder and stanchions with a little decorative metal work, and I think the effect will not lack artistic qualities.

In contradistinction to the ideas I have just outlined we will imagine the most difficult case—a draper's shop where the glass is required to be taken down close to the floor, and the frontage is of considerable width. Let the line of building frontage be set back a few feet, and, instead of using the usual girders and columns for the superstructure, let it be carried upon a series of arches of such sizes and proportions as are suitable architecturally and structurally. Now, let your shell be practically a showcase hung up as a light accessory and projecting from the building face such number of feet as that may have been set back.

The frame itself could be of metal, giving a clear, unobstructed view, and made as much like a large hanging showcase as possible in order to do away with any impression that the building is supported upon glass or wood.

There is an increasingly popular tendency, especially in furniture shops, to take the front up two stories. This is certainly a gain to shopkeepers, as people are attracted from the tops of passing omnibuses.

Architecturally, I consider it also a gain if suitably treated, making the task of proportional reconciliation between the two portions of the building much easier to deal with. As the height to which the observer can see in comfort is never more than 8 ft. or 9 ft., all space above this is really useless unless for effective display, and, with the average ground floor anything from 15 ft. to 20 ft. high, the scope of the designer is enlarged and his difficulty lessened.

I would also plead that more attention be paid to the window back and general fittings.

With regard to a series of shop-fronts, we can do as in the Rue de Rivoli—that is, bring our buildings out over the pavement, making a series of arches upon which the superstructure is carried. The shop-front is set well back, and forms no part of the façade as seen from the street. Or we might have a small lower pier at each end of the front, and a large entrance block in the centre; on either side between the entrance block and side piers, both of which would project 5 ft. or 6 ft., come the shop-fronts proper. These could be appended to the building in the same way as we would attach a conservatory to a dwelling-house, and with, I think, the same architectural effect.

The lecturer concluded by drawing attention to the possibility of using the idea of the old Rows at Chester, where a continuity of thoroughfare was possible.

Mr. F. Lishman, in opening the discussion, considered the use of stall-board lights preferable to pavement lights. He suggested that sun-blinds might be made to run out horizontally, and so avoid the unsightly and awkward irons at sides. Arcades, he considered, were usually unprofitable undertakings. The double-story front, now somewhat frequently used in modern work, he also disliked, and advised a competition in reticence instead of showiness.

Mr. Pearson referred to the way certain well-known firms, such as Slater's and Kodak Co., had become associated in people's minds with certain and definite styles of fronts, so gaining cleverly an advertisement.

One or two speakers referred to the draper's requirements being the most difficult to deal with, the saying that the "eternal feminine is the root of all evil" evidently applying specially to shop-front architecture.

Mr. Max Clarke singled out certain excellent modern fronts, an early work in Oxford-street by Mr. Shaw being one specially noticed. He also, from recent experience, commended the recessed shop-front, it being almost a necessity for grocers' purposes.

Mr. C. R. Ashbee, who acted as Special Visitor, made a special point of reliance on colour and the use of bright metal. An early example of the XVth century, was to be found at Beauvais, where tiles, in a wood setting, made a fine front. After referring to the use of curved glass at Slater's shops as a plucky attempt on legitimate lines, he turned to good lettering, on some of the old traditional models, as being a thoroughly good decoration. In fact, he advocated generally the preference for traditional forms over those of the "New Art."

Mr. Willmott, in replying, again emphasised the importance of avoiding any feeling that the shop-front was responsible for the support of the building above.

Fifty Years Ago.

FROM THE *Builder* OF MARCH 8, 1856.

NEWGATE JAIL.

At a meeting of the Court of Aldermen of the City of London last week, Alderman Cubitt brought up the report of the committee on the state of Newgate Jail, and its improvement or removal. The report, after some preliminary remarks, in which it was stated that, till some important alteration was made in the physical structure of the interior of the building, Newgate must continue to be a standing reproach to the City of London, proceeded to intimate that a plan was under consideration which would give 120 separate cells at a cost estimated by the City architect at 10,000; that they had in view another plan of a comprehensive nature for the entire demolition of the courts and of the jail, and the reconstruction of the courts and such a portion of the jail as might suffice for the custody of prisoners while trials were going on, the objects of this plan being to dispense with Newgate as a prison, except only as above stated. A plan had also been submitted to the committee for such additions to the prison at Holloway as would enable it to receive the prisoners now kept at Newgate. The cost of the combined operations—that is, the reconstruction of the Criminal Courts and a portion of Newgate—was estimated by the City architect at 87,000, less the value of a piece of land at the Old Bailey set free, and estimated at 9,000. In working out these plans, the City architect had so arranged as to permit the smaller one to form an integral part of the larger. The report, after some discussion, was received, and referred back to the committee to act therein as they should think fit.

SECONDARY SCHOOL, BLACKPOOL.—The new secondary school, in Raikes-parade, Blackpool, was opened recently. The scheme of the building is one of three floors—the rooms for trades instruction in the basement, those for ordinary class work on the ground floor, and those for art and science teaching on the first floor. The building contract has been carried out by Messrs. Parkinson & Sons, of Blackpool; and the architects are Messrs. Potts, Son, & Hennings, of Blackpool, Manchester, and Bolton.

Illustrations.

PART OF ELEVATION, HAMPTON COURT.



HIS is one of the drawings which gained for its author, Mr. John H. Markham, the Ashpittel Prize at the Institute of Architects this year.

It appeared to us to be the best of the set; and, though Hampton Court is so familiar, so good a detail drawing as this is worth having, and will probably interest our readers.

The Ashpittel Prize was founded in 1872 as a memorial to the late Mr. Arthur Ashpittel, and is awarded annually to the student who distinguishes himself most highly in any one of the final examinations held during the year, and whom the Board of Examiners recommend as deserving of such honour.

In regard to the present drawing, Mr. Markham writes:—

"This building is probably too well known to need much description. The part illustrated is from the east, or garden, front of the State apartment erected by Sir C. Wren for William III. and Mary on the site of Henry VIII.'s old Cloister Green Court, which was pulled down to make way for it.

The materials employed in this front are Portland stone and brick, the brickwork to the ground floor being of a dark colour, and above that rubbed red bricks five courses to the foot.

The carved frieze between the Corinthian caps is probably by Grinding Gibbons, and the tympanum sculpture by Gabriel Cibbes represents Hercules triumphing over Envy, and is supposed to contain some complimentary allusion to His Majesty. The wrought-iron gates, probably by Fijou, are very fine.

To the south, or river, front the materials are similar, but a good deal of an Oxfordshire oolite has been used owing to the difficulty in conveying Portland stone up the Channel during the troubles with France. This stone has weathered to a warmer hue than the Portland, and can be distinguished from it. The date of the work is about 1690-1700.

The drawing was made from measurements taken in July, 1904, and was used as a testimony of study for the final examination R.I.B.A."

ILLUSTRATIONS OF SOUTHWOLD CHURCH.

THESE illustrations, from photographs by Mr. F. Jenkins, of Southwold, are given in connexion with the leading article in the present issue, to which the reader is referred.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the managers of the Metropolitan Asylums District was held on Saturday last week, at the offices, Victoria-embankment, E.C.

New Central Stores.—Revised plans of the new central stores, submitted by the Contract Committee after conferring with the Works Committee, were approved and ordered to be forwarded to the Local Government Board. Messrs. Northcroft, Neighbour, & Nicholson were appointed to take out the quantities in connexion with this work.

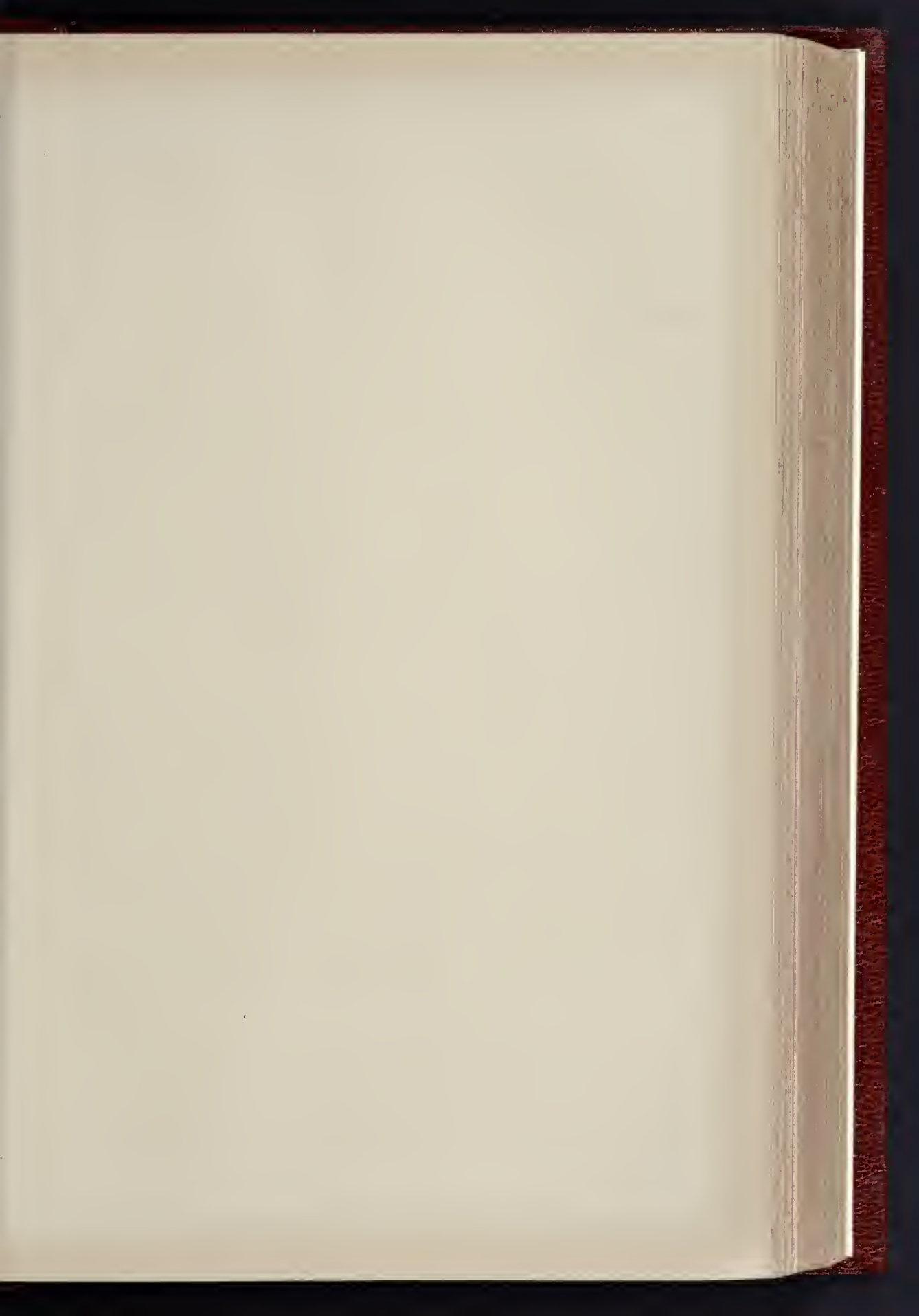
Balmont Asylum.—On the recommendation of the Works Committee Messrs. Jowler & Hugman were appointed to take out the quantities of the proposed stables and other buildings at this asylum.

High Wood School and Leavesden Asylum.—The same Committee reported that the cost on completion of this school and the female attendants' home at the asylum—had been respectively 105,507*l.* and 6,206*l.* Reports dealing with both institutions were ordered to be sent to the Local Government Board.

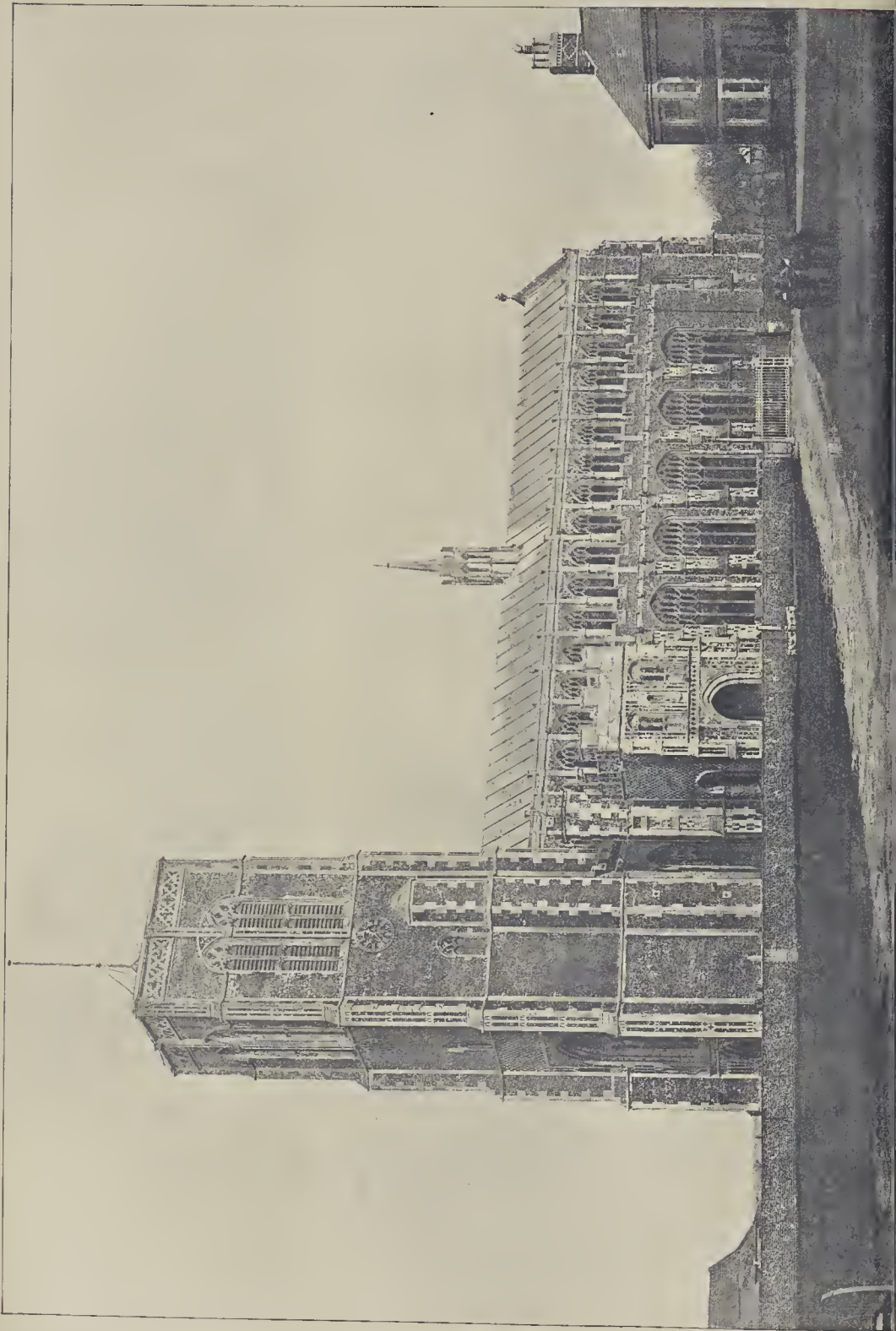
South Western Hospital, Isolation Accommodation.—Messrs. T. W. Aldwinckle & Son were appointed architects in connexion with the provision of additional isolation accommodation at the South Western Hospital.

Joyce-green Hospital.—Messrs. Treadwell & Martin were appointed architects for the new staff cottages and other buildings at this institution.

SCHOOLS, DROYLSDEN.—There were twenty-three tenders for these schools. The District Committee have recommended the acceptance of the tender of Mr. John Tihline, Parker-street Saw Mills, Bury, and, subject to the approval of the County Authority, the contract will be let to him.



THE BUILDER, MARCH 10, 1906.





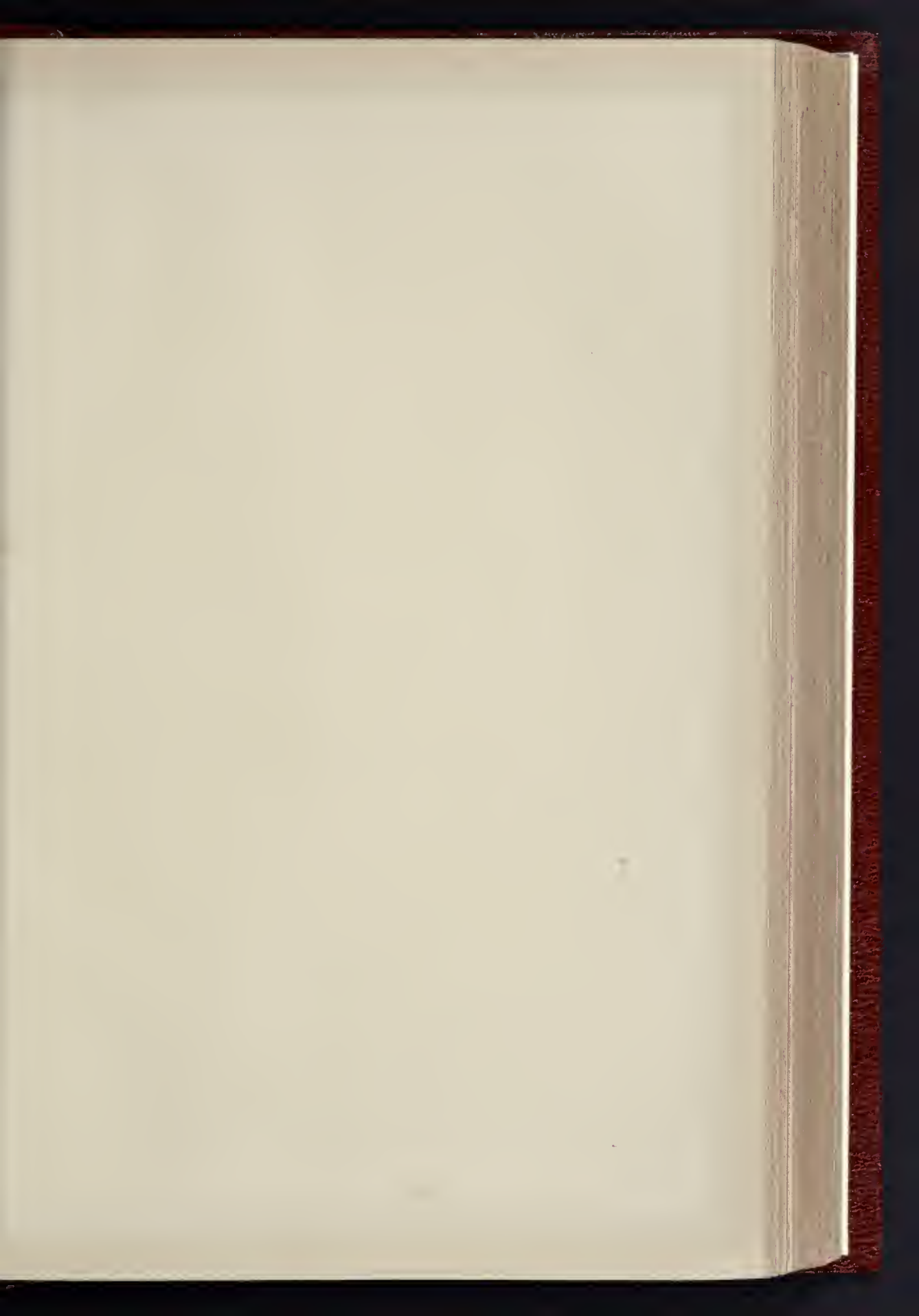
F. JENKINS, PHOTOGRAPHER, SOUTHWOLD

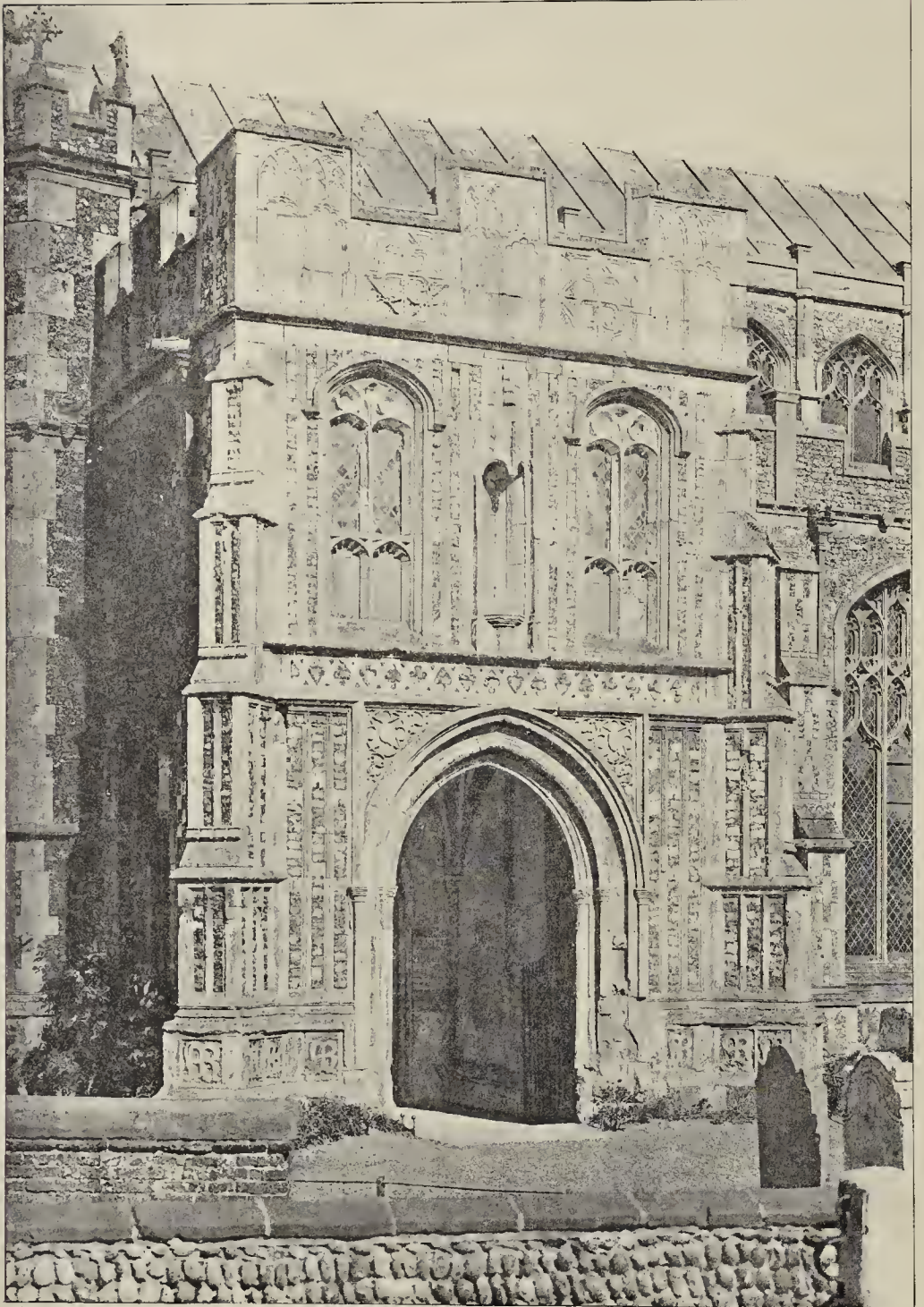
VIEW FROM SOUTH-EAST.

ST. EDMUND'S, SOUTHWOLD.

NEW PHOTO SURFACE, L. & S. EAST-INDIAN, STREET, PERTH, GAIN, E.C.







C. JENKINS, PHOTOGRAPHER, SOUTHWOLD

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

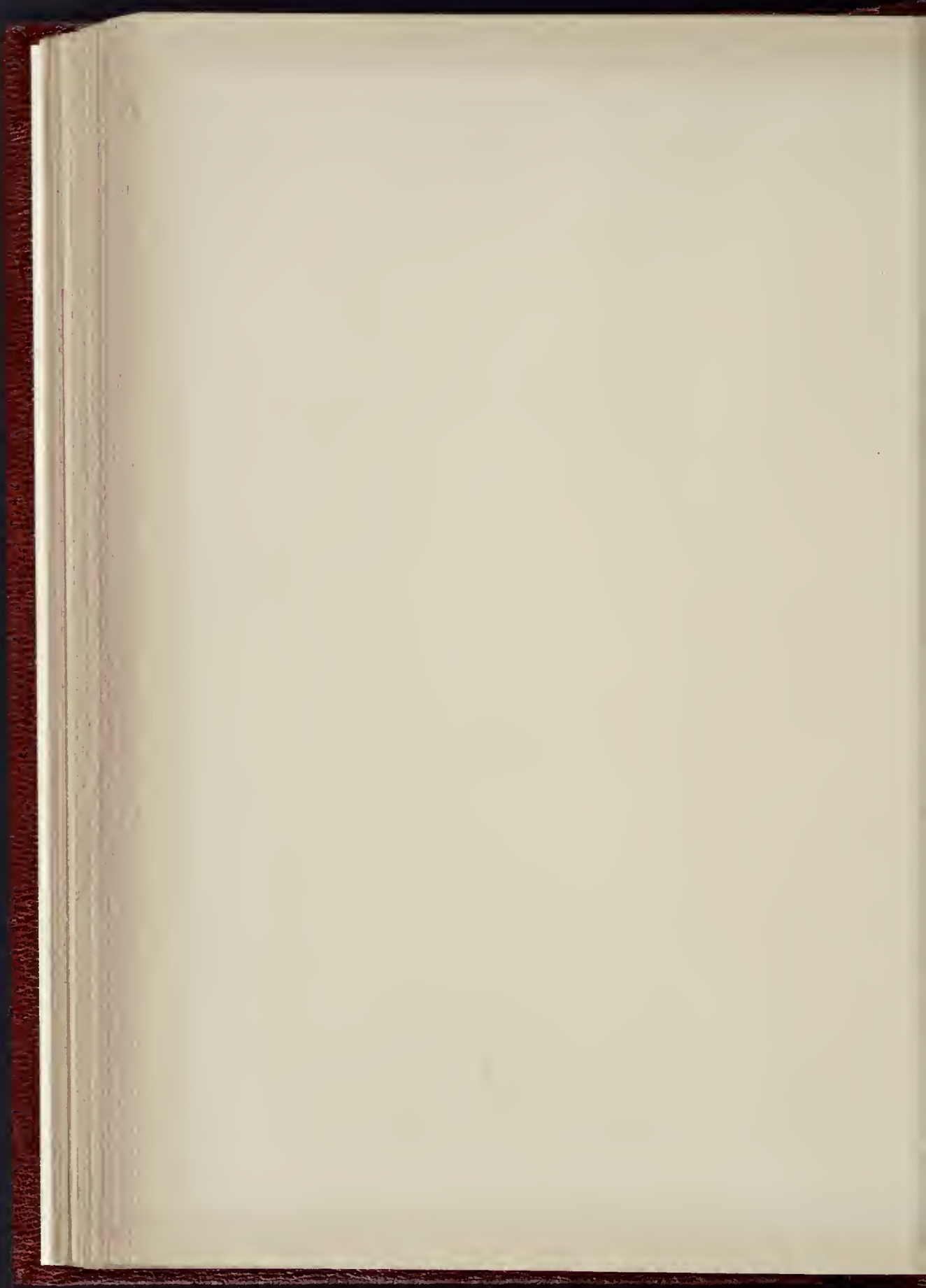
PORCH, SOUTHWOLD.

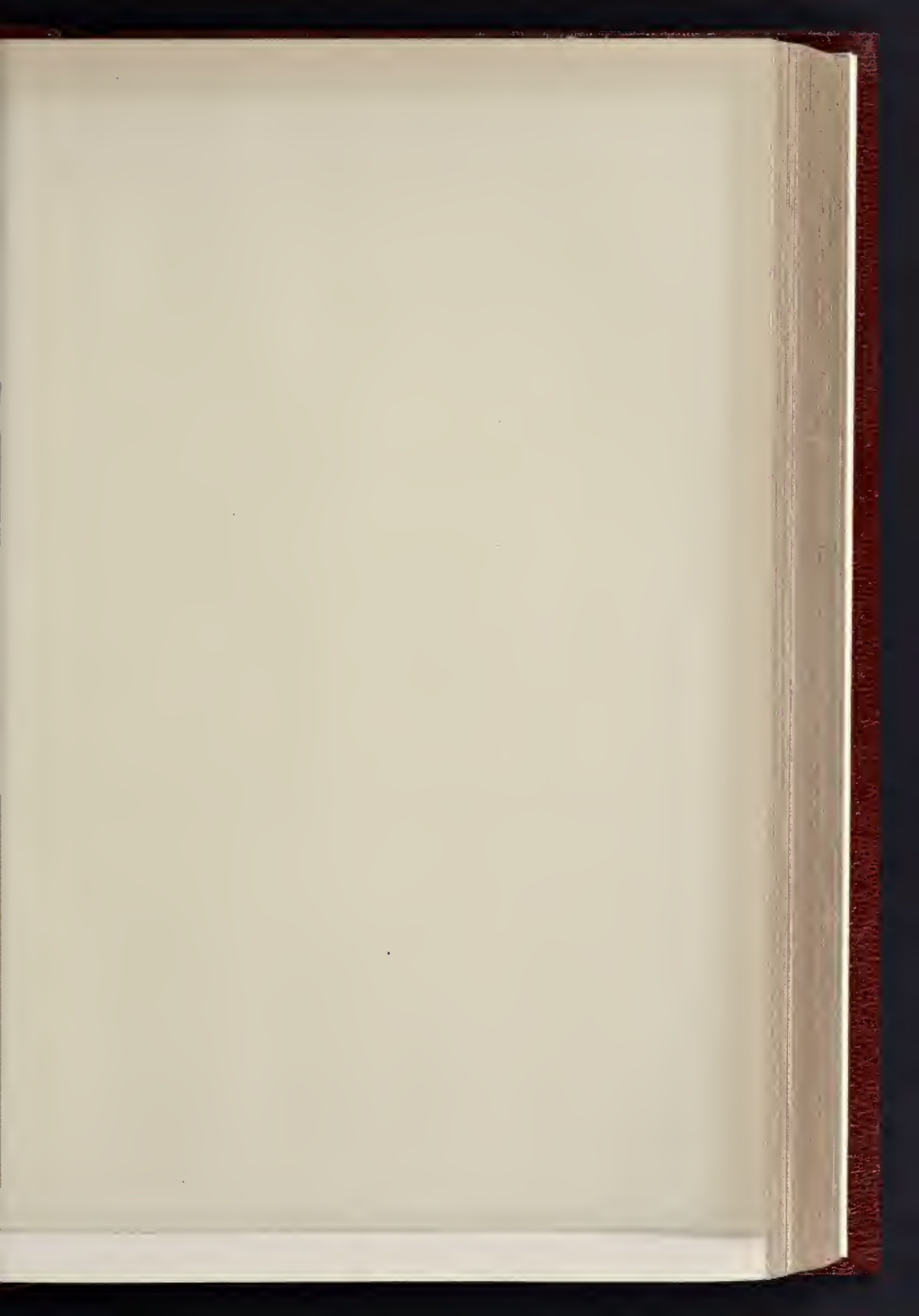


F. JENKINS, PHOTOGRAPHER, SOUTHWOLD.

THE PHOTO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

CHANCEL SCREEN, SOUTHWOLD.





HAMPTON

SIR C. WREN ARCHT.



EAST FRONT
SCALE 1/2"

6 WATERLAIN BRICK OF DARK COLOUR UP
 CRIBBED RED BRICK ABOVE. STONE IS PORTLAND
 PORTLAND PLY AN OXFORD. HERE COLUMNE VAND
 CARVIN C. IN PEDIMENT. HIEROGLIFES IN
 CABINET. CIBBY P. 60 601. DC. T. BILLY. 9

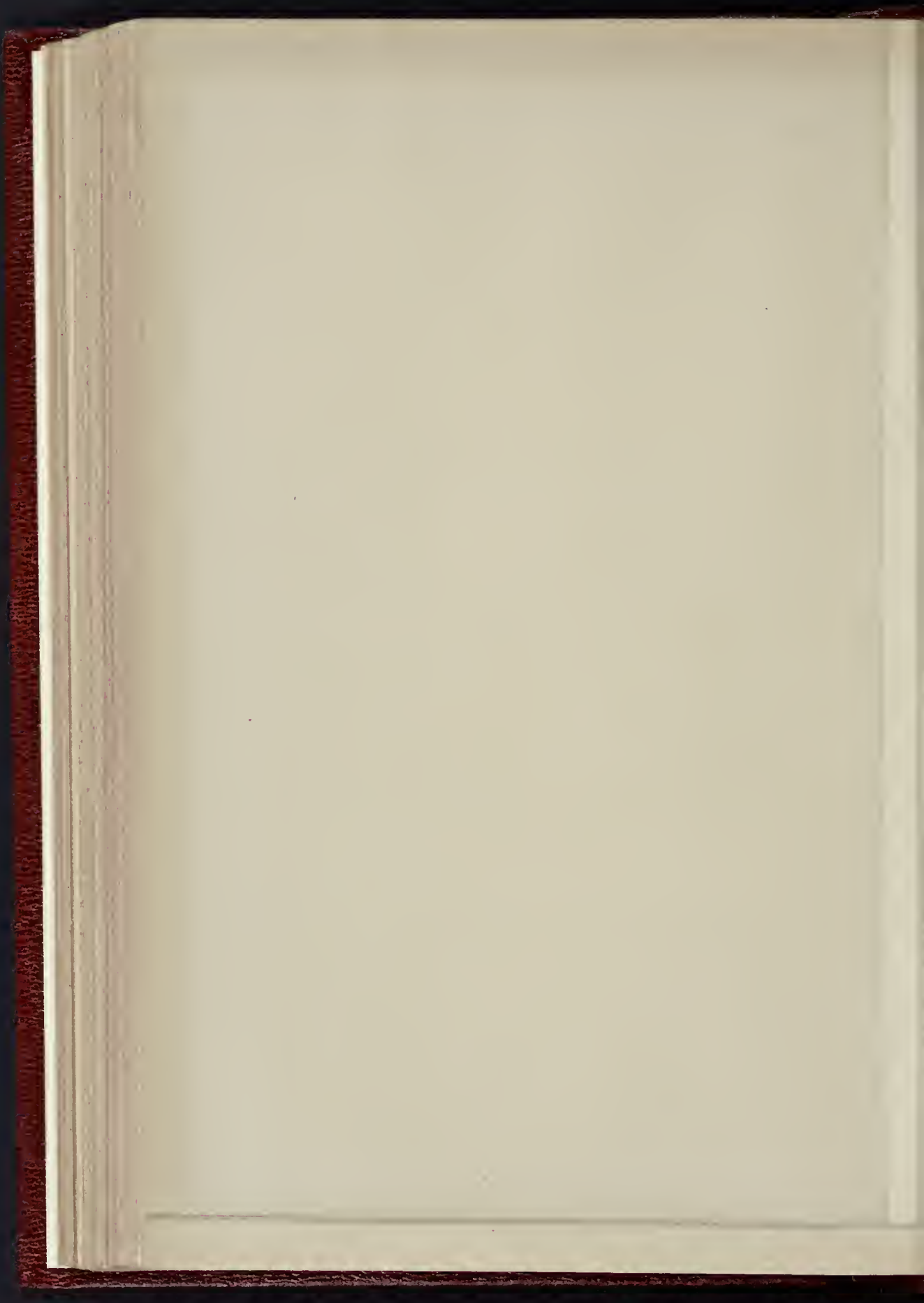
COURT PALACE



NT

John Markham
 near Jan. July 20.
 118 hand 1005

TO SPECIES OF CURVED WINDOW ARCHES
 AND TO FACE OF FRONT AS SOUTH PARTS GO
 WITH THE DEGREE OF IN BEINGING POINTLAND DEGREE
 HANNAH BEING WITH THE DEGREE OF
 TRYPHING. OVER TENNY - WAS DONK ISY
 Y TRYPH BY CURVING. CABBOND. THE



ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Before the members of the Birmingham Architectural Association, Professor Berford Pitt lectured on the 2nd inst., on "Architectural Effects in Cities." Architecture, he pointed out, was the expression of noble thought. It united the practical elements of life with the experience of, and reverence for, past art. So far as Great Britain was concerned, Edinburgh, he said, took the palm for beauty in architectural effect. They did not grudge it its civic glory. There was similarity in architectural effect in Birmingham, Manchester, and Leeds. Each had fine buildings, but the grouping was not really effective. As a matter of effect the civic monuments in architecture in this country were too often lost; they were being lost in the crowd. They were disconnected and scattered, because they were dealt with from time to time, separated by long intervals. Cardiff, however, was a more hopeful illustration of what intelligent foresight could achieve. The acquisition of Butts Park had enabled a site to be laid out for town hall, law courts, museum, and university all adjoining the picturesque castle. As far as practicable there should be characterisation of different districts. There was grandeur in the Thames Embankment, and in this connexion he insisted that public buildings and national monuments could be placed with better effect on the banks of a broad river than on any other class of site. Pictorial illustrations were given of English and foreign architecture in order that the many students present might note the contrasts in style and expression.

NORTHERN ARCHITECTURAL SOCIETY.—At the meeting of the Northern Architectural Society in Newcastle, on the 28th ult., the award of the assessor in connexion with the R.I.B.A. Intermediate examination testimonials of study was read. The first prize was awarded to Mr. Wilfrid Turpin Sunderland, and the second to Mr. J. H. English, of Corbridge. During the evening the Glover Bronze Medal was presented to Mr. Bryan Watson. A paper was read by Mr. J. B. Mitchell-Withers, of Sheffield, on "Early XVIIIth Century Architecture," in which he referred to Greenwich Hospital as the building where the work of Inigo Jones and Sir Christopher Wren could be seen to advantage, but of which portions were built by various architects in the XVIIIth century, of whom Sir John Vanbrugh and Hawksmoor were the most celebrated. He showed lantern slides of portions of this work, and of some of the buildings erected in London during the XVIIIth century. The architects of the period did not confine the tradition of Sir Christopher Wren, but adopted a heavier style, making the details of their buildings much more massive. In the smaller buildings the same feeling was introduced, and the interiors were carefully thought out even in smaller houses, there being evidence of great skill and refinement throughout. Mr. Mitchell-Withers afterwards referred to the buildings erected at Oxford and Cambridge, such as the Fellows' Buildings and the Senate House at Cambridge, and the Radcliff library and buildings to the High-street at Queen's, in Oxford. Domestic and street architecture of the period were illustrated by a number of views of buildings at Bath and Stamford, concluding with views of Belheim Palace and Castle Howard, both of which were built by Sir John Vanbrugh.

CARDIFF, SOUTH WALES, AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—A meeting of the Cardiff, South Wales, and Monmouthshire Architects' Society was held in Cardiff on the 22nd ult., the chair being taken by the President, Mr. J. H. Phillips. A paper was read by Mr. J. Ward, the Director of the Welsh Museum, Cardiff, entitled "Some Observations on the Planning of Romano-British Houses." The lecturer first described the typical Pompeian house, and then proceeded to give the salient features of the Romano-British house. By means of a series of block plans he indicated the development of a typical house of the latter kind from the simplest form to one of considerable complexity surrounding a courtyard, and showed that the planning of the Romano-British was fundamentally different from that of the Pompeian. He then illustrated this point by a series of plans of

actual houses, beginning with several Silchester examples. *En passant*, he paid a high tribute to the explorers of Silchester and Caerwent, remarking that they digged for "plans," not for "plans." Silchester, he said, had revolutionised our views of the Romano-British houses, and he referred with high praise to the illuminating remarks upon their character by Mr. George E. Fox (one of the directors of the former exploration). Mr. Ward pointed out that in its simplest form the Romano-British house consisted of a row of rooms bordered on one side with a corridor, which provided a means of access to these rooms. He considered that the corridor was an external adjunct, carried as high or but little higher than the first floor of the main block. This block, he showed, constituted the nucleus in the more complex houses. While he regarded the nucleus as of two stories, he was inclined to think that the various outshoots were of a single story on the whole. He strongly advocated the use of models of the remains of Roman buildings in museums, and pointed out the excellent work in that direction in the Reading Museum. More could be learned from the model of a house than from an assemblage of broken pottery and fragments of metal found on its site. What, he asked, would anyone learn of a Tudor house from a Tudor candlestick taken from it?

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday, the 5th inst., Mr. Maurice Wilson, President, in the chair, a paper was read on "Submerged Chain Cable Groynes," by Mr. R. G. Allanson-Winn, of which the following is an abstract:—In his opening remarks the author stated that this paper had been prepared with the view of describing the chain cable groyne and its uses, and he dealt with the difficulties often experienced in securing examples to put sufficient life and force into a theory to secure its comprehension and acceptance. The author then urged on all young members of the profession the importance of not only learning all they can from books recording the experiences of others, but of using their best endeavours to make their knowledge their "very own," by efforts to gain what he termed unaided solutions to troublesome problems. By that means they might avoid the danger of sliding into ready-made grooves, and quenching their own originality. The following are the main features of the author's chain cable groyne:—To a heavy chain cable are attached bushes or other suitable obstructions, until the chain is converted into a veritable flexible hedge. When used on the visible shore the chain is strongly pinned down to the shore by iron bars of piles, and is laid in deeper water from low-water mark by paying out from barges or lighters. When the flexible hedge or groyne has been placed in position, seaweed and other travelling material collects in and around the hedge, and the obstruction begins to cause a slowing down of currents and to encourage the deposit of all kinds of detritus. Dealing with the practical question of the areas which may come under the influence of groynes, the author took for example an average shore, on which the horizontal distance between high and low water marks was 600 ft., and the distance from low-water mark to the five-fathom line was one mile. Here it was easy to realise what a large area of the invisible shore was being influenced by currents and waves, compared with the visible area exposed to the sea's action with every tide. Taking 100 ft. of frontage, he said, we saw 60,000 sq. ft. of exposed shore acted on by visible agencies, but when it came to the same width of the invisible sea bottom, constantly exposed to the unseen movements beneath the surface, we had an area of 528,000 sq. ft. over which we knew changes were taking place and material travelling possibly in vast quantities. Reference was here made to the condition of the Dunbar foreshore, and to the troublesome situation at Bray, a description of the groynes at the latter place being given. The reality of deep-sea erosion as the main factor to be reckoned with on the East Coast and elsewhere was enlarged upon by the author, who held that almost any form of low groyne securely held in position between, say, mean sea level and

a point in the deeper water in the offing—to be decided upon by the particular circumstances of the case—would arrest and bring about the retention of large masses of travelling material and the covering up of exposed surfaces. Quotations were given from various recent articles and letters referring to the origin and utility of low groynes, and the conclusion of the paper was devoted to a description of various sections of the East Coast sea bed, taken over certain lines from charts dating back to 1824, and in one case even to 1806, the comparison of the older sections with those of the present day fully bearing out the author's contention as to the deep-sea erosion, and consequent advance of deep water landwards.

COMPETITION.

HACKNEY CENTRAL LIBRARY.—The awards of the assessor (Mr. J. W. Simpson, F.R.I.B.A.) in the Hackney Central Library competition was made known on Monday; 152 designs were submitted. First place was given to No. 26 "for its excellent and economical planning and generally satisfactory design." The assessor continued:—"I have checked the author's calculations of cost, and am of opinion that the design can be executed for the sum stipulated in the conditions. The second place I award to No. 23 for a very good plan and picturesque elevation. I place third No. 140, who submits a design which is in many ways admirable. The following designs may be mentioned as meritorious:—Nos. 6, 22, 32, 45, 49, 53, 55, 58, 67, 71, 86, 100, 128, 134." The Libraries Committee, in its report upon the competition, says:—"The assessor regards the competition on the whole as a successful one, many of the designs being of considerable excellence. Every drawing submitted was examined by the assessor personally, and every report read. Full consideration was given to all, however inadequately presented, and their merits carefully marked as far as possible. The designs are to be exhibited in the swimming baths for members of the Borough Council only this week. From the 12th to the 17th inst. they will be on view for competitors and the public generally. The sealed envelopes containing the names of the competitors are not to be opened until the Council has definitely decided the appointment."

Books.

Lockwood's Builders', Architects', Contractors', and Engineers' Price Book for 1906. Edited by FRANCIS T. W. MILLER. (London: Crosby Lockwood & Son. 1906.)
Laxton's Builders' Price Book for 1906. Originally compiled by WILLIAM LAXTON. Eighty-ninth Edition. (London: Kelly's Directories, Ltd. 1906.)

THESE two works, which can now be considered the standard books of reference on the subject of builders' prices, keep abreast of each other in completeness and the excellence of their contents, and form a good example of the beneficial effects of healthy competition. The position that both have taken in the building world for some years past is due largely to the greater attention to the rise and fall of the markets given in the later issues than was the case some years ago, when the editors of both seemed satisfied to republish the same prices and information (often misleading) year after year, until the suggestion of referring to a price book provoked a smile. Happily, these days have passed, and, so far as it is possible for any price book to be of value in practice, these works meet the demand.

The position of the building trade for the past twelve months has remained practically stationary, and, as everyone interested trusts, at its lowest point, consequently the work of revision has been light. Strangely, "Lockwood," which in the preface notes a slight upward tendency, apparently considers it so "slight" as not to warrant a rise in pricing, while "Laxton," which does not mention this "upward tendency," shows a slight increase—a very slight one—but sufficient to show that the editor has not been idle. While everyone wishing to build is anxious for low prices, the fact remains that the state of the building trade is a fair indication of the

prosperity or otherwise of the country; it is therefore to be hoped that before the next editions are published the editors will find plenty to do in a general revision.

Both works give a reprint of the London Building Act, reports of law cases, conditions of contract, and other miscellaneous information; while "Lockwood" is brought up to date with the Amendment Act of 1905.

Valuations and Compensations for the Use of Architects, Surveyors, etc. By Professor BANISTER FLETCHER, F.R.I.B.A., etc. Third Edition. Revised and Rewritten by BANISTER F. FLETCHER and H. PHILLIPS FLETCHER. (London: B. T. Batsford, 1905.)

The revision and rewriting of this work is obvious to anyone who has studied the earlier editions, while the call for a third edition is a commentary upon the varied practice of an architect—or ought it more properly be that of a surveyor, the practice of architecture as an art being far removed from such prosaic subjects as valuations and compensations? In addition to two of the editors being F.S.I.'s (and one of them a barrister-at-law in addition), the preface refers to three more who have had a hand in the work, which for its size is one of the most complete reference books on these subjects.

The authors have strengthened their advice and information by giving references to former decisions in numerous cases. Especially useful is Chapter III., dealing generally with points to remember in making out a claim, as also is Chapter VII., on procedure—that bugbear to so many professional men, however well qualified they may be to deal with the question of valuing. This chapter deals with almost every prospective difficulty, and, moreover, treats of the question of "latent value" and that much-vexed question of "betterment." In the appendix are given many useful tables, and we have no hesitation in commending the work to anyone who may be called upon to formulate a claim for compensation, or who may have to value property for any other purpose.

The Cathedrals of England and Wales. Second Series. By T. FRANCIS BUMPUS. (London: T. Werner Laurie, 1906.)

THERE have been in recent years so many books and details published of our cathedrals that it may be questioned whether a further book on the subject was needed. The subject will, however, always be a fascinating one for both writer and reader, and the author has brought together from actual observation and former writers a number of facts and details relating to the cathedrals which are included in this, the second volume of the series. Eight cathedrals are described—Canterbury, York, St. Paul's, Winchester, Norwich, Peterborough, Exeter, and Wells. The illustrations are reproduced entirely from photographs, many of them excellent. A view of the interior of the choir of St. Paul's before the mosaics were inserted is interesting as a record, and there is a good view of the interior of the nave at Norwich. The distant view of the Wells from the south-east is one of the most effective points from which this building can be seen, but within a volume of this size it is not possible to attempt anything like an adequate account or illustration of so large a subject. A considerable list of authorities quoted is given at the end of the book, which is capably printed throughout, and will doubtless be a popular publication.

The Year's Art: 1906. Compiled by A. C. R. CARTER. (London: Hutchinson & Co., 1906.)

This useful publication fully keeps up its standard of information as to the artistic events of the past year, and is supplemented by a short critical article by the Editor which contains more of judicious criticism, especially in regard to the recent idolatry of Whistler and Manet, than we generally find in current writing about art. The illustrations to this year's issue consist of a good reproduction of the "Venus" of Velasquez; portraits of Mr. Thomas Brock, Sir Aston Webb, and the late Robert Brough; and a sketch of a little girl under the title "Tired," which was exhibited by the Royal Drawing Society last year, and was a drawing from

life by Beatrice Hirschfield, a child of eight years old. As such it is most remarkable, and was well worth introducing, as an encouraging example of what can be done by young children drawing with the object before their eyes.

For those who do not know "The Year's Art" it may be mentioned that its permanent contents include lists of the chief pictures in our permanent art galleries; information as to art institutions in London; records of the main artistic events in Great Britain and the colonies; lists of the art sales of the year and the engravings published; a directory of artists and art workers; a list of private art schools; and other useful information and records.

The Champagne Standard. By Mrs. JOHN LANE. London: John Lane, 1906.

THE meaning of the title of Mrs. Lane's pleasant and attractive book is that it is a protest, in the first instance, against the evil of show and extravagance in daily life—keeping dinner-parties (and everything else) up to "the Champagne standard," whether one can reasonably afford it or not. This is the subject of the first chapter, and gives its title to the book, which in a general way would hardly come within our province; but Mrs. Lane, who we gather is an American by birth, has some trenchant and amusing criticisms to make on house architecture and arrangements in England, which she finds very inadequate and primitive in some points, compared with American houses.

There is, in the average house, no dinner-lift; there are no speaking-tubes to save servants running up and down stairs; the plumbing is "clumsy and inadequate"—"in America it would be pretty and nickel-plated, resisting the action of the air, and easily kept clean." There is a want of contrivance of cupboards and other recesses, for which she blames the English architect, and suggests, in a chapter on "Women as Architects," that women would plan houses much more conveniently than men. There is some truth in all this, though we should be inclined to think that the author has been a little unfortunate in her architect; she might certainly have found some who would not have overlooked the things she mentions. In illustration of "the remarkable progress in America in all the applied and domestic arts within the last ten years," it is mentioned that when they desired to put away the funeral chimney pieces from a Victorian house, they could get no wooden mantel-pieces but what were expensive and clumsy, and had to go to New York to get those which were artistic and cheap. Of the average wooden chimney piece sold in England this would be true enough; but it is possible nevertheless to get the right thing in England, if you know where to go for it. However, Mrs. Lane's criticisms are both piquant and good-natured, and are worth attention.

BOOKS RECEIVED.

WHERE TO LIVE ROUND LONDON (Southern Side). Edited by Prescott Row. (The Homeland Association, 1s.)

MODERN MILLING MACHINES. By Joseph G. Horner, A.M.I.Mech.E. (Crosby Lockwood & Son.)

A MANUAL OF COSTUME AS ILLUSTRATED BY MONUMENTAL BRASSES. By Herbert Druitt. (The de la More Press, 10s. 6d.)

PAPERS OF THE BRITISH SCHOOL AT ROME. Vol. III. (Macmillan & Co., 50s.)

BUILDING CONSTRUCTION. By Professor Henry Adams, M.Inst.C.E. (Cassell & Co.)

TRADE CATALOGUES.

We have received from the Leeds Fireclay Company a large and well-bound catalogue of nearly 600 pages, containing more than a thousand illustrations (chiefly half-tone) of the most important manufactures of the associated firms, together with prices and other particulars. The catalogue is divided into twelve separately pagged sections, namely—I, Glazed bricks, tiles, partitions, etc.; II, Burmantofts terra-cotta and faience, including illustrations of some important works carried out from the designs of well-known architects; III, "Imperial" porcelain baths with the necessary fittings; IV, Cliff's "Imperial" porcelain lavatory

basins and Oates & Green's lavatory basins and drinking fountains; V, sinks for domestic use, sloop-sinks, etc.; VI, wash-tubs; VII, urinals; VIII, water-closets, both single and multiple, wash down and siphonic; IX, Oates & Green's waste-water-closets; X, hospital and laboratory fittings, including surgeons' lavatories, bracket closets, sloop-sinks, post-mortem tables, laboratory sinks, etc.; XI, stable and farm fittings with glazed-ware mangers, hay-racks, cattle troughs, etc.; and XII, drainage specialties, including pipes, traps, gullies, channels, inspection-eyes etc. The catalogue is a very comprehensive one, and in nearly all cases the sections on sanitary fittings are divided into two parts, one giving illustrations and prices of the unfitted goods and the other of the same goods fitted complete. Separate illustrations and prices are given of the various accessories. Architects and builders will certainly find the catalogue extremely useful.

Messrs. A. & P. Stevens send us their catalogue of electric, hydraulic, and other lifts in the form of a tastefully-produced quarto volume, consisting for the greater part of full-page illustrations and brief descriptive notes. As modern lifts have usually to be specially adapted to prevailing conditions, comparatively little value attaches to a price-list of such apparatus, and in the case of this firm the object of a catalogue is evidently to place before interested readers a general idea of the machinery and fittings supplied, with the view of eliciting correspondence leading up to the preparation of exact specifications and estimates suited to stated requirements. Four distinct types of electric lifts are illustrated, namely—Passenger-lifts of the under-driven drum type with car switch control, the overhead geared drum type with rope control, and push-button controlled lifts, and goods lifts with friction-drive and rope-control. Hydraulic lifts are still more fully illustrated, the examples selected covering practically every type of passenger and goods lift in ordinary use, while belt-driven and hand-power lifts are briefly described. The remaining pages of the book are devoted mainly to the illustration of steam and belt-driven pumps, hydraulic pumps, accumulators, intensifiers, control valves, wrought-iron lift cars and enclosures; and they also include a drawing of a useful hydraulic crane with hydraulic lifting and slewing gear.

Messrs. Wilmer & Sons have sent us a copy of their general catalogue, containing illustrations and prices of fire-grates (including Bond's patent stove without front bars), fire-chimneys, mantles, baths, water-closets, lavatories, manhole covers, stable fittings, rain-water pipes, soil-pipes, builders' hardware, etc. It is somewhat surprising that a catalogue of eighty-eight pages, containing illustrations of such a varied assortment of goods, has been sent out without either index table of contents. From the same firm we have also received a priced catalogue of slate and marble slabs, slate cisterns, drain-pipes and channels, paving bricks, copings, roof and floor tiles, finials, etc. The table of contents is useful.

The Simplex Couduit Co. send us illustrations and description of their electric shade tilter a contrivance for tilting the lamp and shade of a hanging electric light in the direction in which the light is specially required. The action, so far as we can judge from the drawings, is very simple and is contrived so that the shade will maintain its position at any angle at which it has been placed. A flexible wire with extra length for adjustment to different positions is required.

Correspondence.

THE SURVEYORS' INSTITUTION.

SIR,—I am much obliged to you for inscribing my remarks on the discussion following my father's paper last week, but should like to point out that these do not represent my official reply, which will be printed later in the "Professional Notes" of the Institution. H. J. LEANING.

PORCHES AND APPROACHES.

SIR,—The illustration of the very interesting city gateway given on page 237 is wrongly described. It should be "the Amsterdam Gate,

Haarlem." I saw it only in 1884 and, if I remember right, it is the last one of the Haarlem gateways that has not been destroyed.

JOHN NEWNHAM, A.R.L.B.A.

* * * We had an impression at the time that it did not look like anything at Amsterdam, but in our friend Mr. Bagallay's paper it was clearly stated "The Haarlem Gate at Amsterdam" (see page 228), and we therefore assumed that he was correct. It was evidently a slip of the pen.—Ed.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—IX.

APPROXIMATIONS.

WHEN dealing with contracted methods of multiplication and division we called attention, on p. 147, to the relatively small value of the figures in the tens, and hundreds places in large numbers. Of course, in many cases the actual value of the right-hand figures of a number may be of much importance. This is more particularly so in commercial than in technical calculations of practical character, and the consideration to be paid to the figures representing units, tens, and hundreds must depend largely upon the magnitude and value of the units represented by any number in question. For example, it might not be wise to accept approximations if sovereigns or 5s. notes were treated as units, although approximate methods might be permissible in the case if the units were farthings or pence.

Nevertheless, for the purposes of an estimate for works to be executed involving hundreds or thousands of pounds, a few pounds are obviously of little importance, because so many unforeseen contingencies are invariably involved as to preclude any reliable prophecy as to the actual cost of the works.

An architect or an engineer who has to give his client an idea of the amount likely to be required for the execution of a given project never dreams of measuring the cost to a nicety.

Similarly, if contracting firms really calculate every item in minute detail, they usually add a purely empirical margin for contingencies. Tenders submitted are very often brought out to shillings and pence, not as the result of calculation, but for the purpose of effect. Sometimes a little is deducted from and sometimes a little is added to the calculated amount.

If the estimated total were 3,005*l.*, for example, the contractor would very probably make his tender, say, 2,999*l.* 15*s.* 6*d.*, so as to bring the amount below 3,000*l.*, and in the hope of being a few pounds below other competitors. Or if the total came out at, say, 2,975*l.*, a few pounds might be added for luck and a few shillings and pence for decorative purposes, thus giving such a sum as, say, 2,985*l.* 16*s.* 9*d.*

The fact that harmless little devices of the kind exist is sufficient to show that approximations within judicious limits are quite suitable for contractors, as well as for architects, in some monetary calculations.

When we come to statistical computations, the value of approximate methods is even more evident.

For instance, in dealing with population and water supply it would be perfectly futile to take into account units, tens, or hundreds of persons in a large town, or thousands of persons in a large country, or to deal with tens or hundreds of gallons of water. The reason, of course, is that the available statistics of population are never correct except for the particular date on which they were compiled, and that the available supplies of water cannot be precisely guaranteed under all circumstances.

In practical work, measurements forming the bases of computations are rarely correct to more than three decimal places, and even when quantities have been measured with the greatest possible accuracy they are seldom correct to more than six decimal places. In other words this means that an ordinary measurement is sufficiently accurate if its magnitude is determined to within one-thousandth part, and that in scientific work it is generally sufficient to denote quantities within one-millionth part. Of

course, it will be understood that we do not here refer to the very delicate measurements that are now employed in some modern developments of physical science.

Recognising the fact that absolute accuracy in practical work is impossible and unnecessary, a good deal of time may be saved if judicious employment be made of approximate methods of calculation.

The permissible degree of approximation, as already stated, is a matter for discrimination, and may be roughly measured by the number of significant figures known to be accurate in any given quantity.

Examination of published records shows that the coefficient of elasticity of mild steel may be, say, 29,165,000 lb. per square inch under bending tests, 30,866,000 lb. per square inch under tension tests, and 37,050,000 lb. per square inch under compression tests. Yet no useful purpose could be served by taking into account the last six figures in any of these results in calculations relative to the probable resistance of a steel column or beam. In fact, only the first figure is of any practical value, and, as a general rule, the value of the coefficient of elasticity may be put at 30,000,000 lb. per square inch without the least risk.

Similarly if guidance be desired as to the effects of expansion and contraction upon steel or concrete structures, minute accuracy is of no real use. The coefficient of expansion is variously stated at values between 0.000056 and 0.0000665 for steel, and between 0.0000634 and 0.0000656 for concrete. In either case the value denoted by the last significant figure is very small, and for ordinary calculations an approximate coefficient will serve all practical purposes.

For the same reason approximations are generally accepted for various data employed in calculations relating to the strength of structures, and the practice is further justified by the fact that most determinations of the kind include purely hypothetical data, some of which are known to be more or less inaccurate.

When mathematical processes are conducted by students for the sake of acquiring facility in their use it may be advantageous to work out results with great nicety. But in practical work no benefit is derived from carrying results to several places of decimals, especially if, as often happens, the essential data are only correct to within 20 or 30 per cent.

In dealing with money it is very convenient to express shillings and pence in decimal fractions of a pound.

The following is a simple rule facilitating the conversion of all sums under 1*l.* into decimal parts of a pound:—

Rule.—After the decimal point write down the number of florins contained in the sum to be converted; next write down 0.025 for every sixpence in the remainder, and add 0.001 for every farthing in the final remainder. If the number of farthings is more than twelve add 0.001 more.

Example (1): Convert 17*s.* 8*d.* into a decimal part of a pound.

Here there are 8 florins = 8 × 2 = 16*s.*, 3 sixpences = 3 × 6 = 18*d.*, and 8 farthings = 2*d.*

So the decimal fraction is

0.000 = 16*s.* 0*d.*
0.075 = 18*d.* 0*d.*
0.008 = 0*s.* 2*d.*

Example (2): Convert 12*s.* 9*d.* into a decimal part of a pound.

Proceeding as before, we have

0.6 = 12*s.* 0*d.*
0.025 = 0*s.* 6*d.*
0.001 = 0*s.* 3*d.*

The foregoing rule gives results that are correct to the nearest farthing, which is quite accurate enough for practical purposes. If exact results were required it would be necessary to take into account the difference of value between a farthing, 0.0010415 + or 0.001 of a pound, and 0.001, or 1/1000 of a pound.

In practice a penny is the lowest amount that need be considered. Consequently the conversion of shillings and pence into decimals of a pound can be simplified by taking the next penny above or below the stated amount, and accepting 0.004 as the approximate value of each penny.

Then in example (1) we should have

17*s.* 8*d.* = 0.875
0.008

£0.885

and in example (2) either

12*s.* 9*d.* = 0.625 or 0.625
0.012 0.016
0.637 0.641

It should be remembered, however, that if a sum of money be multiplied by a large number the result may not be correct as to pence if fractions of a pound are only expressed to three decimal places.

The multiplication and division of other quantities can be simplified by the adoption of decimal fractions, instead of conventional subdivisions of various units of weight and measurement, in spite of the difficulties presented by the heterogeneous character of British weights and measures.

Among the most convenient decimal equivalents are those given in Table III. Table III.—Decimal Equivalents of Some Weights and Measures.

Avoirdupois Weight.	
1 lb.	= 0.000447 ton (roughly 0.00045).
28 lb.	= 0.0125 " "
56 lb.	= 0.025 " "
112 lb.	= 0.05 " "
Lineal Measure.	
1 inch	= 0.0833 foot.
1 foot	= 0.0001894 mile (roughly 0.00019).
1 yard	= 0.000568 mile (roughly 0.00057).
1 pole	= 0.025 furlong.
1 furlong	= 0.125 mile.
Surveyor's Lineal Measure.	
1 link	= 0.066 foot.
1 link	= 0.001 chain.
1 link	= 0.000125 mile.
1 chain	= 0.0125 mile.
Square Measure.	
1 sq. foot	= 0.111 sq. yard.
1 sq. foot	= 0.000023 acre.
1 sq. yard	= 0.0002962 acre (roughly 0.0003).
1 sq. yard	= 0.00000283 sq. mile (roughly 0.000003).
1 perch	= 0.00625 acre.
1 rod	= 0.25 acre.
10 sq. chains	= 10 acre.
1 acre	= 0.0015625 sq. mile.
Cubic Measure.	
1 cubic ft.	= 0.03704 cubic yd. (roughly 0.037).
Miscellaneous.	
1 gallon	= 0.16046 cu. ft. (roughly 0.16)—
1 lb. of water	= 0.1 gallon.
1 super foot of planking	= 0.01 square.
1 cubic foot of timber	= 0.02 load
1 sack of Portland cement	= 0.1 ton.
1 cask of Portland cement	= 0.16 ton.

Complete lists of decimal equivalents for all weights and measures are of great use to those frequently engaged in calculations, and so also are tables giving decimal equivalents for various fractions of yards, feet, and inches, of tons, hundredweights, quarters, and pounds, and of links reduced to decimals of a foot.

The following examples sufficiently indicate the application of approximation to the ordinary requirements of architects and contractors.

Example (1): Find the cost of 12 tons 3 cwt. 2 qr. 20 lb. of steel bars at 7*l.* 10*s.* 8*d.* per ton.

By the use of Table III, the weight is readily reduced to 12.184 tons, and by the rule for metric conversion of shillings and pence the rate per ton is reduced to 7.527.

Then 12.184 × 7.527 by the contracted method of multiplication (see Article V.) gives

12.184
257
85288
6092
244

91624 = 91.624

Inspection at once shows that this is equivalent to 91*l.* 12*s.* 6*d.*, an amount quite near enough for all practical purposes.

If worked by practice the process would be far more complicated and tedious, as follows:—

4 s. d.
7 10 5 = value of 1 ton.
12

90 5 0 = value of 12 tons.
2 cwt. = 1/10 of 1 ton ... 15 0 5 = value of 2 cwt.
1 qr. = 1/4 of 1 cwt. ... 7 8 2 = value of 1 qr.
2 qr. = 1/2 of 1 cwt. ... 3 9 1 = value of 2 qr.
14 lb. = 1/4 of 2 qr. ... 11 2 = value of 14 lb.
6 lb. = 1/4 of 14 lb. ... 4 8 = value of 6 lb.

£91 12 7 8

The extra trouble here involved is certainly not repaid by the discovery that the value of the material is 1*s.* 6*d.* more than that calculated by the approximate method.

Example (2): Find the value of 2 roods 6 perch. 54 sq. yds. 42 sq. ft. of land at 67*l.* per acre.

By the use of Table III, the area is readily reduced to 0.5387576 acre. Then by the contracted method of multiplication we have

53876
676

362344
37712

360956 = 360.956

This result is at once shown by inspection to be

360l. 15s. 1d. If worked by practice the process would be as follows:—

	c	s.	d.	=	Value of			
670	0	0		=	1 acre.			
2 roads	=	$\frac{1}{4}$ of 1 acre	...	335	0	0	=	2 roads.
5 perches	=	$\frac{1}{16}$ of 2 roads	...	20	18	9	=	5 perches.
1 perch	=	$\frac{1}{16}$ of 5 perches	...	4	3	9	=	1 perch.
21 sq. yds.	=	$\frac{1}{16}$ of 1 perch	...	7	7	3	=	21 sq. yds.
21 sq. yds.	=	$\frac{1}{16}$ of 1 perch	...	7	7	3	=	21 sq. yds.
41 sq. ft.	=	$\frac{1}{16}$ of 21 sq. yds.	...	1	4	4	=	41 sq. ft.

£360 19 1

Example (3). Find the cost of 546 sacks (each containing 2 cwt.) of Portland cement at 2s. 2s. 7d. 6s. 7d. per ton.
By Table III, the weight of the cement is 546 tons, and the rate is 2s. 2s. 7d. Then by the contracted method of multiplication we have

2125
10625
6375
1275
11603=116 03

This result is at once shown by inspection to be 116l. 0s. 0d. If worked by practice the process would be as follows:—

First we should have $546 \times 2 = 1092$ cwt. Then the rate 2s. 2s. 7d. = 2s. 14d. per cwt.

	c	s.	d.	=	cost at 1l. per cwt.
1,092	0	0		=	cost at 2s. per cwt.
2184	0	0		=	cost at 1½d. per cwt.
£116 0 6					

In connexion with all approximate calculations it is important to remember that the number of correct figures in the product of two approximately correct factors is not always so great as the number of correct figures in either of the factors. The degree of accuracy depends upon the relative number of figures in the multiplicand and the multiplier, and upon the value of the figures themselves.

For example, $106 \cdot 3245 \times 2 \cdot 5167 = 267 \cdot 56686915$.

(a) Then by taking three figures in the multiplicand and two figures in the multiplier we get the result correct to two places only; for

$$106 \times 2 \cdot 5 = 265 \cdot 0$$

Similarly, four figures in the multiplicand and three figures in the multiplier only give the result correct to two places; for

$$106 \cdot 3 \times 2 \cdot 51 = 266 \cdot 84$$

(b) By taking four figures in each factor we get the result correct to three places; thus

$$106 \cdot 3 \times 2 \cdot 516 = 267 \cdot 44$$

(c) Again, five figures in the multiplicand and four figures in the multiplier give the result correct to four places; for

$$106 \cdot 32 \times 2 \cdot 516 = 267 \cdot 54$$

If only four places in the product need be correct it is useless to use more figures in the factors than above, as the following results show:—

$$106 \cdot 324 \times 2 \cdot 516 = 267 \cdot 5114$$

$$106 \cdot 3245 \times 2 \cdot 516 = 267 \cdot 5124$$

$$106 \cdot 32 \times 2 \cdot 5167 = 267 \cdot 5754$$

(d) By taking six figures in the multiplicand and five figures in the multiplier we get the results correct to five places; thus

$$106 \cdot 324 \times 2 \cdot 5167 = 267 \cdot 584$$

These workings show that the number of correct places in the product is sometimes the same as and sometimes less than the number of correct places in the multiplier. Hence to obtain results correct to one decimal place it may be necessary to employ five decimal places in the two factors.

THE BUILDERS' EXCHANGE, BIRMINGHAM.

At the Builders' Exchange, Birmingham, on the 1st inst., Mr. J. Miller Carr delivered a lecture on "Architectural Ceramics." Mr. John G. Dunn was in the chair. In the course of his lecture, which was illustrated by a number of cartoons and specimens of artistic pottery for building purposes, Mr. Carr said there were in Birmingham a number of important examples of the use of the ordinary colours of terra-cotta in buildings. He complained, however, that during the last five years, and especially during the last three years, Birmingham had not, in the matter of decorative architecture, acted up to its motto of "Forward." There had been such feverish anxiety in all the more important buildings to make the work cheap that they had omitted to make it nice, and had not attained to that desirable quality expressed by the French word *distingué*. As far as architectural ceramics were concerned Birmingham had only touched the hem of the garment. Dealing with new uses to which terra-cotta might be turned, Mr. Carr said that some years ago he was asked if he could not

apply the methods of manufacture of slab mosaic to the purpose of putting a representation of Warwick Castle on to an old wall about 30 ft. by 15 ft. He at once replied that it could be done with striking effect, and, in order to carry out the idea, he put a tracing over a steel engraving of the castle, subdued all the worrying details, and expressed the subject by just a few broad fields of colour separated by broad outlines. The lecturer gave instances of other directions in which this principle might be applied. By the use of simple means coupled with artistic designs it was possible to express in a permanent and architectural way on the exterior of a building the purpose of any kind of manufacture or business that might be carried on within. Had they not got nearly tired of the vulgar attempt to shout each other down on the part of shopkeepers by each striving to put larger letters across his front than his neighbour could? After all, the shopkeeper only proclaimed his name, but it would be much better if he could make his building itself to declare his craft. The walls of many of the principal hospitals in the country had within the last few years been enriched and rendered almost vocal by illustrations of various nursery rhymes painted on the tiles. The primary object in such cases was to tell the story effectively, but still to do it in such a way that the panel should be manifestly a part of the wall. Concluding, the lecturer did not deny that Birmingham had progressed architecturally. He remembered the Birmingham rickshaws which existed twenty-five years ago when Corporation street now stood, and Birmingham was, indeed, a fine city, but it was only a body—well laid out and compact. If it could attain to the dignity of a soul, what possibilities there were! The city might be the Venice of to-day. There was no need to go to Italy for marble or to Venice for glass. Birmingham has far richer colours at its command, and in wares that would stand the local climatic conditions better than anything brought from abroad.—On the motion of Councillor Tonks, seconded by Mr. J. C. Nicol, a very cordial vote of thanks was passed to Mr. Carr.

NOTTINGHAM MASTER BUILDERS' ASSOCIATION.

SOME sixty members and friends of the Nottingham Master Builders' Association dined at the George Hotel, Nottingham, on the 2nd inst., on the occasion of the annual dinner. The President for the year, Mr. F. H. Fish, occupied the chair at the dinner, and was supported by the Mayor of Nottingham (Councillor Arthur Cleaver), Sir John Turney, Mr. W. D. Pratt, Mr. E. R. Sutton, Mr. A. S. Smith, of Birmingham (hon. secretary of the Midland Centre of the National Federation), and Mr. R. Weston (President of the Derby Association), and others. The loyal toast was honoured, Mr. H. Vickers proposed "The Mayor, Magistrates, and Corporation," and the Mayor briefly replied.

Mr. Jas. Wright submitted "The Architects and Surveyors." The Royal Institute of Architects, the Builders' Institute, and their own federation had, he said, produced a recognised form of contract, which was believed to be a reasonable, businesslike, and equitable document, and it was very desirous that this should be generally adopted. The questions of prime costs and of specialists outside the builders' jurisdiction wanted careful handling. It had become a very general practice for specialists to be appointed by architects to carry out such works as the construction of steel floors, concrete and wood-block floors, and other works; these specialists came on to the work without notice to the builders, and treated the latter as interlopers, when, after all, it was the builders who were responsible for the contracts. They accepted the position of introducing the specialists, but he thought that notice should be given to the builders and that the specialists should be treated as sub-contractors. That was provided for by the form of contract which he had mentioned, and he hoped to see it adopted.

Mr. W. D. Pratt, in reply, said that education was the question of the hour, and he was glad to know that everyone connected with the architectural profession was using every endeavour to make himself conversant with all that was necessary for the profession. He hoped, too, that builders and workmen would take their share of would urge their apprentices, and pupils, and the men under their care, to take advantage of the great opportunities that were now offered by the University College and School of Art in acquiring technical knowledge that they did not acquire in the workshop. They would all benefit if the workmen would take pride in their work, Mr. J. W. J. Barnes and Mr. E. R. Sutton also responded.

Ald. Sir John Turney proposed "Success to the Builders' Federation." For the past thirty years, as chairman of the Works and Ways Committee, he had met not only architects, but builders, and he always fancied that there were no differences between them. He supposed that

the building industry, with the allied trades, was perhaps the second industry in the country. There were over half a million people engaged in the work, they paid more than 74,000,000 a year in wages, and invested in their undertakings was a sum of upwards of 150,000,000. Many people could scarcely realise the magnitude of such an undertaking. They were engaged in building up big cities and towns, and though he admitted that the men who found the money had a good deal to do with it, the builders and architects were, after all, practically responsible for the work, for the appearance of the town, and the character of the work in it. Every consideration, therefore, should be given to the men who undertook such work, and they in their turn should strive to do their duty. He was afraid that some of the builders never knew when the price was low enough. He had had some rather peculiar tenders before him, and he was sure some people seemed to think it was a great honour to work for a Corporation, but the Corporations did not want things at less than cost price. They were prepared to give money for value, but expected value for the money they gave.

A. S. Smith said that employers were beginning to think themselves overpaid for labour in the recent elections protracted? For some years past they had considered that they stood in a favourable position towards trade unionism, because of the common-sense judgment of the late Lord Chancellor in the Taff Vale case. They might have said "Now is our time to go for unionists, but if the Government had not gone further and established in many parts of the country—they hoped to see them established in all parts shortly—Conciliation Boards, with the object of preventing strikes and lock-outs, and settling all disputes. They had, indeed, tried in every way to conciliate rather than irritate the workers. But if the spirit of amity was to be shown, and employers were to be made the target and butt because they were capitalists, he was afraid that those who had money invested in business would be compelled to withdraw it. The Trades Disputes Bill, which sought to place trade unions above the common law of the land, was class legislation of perhaps the worst possible kind, and would bring evil instead of good. Mr. R. Weston also replied. Mr. T. Barlow toasted "The Visitors," for whom Mr. J. Sander and Mr. F. W. Amphlet responded.

THE REGISTRATION AND TRAINING OF PLUMBERS.

A CONFERENCE of representatives of municipal, educational, and labour interests, convened by the Plumbers' Company, was held on Wednesday last week, at the Guildhall to consider the question of the registration and training of plumbers and other skilled workers. Lord Selby presided. The Chairman said that they had met to discuss matters connected primarily with the efficiency of that trade, but also to consider how to improve the efficiency of the workers in other trades. The methods by which it was sought to obtain that result were principally the registration and technical education of the workmen. The Bill for the registration had passed the second reading, but it had never got so far as the third reading stage. With regard to the apprenticeship question, it might be that a period of seven years was too long in view of the superior education that a lad received in these days. Apprenticeship should be coupled with a continuation of education in technical schools during some part of the day or in the evening.

Mr. W. D. Caröe, Master of the Plumbers' Company, said that the Plumbers' Company, in doing what they could for the plumbing trade, had no "axe to grind." They were prepared to lend their influence and to spend their money for the purpose of improving the craft, just as other City Companies devoted their time and money to establish and maintain technical institutions of various kinds. The three things which they had in view were the education, the examination, and the registration of plumbers, and in all they had done they had had the hearty support of the men themselves. The central office, as it were, of the movement was the office of the Plumbers' Company, but they had district councils in all parts of the country affiliated to them, who held examinations of their own, and whose successful candidates were accepted for registration by the Company. The examinations were practical as well as theoretical. It had been borne in upon him, as an architect, that the only real system of training for craftsmen was that of apprenticeship. The work which was done in the past had been done in a very haphazard manner, and was seldom equalled. It was surprising to see, as he often had seen, work done thirty or forty years ago in

restoring old buildings falling into decay, whereas the work of 600 years ago was perfectly sound. It was marvellous to observe the way in which in the XVth and XVth centuries, particularly in Spain, the small technicalities of dealing with masonry were carried out without the slightest effort apparently, and yet always right. Architects nowadays had to give workmen a drawing for all those things. It was important that the working man should be educated to use his brains, and not be merely a machine to carry out drawings. The only sound work which could be accomplished was work to which some definite tradition was attached, and he believed that tradition could be acquired and passed on from one to another only through the responsible training which the apprenticeship system made possible.

Dr. Macnanaara, M.P., proposed a resolution expressing the opinion that the time had come when a more systematic training than had hitherto prevailed among the industrial workers of this country was imperatively required, in order that our skilled trades might maintain and increase their efficiency, and so hold and improve their position in face of the prevailing conditions of modern commercial and industrial competition. Referring to the 200,000 boys in England and Wales who in the fourteen years of age which they left school every year and were obliged to start work at once at a small wage owing to the poverty of their parents, he said that after a few years they were thrown on the labour market without any skilled capacity, and helped to swell the ranks of the unemployed. He advocated the provision of maintenance scholarships for these boys, equal to their actual wages, with a view to their being trained to follow a trade.

Mr. Bostell seconded the resolution, and after considerable discussion, in which Mr. Jowett, M.P., Mr. Priestley, M.P., Mr. Hooper, M.P., Dr. Crawford, and others took part, the resolution was carried.

The committee was appointed to consider the conclusions arrived at by the conference and to report to an adjourned meeting.

COURT OF COMMON COUNCIL.

THE Lord Mayor presided at a meeting of the Corporation held at the Guildhall on Thursday last week.

Bishopgate-street Improvement.—In reply to a question, Deputy Sir George Woodman said that an effort was being made to persuade the London County Council to reconsider their decision in connexion with the proposed widening of this street, and to induce them to contribute to the cost, on condition that the improvement was carried out.

Sir Christopher Wren's House.—Mr. Deputy Sayer moved that the consideration of the desirability of purchasing the stone steps belonging to the school-house which project into Love-lane, Eastcheap, and also the projecting front of No. 14, Love-lane, for the purpose of widening this thoroughfare, should be referred to the Improvement Finance Committee, which was agreed to.

The Lord Mayor laid before the court a letter which he had received from the President of the Local Government Board enclosing a letter from Mrs. S. Arthur Strong on this subject. The building, the letter stated, was an excellent example of XVth century architecture, containing some finely-carved chimney-pieces and handsome panelings and ceilings. These decorations had been removed preparatory to the house being demolished. Mrs. Strong appealed to the President of the Local Government Board to use his endeavours to secure the house to the nation as a public museum or for some similar purpose. In the discussion that followed, Mr. Rome expressed the hope that immediate steps would be taken to preserve the building, while Mr. Lile advised caution, reminding the court of the "historic" building in Fleet-street recently restored by the London County Council. The communication was referred to the Library Committee.

Paving Works.—The following recommendations of the Streets Committee for paving works required during the year were agreed to—

"That the carriageway of Aldermanbury-avenue be laid with asphalt at an estimated cost of 1907.

"That the footways of the undermentioned streets be laid with asphalt at an estimated cost of 9000, viz.—
Finsbury-pavement west side (Short-street to Popemaker-street).

Shilt-street (half east side).

Farrington-street (both sides from Ludgate-circus, half way to Plumtree-court).

Ludgate-circus, north-east and south-east pavements.

That the footways of the undermentioned streets be relaid partly with new and partly with the existing York stone at an estimated cost of 1,0300, viz.—
West side, Smithfield, west side (Giltspur-street to Long-lane).

London wall (Moorgate-street to Blomfield-street), relaid with existing York stone, the deficiency being made good with the best of the old York from the streets where asphalt is to be substituted, at an estimated cost of 1,0300.

Farrington-street (both sides from the end of the asphalt to Plumtree-court).

Biliter-street (half east side).

That the carriageways of the undermentioned streets be relaid with asphalt at an estimated cost of 10,6000, viz.—

London-wall.

Chapsald.

Finsbury-pavement.

Moorgate-street (London-wall to Telegraph-street).

That the carriageways of the undermentioned streets be repaved with cressed wood blocks at an estimated cost of 1,3900, viz.—

Old Bailey.

Plumtree-court.

For altering the line of footway pavement in London-wall, between Moorgate-street and Blomfield-street; and that the necessary works be carried out at an estimated cost (exclusive of the repaving) of 7500, for diverting pipes, etc.

That the contract with the Val de Travers Asphalt Company, for maintaining the carriageway pavement of Mansell-street, be extended for a further period of one year at 1s. 6d. per yard super per annum, being the same price as the existing contract.

Underground Conveniences.—The same committee were authorised to expend 1,6000, on the provision of additional lavatory basins and for accommodation for women at the conveniences in Aldgate High-street and Bishopgate-street Without.

Milan Exhibition.—The Library Committee were empowered to make arrangements for an exhibit from the Corporation to the International Exhibition at Milan, with instructions to confer with those committees controlling suitable objects for exhibition.

Ventilation.—The General Purposes were authorised to spend 2000, in improving the ventilation of the Egyptian Hall at the Mansion House.

OBITUARY.

MR. J. PRICE.—Mr. John Price, City Surveyor of Birmingham, died on the 6th inst. at Burnham, Somersetshire, where he had gone for a short rest. Mr. Price, who was in his fifty-first year, was educated at Sandbach School, Manchester Grammar School, and the Victoria University. In 1871 he entered the office of Mr. Hartley Watson, a civil engineer, of Manchester, and was engaged in a number of important engineering works. In 1884 he became engineer and surveyor to the Toxteth Park Local Board, but upon that district becoming absorbed in the city of Liverpool he was appointed assistant city engineer. In 1896 he went to Birmingham as City Surveyor and deputy engineer to the Tame and Rea Drainage Board. Since his appointment Mr. Price had carried out a number of important works in the city. He was a member of the Council and of the Board of Examiners of the Incorporated Association of Municipal Engineers, a member of the Institution of Civil Engineers, and a Fellow of the Surveyors' Institution. He had served as President of the Birmingham Association of Engineer Students, and he was a vice-president of the Municipal Officers' Association. Mr. Price leaves a widow, one son, and two daughters. Sympathetic reference to the death of Mr. Price was made at the meeting of the Birmingham City Council. The Lord Mayor said that every member would be sorry to hear of the death of the City Surveyor after a short acute illness, and he would move "That the Council express its deep regret at the sudden death of Mr. John Price, the City Surveyor; it records its appreciation of the ability and energy displayed by him in the duties of his office; and it respectfully tenders to Mrs. Price and her family its sincere and heartfelt sympathy in their great bereavement." Mr. Price, he reminded the Council, was appointed City Surveyor in 1896, and all who were brought in contact with him must have been struck by his unbounded energy and devotion to the interests of the Corporation. Alderman Cook seconded the resolution, which was carried in silence, the members standing.

GENERAL BUILDING NEWS.

BAPTIST CHURCH, HULL.—The new Baptist church on the Beverley-road was opened on the 22nd ult. The church occupies a site at the corner of Trafalgar-street, and the buildings are "in a late period of Gothic freely treated." A gable, flanked on one side by a turret and on the other by a tower, terminating in a cupola and spirelet, gives prominence to the block. A lych gate forms a feature in the front. Internally the church is divided up into nave and aisles by a tracied timber arcade. The seating, which is of fumed oak, and has curved seats and backs, and tracied and carved pew ends, is semi-circular on plan. The pulpit and platform furniture are of fumed oak, and tracied and carved, the whole having been designed by the architects, Messrs. George Baines & Son, London. Pastor's and deacons' vestries are provided, together with two choir and baptising vestries, the latter having an approach direct from the baptistry (which is placed under the pulpit). Cloak rooms are provided near the main entrance. There is a church parlour, 36 ft. by 20 ft., having ladies' cloak-room in connexion; also a retiring-room of suitable size is given. The contract amount of the building scheme is 5,5000, but the total cost, inclusive of the organ, will be about 9,0000.

NEW CHURCH, HANDSWORTH.—The foundation-stone of the new church in Grove-lane in connexion with St. James's Church, Handsworth, was recently laid. The church will consist of a nave with north and south aisles, widening into double transepts on either side towards the east end. There will be a chancel arch between the nave and chancel, with another similar arch dividing the chancel from the sanctuary. The east end will be apsidal. The walls will be chiefly composed of Black Country brown bricks and the roof will be covered with rough Bangor slates. Inside the brickwork will be relieved with stone and a certain amount of buff brick. The seating accommodation is to be for 700 persons. The estimated cost of the new structure is between 4,0000, and 5,0000. The architects are Messrs. Chatwin & Son, of Birmingham.

CHURCH RESTORATION, LANTEGLOS-BY-FOWEY.—The restoration of the church at Lanteglos-by-Fowey has just been completed. The work involved considerable care, for the north arcade was leaning towards the aisle about 12 in., and it was held in that position by several iron tie-rods; the north wall also being affected by the outward thrust of the roof. All the XIVth and XVth century roofs were found in their original position. They have been repaired *in situ*, and the arcade has been partially straightened. The whole of the floor had to be dealt with. Oak block flooring has been laid on the spaces occupied by the mediæval benches. The chancels have been paved with Devonshire and Sicilian marbles, and the old altar of the south chapel has been restored. The original west entrance under the tower, which had for many years been blocked, is now opened out. It is proposed to reland the bells, and the tower has been strengthened for the purpose. The pinnacles, which were found in the churchyard, have been restored to their original position. The cost of work already executed is over 2,1000. The architect is Mr. Edmund Sedding, of Plymouth.

WESLEYAN METHODIST CHURCH, CHORLEY.—The New Wesleyan Methodist Church, Gave-lane, Chorley, was opened recently. The auxiliary rooms comprise minister's vestry and classroom accommodation. Externally the building is faced with red plastic bricks and stone dressings, with ornamental relief carving over the large window above the front entrance. The heating is by hot water at low pressure. The church will seat 320 adults, or a mixed congregation of 400 persons. Mr. W. Huggill Dinsley, Chorley, is the architect, and Mr. Leonard Fairclough, Adlington, the contractor.

RESTORATION OF FOHBING CHURCH, ESSEX.—Works of restoration have been carried out at the old church of St. Michael, Fobbing, under the direction of Mr. Hodgson Fowler. The restoration has consisted of practically a new roof and extensive repairs to the tower; while in the interior the centre pillars have been removed and new ones erected. The Norman portion of the church was found to be of chalk, so soft that it crumbled to the touch, and there were no foundations to the outer wall. A carved and coloured stone image of the Virgin and Child, of XIVth century date, was found during the operations.

RESTORATION OF GLOUCESTER CATHEDRAL.—The Lord-Lieutenant of Gloucestershire is starting, as a matter of urgency, a movement for carrying out immediate works of repair to the Cathedral of Gloucester Cathedral. The resident architect (Mr. F. W. Waller) has made to the Dean and Chapter, as described by Lord Ducie, "a disquieting report." The tower is urgently in need of most careful reparative work. Not only are the more ornamental features rapidly disappearing, but the fabric of the tower is being seriously damaged, owing to the perishing of the projecting mouldings of the stonework in many places. Wet has penetrated through the large joints, and is gradually loosening the stonework, and even showing on the inside of the building. A recent fall of some of the stonework connected with the groining of the choir roof close by the tower has been of a very alarming nature. In addition the lead roofs of the nave and south aisle are in urgent need of reparation and renewal. They are all much worn, and the damp is penetrating and seriously injuring the timbers of the roofs. These roofs must be largely renewed. Three of the pinnacles, two on the west front and the other on the south transept, were in danger of falling. One has been repaired, and the other two must be taken in hand without delay. Other less important works are also urgently needed. If these various matters are seriously taken in hand at once the architect is of opinion that grave and threatening damage of the great fabric will be averted in time. His general estimate of the cost of these essential works amounts to 8,1500.

CHURCH RESTORATION, YARMOUTH.—As a parochial memorial to the late Earl of Chichester, the north transept of St. Nicholas Church, which for some years has stood in need of repair, has been restored under the direction of Messrs. Olley & Hayward, ecclesiastical architects. The walls have been recentred, the roof painted white, with vermilion stars, an Early English window on the western side, and the double niche on the

eastern wall restored, and the floor space rearranged. In addition to the restoration, a new scheme of lighting has been adopted in the restored transept.

GORDON BROOK-STREET COUNTY COUNCIL SCHOOL, BROCKLEY.—This school, which has recently been publicly opened, has been designed by Mr. Thomas J. Bailey, the Council's architect (Education), and consists of three principal blocks, each of one story, and planned for elementary teaching in three complete departments with power of future extension, a large central hall being included in each case. The internal finish of the buildings is in plaster with salt-glazed dados and flat ceilings to the classrooms with open timbered roof, top lighted, to each of the three halls. Externally the buildings are finished with picked stock facings enriched by red brick dressings, the angles quoined, the eaves and gabled ends having a moulded and enriched red brick cornice, and the roofs being covered with Broseley tiles. Spacious playgrounds are also provided. The accommodation is as follows:—Boys, 328; girls, 328; and infants, 340; each department being accommodated in seven classrooms and provided with ample cloak, lavatory, and toilet accommodation, together with rooms for the head and assistant teachers respectively. A cookery and laundry centre has been provided in a separate building at the north-east corner of the site. Also a schoolkeeper's house facing Gordonbrook-street. The amount of the contract was 22,836s., and the contractor is Mr. William Downs, of Hampton-street, Walworth.

COUNCIL SCHOOLS, CALTON-ROAD, GLOUCESTER.

—These buildings consist of three blocks and comprise mixed school, infants' school, and cookery and laundry centre, with separate playgrounds for boys, girls, and infants, each department having its own shelter sheds and lavatory. The mixed school provides accommodation for 500 pupils in 10 classrooms arranged round a central hall, 61 ft. by 32 ft., with separate entrances, cloak-rooms, and lavatories for boys and girls, and rooms for head and assistant teachers and school store on each side. The infants' school gives places for 310 children in 6 classrooms, also grouped round a central hall, 56 ft. by 25 ft., with cloak-room and lavatories and head and assistant teachers' rooms, stores, etc. The cookery and laundry is provided with distinct accommodation for each department, both containing general school-room, cloak-room, and lavatory. The schools are built of bricks from Mr. Whitfield's yards on Robinswood Hill, with Bath stone dressings, and the roofs are covered with Staffordshire tiles. The buildings are warmed throughout by hot water from a central apparatus room placed under the cookery school, and the system of pipes and radiators has been installed by Messrs. Beaven & Sons (Gloucester and London), under the direction of Mr. E. J. Cullis (Gloucester). The schools are lighted throughout by electricity put in by Messrs. Woodward & Co. (Gloucester). The whole of the classrooms are fitted with oak dual desks, supplied by Mr. James D. Bennett (Glasgow), and the other furniture throughout the buildings is provided from the architect's designs by the Educational Supply Association of London, and is executed in orham wood. The fixed blackboards are from the Bennet School Furnishing Company (Glasgow). The window blinds have been fitted by The C. P. Price (Gloucester). The whole of the builders' work has been carried out by Messrs. J. Byard & Sons (Gloucester), and Mr. W. H. Bush has acted as clerk of works. The whole of the work has been carried out from the designs and under the immediate superintendence of Mr. Walter B. Wood, architect, of Gloucester. The entire cost of the building, with furniture and fittings, and all attendant expenses, will probably amount to about 14,000l.

SCHOOL, BARNSELY.—The newly-erected mixed elementary school, in Doncaster-road, Barnsley, has just been opened. The accommodation is for 420 mixed and 360 infants. The building, erected from designs by Mr. E. W. Dyson, C.E., is near the St. Peter's Church, with a frontage to Doncaster-road, and has four entrances. The classroom arrangement has been adopted, the infants being on the ground floor, where six classrooms, with central hall, teachers' rooms, cloak-rooms, and lavatories are provided. The boys and girls are on the upper floor, the entrance being provided by a staircase on either side of the building. A marching corridor of fire-proof construction connects the staircases, giving access to seven classrooms, with cloak and teachers' rooms. Two of the main classrooms are divided by glazed sliding partitions, enabling the formation of a central hall. There are drill and play sheds and playgrounds. The building is heated on the low-pressure system, and the lighting by electric light. The contractors are Messrs. R. Ruffles, mason and bricklayer; A. Ovrain, plasterer; Dawber & Townsley, slaters; C. Dryden, joiner; D. Dransfield, plumber and glazier; Snowden & Son, painters; A. Chappell, carving; Saunders & Taylor, Manchester, heating; Laurance & Son, ventilators; J. Taylor, electric lighting; C. Downing, wrought ironwork.

PROPOSED CENTRAL LIBRARY FOR EAST HAM.—At a recent meeting of the East Ham Town Council the Libraries Committee reported that they had directed the Engineer to prepare and submit to them plans and estimates for a central library to be erected adjacent to the Town Hall.

WORKMEN'S INSTITUTE, MARDY.—A workmen's institute has been opened at Mardy. The cost of the building alone amounted to 6,000l., whilst the fittings, gymnasium, and library, etc., made up the amount to nearly 9,000l. The institute is situated at the corner of Ceridwen and Church streets, and is built of native stone, with Forest of Dean stone dressings. In the basement at the entrance to Church-street are a large billiard-room, gymnasium, lecture-room, and games-room. The ground floor entrance is from Ceridwen-street, and contains a vestibule, ladies' room, refreshment-room, magazine-room, and a reading-room. On the first floor is the hall, which, with the gallery, is capable of providing seating accommodation for 1,200 people. The building is lighted by both gas and electricity, the electrical fittings being supplied by Messrs. Clay Brothers, Cardiff, whilst the heating apparatus, which extends throughout, was installed by Messrs. Stott & Co., Oldham. The building was erected by Mr. J. B. Mundy, contractor, Mardy, from plans by Mr. E. Williams, architect, Cardiff.

FREE LIBRARY, STAPLEFORD.—The foundation-stones of the free library which the Stapleford Parish Council are building in Towle's-avenue, were laid a short time ago. The building is to be of red brick and stone. In addition to the library there will be a reading-room, lending library, librarian's room, and ladies' room. Mr. R. Smith, of Long Eaton, is the architect, and Mr. F. Martin, of Stapleford, is the builder.

PUBLIC LIBRARY, BARRY.—A new public library has been erected in Holton-road, Barry Dock, at a cost of 8,000l. The library forms part of a group of municipal buildings, which, when completed, will include municipal offices and town hall. At the lending library there are stacks for 30,000 volumes. The reference library is provided with accommodation for 4,500 volumes and seating for sixteen readers. The news-room is situated to the right of the hall, and contains an area of about 1,375 sq. ft. with accommodation for sixty readers, in addition to newspaper stands for twenty-five persons. On the first floor is a committee-room, which for the present is to be used as a council chamber by the urban council. A reading-room for ladies is situated in the front, at the head of the stairs. The caretaker's apartment is on the second floor. The architects were Messrs. C. E. Hutchinson and E. Harding Payne, of London. Mr. Watkin Williams, of Cardiff, was the builder, and Mr. G. Sanders clerk of works.

WESLEYAN INSTITUTE, SHEFFIELD.—On the 1st inst. the institute connected with Trinity Wesleyan Church, Highfield-place, Sheffield, was formally declared open. Mr. C. B. Flockton was the architect, and he has taken advantage of the difference in the level between the ground at the front and at the back of the building, and has obtained two floors on the ground level. The institute contains on the lower ground floor two classrooms, each 16 ft. square, accommodating twenty-six persons, and a third classroom, 33 ft. by 17 ft., capable of holding fifty-five persons. Close at hand are the store-rooms and kitchen, with two boilers. Upon the upper ground floor is the ladies' room, 33 ft. by 16 ft., and the girls' room, 33 ft. by 22 ft., together with a small classroom, about 15 ft. square, cloak-rooms, and lavatories. The young men's room is on the first floor, and is 39 ft. by 33 ft.

PROMENADE PAVILION, BRIDLINGTON.—On the new Parade extension works at Bridlington the Corporation is about to erect a pavilion and café. The Parade extension works have recently been completed at a cost of about 25,000l. The pavilion is being constructed of wood, iron, and glass, and, with furnishing, will cost 10,000l. It has three domes, and is to be capable of accommodating 3,500 people. It will have a sloping floor, and there will be a gallery extending around the building. There is to be a stage, with manager's room, band-stands, and dressing-rooms. Around the sides of the building lounges are to be provided. The building is to be heated with hot water pipes, and is to be lighted by electricity. Extending the full frontage of the building is a wide balcony and promenade, and doors lead from the gallery inside the building to this balcony. Adjoining this pavilion will be a café, 60 ft. by 60 ft. in area, with flat roof. This roof is to be laid out as tea-gardens. The architects for the pavilion and café are Messrs. Mangnall & Littlewood, architects, Manchester. The Parade extension works have been designed by the Borough Engineer, Mr. E. B. Matthews, C.E.

PROPOSED DISTRICT BATHS, WYKE.—The question of providing district baths at Wyke was again considered by the Bathing Committee at Bradford Corporation recently. The City Architect (Mr. F. E. P. Edwards) submitted three alternative plans, showing how the land could be adapted for the erection thereupon of a building

suitable for baths and a free library. One of these, providing a swimming bath 60 ft. long by 20 ft. wide, douche and slipper baths for men and women, and premises for a free library, was approved by the committee for presentation to the City Council.

SANATORIUM, BARRASFORD.—A new sanatorium for consumptive patients has been established at Barrasford on the North Tyne. The building stands in a site of sixty acres, twenty of which are pine plantation. The cost has been about 20,000l. The buildings were designed by Messrs. Nicholson & Ditchin, Newcastle. The contractors for the various works have been as follows:—Foundation, drainage, and road-making, Messrs. Middlemiss Brothers, Newcastle; superstructure, Messrs. Speirs & Co., Glasgow; plumbing, Messrs. Edwin Joicey, Ryton; heating and hot water engineering, Messrs. R. J. Ward & Co., Newcastle; electric lighting, plant and bells, Messrs. Falconar, Cross, & Co., Newcastle; boilers and boiler setting, Messrs. Arnot & Co., Coatbridge (through their agent, Mr. W. J. Richardson, Newcastle); fencing and tree planting, Messrs. Fell, Ltd., Hexham; sanitary fittings, Messrs. Healy & Wainwright, Newcastle. The arrangements for the water supply were carried out under the direction of Mr. Alfred S. Diming, Newcastle. The contract for the sinking of the well has been executed by Mr. Robert Wood, of Morpeth. The laying of the water mains and the construction of the reservoir have been carried out by Mr. H. H. Nettleton, who has directed a wind motor, with auxiliary petrol engine and pump, have been constructed and erected by Messrs. H. P. Sanderson & Co., Ltd., of Bedford, through their agent, Mr. W. J. Richardson, Newcastle.

TOWN HALL, OSSINGTON.—The foundation-stone of the new Ossington Town Hall was laid on the 27th ult. The architects are Messrs. W. Hanstock & Son, Batley, whose plans were selected in a competition in which the designs of over thirty architects were adjudicated upon by Messrs. Kirk & Son, of Huddersfield and Dewsbury. The building is being erected in the Market-place, and is estimated to cost altogether about 20,000l. It includes offices for the borough officials and a public assembly room to seat 1,300 persons. From the central entrance direct approach is obtained to all the principal municipal offices. The central entrance will be 10 ft. wide, and, in addition to serving the offices, will have a direct approach to the public hall in the rear. From this main corridor cross corridors 6 ft. wide are provided to the main offices. The accommodation on the ground floor will consist of magistrates' retiring-rooms, accountants' offices, rate offices, gas offices, surveyors' and sanitary inspectors' departments. Directly from the main corridor will be a direct staircase to the first floor level, which will also act as an approach to the gallery of the public hall. The first floor accommodation will provide council chamber, mayor's parlour, committee rooms, education room, and town clerk's department. The public hall will be to the rear of the municipal section, with the principal entrance to Dale-street, and a direct approach to the entrance cut off from the municipal section. The accommodation will consist of cloak rooms for ladies and gentlemen, large crush hall, assembly room, orchestra, chorus, and artists' rooms. The police-court section is again arranged independently and separately from the municipal and public hall, and has a direct approach from the outside. It will consist of lavatories, solicitors' rooms, witnesses' waiting-rooms, with borough court. In the basement there will be weights and measures offices, prisoners' waiting-rooms, store-rooms, gas show rooms, large shop for examination of gas fittings, cooking kitchens, heating vault, etc. The corridors are being constructed of Delph wallstones to front and sides, white glazed bricks to areas, and Oxenhop ashlar to walls throughout. The floor of corridors will be laid in concrete and mosaic, and the floors of rooms in wood. The large hall is to be finished in ornamental plaster work, with a decorated ceiling. The corridors will be lined with tiling. A clock turret is also provided.

CONVALESCENT HOME ENLARGEMENT, HORSFORD.—The work in connexion with the enlargement of the Springfield Convalescent Home is expected to be completed by the end of the year. The home at present accommodates thirty-two patients and an administrative staff of seven. When the enlargements have been completed there will be accommodation for sixty-six patients and a staff of fourteen. The present building will be adapted to the purposes of the administrative department, and the new wing will provide the patients' quarters. The administrative department will be so arranged as to isolate the staff from the patients, but there are connecting doors on the ground and first floors for the use of the matron. The estimated cost of the scheme is 3,500l. The architects are Messrs. Hobson & Co., their designs being accepted in open competition.

COURT-HOUSE, BLOFIELD.—A new court-house has been erected at Blofield. The building contains, besides the court, a room for the

magistrates to hold private consultations, a room or solicitors to consult their clients, a waiting-room for witnesses, and a public waiting-room. In the passages connecting these rooms there is a ludo of blue bricks with dark red skirting. Lavatory accommodation is also provided. Adjoining the court-house are large cells. The County Surveyor, Mr. T. H. B. Heslop, was the architect; Mr. T. Gill, of Rupert-street, Norwich, builder; Mr. W. Crotch, of Magdalen-road, Norwich, plasterer; Messrs. C. Payne & Co., Redwell-street, Norwich, fitted in the heating apparatus; Mr. E. Potter, of Chapel Field-road, was responsible for the stone work; and Messrs. Turner, Barnes, & Wright, of Norwich, were the furnicers.

PUBLIC MARKET, SCUNTHORPE.—The new public market at Scunthorpe was opened on the 2nd inst. The principal building is the hall, which measures 95 ft. by 60 ft., clear span, equipped with six butchers' shops, one refreshment-room, one general dry goods store, eight fruiterers' and florists' stands, and sixteen other stalls, as well as a ladies' lavatory and superintendent's office. The roof is matchlaid, stained, and varnished, and is carried by braced steel principals of 60-ft. span; the floor is of concrete, and the whole of the shops, etc., are painted cream, outlined with blue, and the principals with green. The walls are lined with glazed bricks to a height of 5 ft., and the building is lighted by eight pendant arc incandescent lamps (Humphrey's patent) each of 300 candle-power. The open markets are laid out in a modern style with open-fronted sheds, paved with red chequers, and covered cattle pens. The remainder of the market is paved throughout, and gives accommodation for 280 sheep, 120 beasts, and 60 pigs, besides weigh bridge, weigh house, and a public convenience. Slaughter houses are also provided. The plans for the work were prepared by Mr. A. M. Cobban, the Council's Engineer, and the contract let to Mr. W. Pallister, a local builder, for 2,437l.

STAINED GLASS AND DECORATION.

NORTON CHURCH, NEAR EYEMASH.—The stone-work of one of the windows, put in in 1840, on the south side of the nave of this church, has been removed, and a new window put in its place, copied from one of those formerly existing, a specimen of which remains. The new window, of two lights, has been filled with stained glass, showing St. Luke drawing the portrait of the blessed Virgin, and St. Cecilia at the organ, with a background of local scenery. The architect was Mr. C. Ford Whitecombe, of Broadheath, Worcester, and the artist Mr. H. A. Payne, of Birmingham.

SANITARY AND ENGINEERING NEWS.

EXTENSION OF BURNLEY WATERWORKS.—The Burnley Corporation have decided considerably to extend their present water storage, and Mr. Diggle, C.E., consulting engineer, has presented his report, in which he advises the making of a reservoir in the Thursden Valley, with an 88 ft. embankment, to hold 400 million gallons. The report is now being considered by the Water Committee.

DRAINAGE SCHEME, WEST RUNTON.—A Local Government Board inquiry was held recently at the West Runton Hotel by Mr. P. M. Crosswhite, M.Inst.C.E., with regard to the application of the Eppincham Rural District Council to borrow £1,900 for works of drainage in West Runton. The engineer of the scheme is Mr. A. F. Scott, of Norwich and Cromer.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The partnership between Messrs. Tait & Harvey, architects, of Exeter, is dissolved, and Mr. C. J. Tait is now carrying on practice in his own name at 57, High-street, Exeter. The club which was formerly entitled "The Architectural Association Old Day-Students' Club" has changed its title to "Old Architectural Association Day-Students' Club." Mr. A. G. Cross, F.R.I., has been elected Honorary Secretary of the Quantity Surveyors' Association in place of Mr. F. B. Hollis, who has resigned the position. The address of the Association still remains 17, Bedford-row, W.C.—It is announced that Mr. Arthur Pyle Smith has been elected Chairman of the Board of the St. Pancras Ironworks Co., Ltd., and Messrs. Hugh Leader and T. Percival Chubb have been elected directors of the company.

SOUTHAMPTON AND DISTRICT BUILDERS' AND DECORATORS' ASSOCIATION.—The annual dinner of this Association was held at the South Western Hotel recently. About 100 members and guests were present, including the Mayor (Mr. Henry Law), Mr. R. Andrews, J.P., Alderman J. H. Hollis, Mr. Harold Marshall (President), Mr. W. H. Dyer (Vice-President), Major G. Brinton and Mr. Harry Stevens (Past-Presidents). The loyal toasts having been submitted from the chair, and duly honoured, the toast of "The Mayor, Corporation, and Borough Officials" was proposed by Mr. T. Rashley, the Mayor and

the Sheriff responding.—Mr. H. Stevens, in proposing "The National and Kindred Associations," said it was to be hoped that members of the trade would work together, not merely from a personal point of view, but from a general desire to benefit the conditions. Mr. G. Martin (President of the Bournemouth Association), in responding, mentioned that their Association had not been affiliated with the National Association, possibly because there was some feeling that that Association might call upon Bournemouth builders to do something which they might consider detrimental to their interests. He personally had always been in favour of affiliation, and if during his year of office he possibly could he would bring about this affiliation. Mr. G. R. Chamberlain (President, Portsmouth Association) and Mr. F. B. Roscoe (Portsmouth Association) also made brief responses.

—Mr. W. F. Wallis (President, Southern Counties Federation) in proposing "The Southampton Master Builders' and Decorators' Association," emphasised the necessity of organisation amongst master builders in order that they might be enabled to meet employees on level terms. The revival of labour as seen in the recent Parliamentary elections, and the decision of the Association at their last annual meeting, to appoint Conciliation Boards in conjunction with the local workmen's unions, in order to consider points in dispute, and wherever possible to avoid strikes, were other points touched on. Mr. Harold Marshall (the President), in responding, mentioned that of late the number of apprentices had fallen off a great deal. Sir James Knollys, M.P., endeavoured to give a presentation, and to offer every inducement to young fellows contemplating entering the trade. Mr. A. T. Doggell (hon. Secretary) also responded.—The Mayor proposed "The Architectural Profession and other Guests," and traced an abridged history of the profession. The toast was responded to by Mr. G. Gutteridge and Mr. J. Blizard, on behalf of the former, and Alderman J. Hollis, on behalf of the latter.

INTERNATIONAL CONGRESS ON SCHOOL HYGIENE.—A second International Congress on School Hygiene is announced to be held in London from August 5 to 10, under the management of the Royal Sanitary Institute. Sir Leicester Brunton will preside; and the Honorary General Secretaries are Dr. James Kerr, Medical Officer in the Education Department of the London County Council, and Mr. E. White Wallis, Director of the Sanitary Institute. The circular announcing the Congress states that in order to prepare for the annual Congress the first step to be taken is the formation of a Local Committee for each particular town or district, which Committee should approach the authorities of the Education Department and the Treasury, the leaders of Educational movements in town or country, the Presidents or Chairmen of Educational Committees, teachers of experience, philanthropists who are interested in Educational movements, and medical men who have experience in treating children; engineers, and architects, and any other citizens whose assistance would be desirable. This Committee when formed should report forthwith to the London Bureau the name and address of the Chairman and Secretaries. These Local Committees will be co-ordinated from London under National Committees. Their aim should be to do all in their power to promote the success of the Congress by diffusing information, by letters, circulars, or announcements in special and technical journals, and by press notices. They should also endeavour to obtain the co-operation and support of Governments, Municipal or Educational Authorities, and Committees of Institutes and Societies, and induce them to participate by delegating representatives to the Congress or by sending representative exhibits of local interest or manufacture, or scientific appliances or inventions to the School Hygiene Exhibition which is to be arranged. Contributions are invited either from the representatives of Governments, Authorities, Societies, or Academies, or from individual members to the scientific work and proceedings of the Congress by the reading of papers, contribution of reports, or by discussion of various subjects to be brought forward in the national meetings. It is proposed that besides sectional meetings and lectures there shall be held at least three general discussions. The subjects will be announced early, so that there will be time for collective investigation and observation. The English Committee invite suggestions, as soon as possible, as to the subjects under this heading. A list of the various National Committees, the subjects of reference for general discussion, and details as to arrangements of the Congress will be issued shortly. All communications relating to the School Hygiene Exhibition, which will be arranged in conjunction with the Royal Sanitary Institute, should be directed to the Secretary of that Institute, Margaret-street, London, W.

BIRKENHEAD BUILDING TRADES EMPLOYERS' FEDERATION.—The members of the Birkenhead

and Wirral Building Trades Employers' Association held their seventh annual dinner recently at the Woodside Hotel. Mr. P. Rothwell, President of the Association, presided. The loyal toast was honoured, and "The Liverpool Master Builders' Association" was proposed by Councillor G. Snape, who said the Birkenhead Association was merely an adjunct of the Liverpool Association, and they had to go to Liverpool for counsel in matters appertaining to their trade. He coupled with the toast the name of Mr. W. Bullen, who was a most courteous President. The toast was drunk with musical honours, and Mr. Bullen, in responding, said he did not think he would be egotistical if he said that the Liverpool Master Builders' Association had justified its existence, had been a forerunner of many such associations, and was doing a great deal to help other associations. Trade was at present entering into what he might call a new sphere. They as master builders and members of Master Builders' Associations must be fully alive to their positions, or they would find the Labour representatives looking after their own interests only. Mr. James Merritt proposed the health of "Our Guests," Mr. B. B. Moss, secretary of the Liverpool Association, responding. In submitting the toast "The Birkenhead and Wirral Building Trades Employers' Association," Mr. W. Bullen said times were changing very rapidly, and they could not expect that every movement they made would please everyone. One of the old stock sayings was, "Well, they did so and so fifty years ago," but it was no good talking like that now. The years ago building trade associations were not formed. They might expect great changes, not in fifty years nor fifty months, but in the next fifty weeks. Although the associations were good, they were not by any means perfect. What had they to do? They had their associations and federations, and it might be asked: "What else had they to do?" He noticed that the membership in Birkenhead was about 80. He did not expect to see such a fine gathering, but he wanted to know if that represented all the building trade employers in Birkenhead. Well, there was their work. He wanted them to try and persuade those builders who were not in the Association to join not only for their own benefit, but for the benefit of the people at large. He thought that the builders of Liverpool and Birkenhead were too far separated, not by distance, and that they ought to combine more. Mr. P. Rothwell, in responding, said they had been thinking of combination for years, and they would try and bring it about. It would be better if the wages, hours, etc., were the same in Birkenhead as in Liverpool. The toast of the "Town and Trade of Birkenhead" was proposed by Mr. J. Sansom. Unfortunately, he said, there were a lot of legitimate genuine unemployed, but there were always a host of loafers to swell the ranks. From a report of the Labour Bureau that had been sent him he found that with regard to his particular trade—the timber merchants—there was only one man wanting employment, and he was a sawyer. If they took that as a criterion, it was a fair inference to say that the building trades generally in the town could not be in a bad state. That was indeed a matter for great congratulation, but there was one trade in Birkenhead that was not doing so well, and that was the shipbuilding. Mr. Shilton briefly replied.

ROMANESQUE ORNAMENT AND ITS ORIGINS.—Under this title Mr. F. Hamilton Jackson, R.B.A., gave a lecture before the Society of Designers on Tuesday evening, the 27th ult., in the Suffolk-street Galleries, when he sought, with the aid of some 150 lantern slides, to bring more clearly before his audience the early origins and influences at work in Southern Europe during the Early Christian and Medieval times as regards the development of ornament. The lantern views were perfect of their kind, and were almost exclusively of or from more or less well known churches and religious houses in Italy and the South of France. In his rapid review of the slides the lecturer directed the attention of his audience rather to the purely Byzantine influence at work than to the differences between that and the other more local sources and tendencies. We cannot do justice here—either critically or otherwise—to the matter contained in Mr. Hamilton Jackson's lecture, but where architectural objects are concerned, while regarding the value of historical research at its full worth, a proper and logical discrimination ought also to obtain, and admiration, in some cases, proportionately qualified. Notably in some of the doorways and other details shown by the lecturer we failed to find this attribute, while coarse sculptured figures from Lombardian fagades were termed "caryatides."

ST. WILLIAM'S COLLEGE, YORK.—St. William's College, the ancient building at the east end of York Minster, has been purchased by the Convocation and House of Laymen of the Northern Province. It is much dilapidated, but the building has passed into the hands of Convocation on the express condition that it is to be thoroughly restored. It is intended to convert it into a church house, providing accommodation for the two Houses of Convocation and for the House of

Laymen, and available for other church purposes. St. William's College was founded in 1453 as a college for priests holding chantries in the Metropolitan Church. In 1642 Charles I. set up his printing presses here. In the purchase and the complete restoration that is contemplated a sum of not less than 10,000l. will be required. Contributions will be gratefully received and duly acknowledged by the Restoration Committee. Cheques or postal orders should be made payable to the Treasurer of St. William's College Fund, Beckett's Bank, York, or to the Secretary, Rev. C. N. Gray at Liverpool, U.S.A. Visitors are admitted as the chief entrance to inspect the buildings by ticket (price 8d.), to be obtained at the first door of the College next the Minister.

Legal.

AN ARCHITECT AND HIS EMPLOYER: SEQUEL TO A CONTRACT.

In the King's Bench Division, on the 6th inst., Mr. Justice Grantham delivered judgment in the case of *Shallcross v. Bergyl*, an action tried by his lordship at the Liverpool Assizes last week. In this case the plaintiff, Mr. Thos. M. Shallcross, an architect, of Liverpool, sued the defendant, Mr. Moritz Bergyl, for fees, and had obtained judgment. The defendant set up a counterclaim for damages for the alleged breach of duty of the plaintiff, as architect, in connexion with the renovation of the Carlton Hotel and Restaurant at Liverpool, of which the defendant was proprietor. The facts sufficiently appear from the judgment.

His lordship, in giving judgment, said the case was important, even so far as the amount was concerned, but was much more important on account of the principles involved in the dispute and the claim made by the architect to act in the interests of the builder unknown to the building owner at the same time that he was acting as the architect for the building owner. In his judgment it was impossible to act honestly where the interests were antagonistic, and in that case, were it not that the plaintiff, as an architect, claimed the right to do so, and contended with great earnestness that such conduct was legitimate and was adopted by other architects, he should have said that the plaintiff had been guilty of great dishonesty, but he had no reason to doubt his word when he stated that he believed all through that the plaintiff, as an architect, had placed himself. Defendant was the owner of a large restaurant and public hall, and wished to improve it and so structurally alter it as to bring it up to modern requirements. The work might be described as divided into two heads—first, the preparation of plans to lay before the magistrates, and the consequent attendance of the magistrates for the purpose of getting their consent to the alterations; secondly, the preparation of plans for, and the superintendence of, the carrying out of the work. This work, though in one sense distinct, was in reality almost identical and overlapped, because he found that the plans prepared for the magistrates were practically the plans ultimately used for the carrying out of the work, and were mostly the plans charged for by the plaintiff in his charges for carrying out the alterations by the builder, and the whole of the negotiations for the contract, subsequently signed, were being carried on while the proceedings before the magistrates were taking place. Defendant admitted that the plaintiff was his architect during the whole of this period, and that he was liable to pay him for his services as such. Then what was the plaintiff's contention? It was that, during the earlier portion of the time, he had a right to act, and was acting, in the interests of the builder. Messrs. Norman & Stacey were trying to get the job to do the work, or, rather, get a contract to do it, as they were incapable of doing it themselves, and plaintiff alleged that in the interests of this firm he was entitled to get a contractor who would do the work for a specific sum, and then, having fixed that sum as the cost of the work, to add 20 per cent. to that sum as a commission or bonus to these nominal builders, who were a London firm of furniture dealers, who never intended to do a stroke of the work themselves, and to represent to the defendant that sum as the fair price at which that work could be done. In other words, knowing that the real contractor had to do the work for 1,625l., he was entitled to tell his other employer, the building owner, that 1,950l. was the price, and that it could not be done for less, and not only that, but was entitled to do everything for the interests of this nominal builder as against the interests of the building owner until the period of the latter finally signing

the contract with the nominal builder, who simultaneously, through the intervention of the plaintiff, got the contractor to sign a contract to do the work at 20 per cent. less. That was the case. His lordship said he might leave it there, but to do ample justice to the plaintiff he would shortly state the justification that he put forward. He said he was brought into the matter by the nominal builders, and was employed by them to suggest a scheme for the alteration of the defendant's premises, and in that way was introduced to them.

These nominal contractors were introduced to defendant by a person named Copper, who had, or said he had, an idea of taking the place when altered. They now knew that he expected to get a commission of 5 or 10 per cent. out of the nominal builders for the introduction, and they heard no more of Mr. Copper after the first interview. At the first interview with the defendant in London nothing was done, but at a second meeting a few days afterwards, when the plaintiff was present, the defendant agreed to employ the plaintiff as his architect to prepare plans and manage the matter for him before the magistrates, and to get their consent to the proposed alterations. The defendant stating that, if the magistrates passed the plans and the work could be done within his limit of price, he should certainly carry it out. Plaintiff at once set himself to work to prepare the plans and attend the magistrates and the municipal authorities, etc., because the plaintiff said that he continued to act in the interest of Norman & Stacey, the nominal builders, and was justified in getting the more favourable terms he could for them and the highest price he could out of the defendant for the work, though at the same time employed to superintend the work for the defendant. In other words, for nine months, according to his suggestion, he was acting in the interests of the masters whose interests were opposed to each other, and for the last six months, when acting only for the defendant, he was justified in withholding from the defendant all the knowledge that he possessed as to the best way of carrying on the work in the interest of the defendant, because, by so doing, he would be betraying the interest of the other employer who had previously, as it were, a joint employment of him with the defendant. It was an impossible position. There could be no doubt that from start to finish the plaintiff looked to the interest of Messrs. Norman & Stacey, who had become bankrupt long before the work was finished and never once, that he could see, when there was any conflicting interest, looked to the interest of the defendant, though the special work alleged to be done by the plaintiff for Messrs. Norman & Stacey was only of the alleged value of 311l., as against 300l. charged to the defendant. His lordship found, as a fact, that upon the first appointment of plaintiff as architect for defendant and acceptance of that appointment by him, the defendant looked on the plaintiff as his architect, and that the plaintiff neglected the defendant's interest and committed a gross breach of duty in acting at the same time in the interests of the nominal builders. He would find, if necessary, that he was guilty of negligence in the way the contract was prepared and the orders for extra work given. But he found in reality that it was not by ordinary negligence that the work was so done, but because it was to the interest of the builders to do so. Not only was the defendant prejudiced by having to pay 1,950l. as the cost of the work, but, instead of 1,625l., but also extra to the amount of about 2,600l. It had been said that even if the defendant had known Norman & Stacey were getting the work done by a sub-contractor for 1,625l., instead of 1,950l., *non constat*, that the defendant could not have done for that sum. His lordship believed he could have done so, because the plaintiff's own account of it was that by his instructions to the sub-contractor, Marshall, were to put his tender at such a price as would enable Norman & Stacey to obtain the contract against London contractors when they had added 20 per cent. to his price. But why limit it to London contractors? The property was in Liverpool, the architect was there, and the defendant had his agents there, who superintended the property. Defendant did not ask for a London contractor, and it was fair to assume that contractors of the character of Waring & Gillow would put a higher class of work into the job than a local contractor who would raise it at 20 per cent. less. Marshall was not estimating, therefore, as against any local contractor, but was taking advantage of the known higher prices of London firms. He thought the defendant could have claimed the return of almost the whole 20 per cent., but, as defendant's advisers generously said they would accept a basis of 10 per cent., he found that the defendant was damaged to the extent of 400l. by the plaintiff's conduct. As to the extra amount charged for the drawings—as the requirements—unjust and foolish requirements as they were—by the Liverpool Municipal Surveyor undoubtedly did necessitate a great deal of work that had not been anticipated, he thought it would be undgenerous,

not to say unjust, to make the plaintiff refund the money paid to the builder for the work unexpectedly required by the authorities, though, strictly speaking, the contract might be said to make the builder liable for it. It was negligently drawn to leave the matter in uncertainty. He did not give any damages to the defendant on that head. His judgment was for the defendant on the counterclaim for 400l. and costs.

Leave to appeal was refused.

SEQUEL TO THE CHARING CROSS STATION ACCIDENT.

THE cases of Scott and others v. Lennox and Lennox v. Curzon came before Mr. Justice Lawrence in the King's Bench Division on the 3rd inst.

In the first case Mr. Lush, K.C., for the plaintiff, said that the action, which was for rent, arose out of the accident which occurred at Charing Cross Station on December 5 last when the Avenue Theatre was practically destroyed. The plaintiffs were the lessees of the freeholder and the defendant was the assignee of the lease which had been granted to the Theatrical Syndicate, Ltd. Mr. Curzon was a sub-lessee, and he gave the sub-lease to Mr. Maude. The question in the case was whether defendant had excused from paying rent by one of the covenants in the lease. The rent of the theatre was 750l. a quarter, payable in advance. The covenant in question was as follows:—"If and whenever during the said term the said theatre and premises shall be closed by order of any superior authority, or be destroyed by fire, or by any other cause, the same cannot be continued to be used as a theatre, the rent shall as from the date of such closure or from the day following such fire, if any, be suspended." The only question in the case was whether the theatre had been closed by an order of any superior authority. At the time of the accident the theatre was being repaired. The accident caused the destruction of the theatre. As it could not be said that the theatre had been closed by an order of any superior authority, he contended there was no defence to the action. Mr. Roskill, for the defendant, said the lease provided that the cost of structural alterations ordered by the County Council should be borne by the lessors. The County Council had required structural alterations after the accident, and the true construction of the covenant was that, while the theatre could not be opened by reason of an order requiring structural alterations, the rent should be suspended.

In the present case there was not only an order of the magistrate, Mr. Fenwick, on December 8, but a letter from the Lord Chamberlain later, saying that the theatre must not be opened without it was passed as safe by the County Council. The theatre was badly damaged, and in consequence of the injury had been closed by superior authority. As the defendant was not liable as between himself and the plaintiff for any of the structural work ordered by the magistrate, and as the existence of the magistrate's order was one of the reasons the theatre could not be opened, the proviso as to the suspension of the rent was operative.

In the result, his lordship, in giving judgment, said it was one of the cases provided for in the lease. The theatre was still a theatre after the accident, but as it was then impossible to carry on the business of a theatre there, that was the real reason of the closing. He accordingly entered judgment for the plaintiffs for 750l. and costs.

In the second action of *Lennox v. Curzon* a similar question arose on the same covenant. Mr. Lennox, the defendant in the other case, being the plaintiff in this, his claim being against Mr. Curzon, his sub-lessee, and in the result Mr. Lennox recovered judgment for 1,210l. and costs. A stay of execution was granted in both cases on the usual terms.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

2,038 of 1905.—C. J. S. LAMBERT: A Process and Apparatus for Drying Air.

This relates to a process for the desiccation of air for all applications to ventilation and to the condensation of substances, said process consisting in effecting the operation in a system of refrigerating apparatus where the condensation of the greater part of the water vapour is obtained by bringing the air into contact with cold liquid trickling over either plain or corrugated surfaces which are not cooled below the point of congelation of water, the operation being completed by physical and not by chemical means by causing the air to pass into a second refrigerator, in which it comes into contact with any solution capable of forming with water a uncongaleable mixture, and having a vapour tension corresponding to a lower percentage of

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

water than the final percentage which it is desired to attain in the air.

2,045 of 1905.—R. J. BROOKS: Hot-Water Heating Apparatus.

This relates to a hot-water heating apparatus, wherein, at starting, the liquid of the circuit put into motion around the circuit is small in quantity in comparison with the total delivery of the circulator, and offers comparatively little resistance, and the quantity of the liquid so moved is gradually increased until normal circulation is established.

2,383 of 1905.—R. WANDERMAN: Dovetail Cutters.

This relates to an appliance for cutting dovetails, consisting of a slide, a chisel composed of several parts attached to the slide, some of the parts being movable to aid from each other, the ends of the chisel being played out and rebated or overlapped, and a mechanism for moving the parts to widen and narrow the chisel as it descends and ascends.

8,169 of 1905.—J. G. HARRISON: Ventilators for Windows.

This relates to ventilators for windows constructed from perforated sheet metal, two of which comprise a set of ventilators for one window. The first ventilator is similar to a rectangular box about half an inch thick, and of a suitable width, it is fitted closely between the top and sides of the outer window frame, and is secured by its projecting ends and top side to the back of the aforesaid window frame, and immediately in front of the sliding window sash, so as to allow the upper window sash, which presses slightly against the back of the ventilator when in its position, to slide up and down at will. The second or middle ventilator is about 1 1/2 in. wide, and is bent double to a convenient shape, and secured to the bottom part of the upper window sash at a short distance from the lower window sash, so that when the upper window sash is pulled down the perforated metal strip may almost touch the lower part of its downward travel. When required, a V-shaped piece is cut out of the strip so as to allow the strip to fit closely up to the pane and round outside part of centre frame. Screw holes are provided in various positions on the perforated metallic strips for the purpose of fixing the ventilators to the woodwork by means of screws.

8,965 of 1905.—A. TOMKINS: Traps for the Wastepipes of Sinks, Baths, and the like.

This relates to the adjustment and control of the direction of the outlet piece or leg of traps to sinks, baths, and the like by means of a joint at or near the weir of the trap, the seating of such joint to lie in a plane normal to the curved axes of the adjacent parts, and inclined at an angle of 45 deg. or thereabouts to the horizontal plane when the trap is in its usual position. When in use the parts are bolted, screwed, or otherwise fastened together as desired.

9,784 of 1905.—S. S. HELLYER: Pans of Water Closets, Bed Pans, Sinks, and the like.

This relates to pans of water closets, bed pans, sinks, and the like, and consists in applying strips of wood, vulcanite, or other protective material, or material which is a bad conductor of heat, to the rim of the same, and in providing the strips with the said pans, sinks, or the like with parts which will engage together so that the strips are secured in place without the use of bolts or analogous fastenings, and whether cement be interposed or not.

10,012 of 1905.—E. F. GOODALL: Method of Securing Slates, Tiles, and the like.

This relates to the method of securing slates, tiles, and the like by nails or spikes, and of rendering the same waterproof, and is characterised by the use of nails or spikes having on the undersides of their heads recesses or sinkings, which are filled with putty or other plastic material adapted on the nails or spikes being driven home, to fill up and seal the holes in the slates and the like.

10,354 of 1905.—J. HALL: Air Filtration and Means Thereof.

This relates to an apparatus for filtering air for supply to brewers and other factories, and consists of a suction fan inlet chamber, the walls of which are composed of removable frames containing filtering medium and arranged in sets so as to prevent a large filtering surface, whereby the air is drawn through the filtering medium evenly over the entire surface thereof.

11,265 of 1905.—J. H. CARTLAND and J. LILLY: Apparatus for Opening and Closing Swinging Windows, Ventilators, Fanlights, or Similarly Swinging Bodies.

This relates to an apparatus for opening and closing swinging windows, ventilators, fanlights, or similarly swinging bodies, and consists in the combination of a frame having eccentric pivotal connections, and an attachment bracket, said frame carrying a screw and a rotatable pulley nut, which screw is pivotally connected to bracket, and in means for rotating the nut.

21,733 of 1905.—S. GOLLIER: Building Blocks.

This relates to a building block formed from plastic material, and provided with channels in its ends, and consists of metallic binding members embedded near each longitudinal edge of the block, and provided with a hook on one end and an eye on the opposite end, and a binding member disposed centrally transversely of the block, and provided with a hook on each end in engagement with the longitudinal binding members.

23,048 of 1905.—J. DUGDALE: Fastener for Windows and the like.

This relates to a window fastener, and consists of a bracket with a spring pin or catch secured to each window sash, combined with a notched bar secured to the window-frame, and so arranged that both sashes can be locked and secured in different positions independently of one another.

24,244 of 1905.—C. BONAFIDE: Manufacture of Mastic for Flushing the Joints in Flooring and other Similar Purposes.

This relates to the manufacture of a mastic for flushing the joints in flooring, according to which twenty-five to fifteen parts of sawdust and finely ground cork are mixed with seventy-five to eighty parts of a cold starch prepared from pure rye flour and boiling water, for obtaining a mastic of greater elasticity.

3,699 of 1905.—W. TIPPER: Grabs and Means for Operating the Same.

This relates to a grab device for raising grain and other cargoes, excavating or dredging and other purposes, wherein the fall or lifting-chain for the jaws of the grab is provided at one point with an enlarged link, and in which the suspending rods by which the grab jaws are suspended when open preparatory to being lowered are provided with a crown piece or catch device through which the said fall passes, said catch device being adapted to engage the enlarged link on the fall when the jaws of the grab are fully open, and so permit the chain to lower the grab with the jaws in the open positions, but release said link when it is required to close the jaws.

4,335 of 1905.—D. E. L. DAVIES: Means for Indicating and Recording Variations in Level or Depth of Water or Other Liquids, as in Reservoirs, Sewers, and Mines.

This relates to means for indicating and recording variations in level or depth of water or other liquids, as in reservoirs, sewers, and mines, and consists in the use of a revolving drum upon which the fluctuations of the flow of water shall be indicated by means of a pointer to which a horizontal motion is imparted from a revolving shaft by means of a screw with nut working thereon.

10,579 of 1905.—C. AMES: Surface Water Gully.

This relates to a double trapped surface water gully having the one trap formed by a hopper, the lower end of which depends below the surface of the water in the gully, and the other trap formed by a diaphragm in a chamber within the gully, the said chamber being situated about midway between the bottom and top of the gully, through which chamber the water has to pass on its way from the gully to the sewer, the said chamber being divided into two compartments by the said diaphragm, so that one compartment is open to the sewer and the other compartment is open to the interior of the gully.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing property sales with columns for date, location, and price. Includes entries for Romford (Essex), Yarmouth, Bungay (Suffolk), Stoke Newington, Putney, Holloway, Finsbury Park, Southwark, and Mortlake.

Table listing property sales with columns for location, description, and price. Includes entries for Clapham, Streatham, Herne Hill, Islington, Highbury, Palmer's Green, Norwood, Plumstead, Bushey, Kennington, Clapham, Kentish Town, Edgware, Paddington, City, Mables, Sketty, Glastonbury, Bermondsey, Old Kent Road, Marylebone, Kilburn, Maida Vale, Harrods Road, Paddington, Old Ford, Homerton, Bayswater, Clapton, Kilburn, Islington, New Kent Road, Camberwell, Walworth, Peckham, Streatham, Penge, Stoke Newington, Battersea, Clapham, Hackney, Dalston, 2 Shrubland-gate, Clapton, Mile End, and Tower Hill.

List of Contracts, etc.

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*SUNDAY SCHOOLS.	Willesden Wesley, Ch. Trustees	Not stated.	Mar. 26
*BATHS, FIRE-STATION, & BRANCH LIBRARY, REDDISH	Stockport County Borough	Not stated.	No date.

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Materials	Yardley R.D.C.	A. W. Smith, Eng., Council-house, Sparkhill, nr. Birmingham	March 12
Maintenance of Fire Alarm Installation	do.	do.	do.
Materials	Maldon R.D.C.	E. J. Ennals, Surveyor, 8, Market-hill, Maldon	Mar. 13
Alterations and Repairs, Building-stone Workhouse	Samford Guardians	H. J. Wright, Architect, 4, Museum-street, Ipswich	do.
Side Planning Machine	Stockport Gas Department	S. Mennier, Engineer, Gasworks, Stockport	do.
Public Improvement Works, Barley-road	Halifax Improvement Com.	J. Lewis, Borough Engineer, Town Hall, Halifax	do.
Additions, etc., at the Cottage, Cumbury-gardens	Kingston-upon-Thames Corp.	Borough Surv's Office, Municipal Offices, Kingston-upon-Thames	do.
Stores	West Derby Guardians	Workhouse, Walton	do.
Stores	Huddersfield Gas Committee	Gas Engineer, Gasworks, Huddersfield	do.
Tower and Spire, Bulderstone Church, near Blackburn	Sutton Coldfield Corporation	W. A. H. Clarry, Boro' Eng., Council Hse., Sutton Coldfield	Mar. 14
Annual Contracts	Eastbourne Corporation	E. Prescott, Borough Engineer, Town Hall, Eastbourne	do.
Alterations to Steam Engines and Air Compressors	East Indian Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Steel Posts, etc., for Fencing	do.	do.	do.
Galvanised Eyeballs and Strand Wire for Fencing	Ipswich Sanitary Authority	E. Buckham, Borough Surveyor, Town Hall, Ipswich	do.
Materials and Jobbing Work	Sherburn Hill Corporation Soc.	At the Station Premises	do.
Tailor's Shop, etc., Shotton	Greenwich Guardians	Union Offices, Greenwich	do.
Road Materials	Halifax Gasworks Committee	J. Wilkinson, Engineer, Gasworks, Halifax	do.
350 tons of Channel Island Granite Spalls	Leeds Corporation	J. J. Mann, Dock-street Depot	do.
Cast-iron Pipes, Stores, etc.	Rhondda U.D.C.	O. Thomas, Gas and Water Offices, Pentre	do.
Stores	do.	do.	do.
Governor and Exhaustor House, Frocity	do.	do.	do.
15-in Gas Station Governor and Connexions	do.	do.	do.
Gas Engine and Exhaustor	do.	do.	do.
Stores	Stockport Gas Committee	S. Mennier, Gasworks, Stockport	do.
Materials	Goldstone R.D.C.	J. George-Fowell, Engineer, Council Offices, Goldstone	do.
223 yds. of cast-iron Pipes, 18-in. diameter	Morley Corporation	W. E. Fatman, Borough Engineer, Town Hall, Morley	do.
Broken and Unbroken Stone and Haulage	Rothwell U.D.C.	J. Southward, Surveyor, Council Offices, Rothwell, nr. Leeds	do.
*TIMBER WAREHOUSE, LEYTON	Corporation of Preston	A. Marshall, Architect, King-street, Nottingham	do.
Steam and Exhaust Pipes, etc., for Generating Station	Bridlington Corporation	E. J. Barrett, Engineer and Surveyor, Town Hall, Staines	do.
Materials	Staines U.D.C.	J. Witter, Architect, Elgin	do.
Cleaning, Painting, etc., Police-stations	East Ham Town Council	C. S. Morris, County Surveyor, County Hall, Northampton	Mar. 17
Pair of Villas in Beaton-grove, Frlzinghall	Northamptonshire Co. Council	J. Burgess, Tabley, Knaresborough	do.
Road Metal and Carting	Bucklow R.D.C.	do.	do.
Materials, etc.	N.E. Railway Co.	E. H. Clark, Stores Superintendent, Gateshead	do.
Road Material	Longton R.D.C.	C. B. Hodgson, Clerk, the Courts, Carlisle	do.
Sanatorium for Females, Bagthorpe Workhouse	Spennymoor U.D.C.	C. R. Spencer, Surveyor, Council Offices, Spennymoor	do.
Store (Bible Navigation)	East Ham Town Council	C. E. Wilson, Town Clerk, Town Hall, East Ham, E.	do.
Heating Apparatus, Pavilion and Café, Royal Palace	Newark R.D.C.	R. Oakden, Jnr., District Surveyor, Wacchisa-st., Newark	Mar. 19
Granite	Coventry Gas Committee	F. W. Stevenson, Engineer, Gasworks, Coventry	do.
Water Supply from Target Springs to Aberlour	Wellington U.D.C.	W. Jackson, Clerk, Wellington	do.
Annual Supplies	Scunscrope R.D.C.	A. Greaves, Surveyor, Woodbine Villa, Hesse	do.
Granite	Truistees	T. A. Buttery & S. B. Birds, Architects, Queen-st., Morley	do.
Pennaennaw Setts, etc.	Dr. I. H. Davies	Morgan James, The Factory, Maesycwmmr	do.
Paving	do.	Cook & Edwards, Architects, Masonic-buildings, Bridgend	do.
Crescote Oil	Southend-on-Sea Corporation	E. J. Elford, Borough Engineer, Southend-on-Sea	do.
Stone Bridge over Fresh Burn, near Greenhill, Stapleton	Epsom U.D.C.	E. R. Capson, Surveyor, "Bromley Hurst," Church-st., Epsom	do.
Alterations, etc., to Administrative Block of Hospital	Knaresborough U.D.C.	F. Cartledge, Surveyor, Knaresborough	do.
Supplies	Stockton-on-Tees Corporation	M. H. Sykes, Boro' Engineer, Town Hall, Stockton-on-Tees	do.
Road Material	St. Marylebone Guardians	Steward, at Infirmary, Kackham-street, Notting Hill, W.	do.
312-ton Coal Waggons	Ely R.D.C.	R. Ennals, District Surveyor, Lynn-road, Ely	Mar. 20
Granite	Corporation of Greenock	Burgh Electrical Engineer, Greenock	do.
Refuse Destructor Plant	Education Authority	C. W. Bevis, Architect, Elm-grove, Southsea	do.
Girls' Secondary School, Fawcett-road, Portsmouth	Chichester, etc., U.D.C.	E. Rushton, Engineer, Council House, Chichester	do.
Pavilion, Shelters, Conveniences, etc., Kingsway-gardens	Maldstone Corporation	Borough Surveyor, Fair Meadow, Maldstone	do.
Materials	St. Helens Corporation	G. J. C. Broom, Borough Engineer, Town Hall, St. Helens	do.
Materials	Leek U.D.C.	W. E. Beacbam, Surveyor and Water Eng., Town Hall, Leek	do.
Private Street Improvement Works	Twickenham U.D.C.	W. F. Pease, Surveyor, Town Hall, Twickenham	Mar. 21
Elementary School, Lewis-street, Patricroft	Eccles Corporation	M. L. H. Woodhouse, Architect, 100, King-street, Manchester	do.
Two Shops and Dwelling-Houses, Victoria-road, Dartmouth	Mr. W. H. Brown	M. Luke, Architect, Studio Royal, Victoria-road, Dartmouth	do.
Materials	Clayton-le-Moors U.D.C.	A. Dodgeon, Surveyor, Council Offices, Clayton-le-Moors	do.
Road-wagon Weighbridge at Waterworks, Ross Cottage	Darlington Corporation	G. Winter, Borough Surveyor, Darlington	do.
Dwarf Walls, etc., Recreation Ground	Bootle Corporation	B. J. Wallenden, Borough Engineer, Bootle	do.
Wrought-iron Railings and Gates to Recreation Ground	do.	do.	do.
Road Materials	Hoo R.D.C.	R. P. Smyth, Clerk, Strood	do.
*ADDITIONS, ETC., TO MARGARET-RD. SCHOOL, E. BARNET	Herts County Council	County Surveyor, Hatfield	do.
*PAINTING WORKS, WOOLWICH AND NEW CROSS	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
School, Northumberland-road, Old Trafford	Stratford Education Authority	E. Woodhouse, Architect, 88, Mosley-street, Manchester	Mar. 22
Alterations, etc., Armada-street, Electricity Station	Plymouth Corporation	J. Paton, Borough Engineer, Municipal Offices, Plymouth	do.
545 lineal yds. of 12-in. Pipe Sewer	Gorton U.D.C.	C. J. Lomas, Alliance-buildings, 37, Cross-street, Manchester	do.
Sewerage of Part of Extended Area, St. Nicholas Ward	Guilford Town Council	G. G. Mason, Borough Engineer, Tuns Gate, Guilford	do.
Road Material	Leam Corporation	S. F. Fox, Borough Surveyor, Town Hall, Litch	do.
Steel and Cast-iron Work for Drying House Floor	Halifax Union Workhouse	W. Williams, Borough Engineer, Town Hall, Litch	Mar. 23
Pump House, Wiltlington Workhouse	Chorlton Guardians	C. Clegg & Son, Architects, 21, Spring-gardens, Manchester	do.
Supplies, Borough Surveyor's Department	Wrexham Town Council	Borough Surveyor, Wrexham	do.
Supplies, Electrical Engineer's Department	Hythe Corporation	Borough Electrical Engineer, Wrexham	do.
Well-dinking at Blithew, Saltwood	Mr. H. Potter	C. Jones, Borough Engineer, Bank-buildings, Manchester	do.
Cottages, Normandy, near Wanborough	Levenshulme U.D.C.	A. J. Steadman, Architect, South-street-chambers, Farnham	Mar. 24
Small Breakwater, the Bight, St. John's Point, East Mey	Chingford U.D.C.	Carmichael & Sharnan, Engineers, 14, Queen-st., Edinburgh	do.
Private Street Works	do.	J. Jenson, Surveyor, Guardians-chambers, Tiviot Dale, Stockpt.	do.
Sewage Purification Works, Chingford	do.	W. Stair, Surveyor, Council Offices, Chingford	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Stores.....	Madras Railway Company	W. H. Cole, Sec., 1, Broad-street-place, Finsbury-circus, E.C.	March 26
Main Sewerage Works, Burykay-road.....	Tolmorden Health Committee	Borough Sur.'s Drawing Office, Market-ground, Tolmorden	do.
Main Sewerage Works, Halifax-road.....	do.	do.	do.
Sewerage Works, Broughton and Cranley.....	Kettering R.D.C.	D. J. Diver, High-street, Desborough, Northants.....	do.
Hildenborough Sewerage and Sewage Disposal Works.....	Toubridge R.D.C.	F. Harris, Eng. & Sur., Broadway, Southboro' Toubridge Wells	do.
Haslemere Waterworks (Pumping Machinery).....	Hanbledon R.D.C.	R. B. Grantham & Son, Eng. 23, N'umberland-av., London	do.
Taking Down and Rebuilding House at Cenarth.....	Mrs. Williams	A. O. Evans, Williams & Evans, Architects, Pontypridd.....	do.
*CONSTRUCTING SEWERS, ETC.....	Barnet U.D.C.	Council's Surveyor, 40, High-street, Barnet.....	Mar. 27
Sewage Disposal Works at Gredland.....	Deplford Borough Council	Borough Surveyor, Town Hall, New Cross-road, S.E.	do.
Stone, Labour Tools.....	Malling R.D.C.	J. Marshall, Surveyor, West Malling.....	do.
*RECTION OF NEW HEAD POST OFFICE, BIRKENHEAD School, Ropery-road, Galesborough.....	Comms. of H.M. Works, etc.	H.M. Office of Works, Head Post Office, Liverpool.....	do.
Sewage Disposal Works at Gredland.....	Linsley County Council	Surveyor & Gaubie, Architects, Bank-street-chambers, Lincoln	Mar. 29
*NEW COUNCIL SCHOOL, LUDDENHAM.....	Gredland U.D.C.	R. B. W. Berrington & Son, Engs., Bank-bldgs., Wivernhampton	Mar. 31
*NEW COUNCIL SCHOOL, TONBRIDGE.....	do.	E. Pover & Son, Architects, Faversham.....	do.
Rhenish Basalt Spalls.....	do.	J. W. Little, Architect, 149, High-street, Tonbridge.....	do.
Road Materials and Cartage.....	Hastings Corporation	Office of Committee, 44, Bedford-row, W.C.	Apr. 5
Jobbing Works.....	Tenterden Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.....	Apr. 14
Bunzow at Collingham Bridge.....	do.	W. L. C. Turner, Boro. Surveyor, Town Hall, Tenterden, Kent	do.
Dairy Buildings, Dewes-road, Fisherton.....	Salisbury, etc., Dairy Co.	Mr. Reid, East Keswick.....	No date.
Residence, Elgin.....	do.	A. C. Bothams, Architect, 32, Chipper-lane, Salisbury.....	do.
Farm House, Fibert-ort, Eastington.....	do.	R. B. Pratt, Architect, Town and County Bank-bldgs., Elgin	do.
Three-story Stone Building.....	do.	F. Wade, Architect, 24, Bank-street, Bradford.....	do.
*RECTIFYING PORTION OF CHURCH AT BECKENHAM.....	Rector and Churchwardens	Olive & Partington, Ltd., Turn Lee Mills, Glossop.....	do.
*RECT. OF PUB. ELEMENT. SCHL., KINGSTON-ON-TH.....	Education Committee	A. H. Hoole, 36, Great James-street, Bedford-row, W.C.	do.
*NEW DRILL HALL, BISHOP'S STORTFORD.....	1st V.B. Beds. Regt., Hertford	F. W. Roper, B. Adam-street, Adelphi, W.C.	do.
		Captain J. B. Wroughton, Hertford.....	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*SURVEYOR'S ASSISTANT.....	Beckenham U.D.C.	100/- per annum	Mar. 13
*JAW MILL FOREMAN.....	London County Council	Not stated	Mar. 17

AUCTION SALES.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*BUILDER'S, IRONFOUNDER'S, ETC., STOCK-IN-TRADE—18-20, Southwark Bridge-rd., S.E.	H. W. Smith	Mar. 12
*FREEHOLD SHOP PLOTS, HOUNSLOW—At Council House, Hounslow	Long & Sons	do.
*STONE WHARF AND CONTENTS, REGENTS PARK BASIN, N.W.—At the Mart	Rutley, Son, & Hue	Mar. 13
*BRICKMAKER'S PLANT, STOCK, AND BRICKS, IVER SL., UXBRIDGE—On the Premises	Buckland & Sons	Mar. 15
*90,000 HARD CLAMP BRICKS—The Station Brick Works, West Houthly, Sussex	J. B. Thorntou	Mar. 21
*FREEHOLD BUILDING PLOTS—The Greyhound Hotel, Croydon	R. W. Fuller, Moon, & Fuller	Mar. 22
*BUILDING SITE, HAYMARKET, S.W.	May & Rowden	Mar. 29
*FREEHOLD FACTORY SITES, NEAR HAYES STATION—On the Estate	Woods	do.
*FREEHOLDS—The Mart	Alfred Savill & Sons	Mar. 30
*FREEHOLD BUILDING LAND, SHEERNESS—At the Mart, E.C.	Tuckett & Son	Apr. 2
*FREEHOLD BUILDING SITE, TOTTENHAM COURT-ROAD—At the Mart, E.C.	Ventum, Bull, & Cooper	do.

* Those with an asterisk are advertised in this number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xvii.; Auction Sales, xxviii.

TENDERS.—Continued from page 275.

KINGSTON.—For building a pattern stores and extension to foundry for the Campbell Gas Engine Co., Ltd. Messrs. Jackson & Fox, architects, 7, Rawson-street t, Halifax:—

Mason: H. Jenkinson & Son, Queous-road, Halifax.....	£830 0
Steel Merchant: A. Pulman & Son, Ltd., Horton-street, Halifax.....	700 0
Joiner: J. Halliday, Mill-street, Halifax.....	644 0
Plumber: Bolton Bros., Gibbet-street, Halifax.....	166 0
Patent Glazier: Heywood & Co., Huddersfield.....	79 14
Plasterer: Rushworth & Frith, New Bank, Halifax.....	111 10
Painter: S. Ackroyd, Queen's-road, Halifax.....	55 16

LEEDS.—For erecting Trinity Presbyterian Church, Harehills-avenue. Mr. W. H. Bevers, architect, 26, Bond-street, Leeds. Quantities by the architect:—

Mason: J. Richardson, Chapel-town, Leeds.....	£3,146 0 0
Joiner: F. O. Farrell, Wortley, Leeds.....	750 0 0
Slater: J. Atkinson & Son, Whitehall-road, Leeds.....	113 10 0
Plumber: T. Barrand, Meanwood-street, Leeds.....	68 10 0
Plasterer: F. Mountain, Manor-road, Leeds.....	137 4 0
Painter: Greenwood Bros., Briggate, Leeds.....	65 12 0
Leads: J. Williams Bros., Kale-yards, Chester.....	86 8 6
Northern Asphalts Co., Woodhouse-street, Leeds.....	11 18 8

LEITH (N.B.).—For additions and alterations on Bonnington-road public school, for the School Board. Mr. G. Craig, architect, 85, Duke-street, Leith:—

Mason: Stewart & Bucher, Leith.....	425 0 0
Painter: P. & J. Gordon, Edinburgh.....	307 17 4
Cement: J. L. Sutherland, Leith.....	732 19 0
Plaster: J. L. Sutherland, Leith.....	580 15 0
Iron: Respath, Brown, & Co., Edinburgh.....	731 10 9
Tiling: Clahus & Co., Edinburgh.....	853 0 0
Slater: W. McLean, Leith.....	216 14 2
Plumber: Collier & King, Leith.....	678 0 0
Joiner: I. & W. Hamilton, Leith.....	4,248 0 0
Heating: McKendle & Moncur, Edinburgh.....	731 0 0

LITTLE HIFORD.—For the drainage works in connexion with the taking-in of additional land at the City of London Cemetery, for the Corporation of the City of London:—

J. Jackson.....	£275
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LONDON.—For an external iron staircase, and for other measures to secure means of escape from fire, at the Putney-road day industrial school, Clapham, for the London County Council:—

H. & S. Jones.....	£232 10	G. Mills & Co.....	£195 0
Hayward Bros. & Co., Ltd.....	100 0	McDowall, Stevens, & Co., Ltd.....	174 0
Eckstein, Ltd.....	220 0	W. & Sons, 11	160 0
Merryweather & Sons, Ltd.....	218 0	St. Mary Axe.....	157 10
Parson & Co.....	199 19	F. A. Norris & Co.	157 10
A. Ritchie & Co.....	199 0	Cadogan Ironworks	157 10
St. Pancras Ironwork Co., Ltd.....	199 0		

[The architect's (Education) estimate, comparable with these tenders, is £150.]

LONDON.—For reconstruction of first section of Huss, for road-work (a) from Shoreditch to Stamford-hill, and (b) from Bloomsbury to Poplar, for the London County Council:—

Shoreditch to Stamford-hill route.

R. W. Blackwell & Co., Ltd.....	£147,887 5 5
J. Mowlem & Co., Ltd.....	147,717 0 0
W. Griffiths & Co., Ltd.....	145,501 9 2
Dick, Kerr, & Co., Ltd.....	143,108 6 0
J. G. White & Co., Ltd., London.....	141,399 6 9

[Estimate (comparable with tenders) £135,920 9 9.]

Bloomsbury and Poplar route.

J. Mowlem & Co., Ltd.....	£233,190 10 0
W. Griffiths & Co., Ltd.....	222,425 12 8
J. G. White & Co., Ltd.....	239,995 5 6
Dick, Kerr, & Co., Ltd., London.....	239,945 12 8

[Estimate (comparable with tenders) £226,831 18 8.]

LONDON.—For making-up and paving Collingbourne-road and portion of Halsbury-road, for Hammersmith Borough Council. Mr. H. Mair, Borough Surveyor, Town Hall, Hammersmith:—

	Collingbourne-road.	Halsbury-road.
W. Neave & Son.....	£800 0 0	£800 0 0
Martin, Wells, & Co., Ltd.....	790 0 0	278 0 0
H. Moreton.....	738 0 0	249 0 0
J. Mowlem & Co., Ltd.....	727 0 0	251 0 0
M. J. Allen.....	723 12 6	238 15 6
J. Jackson.....	722 0 0	232 0 0
H. J. Greenham.....	719 0 0	274 0 0
A. B. Champness.....	708 0 0	244 0 0
J. & W. Drake.....	702 0 0	259 0 0
G. Wimpey & Co., The Grove, Hammersmith.....	699 0 0	240 0 0

LONDON.—For relaying wood floors at the Eastern Fever Hospital, Homerton, N.E., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief.—
 B. W. Barratt, £445 17 6 | T. Pearce, £1,225 0 0
 R. Woolaston & Co., 349 0 0 | W. Payne, 209 10 0
 W. Ball, 283 15 0 | Son, Wood-
 W. Reason, 269 0 0 | side, Crook-
 Dovecote House, 100 0 0 | ford Park, 100 0 0
 Company, 249 0 0 | Adlestone,
 E. Davey, 234 10 0 | Surrey, 204 0 0
 C. F. Rogers, 226 10 0

LONDON.—For the supply and laying of a penstock on the North Kensington relief sewer at the junction of Cornhill-road and Basing-road, for the London County Council.—
 Ashton Frost, & Co., Ltd., £270 0 | J. Blakeborough & Sons, £185 15
 Hunter & English, 256 0 | G. Waller & Son, 143 0
 J. Cochran, 220 0 | G. Stroud, 143 0
 Gleadfield & Kennedy, Ltd., 215 0

LYDNEY.—For additions to the Lydney secondary school, for the Forest of Dean Education and Lydney Institute Committee. Mr. R. S. Phillips, Architect, Shire Hall, Gloucester. Quantities by Messrs. Vale & Kingsford, George-street, Gloucester.—
 W. E. Lewis, £1,470 0 0 | A. J. Dolman, £3,800 0 0
 T. Griffiths, 4,362 15 0 | J. Byard, 3,826 10 0
 A. S. Cooke, 4,222 16 10 | Son, 3,826 10 0
 W. Jones, 4,157 0 0 | Orchard & Woolley & Son, 4,000 0 0
 Saunders & Sons, Ltd., 3,950 0 0 | E. Walters & Son, Bristol, 3,762 0 0

ORPINGTON (Kent).—For erecting two houses, for Mr. J. Greenwood and Mr. C. P. Jannan. Mr. John W. Rhodes, architect, Mitre Court-chambers, Mitre Court, Temple, London, E.C. No quantities.—
 Rice, £2,138 | Lowe, £1,808
 Spers & Son, 2,078 | Podder, 1,655
 Somersford & Son, 1,932 | Blay, 1,415

ROMFORD.—For reconstructing the bridge over the River Rom, in High-street, for the Urban District Council. Mr. Herbert T. Ridge, Surveyor.—
 W. Eacy, £1,510 0 0 | R. H. B. Neal & Co., £1,276 0 0
 Thory Con-tracting and Dredging Company, 1,396 17 5 | J. Strachan, 1,250 0 0
 G. Bell, 1,297 0 0 | Barking, 1,125 0 0
 W. Wilson, Borden, & Co., 1,190 10 0
 D. T. Jackson, 1,125 0 0

ST. DAVID'S (Pembrokeshire).—For erecting a part of houses, for Messrs. G. & C. T. Spackman. Mr. Hugh J. Protheroe Thomas, architect, 9, Victoria-place, Haverfordwest.—
 James & Lawrence, £902 | T. Williams & Co., £790
 J. Williams, 816 | J. Williams & D. J. Morris, 795 | Edwards, 770

ST. DAVID'S (Pembrokeshire).—For erecting a semi-detached villa, for the Rev. J. H. Davies. Mr. Hugh J. Protheroe Thomas, architect, 9, Victoria-place, Haverfordwest.—
 J. Morris, £852 | T. Williams & Co., £430
 J. Williams, Roch, 568

SOUTHEND.—For new counters, fittings, engines, etc., at the Hotel Victoria, Southend-on-Sea, for Mr. A. E. Broadhurst. Mr. C. Cooke, architect and surveyor, Southend-on-Sea.—
 J. C. Flaxman, £153 | Swire & Co., Earl's-
 E. Triggs, 139 | buildings, Feather-
 F. & E. Davey, 148 | stone-trest, City-
 road, London, £105

TODDINGTON.—For proposed new Council school. Mr. R. S. Phillips, Architect, Shire Hall, Gloucester.—
 A. Estcourt & Sons, £1,615 0 0 | Exley & Co., Ltd., £1,425 0 0
 Sons, 1,522 0 0 | Orchard & Peck, 1,417 0 0
 T. Hopkins, 1,498 0 0 | Collins & God-
 A. S. Cooke, 1,165 19 4 | frey, Tewkes-
 bury, 1,398 0 0

TUNBRIDGE WELLS.—For alterations and additions to "The White Cottage," Coleman's Hatell, for Miss Hoare. Mr. W. Kirk, architect, 30, Monson-road, Tunbridge Wells.—
 J. Luxford, £748 0 0 | F. W. Booth & Sons, £700 0 0
 J. Waters, 739 15 6

For Gardener's Cottage at the above.
 F. W. Booth & Sons, £290

TOOTING.—For cleaning and painting works at the Grove Fever Hospital, Tooting, S.W., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief.—
 W. Furniss, £610 0 | W. A. King, £490 0
 Greenhill & Markham, 593 0 | J. J. Richards, 390 0
 R. Woolaston & Co., 687 17 | W. Husey, 377 0
 Spjers & Pond, Ltd., 550 0 | J. Arundel (execu-
 E. Wall, 498 12 | tors of), 367 0
 E. Proctor & Son, 487 0 | A. Porter, 702
 S. T. Wright & Co., 441 15 | H. H. H. Ford, 440
 J. Walker & Son, 440 0 | Tottenham, N., 364 0
 H. Smith, 430 0

WARMINSTER.—For erecting a cottage at Toppeslane, for Mr. J. Grant. Mr. A. F. Long, architect, 53, Market-place, Warminster.—
 H. Franklin, £194 0 | R. Butcher & Son, A. L. Ponton, 172 10 | Warminster, £169 18

WINCHESTER.—For new roads and sewers, Greenhill Estate, Winchester, for the Ecclesiastical Commissioners. Messrs. Clutton, surveyors, 9, Whitehall-place, S.W. Messrs. Lemon & Bizard, engineers for the works, Southampton, Salisbury, and 11, Victoria-street, Westminster, S.W.—
 A. G. Osenton, £1,458 0 0
 H. Boyer, 4,099 0 0
 Wort & Way, 3,995 0 0
 B. Richards, 3,753 0 0
 Playfair & Todd, 3,621 0 0
 S. Kavanagh & Co., 3,454 16 3
 T. Turner & J. Kersley, 3,317 5 7
 J. Trueman, 3,232 0 0
 F. Osman, 2,209 0 0
 J. Butt, 2,200 0 0
 J. & F. Bions, 1,187 0 0
 Coston & Co., 1,179 0 0
 J. J. Haddington, 1,142 7 7
 H. Lawrence, 1,119 0 0
 Hewitt & Sons, 1,079 1 1
 Cunningham & Co., 1,031 10 0
 Tryhorn & Son, 995 0 0
 J. Douglas, Southampton, 2,946 3 6
 Grounds & Newton, 2,860 0 0

WORKINGTON.—For erecting four houses in Protons-road, for Mr. W. Grave. Messrs. W. J. Scott & Co., architects and surveyors, Victoria-buildings, Workington.—

Builder: J. Roper, Westfield, Workington, £350 17 0
 Joiner: G. H. Chambers, Workington, 212 0 0
 Slaters: J. Lythgoe & Sons, Workington, 50 12 4
 Plumber: W. M. Walker, Workington, 77 0 0
 Plasterers: J. Perrin & Sons, Workington, 79 0 0
 Painter: T. W. Keenlside, Workington, 24 0 0

The BATH STONE FIRMS, Ltd., BATH.

For all the Proved Kinds of **BATH STONE.**
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The New North and South Tube Railway.



MIDING itself under the too modest designation of the Baker-street and Waterloo Railway, the new line of communication between north and south London, of which a portion was opened to the public on Saturday, may justly be regarded as inaugurating a new era in metropolitan underground railway construction. Apart from the City and South London Railway, there has been no means of rapid transit between the northern and southern districts of the metropolis, and absolutely none between them in the western region. For this reason the new tube railway fulfils a great public want, and will undoubtedly be a great success. Even if its operations were confined to north and south traffic the railway would be of much service; but providing for direct junction with no fewer than six existing and sanctioned underground railways, and with four existing surface railways, its value is infinitely greater.

On the next page will be found a plan showing the route and connexions of the Baker-street and Waterloo Railway, the unopened extensions being shown in broken lines, and other railways as indicated in the table of reference. At this stage it may be convenient to explain that the Act authorising the construction of the line was passed in 1893, and that the extensions to Paddington in the north

and to the Elephant and Castle in the south were sanctioned in 1900. In 1902 the Underground Electric Railways Company entered into a contract for the completion of the works, which had been commenced in 1898. This company, having already reorganised the District Railway, are now engaged in the construction of the Great Northern, Piccadilly, and Brompton, and the Charing Cross, Euston, and Hampstead lines—the first two in direct connexion with the Baker-street and Waterloo Railway, and the last having its southern terminus close to the Trafalgar-square Station of the same line. Therefore, the group of lines projected will really provide three new north and south routes, and a new east and west route, in addition to useful connexions between existing east and west railways. The table given at the end of this article indicates the various connexions in a form permitting them to be seen at a glance. Any who examine this table and the plan will agree that the comprehensive system there represented is the greatest and most praiseworthy attempt hitherto made to deal with the passenger traffic of London.

As mentioned above, the construction of the new railway was commenced in 1898, work being started in the Thames near Hungerford Bridge by the erection of a staging on which were built workshops and offices, and an electric generating station to furnish power and light. From this staging two vertical shafts were sunk through the bed of the river to provide means for the removal of excavated earth and for the delivery of

structural materials without involving the necessity of cartage through the public streets.

So far as general construction is concerned the new railway resembles other tubular subways driven through the London clay, the up and down lines being in separate tunnels of 11 ft. 6 in. diameter, practically the same as that adopted on the Central London Railway, the station tunnels being double the tunnel diameter, as usual. The work of tunnelling was performed for the greater part by the well-known Greathead shield, which is so familiar that no description is necessary. In operating below the river bed, however, a new type of shield was employed in connexion with the method known as the "clay-pocket" system, the invention of Mr. Dalrymple-Hay, one of the engineers retained by the company. The shield in question comprises a steel cylinder, 10 ft. long, specially adapted for use in water-bearing strata under compressed air against a pressure of 30 lb. per square inch. To prevent any sudden incursion of water a steel trap, consisting of two diaphragms, is fitted near the middle of the shield, the front diaphragm filling the upper half of the space across the shield, and the back one the space across the lower half. The bottom of the front diaphragm extends below the top of the other, and any inrush of water is prevented from rising above the last-mentioned level by the air-pressure maintained. Before the shield is brought into operation a series of pockets is cut in the face of the soil, and the holes are filled with clay. In

this way an annular ring of clay is formed, about 2 ft. in advance of the shield, and extending 3 in. all round beyond its periphery. Then the shield is forced forward by hydraulic machinery for a distance corresponding with the width of a ring of the cast-iron segments employed for lining the tunnel. When advancing the cutting edge of the shield is forced into the clay ring, and when the cutting edge has advanced beyond the clay first encountered the remaining portion of the ring serves as a protection, permitting the cast-iron lining to be fixed without risk of subsidence, as would inevitably occur in water-logged gravel below the bed of a river. Of course, it will be understood that the shell of clay is held up by the pressure of air employed in this system of tunnelling.

All the stations are lined with Simpson's patent grip stoneware glazed tiles, especially manufactured to withstand the severe tests necessary in the case of underground railway work. The general colour scheme adopted throughout the line represents an innovation, each station being treated in distinctive colours. The object of this colour system is to enable passengers to identify the stations without that anxious search among advertisement placards for the official announcement which is so difficult to find on most railways. The following are the colours of the stations at present open for traffic:—

- Kennington.—Light and dark green.
- Waterloo.—Green and dark brown.
- Embankment. Green and light brown.
- Trafalgar-square.—White (down tunnel); light green and light brown (up tunnel).
- Piccadilly.—Green and celeste blue.
- Oxford-circus.—Dark brown and blue.
- Regent's-park.—Light brown and amber.
- Baker-street. Light and dark blue.

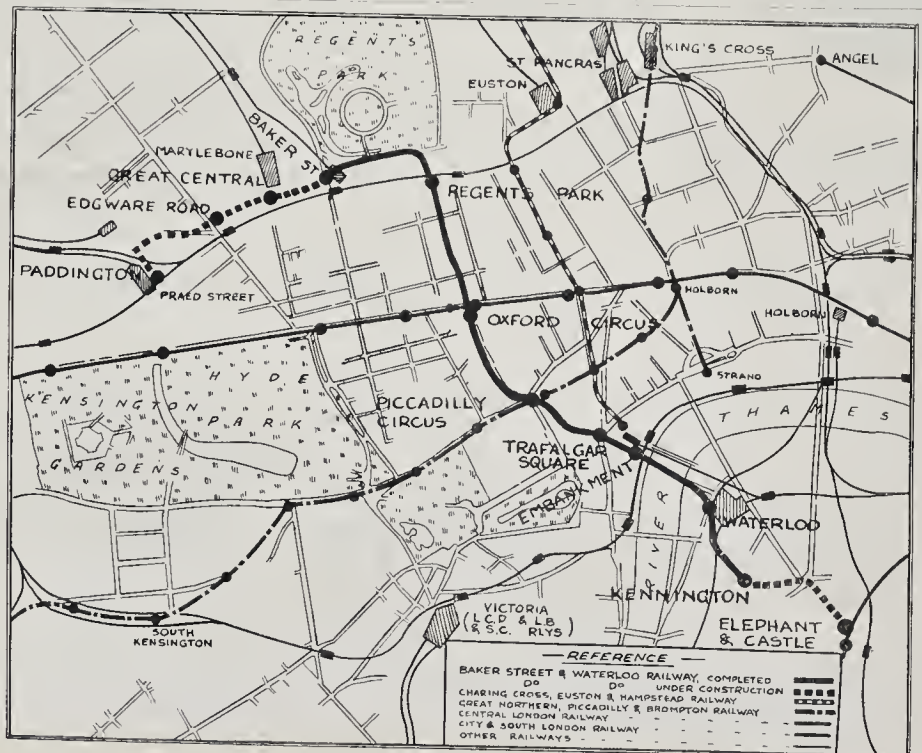
As a matter of convenience to strangers (and the colour-blind) the names of the stations are written in bold characters on the tiles, and permanently fired on. The filing of the corridors and staircase shafts is treated on the same colour scheme as that adopted in the several station tunnels, the staircase tiles being fixed with vertical joints to suit the circular form of the shafts. All the booking-halls on the line are tiled in green and cream colour, the ticket openings being of glazed faience ware. It is worthy of note that a similarly distinctive colour system will be adopted by the company for the stations of the Great Northern, Piccadilly, and Brompton, and the Charing Cross, Euston, and Hampstead tubes.

Each of the station lifts has a floor area of 150 sq. ft., and on the basis of 2 sq. ft. per passenger this gives a capacity of 75 persons per lift. The cages are built of steel with Karri floors, and the entire installation is of fire-resisting construction. Each cage is suspended by four steel ropes of $\frac{7}{8}$ in. diameter, and is counterbalanced to two-thirds of its weight. Various safety appliances have been adopted for the protection of passengers. The Otis safety apparatus has been applied, and as a further safeguard each cage is fitted with two oil buffers. In case the current should fail powerful electro-dynamic brakes come into play, and effectually prevent the cage from running away. An emergency switch is provided so that the lift attendant can cut off current from the entire installation. The lifts are operated by 35-horse-power motors, driving worm-gear winding drums about 4 ft. in

diameter. One innovation of very convenient character in connexion with the lifts is that passengers always leave the cars by the end opposite to that at which they enter. This obviates the objectionable crowding round the entrance which prevails on other tube railways. The lift gates are opened and closed by compressed air, and the general arrangements are such that passengers can be conveyed between the stations and the surface with a minimum waste of time.

Every precaution has been taken by the adoption of fire-resisting construction to eliminate fire risks. The station platforms are built of concrete and steel, the permanent way sleepers are of Jarrah wood, which is of the "slow-burning" class, if not absolutely incombustible; and the carriages are built almost entirely of steel, the comparatively small proportion of timber used having been treated so as to render it non-flammable.

From these brief particulars it will be seen that in respect of safety the new railway exhibits considerable advances on that of some of its predecessors. Outside the stations the running tunnels are whitewashed and lighted by electric lamps, spaced at intervals of 40 ft. apart, the service cables being quite independent of the cables distributing current for power purposes. Another excellent feature which deserves mention is that the cavity between the rails has been filled in with granite concrete, thus providing a secure footway from end to end of the line. Consequently, if a train should come to a standstill through any cause, passengers will be able to walk along a well-lighted footpath to the next station. As an additional provision for



the safety of the public, arrangements have been made for cutting off the current in any section where passengers may be called upon to make use of the footway.

We come next to the very important question of ventilation, which is so great a drawback to all tube railways except perhaps the Great Northern and City, which is the only line where the atmosphere is really fit for human beings to breathe. Although the Baker-street and Waterloo subway has been completed in accordance with designs prepared at a time when the ventilation problem had not assumed a state of urgency, the directors of the company have done their best under the circumstances to exhaust foul air, and to insure the admission of fresh air in adequate volumes. The unfortunate thing is that the tunnels were not designed suitably for perfect ventilation, which, in our opinion, can only be secured by the adoption of absolutely distinct tunnels and access shafts for the up and down lines. After considering various alternatives a system was devised by Mr. J. R. Chapman, Chief Engineer to the Underground Electric Railways Company, and based upon the following hypothesis: That if at every station air be taken out to the surface by means of a closed duct from a point situated on the tunnel platform at an appreciable distance from the physical opening of that platform through the passage-ways and shafts to the surface, then this distance will be partially filled by fresh air; the existing air being replaced by air coming from the surface down the shafts and through the passage openings. In addition, a portion of the tunnel length adjacent to the opening of the closed duct will be similarly affected. A constant closed circuit of air will obtain, and the nearer the duct opening is to the passage openings the more will be this actual short circuiting. If trains be run through a station so treated, horizontal columns of fresh air will be pushed into the tunnel from the station, and further pushed on by subsequent columns propelled by following trains.

After the general lines of the ventilation system had thus been laid down, the next point for discussion was whether the plenum or the exhaust method should be adopted. The decision made in favour of the latter is one we quite agree with. Under the exhaust system the air drawn from the tunnels is ejected through a closed duct above the roof of the station building, while fresh air enters at street-level and passes down the lift and stairway shafts, the movement of air down the passage-ways being likely to assist the movement imparted by trains to horizontal columns of fresh air. Another point is that the safety of the public depends in some measure upon the design of the ventilation apparatus. For example, if the plenum system had been adopted the foul air would be ejected through the passages and shafts, to the manifest discomfort of passengers. Moreover, in case of fire the only means of egress from the tunnels would be filled with smoke, and their use might thereby be impracticable. On the other hand, the exhaust system operates by removing foul air through a duct not used by passengers, and opening from the tunnel roof, to which smoke and other fumes

caused by any unforeseen cause would naturally rise. At the same time the passages will be kept clear by the inflow of fresh air from the surface, and, therefore, always available for use.

With the object of insuring adequate supplies of fresh air, six exhaust fans have been installed at intervals along the line, each capable of moving 18,500 cubic feet of air per minute from the stations and running tunnels. While these fans are in full operation some 11,000 cubic feet of foul air are removed, and a corresponding volume of fresh air is drawn in, sufficient, in fact, to renew all the air in the average length between the stations at least once every hour. The installation is virtually a scheme of station ventilation, although the tunnels will derive incidental benefit. It is certainly a better one than any hitherto attempted on a low-level railway, but it remains to be seen whether all the benefits anticipated by the company will be fully realised.

Turning now to the equipment of the railway, it should be mentioned in the first place that the total length of the authorised line is about five and a quarter miles, and that at Kennington an inclined tunnel has been made, communicating with the surface through a depot established on the site occupied for many years past by the Indigent Blind Schools on the south of St. George's Circus. Here ample accommodation has been provided for the housing and repair of rolling-stock. It has not been necessary to erect a generating-station for the supply of motive power, as electricity is furnished from the power-house of the Underground Electric Railways Company at Chelsea, being transmitted in the form of alternating current at a pressure of 11,000 volts to sub-stations at suitable intervals along the new line, where it is transformed to 600-volt direct current for distribution to the motors installed in every train. In order to guard against the possibility of breakdown, the main transmission cables are in duplicate, and the transformer plant at each sub-station is of sufficient capacity to supply the whole line in case of need.

In order to avoid the repetition of any trouble such as occurred on the Central London Railway, the lower portion of the tunnels has been filled in with concrete, in which a longitudinal drain has been formed, and into this firm foundation the sleepers of the permanent way are embedded. The running rails are laid to standard gauge, and consist of bull-headed sections, 90 lb. to the yard, their length ranging from 35 ft. to 36 ft. 5 in. The rail chairs are secured to the sleepers by means of screwed bolts in place of the ordinary spikes. The negative conductor rail, instead of being an inverted channel, as usual, is of square section, and is laid between the running rails, the positive conductor being carried on insulators of special design near the ends of the sleepers.

The rolling-stock at present in use comprises thirty-six motor carriages and seventy-two trailer carriages, all of these having been built by the American Car and Foundry Company, of Manchester, and, as stated above, they are of the most approved fire-resisting type. The electrical equipment of the cars was furnished

by the British Thomson-Houston Company, and may be thus briefly described. Each motor-carriage is fitted with two 200-horse-power electric motors, with control apparatus and air-compressors in a steel cab at the driving end of the car. The contacts and circuit breakers are hung from horizontal slate panels carried by rigid steel frame-work. This mode of installation is clearly advantageous, for, in the event of any fault taking place, it is far safer to have the apparatus enclosed in a steel compartment than beneath the car, as in the case of the District Railway.

In respect of signalling we may say that the electro-pneumatic system has been introduced, in a manner providing for both automatic and semi-automatic working of the signals and points, and including a complete scheme of interlocking. Each of the trains works the signals in the following manner:—A signal is placed inside the forward end of each block section, this signal being automatically set to "danger" as the train passes. When the train has reached the end of the block section it automatically sets the signal at the backward end of the next block to "clear," so that there is always a danger signal at a sufficient distance behind each train to permit the next train following to be pulled up by an automatic stop. This stop prevents trains from running past any danger signal, and consists of an iron arm outside the track rail, actuated by a compressed air motor acting in unison with the adjoining signal motor. When the signal goes to danger this arm is raised to a position in which it engages with the cock on the air-brake system of the train. Thus the brakes are automatically applied if the driver should disregard the danger signal. Another safeguard is that, should a driver release the handle of his controller for an instant, the current would be automatically cut off from the motor and the continuous brakes applied.

An ingenious telephone system has been provided for the use of drivers, telephone instruments being installed on every motor-car, and fitted so that connexion can be made from a train in any part of the tunnels with copper conductors running alongside the train, and thereby communication can be opened with the nearest passenger station, with any of the exchanges used in connexion with the power-house at Chelsea, or with any of the public telephone exchanges.

From the foregoing description it is evident that every possible effort has been made by the company to provide for the comfort and convenience of the travelling public, and that every available means has been applied to provide for their safety. One disadvantage, however, shared by this line with other tube railways is the gap presented, particularly at Baker-street station, between the carriage steps and the edge of the platforms. Heedless and short-sighted people run some risk of injury under the present state of things, but we understand that this is engaging the serious consideration of the company, and it is to be hoped that a satisfactory remedy may soon be found.

The present line is, of course, only

a portion of the much larger undertaking to which allusion was made in the early part of this article. Consequently, its usefulness cannot be fully developed until the further railways included in the general scheme have been brought into operation. Still, we are confident that this first instalment will confer a great boon upon the people of London, and when the entire system is opened it will constitute an admirable object lesson of what may be accomplished by judicious and well-co-ordinated schemes towards the solution of the passenger traffic problem.

TABLE SHOWING MEANS FOR THE INTERCHANGE OF PASSENGER TRAFFIC (BAKER-STREET AND WATERLOO RAILWAY).

Station.	Connected and Adjacent Railways.
Elephant and Castle	{ City and South London Railway. County Council Tramways.
Kennington	{ County Council Tramways. Waterloo and City Railway. London and South-Western Railway.
Waterloo	{ South-Eastern and Chatham Railway. County Council Tramways.
Embankment	{ District Railway. South-Eastern and Chatham Railway (short walk).
Trafalgar-square	{ Charing Cross, Euston, and Hampstead Railway (short walk).
Piccadilly-circus	{ Great Northern, Piccadilly, and Brompton. Central London Railway.
Oxford-circus	{ Central London Railway.
Begeut's-park	{ Metropolitan Railway (short walk).
Baker-street	{ Metropolitan Railway.
Lisson-grove	{ Great Central Railway.
Paddington	{ Great Western Railway.

NOTES.

At last the full Report of the Board of Consulting Engineers, together with the Report of the Secretary of War, a statement by the Chief Engineer to the Canal Commission, and a letter from the President of the United States, have been submitted to Congress. The President's letter is justly characterised by the *Engineering Record* as "most surprising and scarcely less disappointing." When appointing the Board of Consulting Engineers in September last the President said:—"I have named you because in my judgment you are especially fit to serve as advisors in planning the greatest engineering work the world has yet seen." Now that the Board have reported in favour of a sea-level canal, the President, acting in concert with the Secretary of War, has written to Congress strongly recommending the reversal of the finding, and the sanction of an 85 ft. summit level canal with six locks. It is indeed an extraordinary thing that the President should have thought it worth while to appoint a Commission of experts if his intention was to be his own consulting engineer after all, in the event of a decision adverse to his own feelings. Bearing in mind the fact that the whole subject has been submitted to the prolonged study of a body of the most experienced American and European engineers, it would be only reasonable to suppose that the recommendation contained in their Report would be adopted without question. Of course, the matter is not yet settled, for the final opinion of Congress has to be taken. The project now advocated by the President is clearly not the best, and, if once carried out, there will be no possibility of afterwards converting the lock canal into one at sea-level, as was formerly anticipated.

Hence any false step will be irrevocable. And in view of the enormous expenditure involved, the issue clearly demands most earnest and unbiassed consideration by the final Court of Appeal.

Two Bills on Trade Disputes. TWO BILLS have already been introduced in the present Parliament relating to Trade Unions and Trade Disputes. Of the first, which is presented by Mr. Hudson, nothing further need be said than that it is identical in its terms with the Bill of last year known as Mr. Whitaker's Bill. The second Bill is presented by Sir Charles Dilke, and is supported by Mr. Keir Hardie, who also supports with other members the first Bill. The Bill in the memorandum states that its object is "completely to restore Trade Unions to the legal position in which they were intended, and until recently were understood to stand," but it would appear more accurate had it stated that the intention was to place them in the position in which they wish to stand. This Bill is also only a replica of one introduced by the same members in 1904, save that the clause as to "peaceful picketing" is now the same as in Mr. Hudson's Bill. The two Bills are practically the same, except that Sir Charles Dilke's Bill, besides legalising "peaceful picketing," rendering actions against Trade Unions impossible and altering the law of conspiracy so that combined action on the part of two or more persons in furtherance of a trade dispute shall not be actionable unless similar action on the part of one person would be actionable, in Clause I, carries the matter much further, since it provides that an interference by one person, in furtherance of a trade dispute, with the exercise by another person of his right to carry on his business or with the "establishment or continuance of contracted relations between other persons," is to give no ground of action. Is any comment required on such a clause? We hardly think the labour party can seriously contemplate the introduction of such an element of discord into their trade relations; and, if they do, we feel assured that the working men themselves will resent the introduction of irresponsible interference in their relations with their employers and with the conditions of trade generally.

Making up Streets. AN interesting question was decided last week in the case *Mayor, etc., of Hornsey v. Birkbeck Freehold Building Land Company*, on appeal from the justices. The respondents, the land company, were owners of property which abutted on Birkbeck road, situated on its north side. The boundary between the Hornsey Borough and the Friern Urban District runs along the kerb on the north side of the road, the north footpath being in the Friern District, but the roadway and the footpath to the south side of it being in Hornsey. The Hornsey Borough Council, acting under sect. 150 of the Public Health Act, 1875, had made up the roadway and the south footpath, and apportioned the expense as regards the roadway between the owners of premises on both sides of the road. The sum

apportioned to the respondents was 72l., and the appellants, the Hornsey Borough Council, were suing them for this sum. The Divisional Court have decided that the Borough Council had no power to charge the owners outside their own district, and thus the action failed. The decision is of considerable importance. It is to be observed that sect. 150 of the Public Health Act, which deals with such streets not being highways repairable by the inhabitants at large, contemplates the expenses being borne by the "owners or occupiers of the premises fronting, adjoining, or abutting" upon those parts of the street which require making up. The accident that this road lay between two districts would seem to have the effect of making the whole expenses incurred in making up the roadway a charge upon the owners of houses on one side alone, and to create some hardship to them. The Friern houses did not drain into the sewer under the road as the Hornsey houses did, but their owners appear to have had all the advantages of the road, and yet to escape liability.

Speed Regulators and Motor Omnibuses. THE conviction of two motor omnibus drivers for exceeding a speed of 16 miles in London draws attention for the necessity of motor-car manufacturers applying some mechanical contrivance which automatically shall fix a maximum speed limit. In the two cases in question the defendants relied upon the fact that the omnibuses were fitted with automatic governors, which rendered it impossible to exceed 12 miles an hour, but the magistrate found that these governors were capable of being tampered with, and that the omnibus company had posted notices threatening with dismissal any driver who should tamper with them, and in face of this fact he refused to accept a statement that the governor had not been tampered with, and accepted the evidence of the police as to speed taken by stop-watches. If the motor omnibus is to supersede the horse-drawn vehicle, it is important to the companies that speed governors should be fitted which cannot be tampered with, and there would appear no difficulty in accomplishing this in the case of vehicles going a moderate pace in fixed localities.

Acceleration and Accelerometers. THIS is the title of a paper read before the Junior Institution of Engineers by Mr. A. P. Trotter, the Electrical Adviser to the Board of Trade, who deals in very plain language, not unflavoured by just a suspicion of what may be termed latent humour, with phenomena of much interest to users of railway and other public carriages. Mathematicians tell us that the force of acceleration varies in a manner indicated by a certain arrangement of algebraical and trigonometrical values, which, however, does not appeal to all minds, and certainly does not convey a clear conception of the practical effects produced by acceleration and retardation upon passengers in systems of traction, where high speeds and numerous stops occur. The employment of higher speeds on suburban railways has had the effect of bringing the subject prominently forward, for in such work acceleration is of far greater importance

than full speed running. It is important that acceleration should be taken into account in designing, and equally important that it should be accurately measured in experiments. From the standpoint of the engineer, acceleration is a force measured in pounds per ton of train, while to a passenger it is the rate of change of velocity, which may have the effect of slewing him violently forward or backward when seated, and of throwing him off his balance or throwing him upon a pile of other passengers when standing in a carriage. The various ingenious accelerometers described by Mr. Trotter are capable of indicating acceleration and retardation with much nicety, and are extremely useful for studying the results of traction in a scientific way. The practical value of scientific study is that it ought to lead to the arrangement of braking apparatus so as to reduce the violence of slewing, lurching, and jerking to a minimum, without operating against the reasonable desire of passengers to attain the end of their journeys as rapidly as possible.

At the recent Electrical Exhibition at Olympia the most striking novelty in the design of most of the dynamo and motors exhibited was the use of "interpoles," that is, small poles placed between the field poles so as to counteract the demagnetising effect of the armature currents and the consequent excessive sparking of the brushes when the machines are running under load. The use of these interpoles enables the constructor to build machines for much higher voltages, which will run without sparking at all loads, and, in some cases even, without moving the brushes. In a recent communication to the *Electrical World* of New York (February 24, 1906), Mr. F. J. Sprague, one of the pioneers of electric traction, gives extracts from patents which were taken out by him as long ago as 1884, conclusively proving that he had completely anticipated modern practice in this respect and that motors made on this principle were running in New York in 1886. It is curious that the Sprague Electric Railway and Motor Company should have laid aside this method for many years whilst making developments in other directions, and only taken to it again at the same time as their European rivals. The possibility of constructing direct current dynamo and motors economically for pressures of 1,500 volts and upwards will modify ordinary practice in connexion with the design of electric systems for heavy traction work. With these high voltages new methods of regulating the speed of direct current motors become feasible, and Mr. Sprague states that with his 1,500 volt motors the ratio of the minimum to the maximum economical speed is 1 to 8, and that the motors will run practically equally well at any speed between these limits, the controller giving almost a continuous variation of the speed. In a recent article also in the *Elekrotechnische Zeitschrift* Herr Dettmar predicts the important consequences that will follow from the cheapening of the cost of high voltage direct current machines not only in electric traction but also in power transmission.

THE Report of Dr. Reginald Farrar to the Local Government Board on the Sanitary Circumstances and Administration of the Clun Rural District, Salop. states that, while the district in respect of house property compares on the whole not unfavourably with other rural districts, defects in housing conditions are sufficiently numerous to call for vigilant and systematic inspection by an inspector of nuisances. In regard to water supply, the district being intersected throughout by high hills which form good gathering grounds and yield copious springs at their bases, the problem should present comparatively little difficulty; but it is computed that less than half the population of the district derive their water from supplies conveyed by pipes; the remainder draw water from shallow wells, from springs, sometimes converted by steining into dip-wells, or from brooks; and in many cases the supplies thus obtained are inadequate in amount or liable to serious pollution. The pollution of the river Clun by the sewage of Clun, and by privies built over it, is noted as a state of things that ought not to be allowed to continue. "It would, I think, be practicable," says the Report, "without undue expense to gather the drainage to a single outfall on each side of the river, and by means of septic tanks and filter beds to purify the effluent before discharging it into the stream. This is a measure which the Rural District Council should take seriously into consideration." The disclosures as to removal of excrement are as bad as we are accustomed to find in these cases of insanitary country districts. It was found that some of the school privies had only been cleaned out twice in fourteen years. Dr. Farrar's remark at the close, that "the Rural District Council should take a more serious view of their responsibilities, as a body charged with the care of the public health," seems certainly to be not uncalled for.

The final services were held at St. Michael, Burleigh-street, Strand, on Sunday, September 10, of last year, and the parish having been united with that of St. Paul, Covent-garden, the church will shortly be pulled down by order of the Ecclesiastical Commissioners. It was built in 1832-3, as St. Michael's Chapel-of-ease to St. Martin-in-the-Fields, after designs in the Gothic style by James Savage. The interior was re-seated and otherwise improved in 1862, and 300l. has since been expended upon repairs and decoration in memory of Queen Victoria. The east window was a gift of Lady Burdett-Coutts in honour of the Duke of Wellington; the organ, by Gray, was restored by Richardson thirty-five years ago. The communion plate, font, altar-table and some fittings will be transferred to the church of a new ecclesiastical district at Sutton-court, Chiswick. The net proceeds of the sale of the site and materials are to be applied towards the site and the building of the new church of St. Michael to the extent of 8,000l., and towards the new parsonage-house, a repair fund for the existing parsonage-house (for which the Duke of Bedford gave the ground), and the augmentation of the income of the united benefice. The freehold site, at

the corner of Exeter-street, extends over about 4,400 ft. superficial, and will be offered for sale at the Mart on March 27.

THE impending demolition of No. 15, Buckingham-street, Strand, is announced of the large house which stands at the southern end, east side, of Buckingham-street, near the York water-gate in the Embankment-gardens. The house was occupied in 1689 by the Tsar Peter the Great, who had for his opposite neighbour Samuel Pepys, who lived at No. 14 in the interval 1684-1700. No. 15, a former home of the Institution of Civil Engineers, was afterwards the residence of W. Black, the novelist, and is mentioned in his "Sunrise." Nos. 14-5 are delineated in one or two of Samuel Scott's pictures of the riverside, but No. 14, we may point out, has been rebuilt since, as will be seen from a comparison of the present state of things with the view as depicted by W. James in his painting of or about 1756, which is now, or was lately, hung in the Queen's Presence Chamber, Hampton Court Palace. No. 15, which has two ceilings finely painted by hand, overlooks York-terrace, formerly Villiers-walk, a water-side promenade of which Hugh Hewson, Smollett's school-fellow and the original of his "Strap," was keeper during many years. Hewson's death, at the age of eighty-five years, and his burial in St. Martin-in-the-Fields graveyard are mentioned in the *Dublin Pantheon*, April, 1809.

At the Fine-Art Society two exhibitions are open together. Mr. Fulleylove fills one room with a collection of "Pictures and Studies of some Architectural Monuments of London." These, as a whole, were a little disappointing to us; a good many of them seem to have lost the clearness of light and colour on the buildings through having been somewhat overworked on the surface; we refer mainly to the exteriors. There are some excellent architectural interiors, such as "The Norman Chapel in the Tower" (21). Of two views of the interior of St. Paul's we prefer the smaller one (11); No. 31, on a larger scale, is excellent in perspective, but we have never seen the interior stone-work look so brown as it is shown here. Among the exterior views which are clear and bright in effect are "Hyde Park Corner" (4); "Waterloo Bridge" (18); "Lambeth Palace" (45), and "Old Buildings, Lincoln's Inn" (63), one of the very best. The small drawing of "The Water Stairs, South Side of Waterloo Bridge" (51A) reminds one of a most effective subject, which might very well be worth treating on a larger scale. As a record of London sites and buildings the drawings make a very valuable collection; and the panoramic view of London as seen from the top of the Tower Bridge is a great success, the more so as we are spared the sight of the bridge itself. In an adjoining room is a collection of water-colours by Miss Ina Clogstoun, under the title "Italian Spring and English Summer," of which one cannot speak without enthusiasm; they are beautiful from beginning to end. Miss Clogstoun has a fine sense of colour and gets all her detail in a true water-colour method of execution. We may

mention especially "Red Roses, Villa Carlotta" (37) for composition and colour alike; "A Gay Border—Balcarres" (44), a garden scene in a flood of light; "The Cypress Avenue—Villa Mondragone" (46); "The Pool, Villa d'Este" (52); and "Val d'Arno" (31), as some of the best in a charming collection.

It was a good idea of the Burlington Burlington Fine Arts Club to honour the memory of Mr. Charles Furse by making a collection of his pictures at their rooms, and one is glad to see so many of them together; but it must be admitted that the room is too small to show them to advantage. Furse's large style of banding, in such pictures as "Cubbing with the York and Ainsty" and "Diana of the Uplands," requires large spaces, and the latter does not look nearly so well as it did in the Academy. We hope this beautiful work will be acquired for some public gallery; it ought to be in the Tate Gallery. The collection as a whole impresses one greatly with the power of this early lost painter; he would have been, had he lived, one of the greatest English artists of his day.

At the Baillie Gallery in Baker-street there is on view a large collection of flower-paintings, mostly water-colours but with some oil-paintings; it is stated on the catalogue to be the first of an intended annual series of flower-painting exhibitions. Flower-painting is beautiful practice, but a whole exhibition of this class of work rather wants interest, it is such a merely imitative form of art, and a good deal of the work is hardly the highest of its class. Among the best works are some by Mr. Francis E. James, and a large painting of anemones by Mlle. M. Lemaire, which shows great power of execution both in the flowers and the basket which forms the principal accessory. Flowers are best treated, as in this case, as portions of a still-life scheme of composition. Among the well-known artists exhibiting, but not specially known as flower-painters, are Mr. Clausen, Mr. Lorimer, Mr. Wirgman, Mr. Grosvenor Thomas, Mr. James S. Hill, Mr. MacWhirter, etc. It is odd, in such an exhibition, not to find the name of Fantin-Latour, the only artist we have known who has been able to make an exhibition entirely of flower-paintings really interesting. In the small room are some good landscapes (water-colour) by Mr. Vigoules Fisher, among which we prefer some of the smaller compositions—"Wind in the Sky" (8); "A Ray" (9); "Afternoon in February" (16); and "Amongst the Heath" (29). In the larger drawings the skies tend to be rather heavy and overloaded.

THE Junior Institution of Engineers gave their annual conversation on Saturday last at the Westminster Palace Hotel. The entertainment was of a most varied description; a lecture by the President (Mr. Dugald Clerk) on "Algeria," with a number of lantern illustrations, some of them showing some extremely interesting bits of early architectural remains (Roman and other); an illustrated lecture by Mr. C. Alfred Smith on "The Evolu-

tion of the Battleship"; Mr. W. Day's orchestra, and some good piano-playing and violin-playing from Miss Beatrice Dunn and Miss Evelyn Russell respectively, besides songs from several other performers. In the rooms upstairs visitors could inspect their bones with the Röntgen rays (one lady prepared to take off her glove for the purpose, but was told that was unnecessary—the rays could see through the glove), a working model of a paper-making machine was in operation, and various other models and drawings of engines, etc., were on view. Altogether the Institution may be congratulated on a most successful evening, in which instruction was happily combined with amusement.

HACKNEY CENTRAL LIBRARY COMPETITION.

The public library is perhaps the most popular subject for competition amongst architects, and provides an occasion for the youth of the profession to try its skill. It is therefore not surprising that the request for designs for a central library for the metropolitan borough of Hackney should meet with the very large response represented in the 152 sets of drawings on view at the Corporation Baths. Each set consists of $\frac{1}{2}$ -in. scale plans, elevations, and sections, $\frac{1}{4}$ -in. scale details and perspective view; and the sight of this enormous amount of wasted work lining the upper walls and the entire extent of the tank of a very large swimming-bath is a matter for serious reflection. The depression produced upon the spectator is somewhat lessened when it is seen that at least one-third of the schemes are absolutely without merit of any kind, and represent the extraordinary diversion of thought and ideal existing in the minds of the increasing number of followers of the art of architecture.

Ten thousand pounds is the amount of money at disposal for a building which is to occupy an irregular quadrilateral site measuring about 84 ft. to Mare-street, 128 ft. to Paragon-road, 45 ft. to Valette-road, and 118 ft. to a party boundary on the north side. The usual accommodation is required, and the 152 ways of regarding the problem are interesting and remarkable. With the award and report of the assessor, Mr. J. W. Simpson, we are in entire agreement.

The entrance is subservient to the location of the departments, and in this instance the principal street, Mare-street, has a short frontage. Very few designs provide the entrance from this thoroughfare, but the angle position is mostly attempted, and produces the best solution of the problem, while a side doorway is the one next generally adopted.

The three premiated designs have angle approaches. Mr. H. A. Crouch, No. 26, is the winner of the competition with a design which we say without hesitation is very much the best. Naturally there must be great similarity in the numerous schemes, but the adroit stroke in Mr. Crouch's scheme lies in the protrusion of the public counter of the lending library into the main hall. To the left on entering are the main stairs and the children's library; opposite the door is the lending library, while the newspaper-room is immediately on the right. On the first floor the magazine-room is on the Mare-street front and the reference library on the Paragon-road side, but both floors are arranged in such a way that official supervision is perfect. Through ventilation is contrived for the ground floor departments by lowering the stack-room of the lending library, an important point not generally provided. Areas of rooms were left to competitors, and we think the author has given an excess of space to the reference library. There is no escape for readers in the women's magazine-room other than through the men's part of that department, and the approach to the sanitary conveniences for occasional public use is not happy. It is impossible to include all the necessary points, but this plan obtains more than the other competitors show. The architecture is admirably ex-

pressive of the purpose of the building. A stone rusticated angle pavilion with a semi-circular open porch is the dominant feature. The fronts are of brick and stone, each terminated by a stone projection. There is a sense of dignity in the scheme, which is well expressed in an excellent view, and the deep brick frieze, from which windows are excluded, supplies a breadth and massiveness of considerable value. The Borough Council is to be congratulated upon the successful issue of the competition.

No. 23 is placed second, and is the work of Messrs. Trimmell & Davison. The plan is very similar to the selected design, but is not so simple or easy in working, and is, moreover, greater in cost. Only a part of the news-room receives cross-ventilation, but a mechanical system is provided, for which a turret is placed on the Paragon-road roof. The ground floor supervision is open to improvement, while the first floor lavatory, etc., is liable to become a public convenience owing to its undue prominence. The lighting of it is not happy, a point evidently shared by the authors, who omit the small side windows from the perspective drawing. A large dome emphasises the angle entrance. Some detail hereabouts is very ordinary, but the rusticated Ionic pilasters are eccentric, and the upper main windows have unpleasant proportions. Whereas the first design makes full use of corners in the angular planning of the hall, No. 23 is wasteful in getting nothing out of the corners, in spite of the possibility of the authors' intention to arrange flues.

The third premiated design, No. 140, is the work of Messrs. Crouch, Butler, & Savage, and, although it is still planned upon the preceding principles, has less merit, and scarcely deserves premiation. The whole site is built upon, which produces that excess of corridor and consistent generosity of treatment which is the weak element in the scheme. The inner and outer doming, for instance, is a method more suited to a huge building than the humble institution of a library.

Some remarks upon a selection of the remaining designs may interest our readers in regard to the aspect of variety which characterises library competitions.

No. 6 places one range of ground floor rooms parallel with the north and one with the south boundary, and into the intervening wedge-like space the hall and borrowers' counter are driven. The central door on the Mare-street front produces a third plane in the line of this façade, and it is observed that a piece of the site is given up to the public footway. The fronts are banded in brick and stone, and there is much excellent detail, but supervision is not a strong point. No. 22 is one of the most satisfying exteriors in the exhibition. A side entrance is arranged, with news-room to the left, children's-room to the right, and the lending library between them. The detail is excellent, and, although the side street is widened for this particular perspective view, the central feature would suffer loss of dignity in the side road.

A stone building and another angle entrance plan is No. 32, wherein two stair-cases are unnecessary. The fronts have interest, but the curved angle portico, with columns two stories high, is overpowering, and the arched flanking façades are poor and heavy. The supervision is well considered. A convex wall behind the portico and appearing in the parapet above is an honest way of producing this now popular combination of features.

No. 33 is a very good exterior of the angle entrance type drawn beautifully in pencil; the plans were unfortunately missing. A good example of the typical design of the fronts in this competition is seen in No. 45. Here is the customary domed angle pavilion, with brick side fronts terminating in stone-featured projections. The weak spot in the planning of No. 46 is the placing of the newspaper-room, the most frequented department, in the rear of the site, and the consequent missing of the chief traffic through the length of the building.

There is an air of rapidity about the drawing of No. 50, which also characterises the planning. The fronts are consequently too much broken up. The author has large ideas of the magazine reading public of Hackney, but we are afraid that the ladies

of the borough will not care to ascend and descend the two staircases in order to pass from one side of the building to the other.

There is magnificent force in the external qualities of No. 53, from the view of which the return front is wisely omitted. The scheme covers the whole space, and is wasteful in general respects. The quiet simplicity of No. 54, which is a stone building, is refreshing. The planning is simple, although not facile, but the design and detail are commendable.

The circular hall plus the staircase hall in No. 55 is somewhat unnecessary, but the plan is otherwise excellent and easy working. The exterior is more suited to the demands of a town hall. There is a sense of experience in the details of No. 55, which has a side entrance, but perhaps the main corridors are overdone in length. The elevations have much good detail. Although the rendering of the view of No. 62 suggests the scene of an inquest rather than the eagerness of people in search of light and leading, there are many merits in this design. The angle portico, together with a large inner hall, is not economical, while the door to the news-room is quite inadequate.

No. 67 is on the lines of the leading trio, and is an excellent design. The recessed angle treatment with projecting circular portico, above which rises a charming turret in stone, is one of the most pleasing ideas in the whole series of designs. We certainly think this scheme would have obtained a premium had the Mare-street front received more consideration. No. 71 is emulating the qualities of a town hall, and has a large, overhanging eaves to a flat gable, which is carried to the ground by the agency of three pairs of pilasters. The central pair is unhappy, and occupies a place usually assigned to the entrance doorway, and thus discloses one defect. The news-room at the rear of the site is another, but the interior would be very dignified. The drawings are charming.

We do not understand the special reasons for giving the plan of No. 72 the external expression of a plain domestic residence. Although the supervision is faulty, the scheme merits a more serious idea in front. No. 74 is a good scheme, quite on the right lines. The lending library and book store above, however, prevent the other ground floor departments getting the necessary cross-ventilation, and perhaps the reference-room, although having no windows on the outside wall, would be noisy on the Mare-street side. The view of No. 80 shows much tasteful design, but the scale drawings are miserably rendered. No. 86 is one of the best plans, and has good fronts, but the view does not adequately convey this idea. There is a magnificent lobby for borrowers in No. 91, which will be an excellent romping place for the children, whose room it also serves. Another drawback is that the librarian will see the sky, and nothing else in nature, and would not fail to tell the author of this fact. The party wall copings on the roofs are surely not serious. No. 99 is one of the many miniature town halls, and is municipal even to the balustrade of the basement areas. No. 108 is a charming design, and appears to be a most fitting building for its purpose. The entrance at the north corner of the site involves a long, top-lighted corridor to the news-room at the rear, the position of which is objectionable. Again, the irregular recessing of the side front is not satisfactory. The view admirably shows a brick and stone Georgian design, in which the roof plays a strong part. In addition to the excellent gables, the façade has stone terminal projections and a frieze of circular niches containing busts of famous literary men. The plan is directed chiefly to this front, and not to the actual site. The plan of No. 138 has merit, and the severely learned quality in the Greek Classic idea is interesting.

LABOURERS' COTTAGES.—Answering a question by Mr. John Roche as to the building of labourers' cottages with regard to which the Ballinascloe District Council state that the cost of acquiring the sites for labourers' cottages almost 100% more than it did before 1898, the Chief Secretary for Ireland states that the proposals contained in the Labourers Bill, which the Government are to introduce, will tend to diminish largely the incidental expenses connected with schemes for labourers' cottages.

ROYAL ACADEMY LECTURES.

On Thursday the 1st inst. Sir William Richmond commenced a series of three lectures on "The Development of Sculpture." Lectures, he said, on subjects of this kind could not teach much; they were a stimulus only; and the three which he was to give must be taken as representing a continuous argument; the concluding one would not be intelligible apart from the opening argument. He wished to commence with some preliminary considerations as to the origin of art. It would seem that man had always had an impulse to represent in some way either what he saw or what he imagined; whether the primary moving cause towards doing so was mere curiosity, or admiration, or fear. But the impulse must have existed long before any time of which we had historic evidence, for the oldest known representations, the ancient incised drawings on bone of the cave-men, of which they could see examples in the British Museum, could not be the first efforts of man at drawing; the people who did them were in their way accomplished artists; their drawings could not be called primitive: there must have been a great deal done before they arrived at that stage. Man could never have been without some degree of artistic aspiration; it was that which more than any other quality distinguished him from animals. The communication of ideas by some kind of pictured symbol probably preceded writing, and even was to some extent the origin of it; the symbols drawn became stereotyped emblems, and formed the foundation of alphabets. The origin of design would probably arise in the offering of weapons; weapons were a necessity in savage life, and the idea of decorating them perhaps arose partly from the desire to give them a personal value as property. The love of beauty for its own sake one could not account for, save by supposing that man had in his nature some infinitesimal portion of the Divine nature, leading him to the desire to create some ideal possibility; ideas being at first only expressed by symbols, a block of stone serving as an idol, till from this the symbol rose by degrees to the perfect art of the Greeks. But art had concerned itself also with the grosser aspects of nature; the first ideal was that of beauty, the second that of gauntness and ugliness; this double nature, that of Love and Fear, had always existed in art. Could we question the Primeval man, he could perhaps have told us whether his symbolic art was the offspring of terror or of love. Perhaps it arose from both feelings at once; like the ancient Egyptians, the primitive man might have made a mythology out of his own emotions. All art, in one sense, was symbolism; as the primitive man made the circle an emblem of the sun, a modern child would make some scribble on paper which represented to him some idea that was in his own mind. It was noticeable that children took to drawing before they took to shaping anything in the round; this symbolism in the representation of form was the germ of idol worship, as it was also the germ of portraiture. Recently the attempt had been made to divorce art from meaning; Literature was jealous of Art representing ideas, or recording facts or narrative; art was to be content with form and rhythm. But there was nothing to forbid our uniting the ethical with the aesthetic in art; the greatest men had done so. We should avoid such narrowness, as we should also avoid the mistake of regarding art as a series of different professions. Art was *one*, though a variety of emotions were expressed by different means; to limit sculpture and painting to facts was mere professionalism. Our finer perceptions were injured by a vulgar environment; we too soon got used to it; and the present tendencies in art were vulgar—the tendency to illustrate squalor and misery; it was part of the spirit of hurry of the present day, which drove us to rush at motor-car speed over the fame of our ancestors in the act of advertising ourselves. A nation that had become pessimistic was on the way to its downfall; our proper task was to arrest this decay, not to encourage it. The real difficulty was to build into the old structure wisely and securely. It was never more difficult really to know ourselves than at the present moment. Was legitimate originality impossible? Originality, it must be remembered, was a rare quality; it did

not come by leaps and bounds; it was the offspring of modesty and courage combined. Reynolds was of opinion that a knowledge of all art history was necessary before we could become original. Art had now grown, as it were, to man's estate, after passing, like man, through stages of weakness and disease. What seemed new was a growth out of the old stock; the links in the chain could be traced back to 5000 B.C.; the men of the Stone Age were our artistic ancestors; we were echoes of the past, and our own work would echo to the future. The idea of evolution applied to art as well as to science, and there was therefore a grave responsibility on us of the present day to make a worthy choice of subjects. Intelligent natures would continue to look for a motive in the arts of design, and what was said in art must be related to what was highest in our nature. Religion was the great inspirer of ancient art, its two types, the Pagan and the Christian, the figures of Jupiter and Christ, had become almost inseparable from artistic expression. Philosophy had not reasoned away the idol forms from art. But the fear that beauty was a kind of snare was far too widely spread. The nude form shocked the *bourgeois* mind, yet the Bible quoted it as the image of the Creator. He could not but say that he valued Tradition, and did not believe in a "New Art."

This preamble was necessary in order to explain the view which he took of his subject. Let them consider now what they saw in the artistic remains of the oldest known civilisation—the Pyramids of Memphis and the Sphinx, going back to about 5000 B.C.; perhaps even earlier. The Sphinx was the oldest piece of sculpture known to us; when Pliny saw it, it was coloured, as sculpture was coloured in the Greek and Medieval Periods also. It was an extraordinarily expressive work, especially in its diversities of expression. He had seen it during every hour of day and night, changing its expression with the time of day; it looked grim at noonday, in full sunlight; it took a cynical expression at sunset; it was always changing. It had seen the fall of dynasty after dynasty; Moses and Napoleon had alike contemplated it; and it still remained a masterpiece; no photograph gave any real idea of it.

The Memphian sculpture was very realistic in character. The best examples were found in the tombs, especially figures carved in sycamore or acacia, the only two trees found in the Nile Valley which were suitable for wood carving. He showed the photograph of one which was evidently the portrait of a middle-class man who held some office, with a long wand of office in his hand; the character of the figure was admirably given, and the figure resembled very much the kind of man whom one might find exercising the same kind of office in the Egypt of today. The hands and feet, however, it would be observed, were less carefully executed than the head. In other examples, too, they found the limbs clumsily executed, while the head was full of character; it was an age of portraiture in sculpture. The statue in basalt of Chephren, the builder of the Second Pyramid, showed a great deal of artistic perception in the emphasis given to the most essential details. The life of an ancient people was more vividly shown in the bas-reliefs and paintings in the Memphian tombs than any written record could have given it. The representation of birds and animals was excellent, and reminded one of Japanese work. The gods were not represented as perfect men; they were only alluded to. It was an age of realism and portraiture. But the study of its works was a good preparation for the understanding of Greek art.

In his second lecture, delivered on Monday the 5th, Sir W. Richmond said that he would now consider the art of the Theban period in Egypt, when the seat of government had been transferred from Memphis to Thebes; a period when we found much larger temples, led up to by avenues of sphinxes, and colossal statues of kings represented as gods, and the tombs were larger and more important in their architectural and decorative treatment. From the XVIIIth to the XIXth century there was an inroad of a foreign Turanian race, known as the Hyksos or Shepherd Kings, who adopted the

religion and art of Egypt. The sphinxes might have been portraits of these Hyksos kings; the type of face they showed was not Egyptian. Eventually Egypt revolted and expelled the Hyksos, and after this a new and more brilliant period arose under the new Theban empire. Art in this period became important in connexion with the ideas as to the life after death, and the dead were honoured not only in the quantity but in quality of the art bestowed on their memory. Art thus became a sacred thing, a religious necessity, and illustrated ideas which in the Memphian period were only described in writing. The occupations of the deceased were illustrated on the walls of his tomb, and the myth of Osiris, who, having been permitted to visit the earth, was slain by his brother Typhon, the power of Evil, and became the guide of the souls of the dead, because he had lived with and known men. In the colossal statues the portrait character was much less marked than in earlier art; the expression was more abstract. These colossi were mostly carved out of one block of stone. In the tombs the walls were very carefully prepared for the bas-reliefs, and the design then sketched out for the carver to work upon. They retained the ground of the design untouched, not cutting into it for any accompanying detail. Did the Greeks ever see any of these Theban tomb sculptures? He thought it was probable that they did. But on the whole it might be said that the Greeks learned sculpture in the round from Egypt, and Egyptian influence was quite obvious in early Greek sculpture; but bas-relief they probably learned from the Assyrians. Was it possible that the colossal Zeus of Pheidias resembled at all the colossi of Egypt?

In considering the influences prior to Greek art they had to reckon with five nations—Chaldea, Assyria, Babylonia, Media, and Persia. Art in Egypt had originally progressed from north to south—from Memphis to Thebes; now it took the opposite direction, from south to north. The Greeks were now to be taught by a people in Asia Minor, the Chaldeans, who again were the artistic precursors of the Assyrians. It had never been proved that Hellenic art was Hellenic in its origin.

The Assyrian reliefs might be called drawing on stone rather than sculpture in the usual sense of the term. The hunting propensities of the Assyrians gave them an interest in animals, and their treatment of these was exceedingly artistic; he might mention especially the admirably sculptural spirit in which they created the lions' manes, a much better sculptural treatment than that of the manes in Landseer's lions. Then the Chaldeans and Assyrians were great in metal-work, and it was probable that Homer's description of the shield of Achilles was inspired by Chaldean or Assyrian metal-work. We saw from the well-known gates in the British Museum that it was customary with the Assyrians to overlay sculpture or carving with gold or other metal, an art afterwards practised in Greece. The sculpture at Selinonte was quite Oriental in feeling; and primitive Greek art showed traces of Assyrian influence. And he could understand how this might be, for long before the colony of Naxos was founded, Phœnician sailors, trading along the Mediterranean, had made the arts of the East familiar on European shores. Whence came the inspiration of the lions of Mycenæ, the oldest sculpture in Europe? The heads were missing, and it had been suggested that they might have been of metal. The prototype of the lions of Mycenæ was to be found in a sculpture in Asia Minor. About the sculpture of Persia little was known; the Persians were eclectic in art, and influenced by others rather than making a style of their own; and as far as there was a native art in Persia it was textile rather than graphic.

The sea-faring Phœnicians, who occupied islands in the Ægean sea, must have almost provided an education for the uncivilised countries which they visited. The archaic age of Greece was not a long period; from about 700 to 500 B.C., and it received its earliest inspiration from Oriental sources. Much fine Egyptian art which is known to us was not known to the Greeks.

At the third and concluding lecture, on Thursday, the 8th, Sir W. Richmond dealt with Greek sculpture. He remarked that

the Greek vase-paintings bore a great deal of resemblance to Greek bas-relief in regard to general stylo and composition and the treatment of the figures. More particularly was this the case in regard to the spacing of the figures and the arrangement of the unoccupied spaces between them. The Greek artist was sensitive to the shape of every portion of his design; not only the shape of the figures but the shape of the unoccupied spaces. The vase-paintings should be studied in regard to this point in design, which was most important. The Egyptian and Assyrian relief sculptures, which were the precursors of Greek work, were always in low relief; alto-relief was a later invention. Vase-painting was commenced by the outline of the design being incised by the master artist, afterwards filled in with colour by his pupils or assistants, and probably corrected or touched upon by the master afterwards. Greek bas-relief, on the contrary, was begun as a drawing on a carefully prepared smooth surface, and the spaces occupied by the figures defined by a coating, perhaps of wax or a colour mixed with wax. Then the ground or space between was cut away till the figure composition showed as a growth out of the ground; and the interior modelling of the figures followed. Where a broad light or shadow was required the surfaces were left flat; but for obtaining strength and emphasis of effect a deep sharp sinking would be made here and there in the drapery, where it was clear of the limbs; a sinking sometimes carried even deeper than the ground, which remained as a half-tint. This device was found in the best Babylonian sculpture, but not in that of the Egyptians, who forced their design by a deep incision all round it, sometimes an inch wide, and within this there was little modelling. This was an easy way of getting effect under a very strong sun, and considering the great size and distances of the Egyptian temples there was an excuse for this forcing the design. With the smaller temples of Greece there was not this necessity for forcing the outline, and the air of Greece was so clear that the most delicate moulding would tell. The system of delicate work in low relief was kept for the friezes—which were on the cella wall, and separated from the external architecture of the temple. With the metopes the case was different; they were placed in immediate connexion with the structural portion of the building and (at the ends) were immediately beneath the rounded sculptures of the tympanum; they therefore required a stronger treatment in high relief, some of the figures being sometimes entirely separated from the ground. In the frieze sculpture it was probable that there were no preliminary models made; the first making out of the design was a matter of drawing, not of modelling. And this led him to emphasise the point that it was important that a sculptor should be a good draughtsman, especially for setting out the design of a relief. Recurring to what he had said as to the importance of spacing, he would remark that this applied equally to the sculptures in the round in the tympanum; the spaces, as a matter of composition, were as important as the figures, especially when seen from some distance, where the figures stood out as lights against a darker background; and if, in making conjectural restorations of tympanum sculpture, the arrangement was such as to produce bad and awkward shapes of the spaces between the figures, they might depend upon it that the restoration was incorrect. Badly shaped spaces were enough to ruin a work otherwise good. The same principle held good in all forms of design; in lettering or printing the spacing between the letters was as important as the shape of the letters themselves; and the study of ornament taught the same lesson. The vase-painters worked on a limited surface, and the figures were set out as an ornament within this space. Ornament in its earlier forms was simply expression produced by line, and the earliest attempts both at ornament and sculpture were symbolical. The first statues, the *xoana*, were mere shapeless blocks, which rudely expressed the mysteries of creation. By slow degrees heads and arms were shaped on them. These were rude shapes, but they were objects of popular reverence. The wood statues representing Athene or Zeus

were however richly clad at festivals. The Greeks were a conservative people, however; they did not lend themselves readily to artistic innovations, and the old wooden block still remained the idol. The ivory and gold-covered statue of Athene was the eventual outcome of this cult; was it in fact a development of the vested *xoanon*? Pheidias, in executing a sacred statue, would probably adhere to the ancient type of the idol; he would not care to experimentalise on a new type. The core of his statue was still the wooden idol, covered over with plates of gold and ivory—a *xoanon* to all intents and purposes, which gathered up in itself every ancient tradition. The complete Doric architecture was evolved from the wooden hut, the complete Greek sculpture from the wooden idol. But while Pheidias was opening up new fields of sculpture, an archaic art was being practised at the same time. The figures from the Temple at Ægina, of which fifteen were in the British Museum, ten from the western and five from the eastern pediment, were in a quite different style from the work of Pheidias, a style more suitable to bronze than marble; they had the appearance of having been designed by sculptors accustomed to work in bronze. Eyes that had been accustomed to bronze would find marble too cold in effect, hence the Greek marble statues were coloured, undoubtedly with restraint, but still they were coloured. It was likely that the colouring of Greek architecture and sculpture somewhat resembled that of Persian tiles. Until recently it had been thought that this idea of colouring sculpture was a vandalism, and there was still a prejudice against it. Not long since, however, they had seen at the Royal Academy exhibition a fine example of a modern statue by Gérôme, executed in ivory and bronze, with colour, somewhat after the idea of the Athene statue; though probably less brilliant in colour effect, yet giving some idea of the ancient practice. This was not a thing to be passed over. If a taste and a demand for coloured sculpture came in again, they would be called upon to provide it. It was worth note that Pheidias was the son of a painter; his works were decorated sculpture enriched by colour; he was not therefore a sculptor pure and simple, in the ordinary acceptance of the word; he should rather be called an artist. We could not suppose that the nude portions of the pediment statues of the Parthenon were strongly or realistically coloured, though they would not be left white marble; probably the draperies were coloured; but the interior statues were really huge idols, and it was probable that they reproduced more or less the ancient objects of reverence.

The frieze represented a procession which took place once in four years; a procession in honour of the virgin goddess. The quality of the execution in the frieze varied a good deal; the execution was the work of a large staff of artists, but the whole was drawn by Pheidias himself on the prepared wall surface, looking in that stage like vase-painting. Perhaps Pheidias finished some of the sculpture himself. The delicacy and care with which it was set out and executed were remarkable. In one place seven horses were indicated in a group, one behind another, but the whole twenty-eight legs were carefully made out, one could trace each set to the right animal. It had been remarked that the horses were small in comparison with the men, but Pheidias would take liberties with nature when the composition demanded it, and he did so in this case in order to keep the line of heads unbroken. He recommended to the students a careful study of this work, which was undoubtedly the finest and most perfect piece of relief sculpture in existence; and to produce such a work it was necessary that it should be carefully drawn first.

In studying the style of execution of the Elgin marbles he would tell them of one interesting and instructive experiment that could be made. Take any straight piece of rigid material, say a piece of iron, three or four inches long, and apply it to different portions of the surfaces of these marbles. They would find that everywhere these surfaces were flat; there were differences of planes but no absolutely curved surfaces. In Roman sculpture it was different; if they applied the same test to the Apollo Belvedere, for instance, they would find that

all the surfaces were curved. It was the same with the later Greek work of Praxiteles and his school; and this was the secret of the inferior and sensuous appearance of these works. Archaic sculpture was always building up a strong thing, even if imperfect; then a great man came and, like Pheidias, gathered up all the archaic tradition, breathed the breath of life into it, and made it noble and dignified sculpture with a noble motive and a rhythm in the leading lines and planes; the result of good craftsmanship working on tradition. Let them stick to tradition and cultivate craftsmanship; without industry and love the art could never rise to its old heights.

THE ARCHITECTURAL ASSOCIATION: CAMERA AND CYCLING CLUB EXCURSIONS.

An ordinary general meeting of this Association was held on Friday last week at No. 18, Tufton-street, Westminster, S.W., Mr. John Murray, Vice-President, in the chair.

The minutes and nominations having been read, Messrs. J. B. Scott and P. W. Pocock, jun., were elected members of the Association.

The Chairman announced the following further donations to the Building Fund, i.e.:-

Howell J. Williams, Ltd.	10	s. d.
T. Tyrwhitt	5	0 0
W. Morrison	5	0 0
J. E. Beck	3	3 0
J. E. K. Cutts	1	1 0

Mr. Tanner (Hon. Secretary) proposed a vote of thanks to Mrs. James Scott Stewart for donation of books and photographs.

The motion was agreed to, and it was announced that a meeting of the Camera and Cycling Club will be held on March 20, and a demonstration on "Lantern Slides" will be given.

Mr. Gilbert H. Lovegrove then read the following paper, prepared by very short notice in consequence of the inability of Mr. A. Vye-Parininter to read the paper arranged for, entitled "The Architectural Association Camera and Cycling Club Excursions."

"It has been impossible during the fourteen days at my disposal to prepare a connected, much less a scholarly, paper. I, therefore, propose only giving a brief description of some photographs as they are thrown on the screen to give some idea of the buildings visited by the Architectural Association Camera and Cycling Club during the past few years.

Christchurch Priory.

One of the most beautiful and interesting buildings we have visited is the Priory Church of Christchurch, hard by Bourne-mouth, containing specimens of every period of architecture from the early, possibly Saxon, crypt to the Renaissance of its chantries. The church has, as is usual with our larger churches, legends connected with its foundation and construction, but with these I will not delay you. The site is close to the junction of the rivers Stour and Avon, on the flat lands of the Saxon Tweoxreham, and the first mention of a church here is made in the time of the Confessor. This church, held by a dean and a college of secular canons, was swept away by Ranulf Flambard, the chaplain to William II., and it is suggested that before he was appointed to the bishopric of Durham in 1099 he began the present church, of which part still stands. The earliest existing remains are the nave arcades, the triforium, and the transepts, with the eastern apsidal chapel attached to the south transept. Next in date are the walls of the western aisles, and of about the beginning of the XIIIth century the clearestory of the nave, followed by the vaulting of the western aisles, the north porch, and the chapel attached to the north transept. To the XIVth century belong the rood screen and the reredos.

Early in the XVth century the Lady Chapel was completed and later the western tower and portions of the choir. From an inscription on the vaulting of the choir we know that this was completed between 1502 and 1520, while later still is the chantry at the east end of the south choir aisle, and in 1541 the famous Salisbury Chantry. The stalls and misereres are of various dates from 1200 to 1500.

Wimborne Minster.

From Christchurch we visited Wimborne

Minster, a comparatively small building containing a great many interesting details, but, owing to the journey and the church services, very little time was left for photography. At the western end of the late Norman nave several bays were inserted in the XIVth century when the church was lengthened, and the illustration shows the junction on the north side. The choir is mainly of XIIIth century date, the east window, which is impossible for photography from the exterior, being illustrated in Parker's Introduction to Gothic Architecture. This portion of the building is raised over a crypt, reached from the aisles through an archway, over which is the beautiful tomb to John Beaufort, who died in 1444. The label stops of the arches over the entrances to the crypt are of great interest. The sedilia, which are of great beauty, are, unfortunately, un-illustrated. No one visiting Wimborne should miss seeing the museum in the celebrated chained library.

Bruges.

With the present facilities for cheap travel a week-end in Belgium is of small moment, for one can leave London at 9 p.m. and be photographing in Bruges by 4 a.m. The street opposite the station takes us past the cathedral to the square, one side of which is formed by the Cloth Hall and its celebrated belfry. The Cloth Hall was built in the XIIIth and XIVth centuries, and altered in 1561, the courtyard containing some interesting Renaissance detail. The eastern wing contains one of the most remarkable collections of local relics it has ever been my good fortune to visit, and several days could be spent studying the specimens of iron hinges, door-handles, &c., apart from the other exhibits. The belfry was begun in 1222, and finished at the end of the XIVth century, the delay being due to the rebuilding of the octagonal upper portion. The statue over the entrance is of the Madonna. Continuing along the south side of the Market-square we reach the smaller square containing the Town Hall, begun in 1376, and restored in 1871, adjoining which is the old Municipal Record Office, built in 1535, and now the Law Courts. The facade is gilded over the greater portion of its surface, and so presents great difficulties to the photographer.

The interior is not generally visited by the tourist, but contains some excellent carving. Passing under the archway in the Record Office we reach the Quai de Rosaire adjoining the Fish Market, from which many interesting photographs may be taken. The building on the left of the illustration is the Town Hall, seen from the rear. Continuing along the back streets we reach the Church of Notre-Dame, opposite the Memling Museum, the most interesting portion of which is the old north porch. A walk round the canal encircling the city brings us to the various gateways, of which the Porte Marechale is illustrated.

Ypres.

From Bruges a cross-country railway journey brought our party to Ypres, a grass-grown city, surrounded by ramparts. The most interesting feature, apart from one or two houses, are grouped round the Cathedral and Cloth Hall. As it was Sunday, the Cathedral was left untouched, but the Cloth Hall, completed in 1304, provides plenty of subjects. Over the entrance through which the Cathedral-square is reached is a statue of John I. of Brabant. The interesting way in which monotony in so long and flat an elevation is avoided by the alternate use of blank windows filled by statues should be noted. Adjoining the Cloth Hall is the Town Hall, erected during the XVIth century, the ground floor being an open arcade, about 20 ft. wide, surrounding a vaulted hall. Behind and adjacent to this is the Conciergerie, perhaps the most interesting building in Ypres; passing under the arcade we see the side elevation of the conciergerie to the cathedral-square, and the cathedral tower, with the Cloth Hall in the background. The domestic buildings in Ypres are uninteresting compared with those in Bruges or Ghent, the best building being at the end of the town furthest from the station.

Peterborough.

Approaching Peterborough Cathedral from the station one passes the Guildhall, built in

1671 immediately opposite the entrance to the close, passing through which we see the west front, erected probably about 1238, the porch being a XVth-century addition to support the central piers. The denary gateway, built about 1520, is of considerable interest owing to the carvings of the arms and the rebus of the prior (Robert Kirkton), the Tudor rose and portcullis, the Prince of Wales' feathers, and the triangle of the Trinity. To the south of the cathedral are the ruins of the cloisters, whence one may see the grouping of the western towers. At the east end is the "new building," 1438-1528, from which until the XVIIth century the Lady Chapel projected.

The nave was commenced about 1117, and is of unusual length; it is uncertain whether the Norman west front was ever completed. The font, of XIIIth century date, is placed in the south-western transept.

The eastern transepts and the tower are ceiled, like the nave, with wood, the bosses in the crossing being very finely carved. The transepts are of similar date to the choir, but the eastern and western arches of the crossing are of the XIVth century.

The choir contains the earliest English example of tracery in the triforium; the marble paving and baldachino were completed in 1294. This last illustration shows the original eastern extremity of the cathedral with the tracery inserted in the clearestory in the XVth century. The aisles of the choir contain some matters of interest, such as the double piscina in the north and the ruined monument in the south. The three remaining misereres of mediæval date are fastened to a board in the south choir aisle.

The "new building" was built beyond the apse at the end of the XVth century, and is of the width of the choir and aisles together.

Stamford.

Within easy reach of Peterborough is Stamford, a fascinating town containing many interesting houses and magnificent churches, while those interested in the work of John Thorpe may study Burghley House, of which he is supposed to be the architect. Its architecture, however, did not suit the fancy of our members, and no photographs were taken.

Close to the Stamford Hotel, in St. Mary's, are several small houses of interest, as also in St. Martin's, on the road to one of the entrances to Burghley Park, but to the mediævalists All Saints' Church is the chief attraction, nearly every capital in the church providing a subject, while the roof-corbels, vaulting bosses, and almost every portion of the church are worthy of record. St. Leonard's Priory on the outskirts of the town, and now used as a barn, is of great interest.

Warrington.

A short drive from Stamford on the Oundle road is Warrington, where St. Mary's Church provides a day's work. The building, including the wooden groining of the roof, is of XIIIth century date throughout.

Thorpe.

One mile from Peterborough is Thorpe Hall, where Colonel Strong kindly gave us free access to every portion of the building. According to Blomfield, the house was commenced from Webb's designs shortly after the death of Inigo Jones, and is dated 1655; its design is directly inspired by Inigo Jones, and is uninfluenced by Wren.

Greenwich Hospital.

Greenwich Hospital has been visited twice by our members, and is always a source of interest. When Wren commenced work here there were two buildings on the site, the house facing the park designed by Inigo Jones and the unfinished palace begun by John Webb from designs by Inigo Jones for Charles II. Wren completed King Charles' block, and, making the Queen's palace of Inigo Jones the centre of the extreme south, designed two courts, with colonnades facing each other, running northwards towards the river till they joined the great court, the west side of which was already occupied by King Charles' block, opposite which he built Queen Anne's block. The junction of the colonnades with the great court was marked by the two domes surmounting the entrances to the chapel on the east side and the hall on the west. Hawkesmoor continued the building of the south-western or King William's block, which was finished by Vanbrugh.

Among the City churches we have visited Christ Church, Newgate-street, of which slides are shown of the litany desk, formerly the door of the reading-desk, whose panels now form the front of the choir-stalls. These have all been cleaned, and present an entirely different appearance from the pulpit.

The font of St. Stephen's, Walkbrook, is of great beauty, and a more successful subject to the photographer than the hody of the church, which is too small in area for photography.

The font at All Hallows, Lombard-street, may be taken by artificial light, but the church is far too dark for successful exposures.

Hereford.

Hereford forms an excellent centre for a visit, although the town itself contains little of interest except the houses formerly known as Butcher's-row.

The cathedral tower is profusely ornamented with the ball flower, but, owing to the condition of the stone, the larger part of the exterior has been refaced, and the chief points of interest are the north transept turret and the north porch. The cloisters are almost all new.

The south transept seems to have been built about 1115 and the north in 1240 by Bishop Aquablanca, whose tomb is in the aisle of the north transept, where also is the temporary resting-place of an effigy with beautifully-carved robes of Bishop Westfayling, who died in 1602. The font is of about 11th century date, and is carved with the figures of the Twelve Apostles; the lions supporting the base are of exceptional interest. The nave arcade is of great beauty, but has suffered considerably both accidentally and at the hands of Wyatt and other restorers, and practically all above the crown of the arches has been rebuilt at one time or other.

Ludlow.

The chief points of interest in Ludlow are the castle, the church, and the Feathers' Hotel, where many subjects are ready to hand, one of which, a fireplace, is illustrated. Being Sunday, we could not obtain admission to the church, which contains many points of interest, but the south-eastern windows are shown as an example of weathering. At the east of the church is the Reader's house, an early XVIth century building in half timber, of which the door-head is shown.

Ledbury.

Ledbury, of which I have but two slides, is a charming village filled with interesting buildings. The market-house is one of the easiest to photograph, and is certainly the most striking. At the top of the town is Sir Michael Biddulph's house, of great size and interest.

Kilpeck.

From Hereford we drove to Kilpeck, where the remains of the castle and the little Norman church were visited. The church, as is well-known, was rebuilt in 1848, stone by stone, but nothing was recut and no new stones were used except one in the tympanum of the south door. The extraordinary freshness of the carving is a striking contrast to the condition of the stone at Hereford and Ludlow.

The few slides I have shown will give some idea of the extreme variety of the architecture visited, and, I believe, studied by the members of the Camera and Cycling Club during the past few years. I have omitted, owing to want of time, illustrating several of our most interesting visits, such as those to Gloucester and district, Hampton Court, and Morden College, as it would have been an easy matter to have filled several evenings with an account of our excursions. The excursion to Winchester next Easter will be open, as all our excursions are, to all members of the Architectural Association, and those who will go will find that the members of the Camera and Cycling Club form a very sociable section of the Architectural Association.

The paper was illustrated by a large number of lantern slides, and the Chairman, in inviting discussion, referred to the trouble which Mr. Lovegrove must have taken in preparing the lecture at such short notice.

Mr. Matt Garbutt proposed a vote of thanks, and said that Mr. Lovegrove had

proved an interesting guide to a number of buildings which they all wanted to see.

Mr. E. W. M. Wonnacott seconded the vote of thanks. His advice to ordinary members of the Association who had not taken part in the Camera and Cycling Club excursions was summed up in two words—i.e., "Try them." Members who had been once went again, and that would particularly apply to foreign visits. At any time, with reasonable notice, the Camera Club would give the members of the Association an entertaining evening.

Mr. W. J. H. Leverton having supported the vote of thanks,

The Chairman, in putting the motion, said their thanks were due to Mr. Lovegrove for having prepared his paper and the slides at such short notice. Photography was undoubtedly a considerable aid to the study of architecture, and they had before them that evening a vast field of work. He would advise students to visit the buildings shown whenever the opportunity arose. He thought that they should have one such evening at not infrequent periods.

The vote of thanks was heartily agreed to, and Mr. Lovegrove briefly replied.

The next meeting will be held on the 23rd inst., when a paper will be read by Mr. A. W. Soames, M.P., on "The London Club-house of the Last Century."

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

IV.—ROYAL FRIENDLY SOCIETY BRANCH
OFFICES AND TOLLARD ROYAL HOTEL,
SOUTHAMPTON-ROW, W.C.

SATURDAY, March 10, was the occasion of the fourth spring visit, when the object of inspection, the Royal Friendly Society's new building, proved one of considerable value to the members of the Architectural Association, both as a study in planning and in construction.

The undertaking arises out of the great Holborn-to-Strand improvement, and the site, at the widened end of Southampton-row, was purchased by the Society from the London County Council upon an eighty years' lease. The ground has an average frontage of 60 ft. and a depth of 45 ft. The Council made certain conditions in design, the London Building Act imposed its usual unnecessary restrictions upon construction and the rights of light enjoyed by the school at the rear of the site made the problem of an adequate financial return one of intense complexity.

The general impression of the visitors was that the architects, Messrs. Bradshaw & Gass, had achieved a distinct success as the result of some arduous labours. Under the guidance of Mr. Gass, who came specially from Lancashire, the building was inspected from foundation to roof. Some printed particulars, including lithographed plans and diagrams, were supplied to each member of the party by the architects, a privilege which was greatly appreciated.

The Friendly Society has a large office with a small basement only, at the north end of the site, while the remaining accommodation is sub-let for the purposes of the Tollard Royal Hotel, the main entrance to which is at the south-west corner of the site. The hall, office, and cloak-rooms of the hotel are at the street level. In the basement there are a billiard-room, kitchen, scullery, larders, etc., and on the first floor a large dining-room, a drawing-room, and several bedrooms. The six upper floors contain bedrooms (fifty-three in all) of a small size, but suited to the particular business of the establishment, for visitors and staff.

The back part of the two lowest stories is roofed at the first-floor level, while the main building rises in the rear to the fourth floor, the level of the old buildings on the site, and is then roofed at sixty degrees to enable the school to enjoy its right of light. The whole of the back elevation is faced with white glazed bricks and the roofs covered with white glazed tiles.

The main fronts are faced with Ancaster stone, and have certain features in Portland. The warm colour of the former is interesting. The usual idea of a rusticated treatment to the two lowest floors is introduced, but the absence of columns and their accessories and the idea of leaving the pier masses to express their own purpose is quite refreshing. The

use of the gables terminating the irregular roofs, procures symmetry in the end facades, and it will be realised that a considerable amount of skill is brought to bear on the point.

The construction, however, is mainly that of an American steel-framed building in which a larger extent of cross-bracing is used than is usually the case. All the walls are carried upon steel beams cased in concrete, yet the promoters are driven to the amazing course of building the independent wall-fillings of the enormous substances required for self-supporting walls by the Building Act. One of the main reasons for this form of construction is to render the building easily adaptable to other purposes than those of an hotel. The stanchions are carried upon large steel-grillage concrete foundations, while the construction generally is of a fire-resisting nature.

Some of the London County Council requirements in this building are excellent, such as the means of escape in case of fire. The two internal staircases and the external staircase are well placed, and each of the three parts into which the interior is divided by doors of a fire-resisting design are conveniently arranged for rapid exit. Requirements of an aesthetic nature were also made, such as the cutting off of the angles and the height of the cornice of the main front made to introduce a sense of uniformity with the adjoining buildings.

Bearing in mind all the conditions governing the design, it was unanimously considered that the architects had obtained the utmost possible floor-space out of the site for their clients.

MAGAZINES AND REVIEWS.

The *Art Journal* contains an article by Lady Victoria Manners on the remarkable series of the Penrhire and Vernon tombs in the church of Tong, in Shropshire; which are well worth special illustration and description. "The Craft of Thomas Chippendale" is the subject of an illustrated article by Mr. E. Avery Kedell. The examples given vary much in merit, nor do we gather that the author of the article intends by any means to exaggerate his artistic qualities. The worst things about Chippendale are his "Gothic" and "Chinese" designs for chairs and other articles, which are, to speak plainly, about as bad in their way as anything could be, and the fact of their pretending to be Gothic makes the impression still worse. The best are those which he treated with a broad and monumental-looking arrangement of the lines of construction, with little other ornament, such as the circular-backed chair and the settee at the top of page 79. The "Chippendale Mirror," an illustration placed at the end of the article, in which the wood frame is fairly tortured into all kinds of ragged forms, is a thing so atrocious that one questions whether it ought to have figured at all in an artistic journal; it is a kind of thing better forgotten. A chromolithograph reproduction of a foreground picture by Mr. E. C. Clifford, entitled "A Sussex Garden," is a very successful piece of colour painting. In a notice of the pictures recently exhibited at the New Gallery the writer of the article, we observe, singles out as "one of the best" the hideous travesty of a picture by Manet, "Le Linge." When we see such work held up to admiration, one is inclined to ask whether painters and critics have alike gone mad.

In the *Burlington Magazine* a certain Mr. Robert Dell has revived the old contention that Pugin was the real architect of the Houses of Parliament. From his writing he seems to be totally blind to the architectural genius of Barry, to whom the real greatness of the design of the Houses of Parliament is unquestionably due, and no man who has any perception of what architecture really means can have any doubt on the matter. It is significant to find (what we did not know before) that Pugin's family, in the former campaign, had the more than doubtful assistance of the late Lord Grimthorpe, who pretended that his interest in Gothic (!) induced him to take their side. The fact is that Lord Grimthorpe was always ready to turn against and endeavour to belittle any eminent and successful architect; it was not that he desired to help the Pugins so much

as that he desired to injure Barry. The competency of Mr. Dell to speak on the subject may be estimated by the fact that he thinks the Houses of Parliament a greatly over-rated building, whoever designed it. When he says that "few of us would now agree with the extravagant praise of the Palace of Westminster that seems to have been the fashion in 1867," he only shows that he must be totally unacquainted with the current of architectural thought, not only in this country but in America also. The same number contains a review of Messrs. Agnew's "Independent Artists' Exhibition" by a prominent member of the New English Art Club, who of course discovers that the most remarkable works in the Exhibition are those of another prominent member of the same institution of eccentrics. That is what "art-criticism" seems to have come to now.

The *Magazine of Fine Arts* is going on admirably, both in illustrations and matter. It includes an article on Linné by M. Alexandre Arsène, and one on Ingres (a painter who has been too much forgotten of late) by M. Octave Uzanne, with a large number of illustrations of his works, including a page plate of the beautiful "La Source." "Old Silver Communion Plate" and "English Chairs of the XVIIIth Century" are among other subjects illustrated, and the issue also contains no less than nine separate plates in "sanguine" after drawings by Leonardo da Vinci.

The illustrations in the *Berliner Architekturwelt* are mainly devoted to the exterior and interior and details of a remarkable private house, the "Haus Erich," by Herr Otto Spalding. Externally it is a good-sized but unpretending residence of rather picturesque character, with a specially designed iron rail fence and some other decorative accessories; but the various interiors show a treatment that is full of originality without eccentricity. The walls of the staircase hall are faced with brickwork with white joints; the furniture and fittings, the stairs, the entrance gates, have all a *coquet* of their own, and appear to have been specially designed; an interesting study of the artistic treatment of a modern residence.

Concrete and Constructional Engineering, of which the first number appears this month, deserves more than passing notice as the pioneer journal in this country on the application of concrete, steel, and reinforced concrete in constructional engineering. The literature on concrete in all the chief languages of the world has become very extensive, and the English language is well to the front in this respect, especially when we take into account the United States. Nevertheless, up to the present time no British journal has been specially devoted to the subject of concrete, notwithstanding the fact that numerous publications in other countries are dealing exclusively with that important structural material. The number opens appropriately with an article entitled "The Advent of the Concrete Age," by Lieutenant-Colonel J. Winn, R.E., who deals with the early history and the steady advance of concrete, when once it became recognised by engineers that the material was worthy of a more important place in engineering construction than as a mere backing for masonry and brickwork. The more noteworthy developments that followed, and the use of concrete in combination with iron and steel are then traced, some examples of reinforced concrete construction are given, and the article concludes with a consideration of the difficulties to be overcome before concrete-steel can be introduced so fully as could be desired. We agree with the writer that the great obstacle among engineers is an attitude of distrust, and among architects the restrictions of building regulations. That the obstacle presented to the application of concrete-steel by building laws equally affects another important development of structural engineering is shown forcibly in the succeeding article on "Steel-Skeleton Construction and the London Building Act," by Mr. W. Noble Twelvetrees. The writer points out that architects, even where they appreciate the merits of skeleton building construction, find their way barred by the London Building Act, which he not unreasonably considers to be at least fifty years behind the most advanced architectural practice. Personally, we are not advocates of skeleton construction, but architects who desire to adopt it should certainly

be allowed to do so under rational regulations. At present the capability of a well-built steel skeleton for supporting loads without any help from brick walls is quite ignored, and architects are compelled to use just as much brick as if the steel possessed no greater strength than putty. To illustrate the practical hardship inflicted by this state of things, Mr. Twelvetrees calculates the floor space occupied in a ten-story building, measuring 100 ft. long by 50 ft. wide by 120 ft. high, by walls in accordance with the London Building Act, and with the proposals of the Royal Institute of British Architects. The results show that fully 7 per cent. of the gross area of the building is wasted by the unnecessarily massive walls demanded by the Act, this proportion representing an estimated loss of rental value in an office building of 720l. a year, equivalent to 5 per cent. on a capital expenditure of 14,400l. Among the shorter articles one by Mr. Charles F. Marsh deals briefly with "The Advantages of Reinforced Concrete for Foundations of Buildings"; Dr. Cecil H. Desch commences a series on "The Setting of Portland Cement," dealing in this instalment with the chemical aspects of the question. In addition to original contributions, the issue contains a well-chosen collection of miscellaneous information relating to new uses of concrete, tests, building laws and regulations, industrial notes, and a very complete index to recent articles and papers in the technical press and the transactions of engineering societies. *Concrete and Constructional Engineering* has made an admirable start, and if the present standard is maintained we are sure it will have a most useful and successful career.

Professor Ashley's article in the *National Review* on "Trade Unions and the Law" recognises that the principle set up in the Taff Vale case is not likely now to be got rid of, and that it is desirable that it should be maintained. But his remarks on picketing are really absurd. It should not, he says, be prohibited for several reasons:—

"First, because it is one of the ways in which, without any action worth seriously grumbling at, a work union may possibly become stronger; for it makes the existence of the union to the notice of people in the trade who might otherwise remain ignorant of it; and we have already accepted the apparent paradox that, in the interests of business, strong unions are preferable in the long run to weak ones. Secondly, because the attempt to prevent it cannot succeed, and creates a bitterness of feeling that adds to the friction of industrial life." Thirdly, because it is harmful to confuse together in the popular mind acts which the popular conscience, left to itself, regards very differently. To treat as reasonable what workpeople generally regard as an obvious right is to tempt them to palliate what they themselves feel to be wrong" (1).

The last argument is truly delightful. During the bad days of Sheffield rattening it was thought "an obvious right" to threaten an obnoxious employer or "black-leg" with murder; the argument might equally have been applied there. Because working-men think they have "an obvious right" to make another man's life intolerable to him (for that is what picketing comes to) unless he joins their ranks—a "right" which no other class of society pretends to, therefore we are not to legislate against it for fear of confusing their sense of right and wrong. The passage we have italicised is even more remarkable. We confess we should think that it was the act of picketing itself, not the act of restraining it, that tended to "create a bitterness of feeling" and to "add to the friction of industrial life."

The *Nineteenth Century* contains an article by Dr. Charles Davison, the well-known expert, as we may call him, on earthquakes, on the subject of "Earthquakes in Great Britain," a summary of the evidence on this subject, from which it appears that earthquakes, though nearly always very slight, are far more numerous in this country than is generally supposed. There have been 171 observed earthquakes in England and Scotland during the last seventeen years. This is, indeed, a very small number compared with the records of what may be called earthquake countries; Japan has recorded 8,351 shocks in eight years; but it will be a surprise to many readers to learn that we have had so many. They have been mostly very slight shocks, sometimes hardly noticed except by those who were possessed of

sensitive recording instruments. For the purpose of scientific observation, however, Dr. Davison thinks that these slight shocks are particularly valuable, as they can be better observed than those more serious ones which are disastrous in their effects. Dr. Davison's article contains much interesting information and theory as to the causes of earthquakes and the best system of classifying and observing them, for which we must refer the reader to his article. Mr. D. M. Morrison's short article on "The Unemployed and Trades Unions" is really an implication that the Trade Unions can no longer give any substantial assistance to the unemployed, having spent so much of their funds and influence in organising strikes which, by driving trade orders out of England, have in fact largely contributed to the present crisis, and he thinks "the country should now relieve them of a position they can no longer occupy either with dignity or with benefit to the working men on whose subscriptions they depend for existence." And he goes on to suggest whether the Trade Unions have not "unconsciously" been guilty of a serious breach of trust in utilising funds subscribed by working men in this country to assist and develop strikes abroad. The real gist of his article is the suggestion of a machinery for the regulation of labour in the interests of the labourers by means of a "Labour Tribunal" formed in every centre of manufacture, the proposed duties of which are set forth in tabular form; one of them being to collect and pay into a Government bank every week a fixed proportion of the wages of each man or woman, "the amount not to exceed what is now being paid to Trade Unions." By this the working classes as a whole will purchase the right to an allowance in sickness and a pension in old age, on the same principle now applied in the case of Indian civilians. The idea is partly suggested by the example and working of the Old Age Pensions system in Germany. This, to be sure, is no immediate panacea for the present shortness of employment, but it affords a better outlook for the future. The article is worth study.

School gives a paper on "The Warming and Ventilating of Schools," by Mr. Sydney F. Walker, which does not impress us very much, and we should advise managers of schools to pause before accepting all its dicta, and take another opinion. The paper is rather contradictory in one point, as to the open fire, which we first read has been superseded to a great extent "on account of its want of economy." But on the next page we read that "a glowing fire still offers the simplest and most pleasant method of warming, while it is doubtful if it can be beaten on the score of economy when the fireplace is one of the modern forms." We are disposed to agree with this, but it is rather contradictory of the previously quoted sentence. A large schoolroom, however, cannot be efficiently warmed by fireplaces alone; those near them will be too hot, those far away too cold; but this subject does not enter into the article now under consideration, and is to be considered in a future number of *School*. For small rooms we think (speaking from actual experience) that the best economical substitute for the fire is the Welsh gas stove, which not only gives out a surprising amount of heat for its small size and low consumption of gas, but has the merit of being a pretty and attractive-looking form of combustion, almost as pleasant to the eye as a fire. It requires careful treatment and will not stand rough usage, hence it would never do in rooms where boys were left to themselves; but schools include masters' residences, and for the ordinary sitting-rooms of private houses it is a very pleasant type of gas-fire, and very economical after the first installation. The author of the article recommends hollow walls for warmth, to which we reply that the disadvantages of hollow spaces which no one can get at—their possible disadvantages, at all events—far outweigh their supposed advantages, which we believe to be a good deal over-rated. We also absolutely disagree in the recommendation to have the door close to the fireplace, the supposed object being to prevent draughts crossing the room from the door to the fireplace. To have the hall outside the door warmed (as it always ought to be) would prevent that; and to place the door

close to the fireplace is to destroy all the comfort and repose of the fireside seat, to which everyone naturally gravitates when there is no special occasion to sit at the table.

The *Antiquary* contains two articles on very interesting subjects, neither of which, however, come exactly into our category: "Mary Queen of Scots, her connexion with Art and Letters," by Mr. Blackie Murdoch; and "Notes on the Old Church Bands and Village Choirs of the Past Century," by the Rev. F. W. Galpin, reprinted from the *Proceedings of the Dorset Natural History and Antiquarian Field Club*, with revision by the author. As may be supposed, the subject gives occasion for much curious and amusing record. Mr. Galpin thinks that the disestablishment of the old village instrumental helps to singing—the clarinet, flute, and violoncello in the gallery—to make way for the organ or harmonium, leaves something to be regretted; "the practice of these wind and stringed instruments gave occupation and recreation to the peasant folk"; but if that were all, they could still add their aid to the organ or harmonium. The present writer can just recollect one of these old country choirs with its violoncello and clarinet (there had been a bassoon, but it had been laid up for want of any hand cunning enough to handle it); but to the best of his recollection it was certainly conducive to amusement rather than devotion. The country choir and its instruments were a picturesque characteristic of the period, but we can hardly think their extinction is to be regretted from any point of view. Dr. Ball concludes in this number his interesting article on "Old Heraldic Glass in Brasted Church," with which much history is connected.

THE SURVEYORS' INSTITUTION.

An ordinary general meeting of the Surveyors' Institution was held on Monday evening, at No. 12, Great George-street, Westminster S.W., Mr. G. Langridge, Vice-President, presiding in the absence of the President, Mr. C. Bidwell.

The minutes having been read, some donations to the library and library fund were announced, and a vote of thanks was accorded to the donors.

The Means of Locomotion and Transport in London.

Mr. William Woodward then read a paper entitled "The Means of Locomotion and Transport in London," which consisted to a large extent of a review of and comments on the Report of the Royal Commission which was appointed in 1905. In the course of his remarks the author said, as to the Report of the Advisory Board of Engineers, that he was afraid that the great labour and skill bestowed on the Report had rather tended to hide its practical conclusions and to relegate to some future period works of relief which should be undertaken at once. If he differed from some of the conclusions arrived at by the Board, it was not because he did not grasp and appreciate the results of their labours, but because he thought the relief now sought for was immediate. Of one thing he might be certain, that neither the Legislature nor the London County Council would further the immediate pulling down of any large area for the purpose of forming new streets or of widening existing ones to any considerable extent; and it was, therefore, to the present plan of London we must confine our attention, much as we should, of course, like to make London streets useful as well as beautiful. The author then dealt with the present unlimited liberty of drivers and others, obsolete vehicles to be dealt with, and tramways. To his mind the most important part of the subject was the question of tramways. Should they be retained and perpetuated, or should their future use be immediately prohibited, and the present trams gradually removed from certain roadways? His own view was that the Legislature should at once, if it had the power, stop all proposed fresh expenditure by the London County Council and others on tramways and shallow subways. He included in this category both electric and horse trams. The County Council at present owns forty-eight miles out of the fifty-four now within the Administrative County of London, and

enormous extensions are proposed. He did not suggest that the electric trams in outlying districts should be at once dealt with, but he did suggest that, wherever in the inner circle of London motor buses were likely to compete with tramways, the tramways should go. Parliament should at once step in with a short Act and prevent the enormous contemplated outlay, which the London County Council had before it, from being made. It should stop all proposed contracts both as to subways and trams, and see what effect upon the traffic of London the motor omnibus would have. He felt he could not be too insistent on this grave matter, and he regretted that the Advisory Board had not, with the views they had already expressed, made it perfectly clear that pause should be given before such vast expenditure was incurred as was now determined upon by the County Council. It was true that the Board further said that the time had not, in their opinion, arrived for a definite judgment on this question of motor omnibuses, but they unfortunately go on to say that "whatever may be the eventual result of the rival systems—i.e., motor omnibus v. electric tram—the recommendations they had made as to routes and similar matters, including the widening of streets, will remain unaltered." He felt certain, however, that the views of the ratepayers of London would not remain unaltered, and he would venture to point out to the Advisory Board that if the contention that the motor bus was the mode of transit for London proved to be the correct one, the whole fabric of the contemplated enormous expenditure on tramcar routes and tramcars fell to the ground with a crash. We now know that permanent lines of undeviating rigidity were a mistake; we saw that the elasticity of route possible with a motor bus was the right thing, and he thought that the sooner the County Council also grasped that fact, the better it would be for London traffic and for London ratepayers.

In speaking of the new shallow subway along Kingsway, the author said that at the junction of Southampton-row with Kingsway, the London County Council had debouched a shallow subway for the purpose of continuing the trams coming from the Angel at Islington through Kingsway as far as Aldwych. The opening formed for this subway occupies a surface area of 172 ft. in length by 24 ft. in width, which in itself formed an obstruction to the traffic. This shallow subway is about 14 ft. high from the roadway to the roof, and has a width of about 20 ft. The trams run in the open for the greater part of the distance, and they have been constructed without any top or outside seats. This, to his mind, was a very great error. In the first place the shallow subway could easily have been made a little deeper so as to take the cars with inside and outside passengers through it; next, smoking cannot be indulged in, and the pleasant summer outside ride is lost; and thirdly, there is a great loss in the number of passengers carried by each car. He hoped that the Council would stay its hand as regards these shallow subways and the trams generally. But this was not the only struggle we might anticipate from the County Council to stick to its now antiquated guns. Our bridges and our Thames Embankment were practically doomed. Tram lines would be insisted on as certainly as they must ultimately be removed. The serpentine power of a motor omnibus was bound to kill the rigid lines of the tram, and the speed of the electric tram, even supplanted by the conduit system, would be equalled by the power of the motor to select its own route. Having referred to the Blackwall Tunnel, the camber of the roadway of which was far too great, the author referred to City impediments to traffic, such as loading and unloading wagons, etc., empty cabs, and suggested the appointment of special traffic constables. Bearing in mind the vast importance of this traffic question, he thought the Legislature would be quite justified in appointing special mounted traffic policemen, armed with full powers to deal summarily, on the spot, with all persons, who, in their judgment, impede the traffic. Of course, these special men need only be employed in the busy and congested thoroughfares of London, and they should be under

the control of the present police authorities, or of the proposed new Traffic Board. Other obstructions to traffic were the street refugees, although he did not see how they could well be removed without incurring danger in crossing wide thoroughfares. In some streets they occur too frequently, and in others they could be entirely dispensed with. In watching the effect of these refugees we could see how frequently their presence impeded, and how much injury they did to locomotion. Certain persons took up more than their share of the street areas for carts and waggons. Parcel delivery offices, and music halls and theatres at once suggest themselves as instances of this. Or take, for example, the surroundings of Covent Garden Market. Another little relief might be secured by "moving on" pedestrians at points where they obstruct the traffic. At places of public resort exit was impeded on ordinary occasions by the crawling propensities of the British public. The first to descend a staircase or to use a corridor should be hastened on, and thus a theatre or a music hall could be emptied in half the time now occupied. Then visitors to theatres and music halls were allowed to occupy the footways while waiting to get into these places of amusement. If a bookstall projected a few inches over the footway in Charing Cross-road the owner was summoned at the police-court, but theatre and music-hall proprietors might for hours occupy nearly the whole of a long length of footway for their visitors, while ordinary passengers were driven into the roadway at considerable personal risk. The traffic, both vehicular and pedestrian, was impeded, and all because the authorities, who were so keen in other matters, would not compel the proprietors referred to either to open their doors earlier or face action taken to prevent obstruction. The formation and construction of roadways must always be an important element in the traffic question. He had referred to the Blackwall Tunnel as a modern example of excessive camber, and the Advisory Board of Engineers, of course, fully understood the mischief that arose from this over-cambering. The drivers naturally keep to the centre of the roadway as much as possible, and hence the blocking which would otherwise not occur. "Uniformity of material" was another matter which had a bearing on the subject. Macadam, asphalt, granite, pitching, granite cobbles, and wood of various kinds crop up in a single mile of roadway; some of it was well laid on good foundations, some was not; some of it was always under "repair," some was repaired and "finished off" with what was euphemistically termed "hoggin," which material was converted into mud after a few days' traffic had been on it. Some of the granite pitching had become "polished granite" by effluxion of time; some of the wood was "hard," and some was not; and some surveyors knew how to construct a macadam roadway, and some did not. These various little matters necessitated more frequent repair and attention, and hence traffic was unnecessarily impeded. Again, utter want of common sense and ordinary care on the part of constituted authority permitted steep gradients in roadways in slippery times to be quite unattended, and when half a dozen poor horses had fallen of sand or gravel would be sent to the spot—where it was perfectly well known danger existed—under the charge of a perfunctory workman who took as long to spread it as their masters did to think of it.

The Board had devoted considerable attention to railways. If he were the authority wielding any powers as regards railway companies, they should not be allowed to pass a single fresh Bill until they had made their stations decent, and their carriages sufficiently lighted to enable travellers to read. The sanitary condition of many of the London railway stations was a standing disgrace to the companies, and to the sanitary authorities.

The author then dealt more closely with the Report of the Advisory Board of Engineers. One sentence in the Engineers' Report, which had reference to the widening of Euston and Marylebone roads, he heartily endorsed, and that was that, where public improvements must be carried out, proper compensation should be given for interference

with such private rights as might exist. One word as regards the proposed widths of new streets which range from 140 ft., house to house, for "main avenues," to 40 ft. or 50 ft. for "fourth-class streets," and that word was that wide streets entail correspondingly wide crossings, every foot of which increased the trouble for foot passengers; the engineers would, however, no doubt vary these widths if tramways were abolished, as, he thought, they should be. The engineers, among other suggestions, proposed a bridge across the Strand at Wellington-street, which seemed to him a feasible and not too costly scheme.

As to the report of the Commission, the Commission, on the whole, recommend the extension of tramways, and in this recommendation he thought they had made a fatal blunder.

An innocent-looking little paragraph appeared on page 47 of the Report of the Commission. It was the "Tower subway." It was for a tramway starting at Leman-street, passing under the river, and terminating at the southern approach to the Tower Bridge. If the short, shallow subway at Southampton-row cost between a quarter and half a million sterling, he should like to know what this proposed "river subway" was likely to cost.

The author touched on other matters dealt with in the Report, after which he briefly referred to the President Reports of Sir Joseph Dimsdale and Sir George Bartley, and the "note" by Sir George Gibb.

In conclusion, the author said he agreed with the proposed immediate creation of a Traffic Board. The nature and constitution of that Board required most careful consideration; but its powers should be correspondingly great; and the exercise of those powers should be of such a character as to render red tape unnecessary, and appeals to legal tribunals out of the question. It should, moreover, be thoroughly independent, and outside the control of the London County Council or of other constituted authority.

He warned the London ratepayers that he is in for a thorough and almost immediate crushing expenditure on tramways, shallow subways, street widenings consequent thereon, and some other little accessories pertinent thereto. These tramways would, in his opinion, in the majority of cases, be taken up again in less than ten years from the present time, as would those now existing.

In the discussion which followed Mr. A. R. Stenning, who gave evidence before the Commission, moved a vote of thanks to the lecturer, and said that the great point of the recommendations of the Commissioners was their advice that there should be an Advisory Board to consider questions of London traffic. In his opinion, such a body should be an absolutely independent one. As to tramways, he agreed that the rigid lines impeded traffic, and that a motor bus carried nearly as many passengers as a tram, and that the bus could turn and twist about as the tram could not; but, for all that, he thought that trams outside a certain radius were advisable. By means of trams people could be brought to certain points and then transported to their destination by railway, tubes, or motor buses. That would be a better arrangement to having tramways along the Embankment and over the bridges. Trams on the Embankment would disfigure a great London improvement, and would not result in the good that was expected. The idea of a new thoroughfare east to west was a good one, but the cost of such a work would be great. He thought that an outer circle railway, with a radius of eight miles from the centre, would be a good thing.

Mr. H. Chatfield Clarke seconded the vote of thanks, and said that if a Traffic Board were established omnibuses would not be allowed to use narrow thoroughfares when broad ones were available, and he agreed that the blocking of streets by vans and carts ought not to be permitted. "Dockyards" should be provided, where carts could be backed in. He did not agree with the lecturer as to tramways, and he agreed with the Commissioners. He could not see why trams should not be largely extended on the outskirts of London, and if there were no dead ends to tramways a good deal of trouble would be avoided.

Mr. P. E. Pilditch said he certainly did not think that the London County Council should be the Traffic Board of London, and he agreed with Mr. Clarke rather than the lecturer as to tramways. Tramways would be necessary for the long arterial thoroughfares, but they would have to go through London. But he believed that at least two-thirds of the tramways suggested by the Commissioners ought not to be undertaken until motor omnibuses had shown what they could do. He did not think the motor omnibus would solve the problem; it was not cheap enough for long distances.

Sir G. Bartley, one of the Royal Commissioners, referred to the great increase in the traffic of London, which showed that small improvements would not meet the need, though, of course, they should be carried out. The only solution of the problem was to face the question of wider roads, and especially the provision of the two great avenues north and south and east and west. Of course, the expense would be great, but think of the enormous loss to Londoners in trade and commerce by not having rapid transmission through the streets. Small alterations would cost as much in the aggregate as a real facing of the problem. As to trams, while he thought it would be mischievous to have them in all the places suggested, still he believed in the usefulness of trams when the road was wide enough; he would not allow a tram unless there was room on either side of it for two lines of traffic. The streets of London were for the trade of London, and it was no use complaining about vans and carts, for if trade were kept out of London, London would cease to exist; streets must be wide to suit the requirements of the City. A Traffic Board was the beginning of the solution of the problem, but it would be disastrous for the London County Council to be made that board. The board should be absolutely independent. We should face the problem boldly; if Sir Christopher Wren's plan had been carried out London would have been a very different place, and we must do something to prevent the growing congestion, which was retarding the progress of the City.

On the motion of Professor Robinson the debate was adjourned, and the vote of thanks to the lecturer having been agreed to, the meeting terminated.

REGISTRATION OF ARCHITECTS.

On Tuesday evening a meeting, convened by Messrs. J. S. Gibson, G. Hubbard, and A. W. S. Cross, was held at the rooms of the Royal Institute of British Architects, No. 9, Conduit-street, to consider what further steps should be taken to carry forward the movement for registration. There were about fifty present, and Mr. J. S. Gibson was voted to the chair.

The Chairman explained that the meeting had been called to consider the course of procedure to be pursued. The necessity for it arose really out of the meeting held on June 19 of the members of the Institute Registration Committee, who were in favour of the statutory qualification of architects. At that meeting there was a considerable number of representatives of the allied societies and others. It was felt by the members of the provinces that some steps should be taken by London architects to form a committee of London men to carry the movement forward, and the following resolution was carried:—"That an organisation be formed for the purpose of furthering the Bill adopted by the Registration Committee of the Royal Institute of British Architects, and that an executive be formed consisting of the Presidents and appointed representatives of each of the allied societies and an equal number of London members of the Royal Institute of British Architects who are in favour of the statutory qualification of architects, and that the London members now present are appointed and requested to call such meeting." It was common knowledge that after this meeting the election of the Council for the session took place, with the result that a number of the old members were not re-elected. The new Council then appointed a Registration Committee to still further investigate the subject, and this committee had held meetings and carried forward the

business as rapidly as they had been able. At the same time, they had this resolution to deal with, and it was felt by those who had convened the meeting that it would be well if they could ascertain from a considerable number of representative members of the Institute both in London and the provinces whether at the present juncture they would allow their names to be brought forward to represent the registration cause on the Council for the forthcoming year. They had a number of replies from gentlemen who would allow their names to be put forward. He might say without breach of confidence that the sub-committee appointed by the Council had taken a considerable amount of evidence, and hoped to be able to report within a fortnight, and therefore it was a question whether it would be desirable to bring the names forward, or whether they ought not to allow the house list to go forward, as in previous years, and take no action. Personally, he had a strong feeling that, as this sub-committee had nearly concluded its labours, and was in a position to report to the Council on a certain line of action, which he hoped would commend itself to the majority of the Institute, that it would be impolitic and would jeopardise the whole success of the movement if they as registrationists did anything to set at enmity those members of the Institute whom they all respected and liked, and who had done a great deal for the Institute. He did not think they ought to set out on any electoral campaign merely for the purpose of placing on the Council a majority of registrationists, and he thought it would be better if they merely suggested to the Council that they should place on the house list the names of several well-known advocates of registration. He thought it would simplify matters if they divided the business of the meeting into two parts. First, they should consider whether they should give effect to the resolution of June 19; and, secondly, whether they should select a list of gentlemen and suggest to the Council that they might be placed on the house list. It might be construed into a menace to the present Council if an organisation was formed at the present moment for the furthering of a certain Bill, and he must say that it had been evident right through the session that the Council had honestly tried to deal with the matter of registration to the best of its ability.

A speaker said that if the present Council was really in earnest in taking up the matter they ought not to do anything to interfere with them. If that meeting made a suggestion for names to be placed on the house list, unless it was notified in some way members would not know who were in favour of registration and who were not.

Mr. Leonard Stokes said he received a card for the meeting, and, being interested in the question of registration, he came. He now understood that it was a meeting of those in favour of registration, and, as they were going to settle procedure, he had better retire, for he did not wish it to be said that he was a wolf in sheep's clothing.

Several other members intimated that they also were interested in the question, but were not prepared to say they were in favour of registration; but

The Chairman said they welcomed the presence of all those interested.

Mr. Maurice B. Adams said he would be sorry to pledge himself to any proposals they might make, and would not like to participate in the meeting if he was compromising himself. He was glad to hear the Chairman say that the Council was dealing with the matter on honest and straightforward lines, for that was the only way in which it ought to be dealt with. He certainly thought it would be premature for anything to be done by that meeting in view of the early report of the sub-committee appointed to deal with the matter, and he personally would view any action with a certain amount of doubt. He wanted to arrive at an opinion, but first of all he wanted to hear what the Council had to say.

The Chairman said that officially the Council had no cognisance of that meeting.

Mr. Hubbard said the sub-committee appointed by the Council consisted of four in favour of registration and four against, and the four against had treated the

question in a perfectly fair and open manner. He was doubtful if they carried out the instructions of the resolution of June 19 whether they would not do their cause harm, and accordingly be moved:—"That the consideration of the resolution of June be deferred."

Mr. Cross seconded the motion, and said that they who were on the sub-committee, of course, had knowledge which they could not communicate, but they confidently hoped that a measure satisfactory to both sides would ultimately result from their deliberations.

Mr. Middleton said they ought to follow those who were behind the scenes. He could assure the meeting that, if the Royal Institute of British Architects brought forward a satisfactory Bill, the Bill being put forward by another society would be dropped.

The Chairman remarked that it would be a comfort to know that if a Bill was laid before Parliament they would have the support of the major portion of the architectural profession in the endeavour to carry it through.

Mr. B. J. Capell asked if they could not have some statement made showing the advantages and disadvantages of registration. He was pretty well posted up in the case of the registrationists, but he wanted to know what the anti-registrationists had to say. He knew with regard to registration that they would be in the same boat as the plumbers and sanitary inspectors and so on, but there must be something on the other side which he had not heard.

Mr. Bonner asked how the sub-committee had decided as to who they should get to give evidence.

The Chairman said the sub-committee took the evidence of well-known men in London and the provinces, both in the Institute and outside, and had done their best to arrive at the most comprehensive knowledge of the question of registration as to its effect on architects. He had not the slightest doubt but that the whole of that evidence would be available to the members of the Institute, and he did not think that that meeting was the proper time to go into the origin and history of the question.

The motion was then carried.

Mr. Middleton said he considered it would be unwise to enter into an electoral campaign, and he moved a resolution to the effect that a list of names be placed before the Council with the suggestion that they might make a selection of some of those who were in favour of the statutory qualification of architects to be placed on the house list.

Mr. Leonard Stokes thought that if it was merely a suggestion the Council would welcome it.

Mr. Gilbee Scott seconded the motion.

Mr. D. Blow said he took it there would be no circular sent round as to who they should vote for, which was a course he considered most derogatory.

The Chairman said he was of opinion that the selection should be left to the Council.

Mr. Cross said he honestly thought the Council would meet them liberally in the matter.

Mr. R. Stark Wilkinson deprecated any action being taken in view of the early report of the sub-committee, and proposed an amendment to the effect that the selection of names be deferred until after the sub-committee had reported.

Mr. Maurice B. Adams seconded the amendment, and pointed out that many of them placed a great deal of importance on the opinions of such men as Sir Aston Webb, and if the report of the sub-committee came forward with the benediction of the Council it would be carried without question.

The amendment was defeated and the motion agreed to.

After further discussion it was agreed to select the names of Mr. Gibson and Mr. Perkins Pick (Leicester) for submission for election as vice-presidents. The following Fellows were nominated and voted on as suggested members of Council on the Institute House List:—Messrs. Hubbard (twenty-four votes), Cross (twenty-three), W. Floekhart (twenty-one), Woodthorpe (eighteen), Gilbee Scott (sixteen), C. E. Mallows (sixteen), L. Solomon (sixteen), Max Clarke (fifteen), and W. H. Seth Smith (fourteen). The other Fellows nominated and not selected were—E. Seward

(Cardiff), H. L. Goddard (Leicester), A. W. Brewill (Nottingham), Gilliland (Belfast), T. Cooper (Birmingham), J. W. Beaumont (Manchester), and J. T. Cackett (Newcastle). Three Associates were also nominated for the House List, viz., Messrs. H. W. Willis, C. E. Hutchinson, and G. A. T. Middleton, and the first two were selected for submission. The meeting then terminated.

Fifty Years Ago.

From the *Builder* of March 15, 1856.

METROPOLITAN IMPROVEMENTS.


It is rather singular, that while such a vast number of suggestions on the above subject has inundated the new Board of Works since its appointment, they have all had reference exclusively to the construction of additional thoroughfares between the eastern and western parts of the metropolis. But not a thought has been given to the wretched state of our communications between the north and south, which call loudly for a portion, at least, of the attention which the authorities have to bestow on metropolitan improvements.

The most urgent want of all, and at the same time the most easily remedied and at the smallest cost, is a good line of street from the broad part of the Strand to Holborn through Lincoln's Inn-fields. It is, in fact, already more than half made. Nothing more is required than the destruction of some worthless old houses in confined courts between the Strand and Carey-street, and the setting back of the few houses on one side of Great Turnstile, to complete the whole line as far as Holborn; and the site of this new street would be so valuable for offices and chambers, that the improved ground rents would cover the interest of the outlay three times over! For more than thirty years this very opening has been projected by the inhabitants of the neighbourhood, and the public have constantly been led to believe that it was on the point of being carried out. Yet to this day that magnificent area of Lincoln's Inn-fields—the largest open space in the heart of London—is suffered to remain a perfect *cul de sac*, except for pedestrians!

Illustrations.

SOME ITALIAN RENAISSANCE WORK.

1. PULPIT IN THE DUOMO, RAVELLO.

 THIS pulpit in the Duomo, at Ravello (a tiny town in the mountains above Naples), is one of the finest examples of mosaic work to be found in South Italy. The carving, executed in marble, is particularly clean and perfect. Over the entrance to the stairs up to the pulpit (and not seen in the photograph) is the marble bust of the wife of the donor. A cast of this bust is exhibited in South Kensington Museum, as an example of portraiture of the period.

The maker's name, inscribed upon a panel seen at the back in the photograph, is as follows:—

"Ego magister Nicolaus de Bartholomeo de Fogia marmorumus hoc opus feci."

Another inscription above this in Latin runs as follows:—

"For love of the Virgin, Nicolaus Rufulus Siciliensis lord dedicated this work for his country's honour. Of them were born Valtheus, Ursi, Jacobus too, and Maurus, Laurentius was becomen by the first named."

May this be pleasing to thee, plus Virgin, and do thou pray thy son that hereafter he may grant to them the same good heavenly gifts, when a thousand two hundred twice thirty and three six full years have elapsed from the birth of Christ."

The pulpit has been rather damaged at the back, and portions removed to form a Bishop's throne in the chancel.

2. PULPIT IN SAN GIOVANNI DEL TORO RAVELLO.

This pulpit is supposed to have been executed by Nicolaus de Bartolomeo for this church belonging to "The Nobles of Ravello," after the completion of No. 1. But the design is so different in character that one can only believe the mosaic work to be by the same hand. This pulpit, unlike No. 1, has ancient plaques let in to form centres to the mosaic work, and the carving is much more pagan in type. The mosaic work is

unfinished, and there is a legend to the effect that, when it was seen this pulpit would be finer than the one in Duomo, Nicolaus was decoyed into the mountains and blinded, and that a friend filled in with fresco the unfinished portions. I was told that documentary evidence existed in Ravello as to this, but was unable to see it, although the legend is quite in keeping with the customs of this period.

3. PULPIT IN SAN LORENZO, FLORENCE.

This is from a photograph of one of the two pulpits in this church, of which the bas-reliefs in bronze are by Donatello and his pupils, Bertoldo and Bellano. They are, indeed, wonderful pieces of work, but the angles and joints of the bronze-work need repairing. The door into the pulpit is at the end, and a movable ladder is used, although these pulpits are now seldom, if ever, made use of. Donatello is buried in this church, the foundation of which dates from 394, but it was rebuilt in 1425 from the designs of Brunelleschi, the inner wall of the façade being by Michelangelo, whose design for the outside of the façade was never executed.

4. ORGAN-CASE, VALERANO.

This organ-case, in the church of the "Madonna del Ruscello," at Valerano, has been executed in walnut and pine "painted" from designs by Vignola.

LIONEL U. GRACE.

NEW COMIC OPERA, BERLIN.

The illustrations of this building, which was recently completed, are reproduced from some of the numerous illustrations of it in a recent number of the *Berlin Architekturwelt*.

The theatre is designed to accommodate an audience of 1,230 persons, with an orchestra of sixty, a large stage, and twenty-five dressing-rooms, besides the necessary rooms for rehearsals, etc. The building contains sixteen different staircases—eight of these are for the use of the public, six for the scene-shifters, and two for the artistes.

The foundations presented some difficulties, as water to the depth of 5 metres had to be pumped out and the soft ground removed before they could be laid.

The auditorium is heated by means of openings in the roof through which the warm air is admitted under pressure; the vitiated air is allowed to escape through openings underneath each tier. It is considered that the currents of air pouring downwards would, in the case of a fire, prevent the fumes from rising; this danger is also almost entirely provided against by a large opening in the roof of the proscenium, the cover of which is held down by thin fastenings which would be easily destroyed by fire, so that the fumes would then have means of escape, and at the same time the openings in the roof of the auditorium would be automatically uncovered.

There are two fire alarms in connexion with the nearest fire-station—one for the use of the public, and the other for the artistes; besides these there are, throughout the theatre, thirteen electric buttons by means of which an alarm can be given. The necessary hydrants for the extinguishing of fire are placed at intervals in the building, so that the provision against any danger of this kind is almost as perfect as it can be.

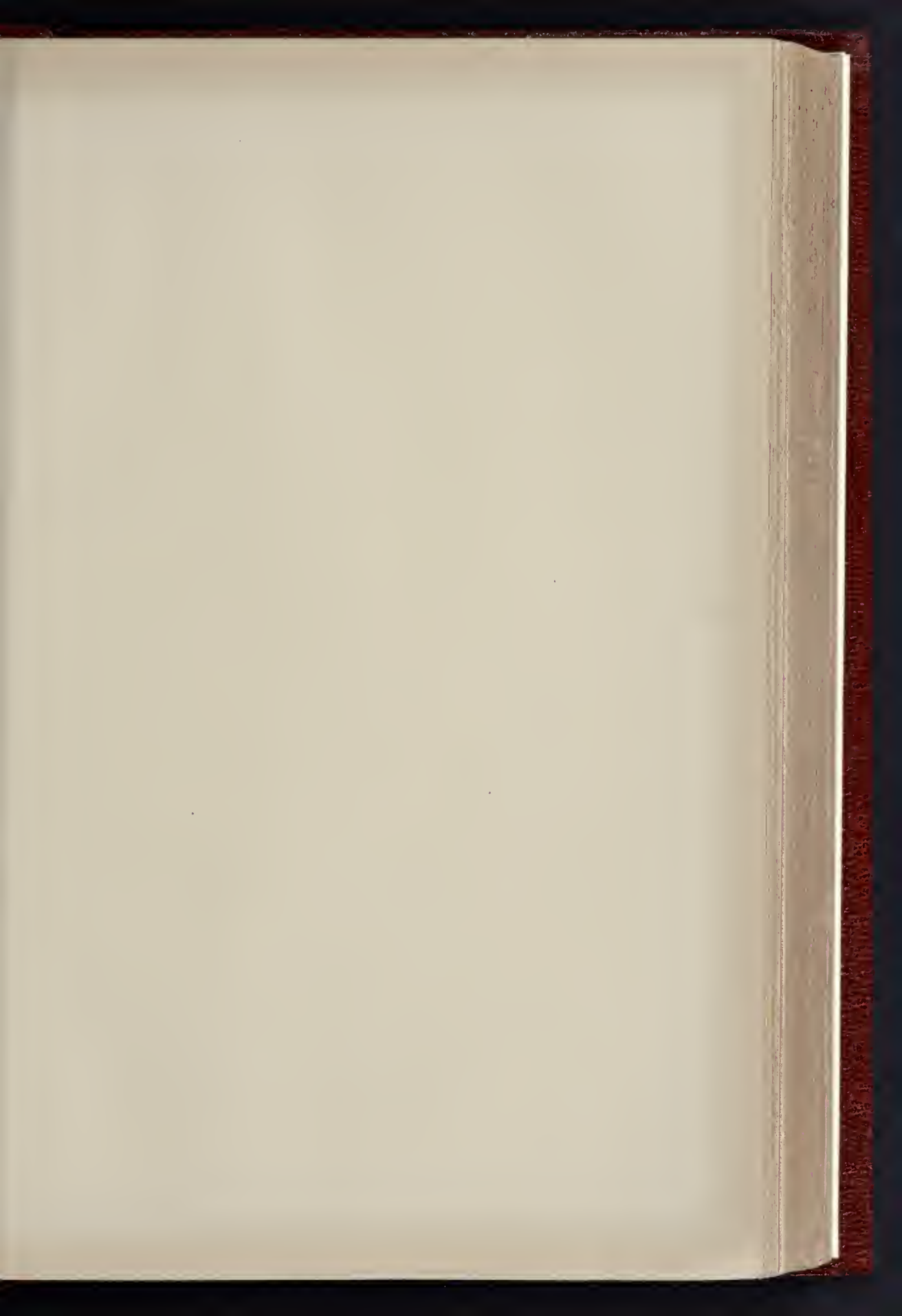
The architects have endeavoured to construct the building in a style which will conform with the purpose for which it is intended—namely, a comic opera house.

The architect for the exterior architectural treatment is Herr Bieberfeld; the house is planned by MM. Lachmann & Zauber. Among others connected with the work were Herr Kuhn, engineer; Herr Brandt, who superintended the stage mechanism, and Dr. Marx, who organised the heating arrangements. The sculpture is by Herr Kreischnar.

NEW LAW COURTS, CAPE TOWN.

This illustration of the accepted design of the new Law Courts at Cape Town is enlarged from a small and not very good photograph of the architects' drawing, which was sent home to us; a second reproduction from a photograph of a drawing of course can never be done with an entirely satisfactory result; but we thought it better worth while to give the design by this means than not to give it at all at present, which was the only alternative.

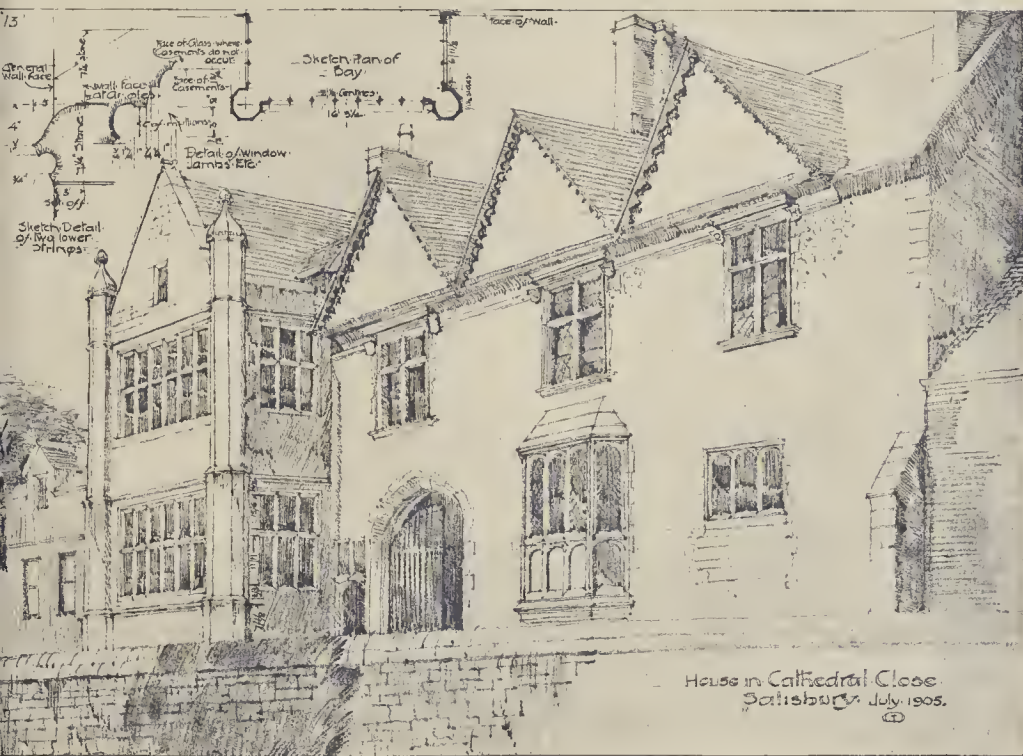
The design is by Messrs. Hawke & McKinlay, of Cape Town. The adjudication

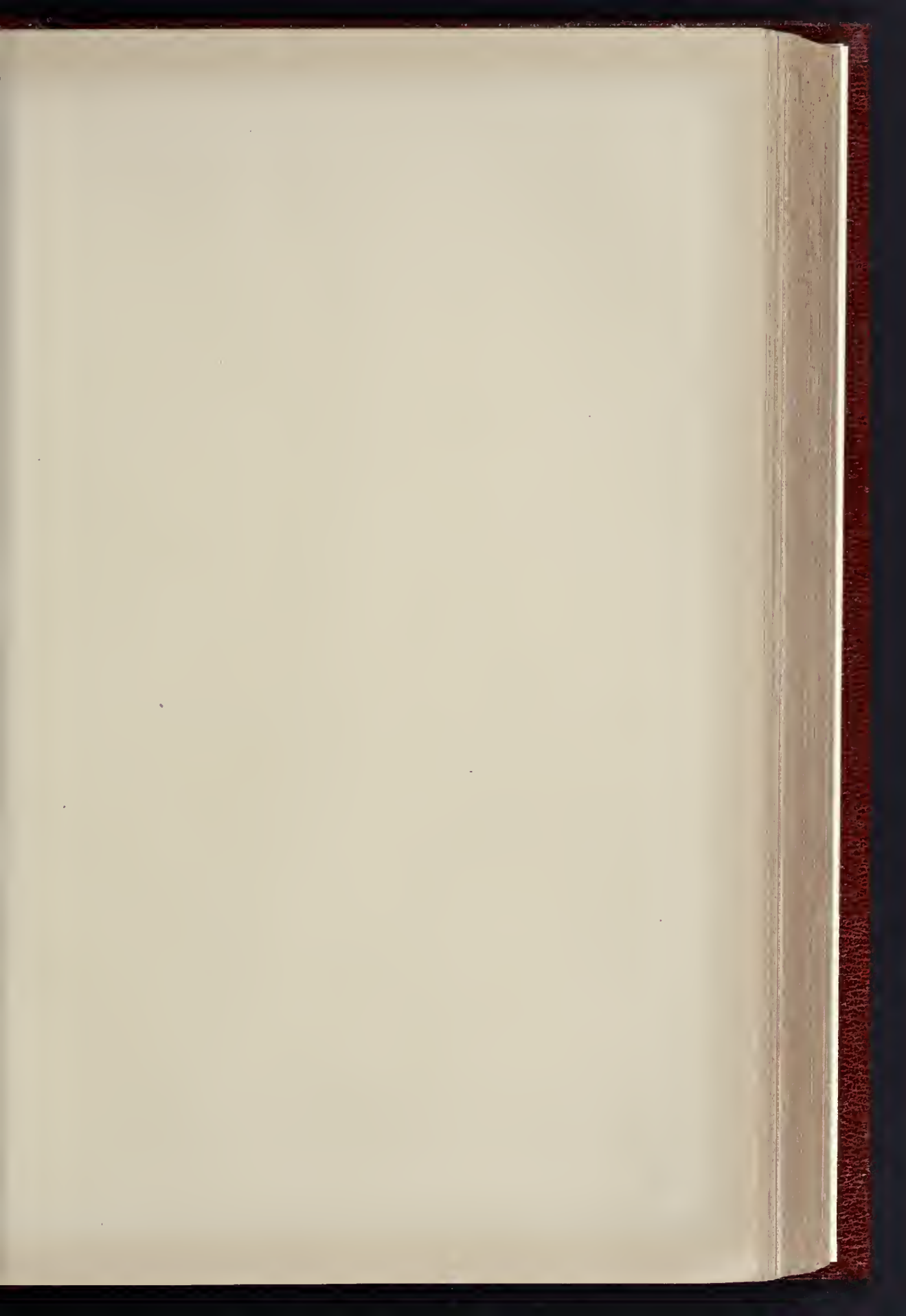


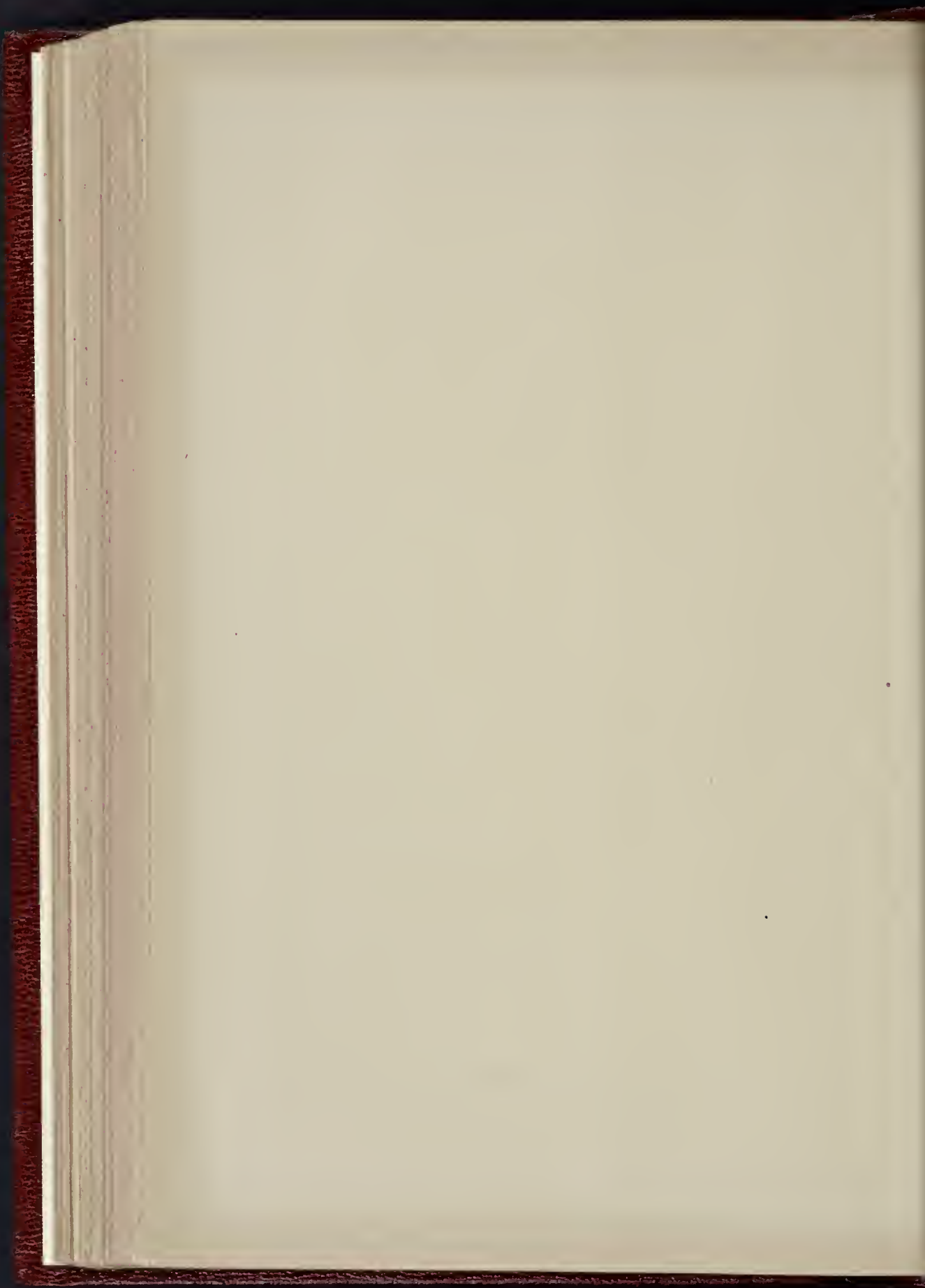


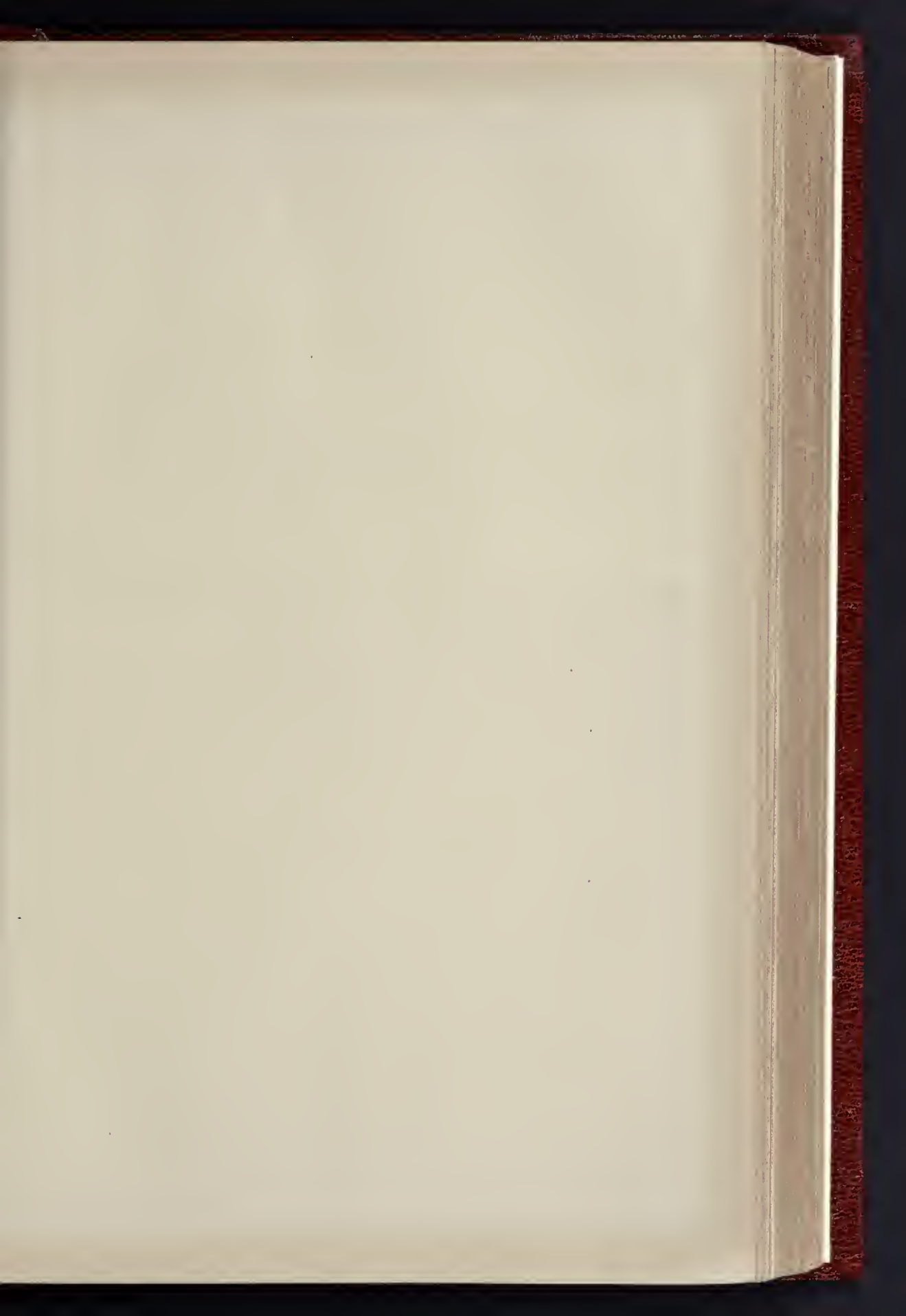
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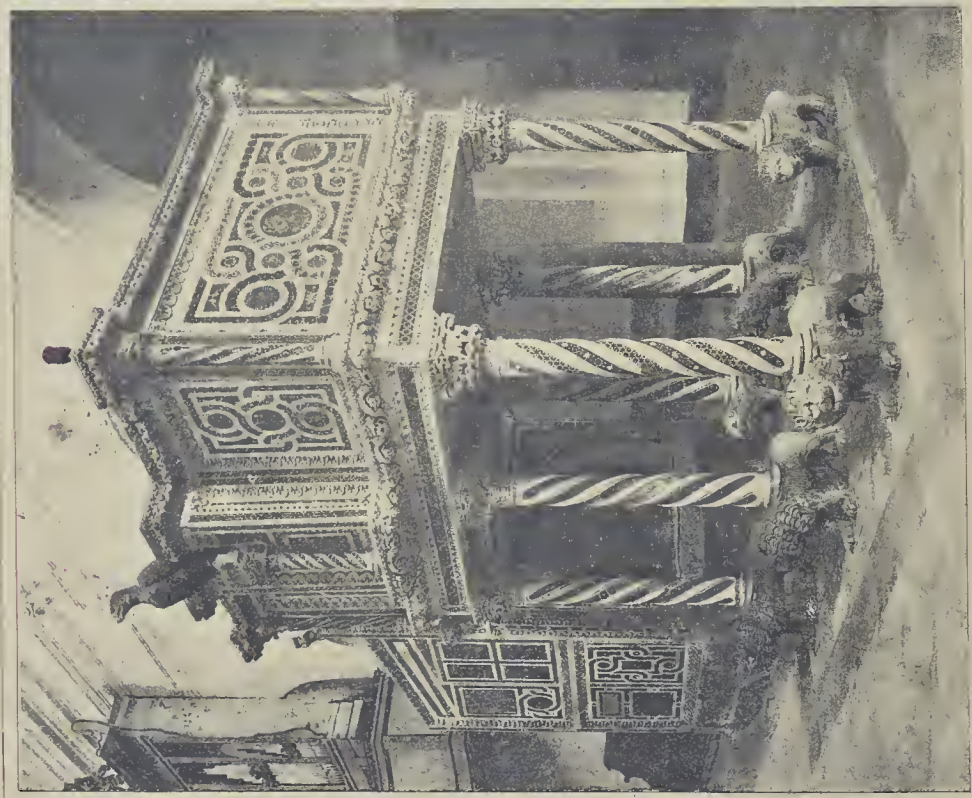








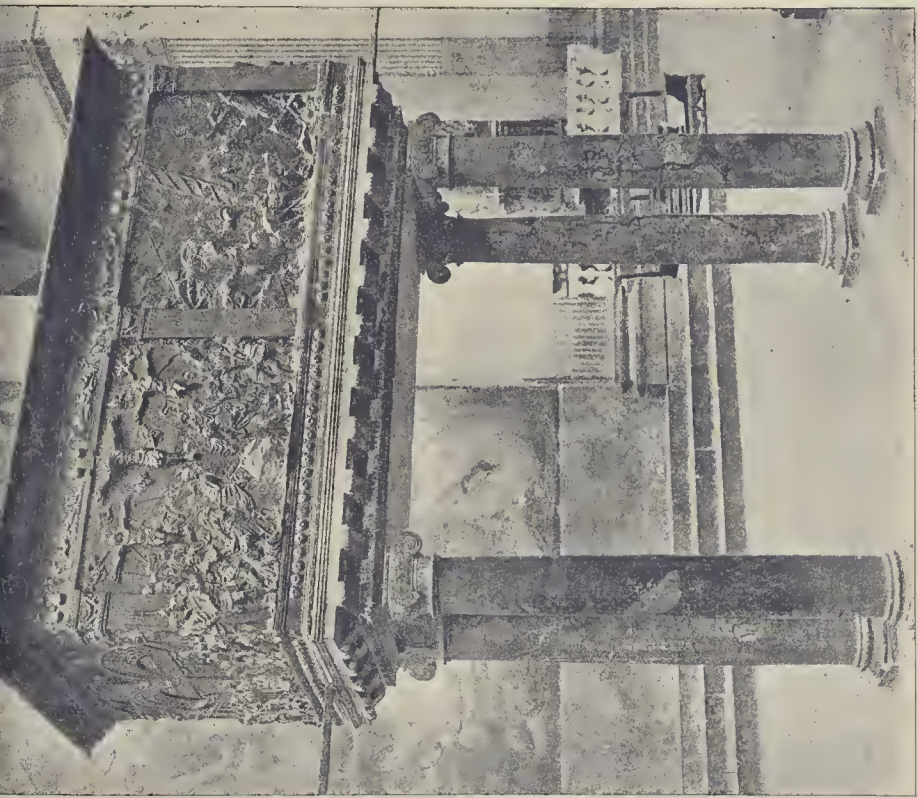
THE BUILDER, MARCH 17, 1906



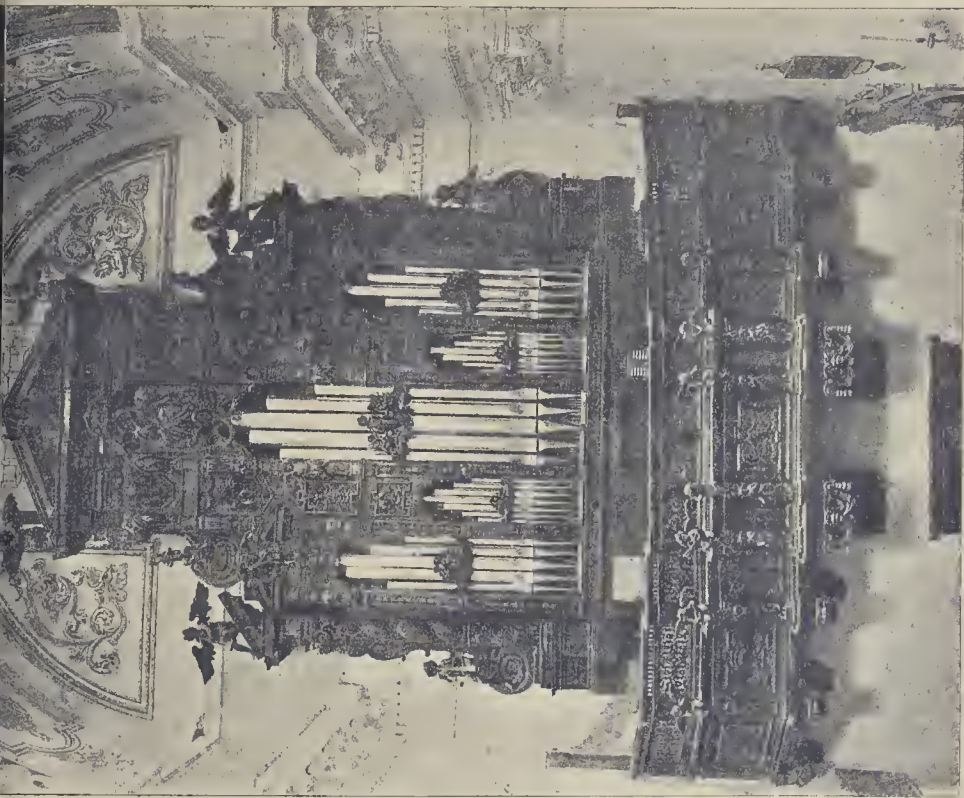
1.—PULPIT IN THE DUOMO RAVELLO (1278).



2.—PULPIT IN SAN GIOVANNI DEL TORO, RAVELLO (ABOUT 1280).



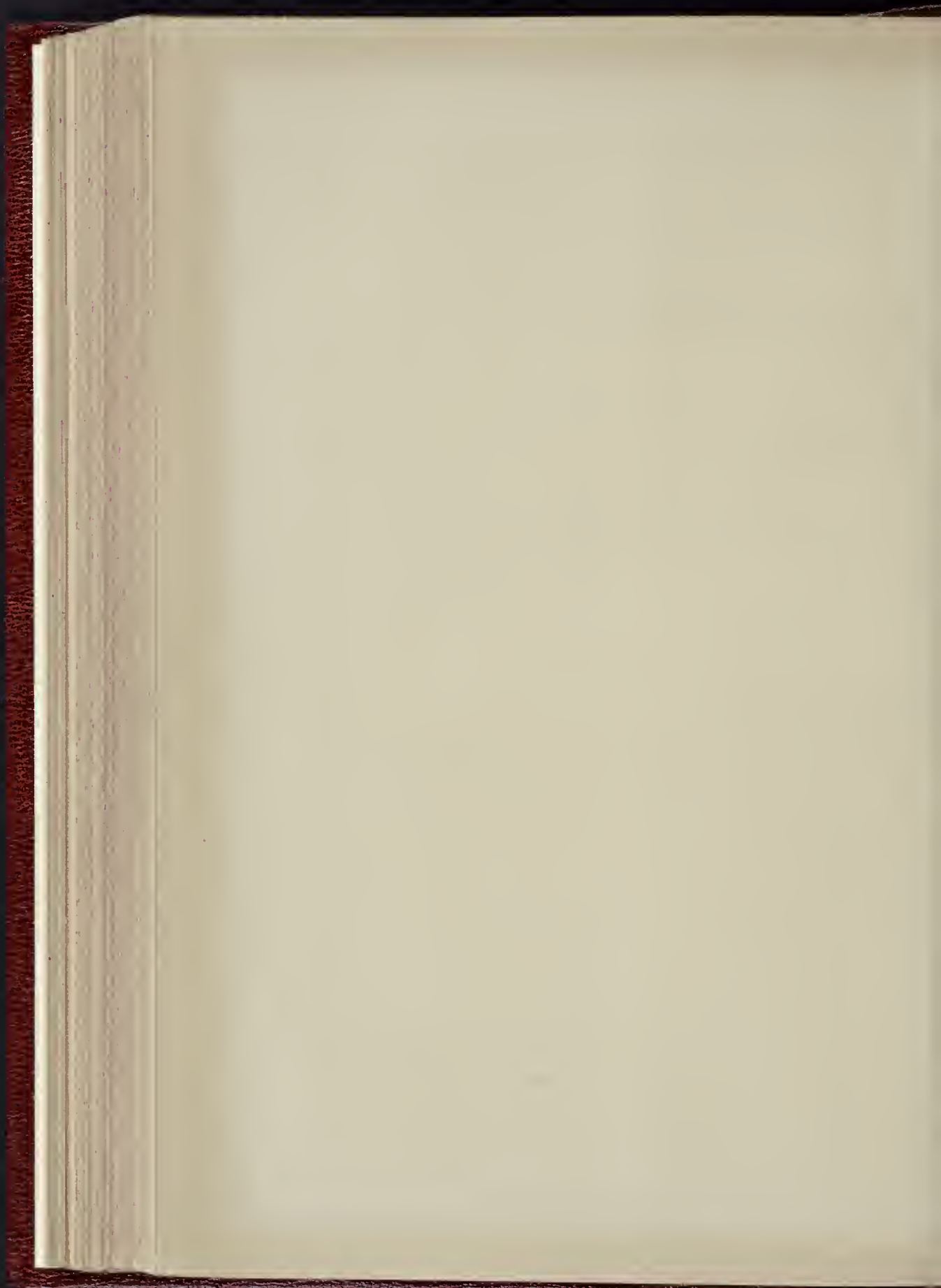
3.—PULPIT IN SAN LORENZO, FLORENCE.

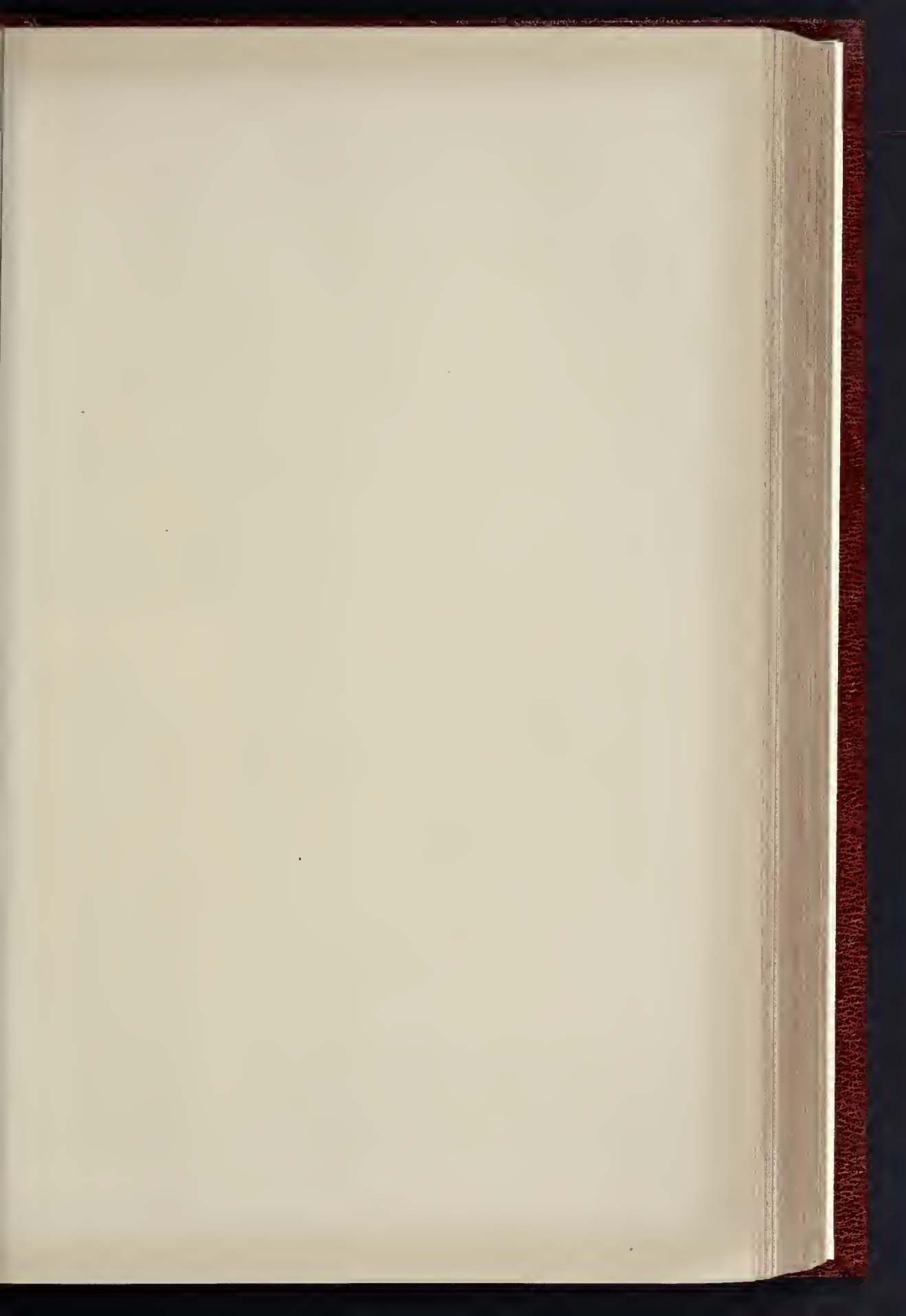


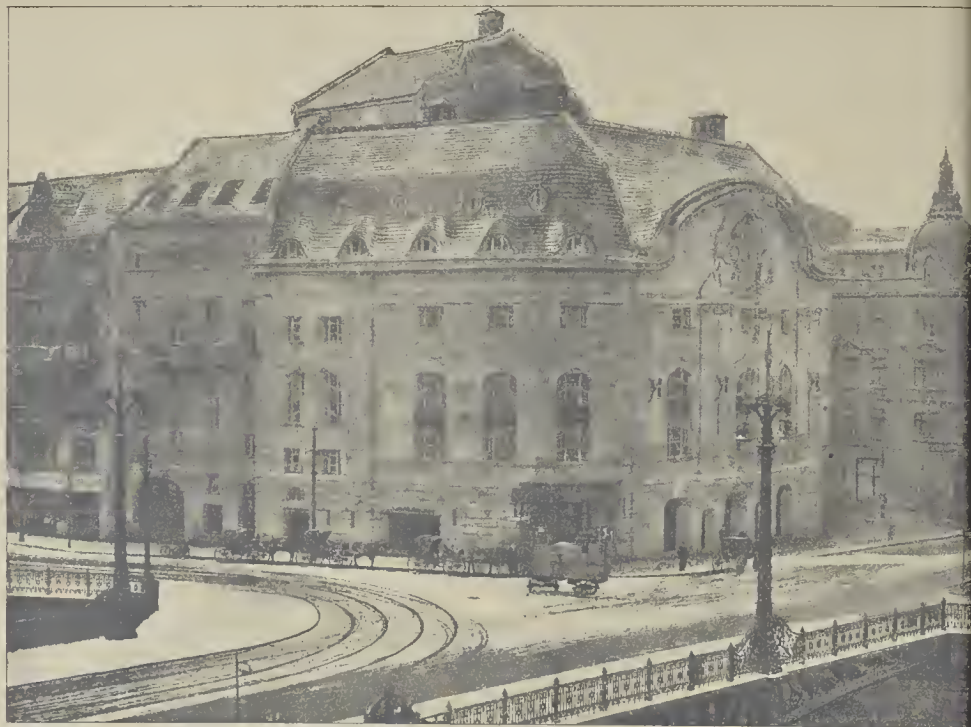
4.—ORGAN-CASE, VALLERANO.

NEW PHOTO ZIRACQUE & C. L. 4-5 EAST WINDING STREET FETTER LANE E.C.

SOME ITALIAN RENAISSANCE WORK







NEW COMIC OPERA BUILDING
(Reproduced from the "B



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

LIN.—HERR BIBERFELD, ARCHITECT.
(Architekturwelt.)

of the competition was entrusted to a special committee appointed by Government, consisting of Sir Henry de Villiers (Chief Justice), Sir John Graham (Secretary to the Law Department), Mr. Advocate Searle, K.C., Mr. C. H. von Tyl, and Mr. Mervyn Macartney, who attended from England as professional assessor. There were forty-two competitors.

The estimated cost of the building is about 175,000. Unfortunately no plan has reached us.

SKETCHES BY MR. GEO. DRYSDALE.

THESE are a selection from the sketches by Mr. Drysdale which gained him the Pugin Studentship this year at the Institute of Architects. The titles are on each sketch, and otherwise they speak for themselves.

We selected these particular sketches of small buildings rather than those of larger and more monumental works, with the object of giving subjects that have not been too much familiarised by illustration.

ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of the subscribers and donors of the Architects' Benevolent Society was held in the rooms of the Royal Institute of British Architects on Friday last week, at No. 9, Conduit-street, W., Mr. J. Macvicar Anderson presiding, in the unavoidable absence of the President, Mr. John Belcher, A.R.A.

The report of the Council was read by Mr. Percival Currey, Hon. Secretary, and, on the motion of the Chairman, seconded by Mr. H. L. Florence, adopted. From the Report we take the following paragraphs:-

The Council, in presenting the fifty-fifth annual report of the Architects' Benevolent Society, have to express regret that, judging by the number of claims made upon the Society, the past year seems to have been one of exceptional difficulty for many of the less fortunate members of the architectural profession. Towards the middle of the year it was found that the demands made upon the Society were beginning to outweigh the funds at the disposal of the Council, and that it was necessary to consider means by which the income could be increased. The President (Mr. John Belcher) accorded his suggestion that should issue a personal letter of appeal, and this was sent out to 5,280 architects practising in the three Kingdoms. The President directed attention to the fact that, although the Society had been in existence for over fifty years, and was the only institution organised specially for the relief of architects or their widows and orphans, not a single one of the architects in the active or practising contributed to its support. As the income had suffered in recent years from the loss of many liberal contributors, the President appealed particularly for subscriptions. Connected with the support hitherto accorded the result of the appeal must be considered satisfactory, the subscriptions having increased some 20 per cent., while a considerable sum has been added to the capital. The grateful thanks of the Society are due to the President for the active interest which he has taken in this matter, and it is to be hoped that the effect of his letter is not yet exhausted.

In connexion with the appeal, the Council wish specially to call attention to an offer of a donation for subscriptions, Mr. Walter Spiers, M.P., and other contributions of an equal amount are received. Mr. Ender's offer has so far been supported by Mr. Wm. G. Scammel, Mr. H. Chatfield Clarke, and the Society of Architects.

The total amount of subscriptions received during the year was 615*l.* 19*s.* 6*d.* (last year 539*l.* 5*s.*); the donations amounted to 755*l.* 17*s.* (last year 145*l.* 1*s.*). The Society's investments were increased by the purchase of 600*l.* New Zealand Three per Cent. Inscribed Stock at a cost of 531*l.* 15*s.* To meet the claims of applicants, it was found necessary to transfer 140*l.* received in response to the President's appeal which was made especially to relieve current needs from Capital to Income Account.

The amount of 1,000*l.* was distributed in grants and pensions. The number of applicants, apart from pensioners, was eighty-six, out of which eighty were granted assistance.

Through the courtesy of Mr. John Holden, the Society's hon. local secretary at Manchester, the Council have been informed that Mr. Alexander W. Mills, of Bowdon, Cheshire, an old subscriber, has bequeathed to the Society 500*l.* Further bequests of 2*l.* from the late Mr. C. Forsler Hayward, and two other subscribers, and Company's shares from the late Mr. H. B. Collins have also been received.

It is with great regret that the Council have to record the death of these members. Mr. Collins was also member of the Council at the time of his death, as well as of Mr. Alfred Waterhouse, Mr. J. T. Wimpey, and Mr. G. Fowler Jones, all old subscribers.

The Council desire to express their appreciation of the kindness of the Committee of the Architectural Association Students' Smoking Concert in devoting part of the proceeds of the concert on February 2 to the funds of the Society, the amount received being 12*l.* 12*s.*

To meet the wishes of corporate bodies, a resolution will be submitted to the Council which bodies may be represented, subject to the fulfilment of certain conditions, on the Council and at general meetings by their Presidents for the time being, and granted the same privileges with regard to the recommendation of applicants for relief as possessed by individual members.

Owing to the absence of Mr. Graham C. Awdry from London, Mr. Edward Greenop kindly undertook the auditing of the accounts with Mr. Sydney Perks, Mr. S. D. Kilson, A.A., has consented to act as Hon. Local Secretary at Leeds.

The following gentlemen, being the five senior members, retiring by rotation from the Council, are:—Edwin T. Hall, Mr. Lewis Solomon, Mr. Wm. Woodward, Mr. H. H. Collins (deceased), and Mr. T. E. Colcutt. To fill the vacancies caused by these retirements, the Council have the pleasure to nominate Mr. Arthur Ashbridge, Mr. Walter Ender, Mr. Reginald A. Roumieu, Mr. H. Chatfield Clarke, and Mr. Alfred Saxon Snell.

The Chairman said he hoped that the offers made to give certain sums of money in aid of the Society's efforts, provided that other contributors could be induced to give the same amount, would not be forgotten. What had once been done could be done again, if members put themselves to a little personal sacrifice.

On the motion of Mr. A. Ashbridge, seconded by Mr. G. Scammel, a vote of thanks was accorded to the retiring members of Council.

Mr. A. T. Taylor then moved, and Mr. Osborn C. Hill seconded, and it was agreed, that the Council for the ensuing year of office be elected as follows:—President, the President of the Institute; Vice-President, Mr. Wm. Glover; Council, Mr. Rowland Plunbe, Mr. C. T. Hine, Mr. Ambrose M. Poynter, Mr. Wm. Grellier, Col. R. W. Edis, Mr. H. L. Florence, Mr. G. E. Bulmer, Mr. F. W. Hunt, Mr. W. L. Spiers, Mr. Arthur Ashbridge, Mr. Reginald Roumieu, Mr. Walter Ender, Mr. H. Chatfield Clarke, and Mr. Alfred Saxon Snell.

On the motion of Mr. Christoper, seconded by Mr. Rowland Plunbe, a hearty vote of thanks was accorded to Mr. W. Hilton Nash, Hon. Treasurer, and he was re-elected to fill that office again.

Mr. Nash, in response, said it was a great source of satisfaction that they had been able to give away the largest sum of money in one year that they had ever done in the history of the Society, i.e., 1,000*l.*, and, at the same time, to have increased the capital. The total capital now represents between 14,000*l.* and 15,000*l.* They ought to try and influence new members to join the Society, especially as only about 1 per cent. of the architects of the United Kingdom were subscribers, and only about 6 or 7 per cent. of the subscribers were members of the Institute. Mr. Curney was re-elected as Hon. Secretary, and a vote of thanks was accorded to him for his past services. In reply, he said that, if only 2 per cent. of the members of the profession would subscribe, the Society would have an income of nearly 1,000*l.* a year. The thanks of the Society were due to Mr. Dircks, Assistant-Secretary, for his work on behalf of the Society.

On the motion of Mr. W. Grellier, seconded by Mr. Walter Spiers, the auditors (Messrs. Sydney Perks and E. Greenop) were thanked for their services and re-elected.

The following resolution was then moved by Mr. Nash:—

That the following be inserted after By-law No. 7:—Societies and corporate bodies who are now or may become annual subscribers of not less than ten guineas, or donors in one sum of not less than fifty guineas, shall be entitled to be represented on the Council by their President or Chairman for the time being, who may also vote at all general meetings, and shall be entitled on behalf of his Society to the same privileges as those of individual donors or subscribers. And to remember consecutively the subsequent by-laws.

Mr. Walter Spiers seconded, and the motion was agreed to.

On the motion of Mr. Florence, seconded by Mr. Nash, the thanks of the Society were accorded to the Institute for the use of the rooms.

The Chairman, in reply, said that, whether the Institute remained at No. 9, Conduit-street or got new premises elsewhere, they would esteem it one of their privileges to accord the use of their rooms to the Society.

On the motion of Mr. J. D. Croce, seconded by Mr. Curney, the Chairman was thanked for presiding, and the Chairman having replied, the meeting terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Sir E. Cornwall, M.P., presiding at the commencement of the proceedings.

Chairmen.—The first business was the election of new chairmen for the ensuing

year, as follows:—As Chairman, Mr. Evan Spicer; as Vice-Chairman, Mr. Henry Ward; and as Deputy-Chairman, Dr. Forman.

New Committees were also elected. The new Building Act Committee consists of the following councillors:—

W. Davies, F. Goldsmith, W. Goodman, R. W. Graville-Smith, H. J. Greenwood, G. A. Hardy, Capt. the Hon. Fitzroy Hemphill, H. Jephson, John Lewis, R. C. Phillimore, John Smith, Hon. Arthur I. Stanley, H. R. Taylor, G. J. Warren, Edward White.

The new Works Committee is as follows:—

T. H. W. Idris, Lewen Sharp, Edward Smith, A. M. Torrance, W. Davies, D. S. Waterlow, Lord Welby.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 3,371*l.* for housing purposes; Stepney Borough Council 10,000*l.* for electric lighting; and Stoke Newington Borough Council 9,500*l.* for street improvement.

Theatres, etc.—The Theatres and Music-halls Committee recommended as follows:—

"A building to be known as the Hammer-smith Public Baths, and to be erected on the west side of Lime-grove, Hammersmith (Mr. J. E. Franck for Hammersmith Borough Council).

The building of the Welcome Club and the construction of the "Austrian Salt Mine" at the London Exhibitions, Earl's Court (Mr. A. O. Collard).

A building to be known as the Parochial Hall, and to be erected at Allardyce-street, Brixton (Mr. C. E. Hewitt).

Reinforced granolithic steps, proposed to be provided at the Putney Hippodrome, Gardener's-lane, Putney, and proposed arrangements for ventilating and heating the premises (Mr. F. W. Hingston).

A heating chamber in the stage basement, and the provision of four radiators on the stage of the Royalty Theatre, Dean street, Soho (Messrs. Smee & Cobay).

Certain alterations proposed to be carried out in connexion with the exits from the Royal Victor Hotel (late Royal Victor Music-hall), Old Ford-road, Bethnal Green (Mr. E. Stephens).

The proposals were agreed to. The Council adjourned at 7.30 p.m.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Lines of Frontage and Projections.

Norwood.—A town hall building upon a site abutting on Brixton-hill and Ace-lane, Brixton (Messrs. Warwick & Hill).—Consent.

Southwark, West.—A wall on the western side of Gravel-lane, Southwark (Messrs. Nevison & Newton for Messrs. Stevenson & Howell, Ltd.).—Consent.

Lewisham.—Projecting one-storey shops in front of Nos. 33 to 45 (odd numbers only) inclusive High-street, Lewisham (Messrs. Kennard Brothers for Messrs. Chessman Brothers).—Consent.

Strand.—A projecting sign in front of No. 32A, St. James's-street (Mr. R. H. Kerr for Messrs. Sandow, Ltd.).—Consent.

Paddington, North.—Re-erection of Nos. 8, 9, and 10, Paddington-green, Paddington (Messrs. Bourchier, Burnmaster, & Galworthy).—Consent.

Hammersmith.—That the application of Mr. L. W. Williams for an extension of the period within which the erection of a projecting lavatory addition and steps in front of "Seion" Welsh chapel, Southerton-road, Hammersmith, was required to be commenced, be granted.—Consent.

St. George, Hammer-square.—Retention of an iron and glass shelter in front of the porch of the Coburg Hotel, Carlos-place, Grosvenor-square (Mr. E. H. Watts for the Coburg Hotel, Ltd.).—Consent.

St. Pancras, South.—A bay-window, five stories in height, in front of No. 14, Fitzroy-square, St. Pancras (Mr. M. M. Smith).—Consent.

Dulwich.—A motor-car shed of a temporary character at the rear of No. 100, Alley-road, Dulwich, to abut upon South Croxted-road (Messrs. J. Harrison & Co. for Mr. Barnett).—Consent.

Marylebone, West.—Retention of a range of luncheon and store sheds at Lord's cricket ground, abutting upon St. John's Wood-road, Wellington-road, and Wellington-place, St. John's Wood (Mr. F. E. Lacey).—Consent.

Hammersmith.—A building upon a site abutting on Blythe-road and Addison-gardens, West Kensington (Col. E. Clarke for Mr. F. Smiths).—Refused.

St. George, Hanover-square.—An iron and glass porch in front of No. 6, Chesterfield-street, Mayfair (Messrs. Hindley & Wilkinson for Mr. R. G. Behrens).—Refused.

Finchley, Central.—The retention of a wall in the rear portion of the one-story shops in front of Nos. 190 to 208 (even numbers only) inclusive, Pentonville-road (Mr. C. E. Pettitt for Mr. T. Lilley and Messrs. Lilley & Skinner, Ltd.).—Refused.

Strand.—Projecting lettering in front of No. 56, Charing-cross (Liverpool, London, and Globe Insurance Company).—Refused.

Hackney, North.—The retention of a shed at the flank of No. 17, Bethune-road, Hackney, abutting upon St. Kilda's-road (Mr. H. Willmott).—Refused.

Width of Way.

City of London.—A warehouse building on the northern side of Tenter-street, Moorfields (Messrs. Gregg & Detmar for Messrs. Raphael Tuck & Sons).—Consent.

Kensington, South.—Two studio buildings on the southern side of Logan-place, Kensington (Mr. G. H. Jenkins for Professor G. Moira and Mr. F. L. Jenkins).—Refused.

Lines of Frontage and Space at Rear.

Poplar.—Two houses on the southern side of Mellish-street, Glengall-road, Poplar, and a building on the northern side of Glengall-road, to abut upon the western side of Mellish-street (Messrs. J. & W. Clarkson for Mr. A. E. Ricks).—Consent.

Width of Way and Construction.

Brizton.—A wood and iron cart-shed upon a site on the south-west side of Eastcote-street, Lambeth (Messrs. J. Harrison & Co. for Mr. Cornell).—Refused.

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

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society on Thursday, the 8th inst., Mr. H. Phillips Fletcher read a paper on "The St. Louis Exhibition," Mr. G. B. Bulmer in the chair. The lecturer said:—"It is possible that some few of us are but dimly aware of the great event which the World's Fair at St. Louis commemorated. It was the centenary of the purchase of the Louisiana territory from Napoleon by the United States Government. The first organised action for the holding of the Exposition was taken in 1836, and it was determined, in the typical American fashion, to make it the 'biggest' ever held in the history of the world; 15,000,000 dols. was the amount of capital which was proposed for the financing of the enterprise; 5,000,000 dols. of this was raised by public subscription from the citizens of St. Louis, 5,000,000 dols. by the issuing of City bonds, and the remaining 5,000,000 dols. was appropriated by the United States Government, together with the support of the latter. Later, this capital had to be considerably augmented. The site chosen for the exhibition was a good one, being situated on the western limits of St. Louis. In all there were over 1,240 acres, 250 acres of which were roofed in. The general scheme of the plan was designed by a committee of American architects, amongst whom were such men as Cass Gilbert, Carrere, Hastings, Hames, and Link, and it resembled a lady's open fan. The centre of the picture, and what may be likened to the handle of the fan, was the festival hall, situated on the top of the hill. Flanking the festival hall on either side was the colonnade of States formed in a crescent, with a restaurant pavilion at each extremity. The face of the hill in front of these was terraced, and three series of cascades discharged 90,000 gallons of water per minute into the grand basin at the foot. From the hill as the focal point three main avenues radiated like the ribs of a fan offering a vista, terminated with the highly-decorated features of the festival hall and the colonnade of States. A grand transverse avenue crossed the three main avenues, and gave the general outline to eight of the main exhibit buildings." The lecturer then described the engineering of the building. The construction of the main buildings was under the control of the Division of Works, and it was decided to erect these in timber, partly owing to the then congested state of the steel market, and partly to save expense. Internally, the buildings were intended to be finished in plaster, but this and much of the colour scheme for the exteriors had to be omitted for lack of funds. Some idea of the

enormous size of the exhibition may be gained from the fact that the average height of the cornice level to the buildings was 60 ft. from the ground. The lecturer then described in detail the festival hall, colonnade of States, restaurant pavilions, cascades and gardens, United States Government building, mines, liberal arts, education, manufactures, electricity, varied industries, machinery, transportation, agriculture, horticulture, forestry, administration, Washington State, and foreign buildings. Perhaps one of the most surprising facts of all the wonders of the World's Fair was that, with all the inventive genius at the disposal of the American race, so few original architectural efforts were made. The architects of the mines and transportation buildings alone made any attempts at conceiving original designs. The lecture was illustrated by lantern slides. The following officers were nominated for the ensuing session:—President, Mr. H. S. Chorley, M.A., A.R.I.B.A.; Vice-Presidents, Messrs. P. Robinson (F.), and S. D. Kitson, M.A.; hon. treasurer, Mr. G. F. Bowman; hon. librarian, Mr. E. Musto (A.); hon. secretary, Mr. A. E. Kirk (A.); members of Council, Messrs. W. G. Smithson (A.), E. P. Edwards (F.), C. B. Howdill (A.), H. A. Chapman (A.), A. R. Hill (A.), and G. E. Reason (Assoc. member).

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual meeting of this Association was held on the premises, 6, Higham-place, Newcastle, on the 7th inst., Mr. J. T. Cackett (President) in the chair. The annual report of the council for the forty-sixth session was read by the hon. secretary, Mr. A. B. Plummer. The report expressed the pleasure of the council in again recording the increased success of the Association. During the session, and since the last report, two members, nine associates, and fourteen students were elected, as compared with nine members, ten associates, and thirteen students during the previous twelve months. The roll of members for 1906 was as follows:—Members, seventy-eight; associates, seventy-two; students, seventy—total, 220. The report of the treasurer showed a total income of 271l. 2s. 8d., the cash balance from 1904 being 79l. 2s. 7d. The total expenditure amounted to 267l. 8s. 7d., leaving a balance in hand of 3l. 14s. 1d. It was stated in the annual reports of the Students' Sketching Club and the Students' Classes Club that the memberships were twenty-two and twenty-nine respectively. The drawings submitted for the Northern Architectural Association for the degree of R.I.B.A. were exhibited during the evening. Mr. Bryan Watson was successful in securing the Glover Bronze Medal. Only one set of drawings, however, was submitted for this competition. The award of the assessors in connexion with the essays competition was read by the Chairman, who expressed his regret at noting that there had been only two competitors that year. The two entrants were placed as follows:—Mr. William Stockdale (under the motto of "York"), of North Shields, 1; Mr. Arnold Sutherland Constable ("Essayez"), of Stockfield-on-Tyne, 2. On the proposition of the Chairman, a vote of thanks was accorded to the hon. secretary, Mr. A. B. Plummer, for his services to the Association, it being also decided to record in the minutes appreciation of Mr. Plummer's work in connexion with the Association's premises. The President intimated that considerable interest was being shown in regard to his suggestions for the proposed alteration of New Bridge-street. He believed that his ideas would influence the City Council in their line of policy in reference to the alterations. With the election of Messrs. Hill and Badenoch as auditors and a vote of thanks to the Chair man the meeting ended.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of the Edinburgh Architectural Association was held in the Association Rooms at 117, George-street, Edinburgh, on the 7th inst., when a paper was read by Mr. E. S. Lorimer, A.R.S.A., architect, on "Scottish Gardens and Garden Architecture." In the course of his remarks, Mr. Lorimer laid stress on the fact that there was at the present time a great interest taken in gardens. He gave a sketch of the development of garden design in Scotland, and spoke of the relation between the garden and the house. A historical account was given of some of the

principal gardens in Scotland, and these were described, and Balcasie, in Fife, was instanced as the ideal of what a Scottish country gentleman's garden ought to be. It was a fine specimen of a terrace garden. The lecture was illustrated by a series of lantern slides, which showed some of the gardens of Scotland and their sculpture and architectural setting, and another series illustrating some foreign—French and Italian—garden sculpture.

ARCHAEOLOGICAL SOCIETIES.

SUSSEX ARCHAEOLOGICAL SOCIETY.—There are at present 706 members on the roll of the Sussex Archaeological Society, the number elected during last year being thirty-three. In their annual report, which has just been issued, the Council state that the sub-committee appointed to negotiate for the purchase of a site for the new museum and library has to report that some of the difficulties attendant on the Gun Garden site have been removed by enfranchisement, and that the services of Messrs. Runtz & Ford have been acquired as architects. Since the plans and elevations prepared by them are now before the landlords for approval, it is hoped that it will not be long before the committee can begin building. The Council regret that, owing to ill-health and his removal from the county, Mr. H. Michell Whitley felt compelled to resign the office of hon. secretary. Mr. W. E. Nicholson has been appointed in his place. Mr. C. G. Turner has also resigned the office of clerk, and Mr. W. W. Davey has been appointed to succeed him. In reference to Lewes Priory, Mr. W. H. St. John Hope reports that, through the kindness of Mr. Kenward, he has been permitted to make excavations in his garden for the purpose of finding any remains of the choir and transept of the Priory Church. Strong foundations are found to exist in many places, but no definite lines of masonry, and a portion of the tiled floor of the south transept was the only important point disclosed. By the like kindness of Mr. F. G. Courthope, Mr. St. John Hope was allowed to sink a number of holes in his garden, with the result that he was able to find the rubble core of the western end of the Priory Church, and also of the circular building which enclosed the conduit and lavatory above the so-called "lantern." Mr. St. John Hope further reports that he has elsewhere lighted upon the original letters in Italian of Giovanni Portinari to Cromwell, describing the destruction of the Priory Church. They seem to throw a rather different light upon the plan of the church from that afforded by what can now be proved to be Richard Moryson's somewhat inaccurate translation. During the year the Roman pavement at Bignor has been repaired, and the tesserae fixed at the cost and under the supervision of the Society of Antiquaries, of London, and a probably unique wall-painting has been discovered in a house known as the "Old Flushing Inn," Rye. The Society has made a grant towards the copying of this wall-painting, which will be reproduced in a forthcoming volume.

COMPETITION

HACKNEY PUBLIC LIBRARY.—In the competition for the Hackney Public Library 152 designs were sent in, and from these the assessor (Mr. J. B. Simpson F.R.I.B.A.) selected three. The competitors were Mr. Crouch, Mr. Trimble, and Messrs. Crouch & Butler, and they were selected in that order. The Committee selected the designs of Mr. Crouch.

BOOKS RECEIVED.

SANITARY ENGINEERING; A PRACTICAL MANUAL. By Francis Wood, M.Inst.C.E. Second Edition. (Chas. Griffin & Co.)
PORTFOLIO OF MASTER DRAWINGS. School of Architecture, University of Liverpool. Vol. I. (University Press, Liverpool, 15s.)

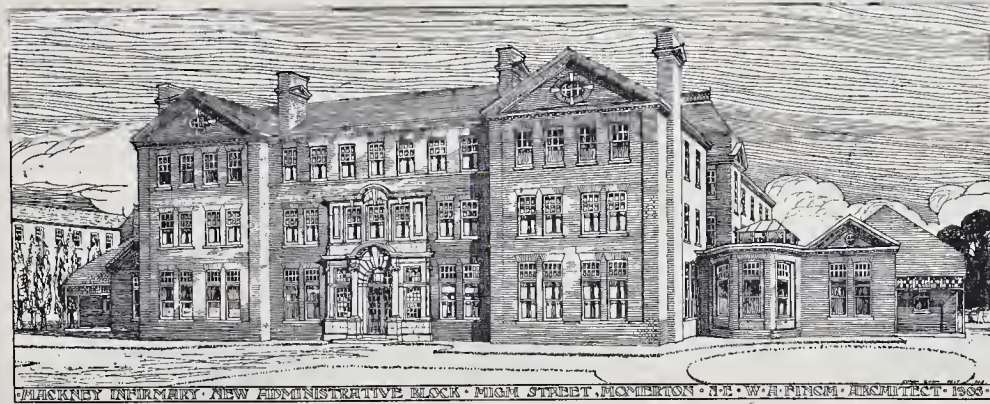
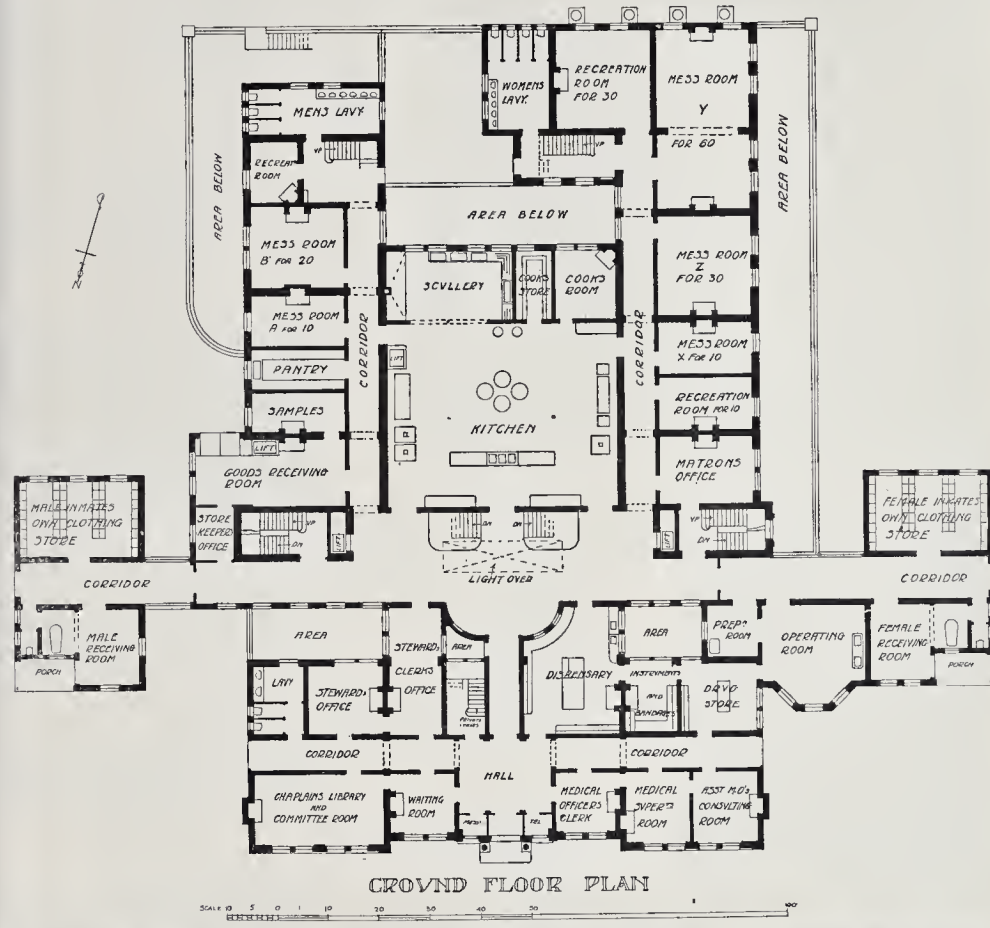
HISTORICAL MANUSCRIPTS.—In reply to a question by Sir Thomas Esmonde as to when the report on the MSS. of the Irish Franciscans will be published by the Historical Manuscripts Commission, Mr. McKenna replies in the Parliamentary papers that the report is now in type, and it is hoped to issue it in the course of next month.

HACKNEY UNION INFIRMARY NEW ADMINISTRATIVE BLOCK.

The scheme of which the present building forms an important part had its inception so long ago as 1892. If carried out in its entirety the administrative block now in course of erection would eventually become the central building of the Infirmary group, having in addition to the two present pavilions on its eastern side, which will then serve for the accommodation of male patients, two additional pavilions for women on

the vacant ground to the west. The whole would be connected by a covered way at the ground floor level, and subway beneath, running from end to end, by means of which service would be conducted from the building to the various departments on either side. The old building fronting the High-street would be cleared away and the ground left clear with the exception of a site for a porter's lodge and possibly a residence for the medical superintendent. The final design for the new building was completed by the archi-

tect, Mr. W. A. Finch, in 1903, and is intended for the administration of the existing Infirmary and also for a possible extension. It will contain accommodation for seventy-six resident male and female officers, with spare rooms, should this number be increased. Provision is also made to enable an extra story to be easily added to the east block should it at any time become necessary. The building will consist of a basement, ground, and two upper stories. The basement contains a central general store and goods distributing



room, lit from an open area on the south, in rear of which are the coal store and a chamber in which will be placed the valves controlling the heating and domestic hot water service throughout the building. This chamber is in direct communication by means of a tunnel, with the boiler and engine-house situated in the workhouse. On the east of the general store is a corridor giving access to the various rooms, stores and a dining-room and a spacious open area. On the west is a similar corridor affording access to the needle-rooms, clothing, and drapery stores, and matron's store, which also derive their light from an open area. The main axial corridor to the north is lit by three open areas, and affords communication to the existing pavilions, switch-board and battery-room, and a pipe subway under the northern portion of the building. Four lifts will be provided for conveying goods to the various floors. There are three staircases from this basement, the main one communicating with the ground floor only, the others with various floors above.

The ground floor provides in the north block for an entrance-hall, with corridors to the east and west, communicating with a waiting-room, chaplain's library and committee-room, stewards' offices, dispensary and drug and instrument stores, medical officers' consulting-rooms, and the necessary lavatory accommodation. There is here a staircase, which gives communication to the first floor only. A short passage leads from the hall to the main axial corridor, which communicates with the male and female receiving-rooms, to each of which are attached baths and lavatories, with inmates' own clothing stores in close proximity. An operating-room, with north light, and a preparation-room adjoining are also approached from the main corridor. The east block contains a good receiving room with storekeepers' office and sample room attached, a pantry, mess and recreation-rooms for male officers, also their lavatory accommodation. The west block contains the matron's offices and female mess and recreation-rooms, together with the necessary lavatory accommodation. The space between the east and west blocks is taken up by a large and lofty kitchen, top-lighted and ventilated, to which is attached a scullery, cooks' store, and cooks' room.

Five staircases give access to the first floor, which will contain the various officers' bed and sitting rooms, bath-rooms, lavatories, etc. There will also be a small kitchen and scullery for the use of the medical officers, matron, and steward. From this floor access will be gained to the second floor by three staircases. The floor will contain cubicles for ward, dormitory, kitchen, and laundry-maids and rooms for the remainder of the female staff, for whom bath and lavatory accommodation is also provided. Officers' box-rooms will be provided on each floor. Above the ground floor the building will resolve itself into three detached blocks, thus allowing for the free circulation of air, but communication will be preserved by means of external fire-escape staircases and bridges. To facilitate progress in erection, the contract was divided into two portions.

The removal of the old buildings and erection of the substructure to the ground level was executed by Messrs. Stapleton & Sons, of High-street, Stoke Newington, and the remainder of the building is being carried out by Mr. Albert Monk, of Lower Edmonton. It is of brick, with slated roofs and of fire-resisting construction throughout, but fire hydrants are to be fixed in convenient positions. The decoration throughout is of the simplest character, economy consistent with sound construction being the rule. The quantities were prepared by Mr. G. T. G. Wright, of Great Winchester-street, E.C. The clerk of the works is Mr. J. T. Hodzson.

Correspondence.

FELLOWSHIP, R.I.B.A.

SIR,—I should like to be allowed, as an Associate of some eleven years' standing, to express my surprise at the result of the recent election by ballot, and regret at the exclusion of the majority of the candidates for election to the Fellowship.

In my opinion it would be preferable, where members demand, according to the by-laws, an election by the ballot, that they should restrict such method of election to certain candidates, as to whose qualifications they may have information—information, perhaps, not in the possession of the majority of the members of the Institute.

The fact that there might occasionally be a candidate or candidates for election to the Fellowship, proposed and supported in perfect good faith by those responsible for a nomination or nominations, against whom there might be reasonable objections, cannot be controverted. But the indiscriminate rejection of candidates for the Fellowship who have not passed an examination for election as "Associate" previously would at any time be deplorable.

HENRY JAMES WISE.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—X.

SQUARE ROOT.

AS the main object of this article is to indicate contracted and other ready methods of extracting square roots, brief reference only is made to the methods more generally employed, these being introduced chiefly for comparison.

The general rule for the extraction of a square root is stated below as a matter of convenience.

Rule (1).—(a) Mark off the figures in pairs, commencing from the right-hand, by dots over alternate figures, or by commas between alternate figures. If the number includes a decimal fraction, mark off the figures of the fraction in a similar manner, commencing from the decimal point, making the number of digits even, if originally odd, by the addition of a cipher.

(b) Divide the first period of the dividend by the highest number whose square does not exceed the amount of that period. This number is the first figure in the required square root.

(c) After the remainder bring down the next period of the dividend and divide by the highest digit which, multiplied into twice the first digit of the quotient (considered as so many tens) and into itself, will give products whose sum does not exceed the number to be divided. After division bring down the remainder, and proceed in a manner similar to that before described until the exact square root or a sufficiently exact approximation has been obtained.

Example (1): Find the square root of 62809645586.

Adding one cipher at the end of the decimal fraction, marking off the periods, and proceeding as above,

We have

62,80,96,45,58,60/7925 253 +	49
149|1380	1341
582|3996	3164
15845|83245	79225
158502|402058	317004
1585045|8505460	7925265
15850503|8023500	4381509
	10471991

The working may be shortened by applying the Italian method of division, as given in Article VII, p. 206.

Thus

62,80,96,45,58,60/7925 253 +	
149|1380	
582|3996	
15845|83245	
158502|402058	
1585045|8505460	
15850503|8023500	
	10471991

A contracted method of extracting the square root is given below. In some cases the result will be the exact root, and in others a close approximation thereto.

Rule (2).—Find one more than half the number of figures in the required root by the ordinary method (see Rule 1), and determine the remaining figures of the root by ordinary division of the remainder by double the part of the root already found, the units figure of the product being rejected.

To apply this rule it is first necessary to know how to find the number of figures there are in the square root of any given whole number. The process is quite easy, for it is simply necessary to mark off the figures in pairs from the right, and then if the number of figures is even, each pair gives one figure in the square root, or if the number of figures is odd, each pair gives one figure in the square root, and the single figure remaining also gives one figure.

Example (2): Find the square root of 168558289.

Marking off the periods we find there are four pairs of figures and a single figure over. Therefore, there are five figures in the square root.

We have first to find three figures by Rule (1),

Thus

1,68,55,82,89/129
1
22|68
44
249|2455
2241
2148289

The first three figures of the square root are 129 with the remainder 2148289.

Next we have to find the two remaining figures of the square root by Rule (2), dividing the remainder 2148289 by (129 × 2) = 258 after rejection of the last figure. Here as the figure rejected is more than 5, the next figure to the left must be increased by 1 (as explained in Article V, p. 147), giving 26 as the divisor.

Then 2148289 ÷ 26 = 826, which is taken at 83.

Writing the quotient so obtained after the first three figures of the root previously determined we have 12983, which is the exact square root of 168558289.

Rule (3).—The Method of Factors.—The process of evolution can be very much facilitated in the case of numbers readily separable into prime factors, for as a perfect square, or the square of a whole number, is the product of two equal factors, it follows that when a perfect square is expressed as the product of its prime factors, each prime factor occurring must be raised to an even power.

Consequently familiarity with prime factors frequently enables the operator to arrive at the square root of a number by mere inspection.

Rules for ascertaining the prime factors of a number are given in all manuals of arithmetic, and need not be repeated here, but the following tests of divisibility are specially worthy of note.

- 2 is a factor of any number whose last figure is divisible by 2.
- 3 is a factor of any number the sum of whose figures is divisible by 3.
- 4 is a factor of any number whose last two figures are divisible by 4.
- 5 is a factor of any number whose last figure is either 0 or 5.
- 6 is a factor of any number divisible by both 2 and 3.
- 8 is a factor of any number whose last three figures are divisible by 8.
- 9 is a factor of any number the sum of whose figures is divisible by 9.
- 10 is a factor of any number whose last figure is 0.

11 is a factor of any number if the difference between the sum of the figures in the odd and even places is divisible by 11, or equals 0.

12 is a factor of any number divisible by both 3 and 4.

It should also be remembered that no whole number which is a perfect square ends with the figures 2, 3, 7, or 8.

Example (1): Find the square root of 1089.

3|1089	∴ 1089 = 3 ² × 11 ²
3388	and 1 √1089 = √3 ² × 11 ²
11|121	= 3 × 11
11	

∴ 33 is the required square root.

Example (2): Find the square root of 7056.

4|7056	∴ 7056 = 2 ⁴ × 3 ² × 7 ²
4|7164	and √7056 = √2 ⁴ × 3 ² × 7 ²
3|441	= 2 ² × 3 × 7
3|117	= 4 × 21
7|49	
7	

∴ 84 is the required square root.

To extract the square root of a vulgar fraction the following rules are available:—

Rule (4).—Reduce the fraction to its lowest terms, and take the square roots of the numerator and denominator as the terms of the required square root.

Example: Find the square root of $\frac{21}{54}$.

As neither the numerator nor the denominator in this fraction is an exact square, it is impossible to obtain an exact result without reduction of the fraction to its lowest terms.

Here

21	4
54	9

Therefore

$$\sqrt{\frac{21}{54}} = \sqrt{\frac{4}{9}} = \frac{2}{3}$$

When the numerator and denominator are not exact squares two methods are open.

Rule (5).—Multiply the terms of the fraction

by such a number as will make the denominator an exact square, and extract the square root of the fraction so obtained, or

Rule (6).—Multiply the numerator and denominator together, then use the square root of the product as the numerator of the required root and the original denominator as its denominator.

Example: Find the square root of $\frac{5}{32}$

By Rule (5)

$$\sqrt{\frac{5}{32}} = \sqrt{\frac{5 \times 2}{32 \times 2}} = \sqrt{\frac{10}{64}} = \frac{\sqrt{10}}{8}$$

The required square root being $\frac{3.16 +}{8} = 0.395 +$

Example: Find the square root of $\frac{5}{3}$

By Rule (6)

$$\sqrt{\frac{5}{3}} = \frac{\sqrt{5 \times 6}}{\sqrt{3 \times 6}} = \frac{\sqrt{30}}{6}$$

The required square root being $\frac{5.477}{6} = 0.913$.

Rule (7).—Convert the vulgar fraction to its equivalent decimal, extract the square root of this, and, if desired, re-convert to a vulgar fraction.

Example: Find the square root of $\frac{5}{6}$.

By Rule (7)

$$\sqrt{\frac{5}{6}} = \sqrt{0.833 +} = 0.913$$

The square root of a mixed number can be treated by Rules (4), (5), (6), or (7), after reduction to an improper fraction, or after reduction of the vulgar fraction to its decimal equivalent.

In dealing with expressions containing surds, or roots whose exact magnitude cannot be stated arithmetically, methods can often be adopted which simplify to a considerable extent the incidental extraction of roots and the determination of the required values.

Rule (8).—The product of the sum and the difference of two quantities is equal to the difference of the squares of the same quantities. (Illustration $(a + b)(a - b) = a^2 - b^2$).

Example (1): Find the value of $\frac{1}{\sqrt{2} - 1}$

It is always troublesome to have a surd in the denominator, and if we multiply the numerator and the denominator by $\sqrt{2} + 1$ then, in accordance with Rule (8), the denominator reduces to 1, and the surd is transferred to the numerator, where it can be dealt with more readily.

The process is as follows:—

$$\frac{1}{\sqrt{2} - 1} = \frac{1 \times (\sqrt{2} + 1)}{(\sqrt{2} - 1)(\sqrt{2} + 1)} = \frac{\sqrt{2} + 1}{2 - 1} = \frac{\sqrt{2} + 1}{1} = \sqrt{2} + 1$$

Then we have only to extract the square root of 2 approximately, and the addition of 1 gives the required value: $(1.41421 + 1) = 2.41421$.

If worked in the ordinary way we should have

$$\frac{1}{\sqrt{2} - 1} = \frac{1}{1.4142136 - 1} = \frac{1}{0.4142136} = 2.41421$$

This involves the extraction of $\sqrt{2}$ to seven places of decimals, and the division of 1 by 0.4142136, both of these operations involving tedious division sums. If $\sqrt{2}$ were only extracted to five places of decimals we should get the incorrect result 2.41423.

Example (2): Find the value of $\frac{\sqrt{3}}{\sqrt{6} + \sqrt{3}}$

Multiplying the numerator and denominator by $(\sqrt{6} + \sqrt{3})$ we get

$$\frac{\sqrt{3}}{\sqrt{6} + \sqrt{3}} = \frac{\sqrt{3}(\sqrt{6} + \sqrt{3})}{(\sqrt{6} + \sqrt{3})(\sqrt{6} + \sqrt{3})} = \frac{\sqrt{18} + 3}{6 + 3} = \frac{\sqrt{18} + 3}{9}$$

As $\sqrt{18}$ is found to be 4.2426 approximately, we have $\frac{4.2426 + 3}{9} = \frac{7.2426}{9} = 0.8047$

Rule (9).—The square of a binomial expression (that is, an expression consisting of two terms connected by the sign + or -) is equal to the square of each of its terms, and twice the product of the same terms.

Thus

$$(a + b)^2 = a^2 + b^2 + 2ab$$

$$(a - b)^2 = a^2 + b^2 - 2ab$$

This rule can be applied with considerable saving of time in finding the square roots and expressions where one term is a binomial

surd which is the square of another binomial surd.

Example: Find the square root of $21 - 8\sqrt{5}$.

Here

$$21 = 16 + 5 = 4^2 + (\sqrt{5})^2$$

and

$$8\sqrt{5} = 2 \times 4\sqrt{5}$$

It will be observed that 21 represents the sum of the squares of the terms 4 and $\sqrt{5}$ in the expression $4\sqrt{5}$, and $8\sqrt{5}$ represents twice the product of the terms in the same expression.

Hence

$$\sqrt{21 - 8\sqrt{5}} = \sqrt{(4 - \sqrt{5})^2} = \sqrt{16 + 5 - (2 \times 4\sqrt{5})} = \sqrt{21 - 8\sqrt{5}}$$

and the required square root is $(4 - \sqrt{5})$.

By finding the square root of 5, say 2.236, and subtracting, $4 - 2.236 = 1.764$, we obtain the result with very little trouble.

To get an equally accurate result by the ordinary method, the square root of 5 would first have to be extracted to at least nine places, nine times the root would then be deducted from 21, and the square root of the remainder extracted to four places.

Applications of Square Root.

Example (1): Find the length in yards in the side of a square plot of land containing 83 acres 2 roods 12 perches and 8 sq. yds.

83 acres 2 roods 12 perches 8 sq. yds. = 404,511 sq. yds. As the area of a square = (length \times breadth) = (length)². Therefore, the length of the side is $\sqrt{404511}$ sq. yds. = 636.011 yds.

Example (2): Find the length in feet of the diagonal of a square field containing 3 acres.

3 acres = 43,560 \times 3 = 130,680 sq. ft. Therefore, the length of the side is $\sqrt{130680} = 361.49$ ft.

As the diagonal of a square = $\sqrt{2} \times$ length of side, Therefore, the length of the diagonal is $\sqrt{2} \times 361.49 = 511.227$ ft.

Example (3): Find the length in yards of the diagonal of a rectangular plot of land measuring 320 yds. by 152.4 yds.

By Euclid I., 47, the area of a square described on the diagonal of a rectangle is equal to the sum of the areas of the squares described on the two other sides of either triangle formed by the diagonal and the sides of the rectangle

Therefore, the length of the diagonal is

$$\sqrt{320^2 + 152.4^2} = \sqrt{102400 + 23225.76} = \sqrt{125625.76} = 354.43$$

Example (4): Find the radius in feet of a circular enclosure covering an area of half an acre.

As the area of a circle = 3.14159, say 3.1416, times that of the square described on its radius, Therefore, the required radius

$$= \sqrt{\frac{0.5 \times 43560}{3.1416}} = \sqrt{\frac{21780}{3.1416}} = \sqrt{6932.6} = 83.26$$

Example (5): Find the circumference in feet of the circular enclosure in example (4)

As the circumference of a circle = diameter \times 3.1416, Therefore, the required circumference = 83.26 ft. \times 2 \times 3.1416 = 523.14 ft.

Example (6): Find the length in feet of a rectangular hall, the area of which is 202 1/2 sq. yds., the length being two and a half times the breadth.

Since the length = the breadth \times 2.5, the area can be divided into two squares each of whose sides is equal to the breadth of the hall, and one rectangle having one side equal to the breadth and another side equal to half the breadth of the hall.

The area of each square in square feet

$$= 202.5 \times 9 \times \frac{2}{5} = 729 \text{ sq. ft.}$$

and the side of each square

$$= \sqrt{729} = 27 \text{ ft.}$$

Therefore, the breadth of the hall is 27 ft., and the length of the hall = 27 \times 2.5 = 67.5 ft.

OBITUARY.

MR. F. WHITTINGHAM.—The sudden death is announced of Mr. Frank Whittingham, architect, of Wrexham and Cornhill Quay, which took place at his residence at Cefnybedd, near Wrexham, on Wednesday last week. The deceased gentleman, who was only twenty-eight years of age, was the only son of Mr. James Whittingham, J.P., of Fechan House, Wrexham.

Mr. F. J. Morris, of Francis J. Morris, Borough Surveyor of Grantham, died somewhat suddenly at the home of his father, at Sleaford, on the 12th inst. Mr. Morris, who was only forty years of age, was appointed by the Grantham Town Council ten years ago.

GENERAL BUILDING NEWS.

PRIMITIVE METHODIST CHURCH, ASHBY-DE-LA-ZOUCH.—The foundation-stones of the new Primitive Methodist Church, on Burton-road, Ashby, were laid a short time ago. The style of architecture is Gothic. The cost of the buildings will be about 2,200. The contractors are Messrs Orton & Son, Ashby, and the architect is Mr. Harry Smedley, of Ashby.

COUNCIL SCHOOLS, CHATHAM.—New Council schools have been erected in Glence-road, Chatham. The departments are arranged as follows: A two-story building, accommodating 304 boys on the ground floor and 304 girls on the first floor, and a separate one-story building for 308 infants. The classrooms in each block are grouped around three sides of a central hall, and each hall is directly accessible from the entrances. Duplicate entrances are provided to the departments on the ground floors and two staircases give access to the girls' department and the first floors. All classrooms have stepped galleries, and they are so arranged that all scholars obtain direct light from the left side. Two commodious cloak-rooms and lavatories are provided to each department, fitted with numbered hat and coat hooks on iron rails and standards. There are also teachers' rooms and stock rooms, those in the boys' department being placed on a mezzanine floor over the cloak-rooms. The central halls, cloak-rooms, and corridors are warmed on the low-pressure hot water system; each radiator is capable of independent control. The apparatus was installed by Messrs. Gibbs & Sons, of Liverpool. The classrooms are warmed by means of warm air ventilating grates, supplied by Messrs. Hand & Pattison, of London. All rooms and halls have separate wall inlet ventilators and extract shafts carried up in the chimney stacks. The lighting is by gas, with two-light pendant in the classrooms, and reflecting star lights in the central halls. The gas fittings were supplied by Mr. Frank Rayfield, of Chatham. The site is a sloping one, a special centre has been provided on the sub-ground floor, affording accommodation for upwards of forty pupils. The materials used in the outside work are red bricks from the Darnall brickfield, and Portland stone copings, strings, and key stones, etc. The roofs are covered with Broseley tiles, and the flats with Val de Travers asphalt. All corridors, staircases, and cloak-rooms have high dadoes of glazed bricks, the classrooms and central halls have dadoes of matched boarding, the walls above the dadoes are distempered in a dull reddish colour, and the interior woodwork is stained and varnished. The floors throughout are fire-resisting and covered with pitch-pine blocks. The offices are placed well away from the school buildings, and the sanitary fittings were supplied by Messrs. T. & W. Farmiloe, of London. The playgrounds are paved with tar paving, and covered shelters, with a drinking-fountain in each, are provided for each department. The schools have been erected from the Architect to the Education Committee, Mr. Herbert H. Dunstall, by the contractor, Mr. H. E. Phillips, of Gillingham, at the contract price of 11,637. Mr. George Carr was foreman of works, and Mr. Thomas Cramp carried out the duties of clerk of works.

SCIENCE SCHOOL, DULWICH.—On the 3rd inst. Lord Rayleigh laid the foundation-stone of the new science school which is being erected in connexion with Dulwich College. The building is to cost 18,000. It has been designed by Mr. Charles E. Barry, and is being built to the north of the present buildings in red brick and terra-cotta. On the ground floor there is to be provision for the teaching of physics, with a museum, and on the top floor there will be chemistry rooms with an optical laboratory. Both lecture theatres and teaching laboratories will be provided.

PROPOSED COTTAGE HOSPITAL, ALSTON.—Plans have been prepared by Mr. T. Taylor Scott, architect, Carlisle, for a cottage hospital which is to be erected at Alston. The plans show that the new hospital will have a frontage of over 70 ft., with the main entrance in the centre, which forms a porch leading into the vestibule hall and corridors. On the right-hand side of the hall is situated the operating-room, and beyond it, approached by the main corridor, will be a female ward with a cut off sanitary wing. The opposite end of the main corridor will give access to the male ward with an isolated sanitary wing practically the same as the female ward, and a nurse's night room adjoining it with inspection window. Bathroom and hospital stores for both wards will be approached from the main corridor. At the rear will be erected a large two-story block forming the administrative department at right angles with the body of the hospital, and consisting of kitchen, pantries, larder, scullery, matron's and nurse's bedrooms, etc.

PUBLIC LIBRARY, FENTON.—The new public library at Fenton is situated at the corner of Station-road and Baker-street. The exterior is of red Accrington brick and Hollington stone, and the roofs are covered with brimble tiles. In the entrance-hall is a decorative painting in oils of children sitting at the feet of an allegorical

figure of Knowledge. It has been painted and presented by Mr. G. M. Forsyth, of Stoke. The lending library has bookshelves of 12,000 volumes capacity. The reference library is placed in the quietest and most secluded part of the building.

The general reading-room will accommodate seventy-eight readers—eighteen at newspaper-stands and sixty at tables. In the basement there is a heating chamber with coke and coal stores. A staircase leading from the entrance-hall is constructed of Stuart's granolithic. The principal room on the first floor is a lecture-hall, to seat 120 persons, and on the same floor are a ladies' reading-room, committee-room, and filing-room. The walls in the building are painted with Harland's enamel; the woodwork is of selected varnished pitch-pine; the railings, balustrades, grates, and gas fittings are executed in wrought iron; the floors are of steel and concrete, and are fire-proof; all the rooms are laid with wood blocks, and the building is heated by means of low-pressure hot-water apparatus. The architect of the building is Mr. F. R. Lawson, of Fenton and Longton, and the contractor Mr. John Bagnall, Messrs. Minton, Hollins, & Co., of Stoke, supplied all the mosaic, faience, and wall-tiling; Messrs. Thomas Brawn & Co., of Birmingham, the wrought-iron grates and gas fittings, the remaining ironwork being supplied by Mr. W. Durose, of Tunstall; Messrs. Burgess & Co., of Liverpool, the wood-block floors; the Critical Manufacturing Company, of Braintree, Essex, the wrought-iron casements; Messrs. E. Peake & Sons, of Fenton, the heating apparatus. The sanitary ware was presented by Messrs. F. Winkle & Co.

ASYLUM, NABURN, YORK.—The new asylum which has been built by the Corporation of York at Naburn has a present accommodation for 362 patients, but the building could be extended so as to permit of 124 more being received. The new asylum faces south-west, and the extreme length of the building from north-east to south-west is about 740 ft., and the depth from north to south 430 ft. A lodge has been built at the entrance from Naburn-lane, and a wide drive leads up to the north entrance, over the doorway of which is a medallion containing the City Arms carved, and surmounting this is a turret with a domed roof. The entrance hall has a flooring of mosaic, on which is represented the City Arms. The build-ings have been arranged somewhat in the form of a fan, and there are three blocks on each side of the centre all facing south-east. Those on the north-east side are for males and those on the south-west for females, with the apartments of the assistant medical superintendent between. The requirements of the Lamscy Commissioners have been fully met, the details of the accommodation being as follows:—Female side, block A, epileptic, ground floor, 40; chronic, first floor, 40. Block B, recent and acute, ground floor, 30; recent and acute, first floor, 30. Block C, sick and infirm, ground floor, 35; sick and infirm, first floor, 35; total females, 210. North side, Block D, sick and infirm, ground floor, 25; sick and infirm, first floor, 25. Block E, recent and acute, ground floor, 20; recent and acute, first floor, 20. Block F, epileptic, ground floor, 30; chronic, first floor, 30; total males, 152. The estimated cost of the institution, fully equipped, is 133,000. The cost works out approximately at 280l. per bed, exclusive of the land. The corridor from the entrance block and that of the assistant medical officer's block have terrazzo floorings by Geary Walker, of London. The plans of the building were drawn by Mr. A. Greer, City Engineer, and his assistant, Mr. Spurr, the contract having been executed by Messrs. Longden & Son, of Sheffield. The clerk of works has been Mr. J. C. Laight, who had for his assistant Mr. W. Berkeley, who has been appointed by the Asylum Visiting Committee resident engineer. The wooden flooring of the building has been in the hands of Messrs. "Ronuk," Ltd., of Portslade, London, and Manchester, for treatment by their sanitary methods. Leading out of the main corridor are the night nurses' quarters. There are two stories with ten rooms on each. At one end of the long corridor is the female bath-room, that for the males being at the other end. The fittings are by Doulton, of Lambeth, the floors having been laid by the Challenge Flooring Company, of London. The dormitories have Dunsco coloured walls and polished floors. The fire grates are of various designs with tiled hearths. They have been supplied by Messrs. Doulton, London, Messrs. Burnmantotts, Leeds, the Selby Brick Company, Messrs. Dove, of York, and Messrs. Bushell, of York. The glazed bricks throughout the building have been supplied by Burnmantotts and the Selby Brick Co., and the latter with the Castleford Brick Company have been responsible for the bricks for the external walls. The rubber arches over the doors and windows are made of bricks supplied by Lawrence, of Bratton, Berkshire, and the fire-proof ceilings and iron roof principals come from the works of Homan & Rogers, Manchester. A water tower 100 ft. high with a clock dial 7 ft. 6 in. in diameter, by Nowey, of Petergate, York, has been provided. An isolation hospital and a mortuary have been built. The chapel, which is built on the left of the avenue leading to the

entrance from Naburn-lane, is small in dimensions, and is built of brick with an open roof of stained and varnished pitch-pine. The interior of the walls are plastered in Keen's cement and coloured. The floor is of oak blocks, and the general seats are of pitch pine, while the choir stalls are of oak. The heating is supplied direct from the main building by radiators. The house for the medical superintendent is situated on the right of the entrance gates. On the north-west corner of the site six cottages have been erected for the head attendant, head gardener, and other employees. Messrs. Dent & Co., of York, are the contractors for the rebuilding of the farm steading.

HOLBORN COUNCIL'S NEW OFFICES.—The Establishment Committee of the Borough Council reported on Monday having authorised the Town Clerk to invite preliminary plans for this building from the following architects:—Messrs. Colcott & Hamp, Edwin T. Hall, Henry T. Hare, Gerald C. Horsley, A. Brunwall Thomas, Septimus Warwick, and Herbert A. Hall.

DEPTFORD MORTUARY AND CORONER'S COURT.—Instructions have been given for the three sets of designs for the mortuary and coroner's court to be open for public inspection at the Town Hall from the 19th to the 24th insts. inclusive.

APPOINTMENT.

ROYAL BOROUGH OF KENSINGTON.—It is announced that Mr. Alfred Robert Finch has been appointed Borough Engineer and Surveyor, Kensington, in succession to Mr. William Weaver, who recently tendered his resignation after having been injured through an accident, and has been granted a pension of 500l. per annum. Mr. Weaver had served during more than forty years the former vestry and its successor, the Borough Council, firstly as a pupil and ultimately as chief in connexion with the largely increasing municipal work of the district, and is a past-President of the Incorporated Association of Municipal and County Engineers.

SANITARY AND ENGINEERING NEWS.

VENTILATION OF SEWERS.—The Highways Committee of the Greenwich Borough Council are to consider as to the advisability of convening a conference of the Camberwell, Deptford, Lewisham, and Woolwich Borough Councils to exchange opinions as to whether danger to the health of the inhabitants is likely to arise from the proposed sewer ventilators of the main sewers now in course of construction, and to ascertain whether any practical means can be devised for preventing a nuisance arising from the ventilation of sewers.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment, in the place of Mr. R. W. Hindhaugh, resigned, of Mr. W. S. Matson as sanitary inspector in the Metropolitan Borough of Finsbury, as from February 19, 1906.

INSTITUTE OF SANITARY ENGINEERS.—A meeting for the formation of a Northampton District centre will be held at the Guildhall, Northampton, on Saturday, the 17th inst., at 3 p.m. The chair will be taken by the President of the centre, Mr. Alfred Eider, M.Inst.C.E., Borough Engineer and Surveyor of Northampton. After the meeting an official visit will be made to the refuse destructor, tramway power-station, etc., under the direction of the President. The Hon. Local Secretary is Mr. A. E. Abbott, Engineer and Surveyor, Wolverton, Bucks.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The partnership hitherto existing between Mr. Stephen Salter, of Oxford, and Mr. R. C. Davy, of Maidenhead, architects, has been dissolved. Mr. Henry Stock, of the firm of Stock, Page, & Stock, architects, who recently resigned the appointment of Surveyor to the Haberdashers' Company, which he had held for twenty-three years, has been succeeded in that appointment by his son, Mr. H. W. Stock. Mr. C. P. Knowles, A.M.Inst.C.E., has removed his offices from Craven-street to 39, Victoria-street, Westminster.

STATUARY AT THE CENTRAL CRIMINAL COURT.—The upper portion of the scaffolding at the new Central Criminal Court has now been removed, and the massive bronze-gilt figure of "Justice" which surmounts the building is visible. It is over 200 ft. above the street level, and was designed and executed for the casting by Mr. F. W. Pomeroy. Including the globe on which it stands, the figure is 20 ft. high, measures from 10 to 15 ft. from the extremities of the outstretched arms (uplifting the sword and scales of Justice), and weighs several tons.

PROPOSED STREET EXTENSIONS, NEWCASTLE.—A report has been issued by the City Engineer of Newcastle-on-Tyne Corporation with regard to the proposals for dealing with Market-street extensions. The first proposal is that part of New Bridge-street be widened a minimum width of 60 ft.; second, that Rose-street be continued to New Bridge-street, opposite to the foot of Higham-place, and with a width of from 40 to 50 ft.; third, that Erick-street be diverted a

little westward, and become a continuation of Princess-street; fourth, that a street of 20 ft. wide be provided from Pilgrim-street to Trafalgar-street to give better access to the block of buildings on the south side of the new Market-street. The City Engineer recommends that the improvements should be commenced as early as possible after the necessary preliminary work has been obtained.

WAR MEMORIAL, PENRITH.—A memorial to the local volunteers who were killed in the South African War has been erected in Comez-square, Penrith. It consists of a bronze figure representing the angel of peace placed on an unpolished column of Shap granite, which, in its turn, stands on a base of the same stone, formed into three steps. The angel stands with outstretched wings and arms, and holds in its hands a laurel wreath. The full height of the monument is 21 ft., and it has been designed by Mr. F. W. Doyle Jones, of West Hartlepool.

THE PEABODY FUND.—The forty-first annual report of the Peabody Fund states that 154 cottages of five rooms each are in course of erection at the Tottenham estate, and it is hoped that some of them will be ready for occupation towards the end of the present year. At the end of the year the governors had provided for the artisan and labouring poor of London 12,328 rooms, including the houses occupied by the superintendents and porters, besides bath-rooms and lavatories. These rooms comprised 5,448 separate dwellings, viz., 82 cottages of 5 rooms, 105 tenements of 4 rooms, 1,833 of 3 rooms, 2,550 of 2 rooms, and 899 of 1 room.

CHICHESTER CATHEDRAL.—The programme of restorations of the cathedral during the coming summer was discussed at a meeting of the Executive Committee of the Cathedral Restoration Fund held in the Chapter House last week. The Committee had before them the chapter clerk's report as to the result of the appeal recently made to the county at large for the purpose of completing the restoration of the bell-tower, and of replacing the lead roof of the cathedral. The result has not been so favourable as the Committee hoped would be the case, though the substantial sum of 1,055l. has been paid or promised, besides 500l. promised by the Ecclesiastical Commissioners. In the absence of the supervising architect (Mr. Somers Clarke, of Brighton), who is abroad, Messrs. Vick & Sons, of Chichester, who have had the carrying out of a considerable amount of the recent restoration work, were consulted as to the details of the nature and cost of the further work required. They gave it as their opinion that at least 2,000l. will be needed to complete the bell-tower, while the work on the cathedral roof will necessitate another 3,000l. They recommended that the roof should be left for a year or two, as it is not so urgent, and that they should be instructed to get on with the repairs to the northern half of the bell-tower, which would take them practically the whole summer, and cost about 1,000l. The Committee, after discussion, resolved to instruct Messrs. Vick to carry out the renovation of the bell-tower, but limited the expenditure for the time being to 700l. The works will be under the supervision of Mr. Somers Clarke. For the completion of all the contemplated repairs and renovations above mentioned some 3,500l. is still needed. Meanwhile, 100l., which is in hand, of the old restoration fund is to be applied to the further pointing of the cathedral.

ARTESIAN WELLS IN LONDON.—An artesian well has just been bored at Bric House, the large buildings just completed in Leadenhall-street, and a good supply of pure water obtained, which is remarkable for its softness, it being less than 6 degrees. The well was carried to a depth of 450 ft., and beds of yellow, blue, and variegated clays, also sand and pebbles, were passed through before the chalk was met with. An electric bore hole pump raises the water noiselessly to the top of the building, at the rate of 2,500 gallons per hour. Messrs. Alfred Williams & Co., of Artesian Works, Bow, were the engineers.

PROPOSED EDINBURGH EXHIBITION.—A special meeting of the Parks Committee of the Edinburgh Town Council was held on the 8th inst. to consider the application of the promoters of the Scottish National Exhibition, which it is proposed should be held in Edinburgh in 1908, for the use of Saughton Park as an exhibition site. The general feeling was that the committee could not adopt the policy of standing in the way of the success of the scheme, but members wished to be satisfied that it would be carried through, and that certain work which the exhibition authorities would have to undertake would be made of permanent value to the city.

THE SQUARE CLUB.—The club is holding its third smoking concert in the Institution, the Hall, Monico Restaurant, at 8 p.m. on Tuesday, the 20th inst. The chair will be taken by the President, Sir Aston Webb.

LONDON COUNTY BUILDING BILL.—In the House of Commons on Tuesday, on the motion for the second reading of the London County Building Bill, Colonel Legge said he rose not to oppose the Bill, but to express a doubt whether the present was the best time to incur the expense proposed in erecting municipal offices on the south side of the Thames. The debt of the

County Council had risen from 17,500,000, in 1889 to 33,000,000, in 1905, although in the latter sum was included the burden occasioned by taking over the Board Schools. It regards as another scheme of the County Council, and stated that the County was in danger of overstraining its credit. The total cost of the site and buildings now proposed was 2,000,000, but this Bill only asked for 655,000, for the site.—Sir E. Cornwall remarked that, leaving out of the question the cost of education cast upon the County Council, the debt had only increased by 8,000,000, or 2d. in the pound on the rates, in respect of public works in the last ten years. The percentage of debt to the rateable value was very much less in London than in most of the large provincial towns and cities, therefore these alarmist statements were not quite worthy of those who wished to regard London in its highest aspect. Of the staff of 1,950, the central offices housed 525, and the remaining 1,425 were accommodated in twenty-five separate buildings. The architect's department occupied seven buildings, the clerk to the Council's department occupied five, the controller's four, and the engineers' four. The proposed outlay, although he doubted whether the expenditure would be kept within the limit mentioned, The Bill was then read a second time.

TRADES DISPUTES BILL.—A deputation from the Employers' Parliamentary Committee and the Trades Union Congress, headed by Mr. Gladstone and the Attorney-General, at the House of Commons, on the subject of the Trades Disputes Bill. The Earl of Wenys introduced the deputation, who asked that in any Bill contemplated by the Government their views should be considered. Nowadays it appeared to be the opinion of many people that only the interests of labour were of importance, and that the employers should be ignored. It was strongly urged that clear instructions should be given on picketing. The Home Secretary, in reply, said the time had come for attempting some settlement of this important and difficult question. A Bill was now under the consideration of the Government—in fact, was in the last stages of consideration—and in the course of a week or two it would probably be introduced into the House of Commons. The difficult points of the Bill were the liability of funds, the question of the law of conspiracy, and the question of picketing. Whatever proposals might be brought forward he was confident that they would not depart from the principle that it was the duty of the Government to see that all reasonable protection, as far as possible by law and executive action, should be given to everybody in the execution of his lawful business. He assumed that the Government was perfectly aware that there were other interests in this country besides labour interests, and that it would view this matter from the standpoint of public policy.

CHARING-CROSS IMPROVEMENTS.—In the House of Commons on Tuesday, Mr. Bryce, in answering Mr. Hay, said all the lands and buildings necessary for the completion and opening of the new road from St. James's Park to Charing-cross had been purchased in 1883 and 1885, and that the foundations of the buildings and entrance to Charing-cross would be completed by the end of June next.

BUILDING BY-LAWS.—In Tuesday's Parliamentary papers Mr. Brodie asked whether it is the case that inquiries have recently been addressed to the district and parish councils throughout the country asking for a return as to the housing requirements in their respective districts. The President of the Local Government Board stated that he has not asked district and parish councils for a return as to the housing requirements of their areas, but he recently addressed a circular to rural councils relating to by-laws with respect to new streets and buildings, and he stated that the object of the circular was to secure that, whilst sanitary requirements should be strictly observed, all unnecessary impediments in the development of building should be avoided.

IRISH SLATE QUARRIES.—In the Parliamentary papers for last Tuesday, Mr. Edward Barry, M.P., asks the Chief Secretary for Ireland if he will ask the Department of Agriculture to send an inspector to visit the slate quarries at Benduff, Roscommon, County Cork, and report on the quality of the slate and the possibility of further development, giving special attention to the disadvantage under which the quarries at present suffer owing to the fact that they are ton miles from a railway station. Mr. Bryce replies that the Benduff slate quarry was investigated in 1904 by the Department's economic geologist in compliance with an application made to them by the managing director of the quarry, and the inspector's report was communicated to the managing director.

SHEFFIELD MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Sheffield Master Builders' Association took place on the 8th inst. at the

Building Trades Exchange. Mr. T. Roper (President of the Association) was in the chair. In submitting the "Corporation, City, and Trade of Sheffield," Mr. A. J. B. Smith concentrated on the fact that all trades were better represented on the Council than the building trade. Councillor A. Neal responded. He expressed the hope that the Federation would be conducive of peace, and not of war, that it would meet the men always in a proper spirit, that it would meet the architects and make them give reasonable conditions under which to execute contracts, and that it would raise the status of the building trade in Sheffield. Councillor G. L. Wood also responded. Mr. J. D. Cook claimed in proposing "The National and Yorkshire Federation of Building Trade Employers" that, although the Federations were at first regarded as antagonistic to the Labour party, they were seen to have worked equally in the interests of the men. Neither a strike nor lock-out could now take place in Sheffield until the matter in dispute had been referred to the conciliation board of the district, and after that to the Yorkshire Federation, then to the Northern centre, and finally to the National Association. If the Federations had done nothing more than render the establishment of conciliation boards possible they had justified their existence. Mr. P. Rhodes (President of the Yorkshire Federation) said that, with the exception of agriculture, the building trade were the largest industry in the kingdom, and employed about 1,000,000 men. He waxed indignant over the proposal to be made in Parliament to sanction picketing, and expressed the opinion that if the law were amended in the way suggested the men's organisations would soon be backing out of the conciliation board. His views were expressed by Mr. A. Moulson (Bradford). The toast of "The Architects, Surveyors, and Engineers" was proposed by Mr. J. Biggin. Mr. C. F. Wike, City Surveyor, replied, and gave some figures and details as to the continued spread of the city. Last year, he said, plans for 1,982 dwellings were passed by the Council, compared with 1,950 the previous year, which meant that about 10,000 people were being added to the population of Sheffield every year. Plans were also passed last year relating to 2½ miles of streets, and this year a single plan submitted contained nearly four miles of streets. What had been one of the beauty spots of the city would therefore in all probability in a few years be a "landscape of masonry." Mr. Wike also touched on the question of the unemployed, and intimated that the list of unemployed in Sheffield had contained 2,200 names. Out of that number the city had found work for about 600. Some of the others were unsuitable owing to age and other reasons, but some undoubtedly were wastrels and did not want to work. Replies were also made by Mr. E. M. Gibbs and Mr. E. Holmes. The toast of the evening, "The Sheffield Master Builders' Association," was given by Councillor W. C. Epton, who referred at some length to the much-discussed question of direct labour. The only difference between direct labour and contract work, he thought, was that direct labour was more expensive than the other. Nevertheless, there were times when direct labour was the class he certainly should employ. He was not in favour of the attacks so often made upon builders by people anxious to obtain cheap notoriety, he urged the builders not to sit quietly down under them, but to give forcible replies. The President of the Association (Mr. T. Roper) briefly responded, declaring that the Association was not formed for fighting purposes, but to settle matters amicably. "The Visitors" were honoured at the behest of Mr. G. E. Powell, and Mr. J. Bingham and Mr. J. Sissons responded.

THE LONDON GEOLOGICAL FIELD CLASS.—This Class, conducted by Mr. H. G. Seeley, F.R.S., F.G.S., Professor of Geology in King's College, London, is one in which students are taught continuously by the same teacher in the open country and in quarries. The excursions for this year will commence on the last Saturday in April. The departure by railway is usually between two and three o'clock in the afternoon, returning to London between eight and nine o'clock. Some excursions start earlier and return later. The afternoon walk varies from two to six miles. A drive is arranged when the distance is longer. A suitable tea is taken after six o'clock at the hotel or village inn. At the conclusion of tea a connected account of the geological work done during the day is usually given by Professor Seeley. The remainder of the excursions are held during the Whitsun, Summer, and Christmas vacations. Each extends over two or three days, and is unlimited as to distance. Each excursion is planned either to compare the geological deposits of the London district with those found in other parts of the country; or to examine the outcrops of the older rocks which have been proved by engineering work to underlie the London district; or to examine rocks which are not known in the south-east of England, such as the crystalline and volcanic rocks. The excursions of this series for 1906 will be chosen from the following:—A tertiary locality in the Hampshire Basin, the cretaceous rocks of north-west Norfolk, Devizes, or Folkestone; the oolites of

Swindon or Cheltenham; and the primary rocks of Clifton, the Mendip Hills, the Welsh Border, or Leicestershire. Particulars of each excursion will be sent to all members of the Class as the details are arranged. The director will issue a report on these longer excursions at the close of the session. The fee is one guinea for all the excursions for the session, 1906.

TOWN HOUSES, OLD AND NEW.—Speaking before the Auctioneers' Institute on the 9th inst. at Hamilton House, Victoria-avenue, on the subject of "Town Houses, Old and New," Mr. W. Henry White said that the housing of the working-classes and garden cities had been so much to the fore during the past year or two that the charms of a more town house or mansion were in danger of being forgotten. So far as comfort went the modern town house was much more luxurious than was its prototype, and the improvements which had taken place, together with the conditions imposed by various Acts of Parliament, had materially increased the size and costliness of houses, apart from the question of labour and materials. They had also given the architect fresh problems in design. In the hands of educated and trained men he believed that these fresh conditions had been an incentive to design of a high standard, as evidenced in many instances on the great West-end estates, but, unfortunately, the bulk of modern work was not done by highly-trained men, and the results were disappointing. He believed, however, that there was a constantly increasing number of capable men, and he hoped that the building-public and great landlords were beginning to appreciate the better class of work, and that they would assist architects by demanding a high standard of design. Why were there so aptly now amongst the citizens as to the appearance of London streets? The average building owner thought mainly of the matter from a commercial point of view, and there was but little evidence of any large view of citizenship and of "the city beautiful" being to the fore. A high such a view was more general it would be only here and there that beautiful buildings would be erected. It was an age of speed, hurried work, and hurried schemes, and he was convinced that even from a commercial point of view the result was not satisfactory. He drew attention to Park Lane, and remarked that a study of those homes of the millionaires showed an extraordinary conglomeration of buildings. There was no stately laying-out worthy of such a position, but practically each house was different in style from its neighbour.

GREEK ARCHITECTURE.—On the 6th inst. Professor Capper lectured to the members of the Northern Art Workers' Guild, at the Grand Hotel, Manchester, on Greek architecture. His impressions from a recent visit to Greece were, he said, not those usually accepted. The general view was that ancient Greek architecture was purely abstract art, and that once the abstract proportions were mastered they had the correct Greek architecture. He did not believe that view was sound. Another point on which he differed was that once the Greeks had fairly established it, they worked at their system and were content to do nothing but continue practising it. That was an entire misconception of Greek architecture, and one of his impressions had been how greatly progressive their art was.

ORGAN, CARLISLE.—A new organ has been erected in the Warwick-road Presbyterian Church at a total cost of 743l. It was built by Messrs. Alexander Young & Son, Manchester, in accordance with designs prepared by Mr. T. Taylor Scott, of Carlisle.

WANDSWORTH PARISH CHURCHYARD.—A portion of the parish churchyard of All Saints, Wandsworth, is to be taken for a widening of South-street in connexion with the London County Council's scheme for tramways and local improvements. The remains to be disturbed will be re-interred in Streatham cemetery, Garratt-lane, at the charges of the Council, who will defray the cost, to the extent of 10l., in respect of each grave taken for the new works.

Legal.

TRIBUNAL OF APPEAL CASE.
ESTON-ROAD BUILDING LINE.

ON Friday last week the Tribunal of Appeal was engaged for over five hours at the Surveyors' Institution in hearing the appeals of the Worshipful Company of Skinners (as governors of Tonbridge School), Mr. W. F. Howard Flanders (as trustee of the Flanders Estate), and the Metropolitan Railway Company against the certificate of the Superintending Architect of Metropolitan Buildings, dated January 17, 1906, defining the general line of buildings on the south-east side of Eston-road, St. Pancras, between Liverpool-street and Duke-street. Mr. Horace Avory, K.C., and Mr. Cumming Glen, represented the Skinners Company; Mr. Macmorren, K.C., the Metropolitan Railway Company; and Mr. Avory and Mr. Jenkins, Mr. Howard Flanders, Mr. Morton

supported the appeal on behalf of the United Kingdom Temperance and Provident Institution; Mr. Payne on behalf of the Euston Theatre Company, while a number of other owners and lessees were represented. The London County Council was represented by Mr. C. Russell, K.C., and Mr. Bailhouse.

Mr. Avory, in opening the case, said the Skinners' Company were the owners of the houses numbered from 45 to 113, and Mr. Flanders from Nos. 23 to 35, and in between was the property of the Euston Theatre Company. The matter of the building line was of the greatest importance to his clients because the line, as it had been fixed by the Superintending Architect, absolutely prevented the advantageous development of the property, the lessees of the majority of which were just about to fall in. It also prevented any advantage which the public might have acquired by the widening of this important thoroughfare, for his clients could hardly be expected to give up property for the widening of the road unless they were going to get some corresponding advantage. The line as at present fixed by the Superintending Architect would prevent any buildings being erected on the gardens in front of the houses, and so would prevent the property being developed for modern purposes. On January 3 they invited the Superintending Architect to fix the line of building for their property between Belgrave-street and Mapleton-place. If there had been a general line of buildings in that portion of the Euston-road it would have been the duty of the Superintending Architect to define it, but when he came to his certificate he admitted that in that portion of the Euston-road there was no general line of buildings existing, and so in order to define one he had to extend his view along the road to Liverpool-street to the east and to Duke's-road to the west. He submitted that even if they took that limited view the line which had been laid down could not be justified, but his contention was that in order to define the line it was necessary to take a much larger survey of the road. At present near Chester-street there were one-story buildings projecting beyond the line now laid down by the architect, and going west they had at the corner of Mapleton-place buildings of two stories projecting to the pavement-line. Between Mapleton-place and Duke's-road there were a number of buildings which came in front of the line defined by the architect. He submitted that they were bound to take into account these existing buildings because they were in front of the line now laid down by the architect, and further, if they looked at the line laid down, he ventured to doubt if there had been any exercise of judgment at all. It simply looked as if a clerk in the office had drawn a red line along the fronts of the existing houses. Unless the County Council was prepared to show that these one-story houses were erected without consent of the Metropolitan Board of Works, how could it be laid that they were beyond the existing frontage? If they were to take the line from Liverpool-street to Duke's-road then the line of building should be defined to the line occupied by the buildings he had mentioned, viz., the pavement-line. He suggested, however, that they ought not to stop at Duke's-road, but should have regard to the whole of Euston-road and begin at Portland-road station. The question of the building line of Euston-road had already been before the Tribunal.

Mr. Hudson said the Tribunal did fix the building line between Tottenham Court-road and Southampton-street.

Mr. W. Campbell Jones, architect and surveyor to the Skinners' Company, gave evidence with regard to the property belonging to the company, and expressed his disagreement with the line as defined by the Superintending Architect's certificate. He thought the architect should have taken in the whole of Euston-road in fixing the line, and so bring it to the pavement-line.

In cross-examination by Mr. Russell, witness said that if they took the property in blocks, the building line as laid down by the architect would be the right line so far as the blocks were concerned. In their earlier applications the Skinners' Company offered to give up from 25 ft. to 30 ft. of the frontages for the widening of the road if they could build on the remainder of the forecourts.

Mr. Stenning, surveyor, stated that he had examined the part of Euston-road in question owned by the Skinners' Company and was of opinion that the line as laid down by the Superintending Architect was not the general line of building. He considered that the one-story and two-story buildings must be taken into account in fixing the line, and agreed that the line should be drawn from Portland-road station to King's-cross.

Cross-examined, witness said he thought some consideration ought to be paid to the north side of the road in fixing the line. On this side the buildings were brought out. It might be that the Royal Commission on London Locomotion had recommended that the forecourts in Euston-road should not be allowed to be built upon, and he agreed that it would be a good thing to make the road 100 ft. wide.

Other evidence of a similar character was submitted.

Mr. Macmorren addressed the Tribunal on behalf of the Metropolitan Railway Company. He pointed out that his clients had not asked the Superintending Architect to define the line of building, but if the line was now defined between Duke-street and Liverpool-road they would be seriously affected. The railway company had acquired property under an Act of Parliament really for the purposes of ventilation of the railway, and the building line as now laid down would absolutely go to take away a large quantity of their property. The property of the company was one-story property. When the time came to rebuild, he contended that they would be able to do so on their statutory title.

Mr. Russell, K.C., argued that the line ought to be defined in accordance with the previously existing lines for the different blocks of property in the line, and he suggested that there was a well-defined part of Euston-road which lay between Liverpool-street on the east and Euston-square to the west. The Superintending Architect had taken a well-defined part of Euston-road in which the buildings in question were situated, and had dealt with that part with regard to the more important question as to what was the general line of buildings of the street; the reason for the contention that the line should be defined from Portland-road station was obvious. When they got beyond Gover-street there was a considerable number of buildings which were brought right up to the pavement-line and further, it enabled the appellants to drag in that portion of the road between Tottenham Court-road and Southampton-street with regard to which the Tribunal had settled the line of buildings. Euston-road had a history and up to 1862 it was unlawful to bring any building nearer than 50 ft. from the street, therefore up to that date it was certain that the general line of building was the front of the existing houses, which were 50 ft. from the pavement. Then the question arose whether a new building line had come into existence since 1862. The one-story buildings had been erected on conditions and must be eliminated from the minds of the Tribunal.

The Chairman said it might save time if he intimated that it was in the minds of the Tribunal to limit their finding as to the general line of buildings as between Chesterfield-street and Mapleton-place.

Mr. Avory said if only that piece of the road was taken, then there was no building projecting beyond the line which the Superintending Architect had fixed, and he contended that they must take the other portions of the road into consideration.

The Chairman said their intimation would not prevent argument as to where the building line should be fixed.

Mr. Russell read the conditions on which the one-story buildings were erected, which were to the effect that they were not to be altered or raised without the consent of the Metropolitan Board of Works. As to the two-story buildings, he had no records of how they came to be erected, but the appellants had brought no evidence to show how they came to be there.

Mr. Avory said that if the Tribunal were going to exclude from their consideration those buildings which had been erected with conditions, he should have to ask for a case to be stated for the High Court. As to the two-story buildings, it was a rule of law that a thing was legally done until it was proved to the contrary, and the old Act of Parliament only said that no new building should be erected on a new foundation. There was no law which said that a one-story building was not to be considered in defining a building line.

Mr. Macmorren said that, of course, his clients' property did not come in if the Tribunal limited their finding as intimated.

The Chairman said the Tribunal had decided to uphold the line of building of the Superintending Architect as between Chesterfield-street and Mapleton-place.

On the question of costs, the Tribunal gave the County Council costs against the Skinners' Company and Mr. Flanders, and awarded the Metropolitan Railway Company costs against the London County Council.

CASE UNDER THE PUBLIC HEALTH ACT.

The case of the Mayor, &c., of Hornsey v. the Birkbeck Freehold Land Society, came before the Divisional Court of King's Bench composed of the Lord Chief Justice and Justices Ridley and Darling last week on a case stated by the Justices of Highgate on a complaint by the Hornsey Borough Council against the Society, whereby the Borough Council sought to recover from the Society 72s. as the apportioned share of expenses incurred by the Council in the execution of certain works in the Birkbeck-road under the Public Health Act, 1875. The road in question was a highway not repairable by the inhabitants at large, and the boundary between the Hornsey borough and urban district of Friern Barnet runs along the line of the kerb of the footpath on the north side of the road, so that the carriage-way and the footpath on the south side are in the borough of Hornsey and the footpath on the

north side is in the urban district of Friern Barnet. It appeared that the Society were the owners of premises abutting on the footpath on the north side of the road within the urban district of Friern Barnet, and these premises were wholly within the district. In July, 1903, the Hornsey Borough Council, under the provisions of the Public Health Act, 1875, caused notices to be served on the Society, calling upon them to make up the parts of the road within the borough of Hornsey, but this work was not done. The work covered by the notice comprised work to the carriage-way and to the footpath on the south side, but did not comprise sewerage or any work to the footpath on the north side. The notice was also served on all the owners of premises abutting on the south side of the road, and, as none of the owners executed the work, the Hornsey Borough Council carried it out themselves. The expenses, which amounted altogether to 949s., were attributable 739s. to the carriage-way and 210s. to the footpath on the south side of the road. The Borough Council's Surveyor apportioned the 210s. among the owners of the premises abutting on the south side, and he apportioned the 739s. among the owners of all the premises, whether on the north or south side, including the Society whose share of the 739s. was 72s., but this sum, although demanded, was not paid. About this time the Friern Barnet Urban District Council served notices under the Act with reference to the footpath on the north side, and, having executed the works, apportioned the expenses on the owners of the premises on the north side only, including the Society, who had paid the sum so apportioned. Certain sewers ran through that part of the road which is within the borough of Hornsey, and these were vested in the appellants. The houses on the south side of the road drained into these sewers. The houses on the north side drained into a sewer which ran along that part of the back-road within the Friern Barnet Urban District, and which was recently constructed by the Friern Barnet Council at the request and cost of the owners on the north side. The contention on behalf of the appellants was that the fact that the Society's premises were not within the appellants' borough was immaterial under section 150 of the Act. The case for the Society was that their premises, being outside the district of the appellants, were beyond their jurisdiction.

In the result, the Lord Chief Justice, in giving judgment, said it lay on the appellants to establish their right to charge people outside their district. It had been laid down that the authority of one district should not charge or tax the inhabitants of another, and the appellants had failed to show that they had any power to do so.

Justices Ridley and Darling concurred, and the appeal was accordingly dismissed with costs.

Mr. Macmorren, K.C., Mr. Jenkins appeared for the appellants; Mr. Alexander Glen, K.C., and Mr. Aldrett for the Society.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

4,808 of 1905.—A. DRYSDALE: Means for Hinging Windows.

This relates to means for hinging windows, and consists of a hinge plate for securing to the inside of the sash frame, the hinge plate to the window sash being moved at right angles to the fixed plate when it is desired to open a window inwards. The said hinge plate is bifurcated at the top and bottom so as to form a hinge so that the window sash can engage therewith to pivot on, the hinge plate being slung with the fixed plate when not in use. To allow the hinge plate to be secured to the window the baton is hinged with an ordinary hinge to open outwardly, the same with regard to the centre or parting baton. After the baton or headings have been turned out wardly the window is turned, on its hinge, one of the sash ropes being held by a blind check action.

5,806 of 1905.—W. LAVERY: Construction of Bricks for Building Purposes.

This relates to the construction of bricks for building purposes formed with a number of circular bottom and circular side shaped grooves on one or more of the sides or ends of the bricks. The grooves, preferably either two or three in number, may be formed on the side of the brick which is intended to form the outer surface of the wall or building or on both sides, and may be placed longitudinally. One or more grooves may be formed on the end or ends of the brick when these are to form part of the outer surface of the wall. These grooves, which will be narrow at the surface of the brick and be widened out at the bottom or back in oblong circular form, will give a strong hold or key to any coating of cement, stucco, or plaster applied thereto.

10,756 of 1905.—G. GREEN and W. GREEN & Co., Ltd.: Stoves, Ranges, and the like.

This relates to a combined sitting-room grate and cooking range, comprising a grate proper, partially projecting from the chimney wall and having a movable cover, a chamber or oven

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

above the grate enclosed by the chimney wall, and having an open front capable of being closed by a door or the like, and flues extending from beneath the grate cover for heating the chamber or oven.

12,906 of 1905.—J. WATERHOUSE: Water Waste Preventer.

This relates to a water waste preventer, which consists of an ordinary flushing cistern in which is mounted a siphon arrangement composed of a central pipe forming the long leg of the siphon, a cap on its lower end surrounding the said central pipe, two or more side passages rising from the top of the said cap and opening into a ball or chamber over the said central cap, the said cap, side passages, and ball or chamber forming the short leg of the siphon.

19,786 of 1905.—J. H. JONES: Combined Sash and Casement Windows.

This relates to a combined sash and casement window, and has for its object to construct said combined sash and casement window so that it can work in two ways, that is, up and down like a sash window, and also open inwardly and outwardly upon hinges at any height required, thus combining two windows in one without requiring any more brickwork "reveal" than is usual in ordinary windows.

3,708 of 1905.—P. KUBNE: Combination Concrete Steel Construction.

This relates to a combination concrete steel construction having two or more sections or floor fillings, separated from each other by a beam or beams and reinforced by tension-rods, which cross the line of shear, and consist in an arrangement of the tension-rods such that the tension-rods of adjacent sections or fillings overlap each other at suitable intervals apart, the tension-rods of each section or filling extending beyond the beam or beams into the adjacent section or filling.

26,553 of 1905.—A. HEMSELY: Means for and the Method of Cleaning Sink and Similar Waste Pipes.

This relates to means for cleaning sink and similar waste pipes, comprising a cylindrical vessel which is, or can be, closed at one end, and at the other end is provided with a rubber or similar washer, by which a joint can be made between the appliance and the sink or the like. The appliance is charged with chemicals capable of generating gas or steam, and when the charged appliance is placed in position over the waste pipe the gas or steam generated passes through the waste pipe and effectually removes all objectionable matter which accumulates therein.

27,231 of 1905.—R. L. HARRISON: Water Closets.

This relates to water-closets that are flushed with waste water from a sink or other source, and consists in the combination with a closet pan and a waste water cistern of a jet pump connected either to the main or to a cistern placed in such a position as to cause the water issuing from the nozzle of said jet pump to draw up waste water from the cistern, which, with the addition of the fresh water issuing from the pipe through the nozzle, will be forced through the inlet.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing recent property sales with columns for date, location, and price. Includes entries for Camberley, Bishop's Stortford, Shrewsbury, Great Shelford, Little Shelford, Whitteford, Beckenham, and Islington.

Table listing real estate listings with columns for location, agent, and price. Includes entries for Paddington, Dalston, Lambeth, Aberavenny, Stratford, Clapton, South Kensington, Dulwich, Battersea, Finchley, Dulis-ay, Notting-hill, Clapham, Southall, Walsworth, Battersea, Hackney, Bromley, Ealing, Hoxton, Palmer's Green, Mile End, Plaistow, Loweham, Crouch Hill, Hornsey, Sutton, Whitechapel, Haggerston, Clapham, Poplar, Plastow, Maudray, Old Kent, Putney, March 9, Shepherd's Bush, Tooting, and Islington.

PUBLISHER'S NOTICES

THE INDEX (with TITLE-PAGE) for VOLUME LXXXIX. (July to December, 1905) was given as an appendix with the issue of January 1906. CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each. READING CASES (Cloth), with Bindings, price 6d. each. THE EIGHTY-NINTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence. SUBSCRIBERS' VOLUMES, on being sent to the Office, will be found as a cost of 2s. 6d. each.

CHARGES FOR ADVERTISEMENTS. COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, etc., 6s. 6d. Six lines or under 1s. 3d. Each additional line (about ten words) 1s. 3d. SITUATIONS VACANT, PARTNERSHIPS, APPOINTMENTS, TRADE AND GENERAL ADVERTISEMENTS. Six lines (about fifty words) or under 4s. 6d. Each additional line (about ten words) 1s. 6d. Terms for series of Trade advertisements, and for front page and other special positions, on application to the Publisher. SITUATIONS WANTED (Single-handed-Labour only). Four lines (about thirty words) or under 2s. 6d. Each additional line (about ten words) 1s. 6d. PREPAYMENT IS ABSOLUTELY NECESSARY. Stamps must not be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.O.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the outside wrapper should be in by TWELVE O'CLOCK on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS OR ORDERS, to be made, must be received at the Office before TEN O'CLOCK on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have Agents addressed to the Office, Catherine Street, Covent Garden, W.C.O., first of charge. Letters will be forwarded if address envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

The Reply Boxes are not intended for trace lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

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

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

Table listing meetings and reading cases. Includes sections for MEETINGS (Saturday, Monday, Tuesday, Wednesday, Thursday, Friday) and READING CASES (NINEPENCE EACH).

discussion will be opened by Mr. C. Killick Millard, M.D., D.Sc., Medical Officer of Health, Leicester, 11 a.m. Edinburgh Architectural Association. Visits to the new offices of the North British and Mercantile Insurance Co., and new premises of the Professional and Civil Service Supply Association, Ltd.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

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

Any commission to a contributor to write an article, or to execute or send a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

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

Table listing prices for various materials including Hard Stocks, Rough Stocks, Grizzles, Pickled Stocks, Facings, Plettons, Red Wire Cuts, Best Farham Bed, Best Bed Pressed, Kaulon Facing, Best Blue Pressed, Staffordshire, Do. Bullnose, Best Stourbridge, Fire Bricks, Glazed Bricks, Best White and Ivory Glazed, Stretchers, Headers, Quoins, Bullnose, and Flats.

Table listing prices for various types of Stone including Bath Stone, Portland Stone, and Grey Stone Lime.

STONE (continued).

Table listing prices for various types of Stone including York Stone, Scappled random blocks, 6 in. sawn two sides landings to sizes, 40 ft. super., 6 in. rubbed two sides ditto, 6 in. sawn two sides slabs, 2 in. to 2 1/2 in. sawn one side slabs, 1 1/2 in. to 2 in. ditto, and Hard York.

Table listing prices for various types of Hopton Wood (Hard Bed) in blocks, 2 to 8 per ft. cube, delivered, and sides landings.

Table listing prices for various types of Slates including In. In., 20x10 best blue Bangor, 20x12, 20x10 first quality, 20x12, 16x8, 20x10 best blue Fortmadoc, 16x8, 20x12, 20x10 best Eureka, 16x8, 20x12, 18x10, 16x8, 20x10 permanent green, 18x10, and 16x8.

Table listing prices for various types of Tiles including Best plain red roofing tiles, Hip and Valley tiles, Best Broadley tiles, Do. Ornamental tiles, Hip and Valley tiles, Best Rulon red, brown, or shire do., Do. Ornamental do., Hip tiles, Best Red or Mottled Staffordshire do., Do. Ornamental do., Hip tiles, Best 'Rosemary' brand plain tiles, Best Ornamental tiles, Hip tiles, Best 'Hartshill' brand plain tiles, Do pressed, Do Ornamental do., Hip tiles, and Valley tiles.

WOOD.

Table listing prices for various types of Building Wood including Deals, Battens, Second yellow deals, and various sizes of Deals and Battens.

WOOD.

Table listing prices for various types of Wood including Fir timber, Danzig or Mosaic (average specification), Second yellow deals, Small timber, Swedish balks, Pitch-pine timber, and Joyners' Wood.

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WOOD (continued).

Table listing prices for various types of Joyners' Wood including White Sea and Petersburg, First white deals, Battens, Second white deals, Yellow Pine, Oddments, Seconds, regular sizes, Yellow Pine oddments, Kaur Pine, Danzig and Stettin Oak Logs, Large, per ft. cube, Wainscot Oak Logs, Dry Wainscot Oak, Mahogany-Honduras, Mahogany, per ft. super., Selected, Figury, per ft. super., Dry Walnut, American, per ft. super., Teak, per load, American, per ft. cube, Prepared Flooring, 1 in. by 7 in. yellow, 1 in. by 7 in. yellow, 1 in. by 7 in. white, 1 in. by 7 in. white, 1 in. by 7 in. white, and 1 in. by 7 in. white.

Table listing prices for various types of Joyners' Wood including Rolled Steel Joists, Compound Channels, Steel Compound Stanchions, Angles, Tees, and Channels, Flitch Plates, Cast Iron Columns and Stanchions, Iron—Common Bars, Staffordshire Crown Bars, Staffordshire 'Marked Bars', Mid Steel Bars, Hoop Iron, Sheet Iron Black, Ordinary sizes, Sheet Iron Galvanised flat, Ordinary sizes, Sheet Iron Galvanised flat, best quality, Ordinary sizes, Galvanised Corrugated Sheets, Best Soft Steel Sheets, Best Soft Steel Sheets, Cut Nails, Lead, LEAD, Sheet, Pipe in coils, Sol pipe, Compo pipe, Zinc-Sheet, Yellow Metal, Silesian, COPPER—Strong Sheet, Thin, Brass—Strong Sheet, Thin, TIN—English Ingots, SOLDER—Plumbers, Blowpipe, ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES, 15 oz. thirds, 2 1/2 lb. thirds, 2 lb. thirds, 26 oz. thirds, fourths, 3 1/2 lb. thirds, 3 1/2 lb. fourths, Fluted Sheet, 15 oz.

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ENGLISH BOLLED PLATES IN CRATES OF STOCK SIZES.

Table listing various types of bolts and plates with their respective prices per ton or per hundred.

Table listing various types of varnishes and oils with their respective prices per gallon.

TENDERS.

Communications for insertion under this heading should be addressed to 'The Editor,' and must reach us not later than 10 a.m. on the day before the opening of the tenders.

* Denotes accepted. † Denotes provisionally accepted.

ALDBOURN.—For the erection of a Primitive Methodist church at Aldbourn, Wilts. For the Aldbourn Primitive Methodist Trustees. Mr. T. Colborne, architect, Swindon.

BANGOR.—For remaking streets (Farnham-road, Somerset-avenue, etc.) for the Urban District Council. Mr. E. L. Wood, C.E., Town Surveyor, Bangor.

BUNCRANA.—For constructing outfall sewer, Bunrana main drainage, for the Inishowen Rural District Council. Mr. T. Johnston, Engineer, East Wall, Derry.

CARLISLE.—For erecting a small-pox hospital, administrative block, mortuary, etc., Bell Vue, for the Corporation. Mr. H. G. Marks, City Engineer and Surveyor, 36, Fisher-street, Carlisle.

CLAVERING (Essex).—For erecting a farmhouse, for Trustees of the Deverux Charity, Chessington. Messrs. Crawley, surveyors, Chessington.

COOLMORE.—For erecting a dwelling-house. Mr. F. G. Bennett, architect, Ballinacorney, Clonsilla, Co. Wick.

COWDEN.—For resewing and paving portion of Back Bowers-street, Waterloo, for the Urban District Council. Mr. R. Graves, Surveyor, Seaforth-street, Waterloo, Hants.

DARTFORD.—For erecting two new Council schools, for Kent Education Committee. Mr. W. Harston, architect, 3, Hythe-street, Dartford.

FRIENTON-ON-SEA.—For storm overflow from sewer opposite Second-avenue, with sea outfall, for the Urban District Council. Mr. E. M. Bate, Engineer and Surveyor, Council Offices, Frinton.

GUILDFORD.—For constructing surface water drainage, for the Town Council. Mr. C. G. Mason, Borough Engineer and Surveyor, Guildford.

GUILDFORD.—For private street works, Gardner-road, Linden-road, Chesnut-road (Sycamore-road, etc.) for the Town Council. Mr. C. G. Mason, Borough Surveyor, Tun-street, Guildford.

HINCKLEY.—For sewage disposal works, Burbage, for the Rural District Council. Mr. F. C. Cook, Surveyor, Ynnerton.

LONDON.—For the erection of children's conveniences in Southwark-park, for the London County Council.—For prior & Co., 4327 3 3; F. & G. Foster, 1234 0 0; F. Bull, 290 10 0; E. Harding, 230 0 0; Griggs & Son, 273 7 7; Son, 230 0 0; Doulton & Co., 264 0 0; W. H. Hyde, 264 0 0; Johnson Bros., 233 0 0; Junction, 206 0 0.

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LANCHESTER.—For domestic hot and cold water supply and heating installation at the Union Workhouse, for the Guardians, Messrs. Newcombe & Newcombe, architects, 89, Pilgrim-street, Newcastle.

LINCOLN.—For fire-escape staircases, Lincoln Union Workhouse. Messrs. W. Watkins & Son, architects, Lincoln.

LLANGADOCK.—For Gosen Chapel (renovation), Llangadock. Messrs. G. Morgan & Sons, architects, Carnarvon.

LONDON.—For the erection of children's conveniences in Southwark-park, for the London County Council.—For prior & Co., 4327 3 3; F. & G. Foster, 1234 0 0; F. Bull, 290 10 0; E. Harding, 230 0 0; Griggs & Son, 273 7 7; Son, 230 0 0; Doulton & Co., 264 0 0; W. H. Hyde, 264 0 0; Johnson Bros., 233 0 0; Junction, 206 0 0.

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List of Contracts, etc.

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*BATHS, FIRE-STATION, & BRANCH LIBRARY, REDDISH	Stockport County Borough	Not stated	No date.

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Brass Sliding Poles, Hose Racks, etc., Great Brunswick-street	Dublin Waterworks Com'tee	City Architect, Municipal-buildings, Cork-hill, Dublin	Mar. 20
Road Material	Hunslet R.D.C.	W. B. Pindar, Clerk, Olia-house-street, Hunslet, Leeds	do.
Painting, etc., at Hospital, Swallowtail	S. Rotherham, etc., Hos. Com.	N. Creswick, 9, East-parade, Leeds	do.
Semi-Detached Dwellings, Park-street, Borgead	Aston Manor Corporation	J. Jameson, Architect, 77, High-street, Edin.	do.
Taking Down and Re-erecting Disinfecter Buildings	Waterloo with Seaford U.D.C.	F. Spencer Yates, Surveyor, Town Hall, Waterloo	do.
Villa at Dorking	Leeks Waterworks Committee	H. H. Horne, Station-road, Dorking	do.
Stores	Leeks U.D.C.	W. E. Baebam, Surveyor, Town Hall, Leek	do.
Whinstone and Slag	Blackrock U.D.C.	R. F. Heron, Clerk, Town Hall, Blackrock, Co. Dublin	do.
Annual Contracts	Nelson Plans, etc., Committee	G. H. Jack, Borough Surveyor, Council House, Aston Manor	do.
Materials	Oldham Corporation	B. Ball, Borough Engineer and Surveyor, Town Hall, Nelson	do.
Supplies	Loandale Gas, etc., Committee	Borough Surveyor's Office, Town Hall, Oldham	Mar. 21
Brickwork and Boiler Settings, etc., Electricity Department	Easingwold R.D.C.	F. J. H. Robinson, Clerk, Easingwold	do.
Annual Contracts	Sevenoaks R.D.C.	R. Bailey, Surveyor, Sundridge, Sevenoaks	do.
Materials	Airdrie Town Council	A. Gillespie & Son, Engineers, 65, Bath-street, Glasgow	do.
Stores	North-Eastern Railway Co.	W. Hill, Architect, York	do.
Whinstone and Slag	do.	do.	do.
Widening and Fencing Part of Station-road, Halstead	do.	C. A. Harrison, Engineer, Forth Banks, Newcastle-on-Tyne	do.
Timber Framing for a Gasholder	South Stoneham R.D.C.	W. J. Potter, Glenroy, Portswamp	do.
Alterations to Refreshment-rooms, Selby Station	Darwen Corporation	Borough Engineer, Darwen	do.
Yearoom, York Station	Bredbury and Romley U.D.C.	Surveyor, School Brow, Bredbury	do.
Painting Station Buildings	East Indian Railway Co.	C. W. Young, Secretary, Nicholas-lane, E.C.	do.
Carting Gravel and Flints	Dundee Harbour Trustees	J. Thompson, Harbour Engineer, Dundee	do.
Annual Contracts for Materials	do.	Varteg House, Llanthelid	Mar. 22
Street Works, Cranepiasy Bailey Estates	do.	J. Hoare, 17, Westera-rd, Ivybidge, & J. Tollit, Archd, Totnes	do.
Private Street Works	do.	Prescot Guardians	do.
Granite, Edging, Portland Cement, etc.	do.	G. J. Gandy, Architect, Masonic-buildings, St. Helens	do.
Laminated Bearing Springs for Waggon	Farsley U.D.C.	F. J. H. Robinson, Acting Clerk, Lonsdale Buildings, Farsley	do.
Calodon Jetty in Hennebique's Patent Ferro-Concrete	Brixham U.D.C.	J. C. Wright, Surveyor, Council Offices, Farsley, Leeds	do.
House, Plymouth-road, Ivybridge	do.	J. L. Arlidge, Clerk, Town Hall, Brixham	do.
Two Infirmary Blocks, Whiston Workhouse	Rhondda U.D.C.	Langidge & Freeman, Surveyors, The Broadway, Tun. Wells	do.
Whinstone & Slag	Finchley U.D.C.	W. J. Jones, Surveyor, Council Offices, Rhondda	do.
Granite Sels	Peterborough City Council	Engineer to Council, Gurod End, Finchley	do.
690 lineal yds. of York Stone Kerb	do.	J. W. Washaw, City Surveyor, Guildhall, Peterborough	do.
Annual Contracts	East & West Molesey U.D.C.	Rayne & Bridland, Architects, 16, New-road, Gravesend	do.
Road Works, Southborough to High Brooms	Powell Doffry & Stain Coal Co.	Surveyor, District Council Offices, East Molesey	Mar. 23
Street Works, Cranepiasy Bailey Estates	Norfolk Education Committee	C. Kenislo, Architect, Station-road, Bargoed	do.
Private Street Works	Eckington Parish Council	A. F. Scott, Architect, Castle Meadow, Norwich	do.
Granite, Edging, Portland Cement, etc.	Driffield R.D.C.	G. A. Millard, District Surveyor, Chadder	do.
Annual Contracts	Scally U.D.C.	C. F. Chamberlin, Clerk, Union Offices, Burton-on-Trent	do.
120 Houses at New Tredegar	Axbridge R.D.C.	N. P. Pattinson, Borough Surveyor, Town Hall, Gateshead	do.
Alterations and Enlargement of Grammar School	Repton R.D.C.	G. H. Gott, Engineer, 8, Charles-street, Bradford	do.
Alterations at the old Police-court, etc., Eckington	Gateshead Corporation	C. A. Millard, District Surveyor, Chadder	do.
Road Material	do.	E. M. W. Corbett, Architect, Castle-street, Cardiff	do.
Two miles of Main Sewers	do.	E. M. Bruce Vaughan, Architect, Cardiff	do.
Road Rolling and Scarifying	Rev. J. Rees	R. F. Sergeant, Clerk, Ramsey, Hunts	do.
Road Materials and Cartage	Ramsey U.D.C.	J. Answorth, Sattle, Bor. Eng., Municipal-bldgs., Heywood	do.
Three Detached Residences at Fribra-road, Newquay	Govverners, Camelford, Sec. Sen.	Lawrence & Pomey, Solicitors, Camelford	do.
Alterations, etc., to Institute of Eng's Bldgs., Park-place, Cardiff	Nelson Plans, etc., Committee	B. Ball, Borough Engineer and Surveyor, Town Hall, Nelson	do.
Church at Cynllyn-y-du, Tylorston	Postypridd U.D.C.	W. H. Byrne & Son, Architects, 29, Suffolk-street, Dublin	Mar. 25
Broken Granite	Leeds Gas Committee	P. R. A. Willoughby, Engineer, Council Offices, Postypridd	Mar. 28
Materials	Mountain Ash U.D.C.	R. H. Townsley, Gas Offices, East-parade, Leeds	do.
Extension of School Buildings, Camelford	Edinburgh & Dis. Water Trust	Surveyor, Town Hall, Mountain Ash	do.
Revolving Screening Apparatus for Sewage Works	Auneaton, etc. U.D.C.	Superintendent of Works' Office, 12, St. Olives-st., Edinburgh	do.
Additions to Convent of St. Louis, Kiltinagh, Co. Mayo	East Ham Town Council	C. C. Cook, Surveyor, Council Offices, Auneaton	do.
Stoneware-Pipe Sewers at Fudwigswan, Treforest, etc.	Bombard U.D.C.	A. H. Campbell, Borough Eng., Town Hall, East Ham, E.	do.
Dry Gas Meters	Little Hulton U.D.C.	Surveyor, Council Offices, Bomford	do.
Sewer and Drain, Old Yngybwyl	Edinburgh, etc., Gas Commrs.	J. H. Hoyes, Council Offices, Little Hulton	do.
Materials, Team Labour, etc.	Peth Town Council	W. B. Kerring, Engineer, New Street Works, Edinburgh	do.
877 tons of Cast-iron Pipes	Southgate U.D.C.	R. M. Kilgip, Burgh Surveyor, 16, Taz-street, Perth	do.
Scarlet Fever and Laundry Blocks, etc., Boundary-road	Mountain Ash U.D.C.	Council's Surveyor, Palmer's Green, N. ork	do.
Blue Courtesy Granite	do.	Surveyor, Town Hall, Mountain Ash	Mar. 27
Annual Contracts	do.	do.	do.
50 ten or twelve ton Coal Waggon	do.	do.	do.
Causewaying Cartways	do.	do.	do.
WORKS AND MATERIALS	do.	do.	do.
Broken Mountain Limestone and Gravel	Durham Education Authority	Liddle & Brown, Archts., Prudential-bldgs., Moaley-st., Newc.	do.
Native Stone	Lancashire and Yorkshire Ry.	Engineer, Hunt's Bank, Manchester	do.
Hauling Stone and Gravel	Sowerby Bridge U.D.C.	Mr. Whitehead, C.E., Council Offices, Sowerby Bridge	do.
Private Street Works at Miskin	Southampton Corporation	Borough Engineer's Office, Southampton	do.
Council School at Emma Hill	Lancaster R.D.C.	Engineer's Office, Hunt's Bank, Manchester	do.
Widening Bridge Carrying Grouping-lane over Railway	Lancashire and Yorkshire Ry.	do.	do.
Stores, etc.	do.	do.	do.
Storm Water Sewer on Western Shore	do.	do.	do.
1,600 yds. of Sewers, etc., Quebec and Wilks Hill	do.	do.	do.
Re-roofing, etc., Warehouse at Houghton	do.	do.	do.
New Shed at Houghton	do.	do.	do.
Station Buildings, Platforms, etc., for Hates, at Lincera-road	do.	do.	do.
Seaton Buildings, Platforms, etc., Captain's-shed, Boodle	do.	do.	do.
Laundry Block at Workhouse, Solihull	Solihull Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	do.
Making-up Roads	Ealing Town Council	C. Jones, Borough Engineer, Town Hall, Ealing, W.	do.
soil Sewer in Hanger-lane	do.	do.	do.
Granite and Slag	Rushden U.D.C.	W. B. Madin, C.E., Vestry Hall, Rushden, Northants	do.
Road Materials	King's Lynn Corporation	J. H. Webb, Borough Surveyor, King's Lynn	do.
*ERECTION OF NEW HEAD POST OFFICE, BIRKENHEAD	Canmors, of H.M. Works, etc.	H.M. Office of Works, Head Post Office, Liverpool	do.
*COLLECT, REMOVE AND DISPOSAL OF HOUSE REFUSE.	Witleaden District Council	Council's Engineer, Public Offices, Dyne-road, Kilburn, N.W.	do.
*TRACK WAGON OVERTURN, NR. GLADSTONE PARK	do.	do.	do.
BOUNDARY WALL, ISOLATION HOSP. CRDS., NEASDEN	do.	do.	do.
*ROADMAK. & PAV. WKS., CRICKLEWOOD & HARLESDEN	do.	do.	do.
Chapel Entrance Lodge, Boundary Walls, etc., S. KIRBY	do.	do.	do.
Road Materials, Carting, and Stones	Whiston R.D.C.	W. E. Richardson, Quantity Surveyor, Rothwell, Leeds	Mar. 28
		R. J. Knappman, Sur., Delphians Offices, Whiston, Preston	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Two Single-Floored Sheds, Central Mole of New Dock	Caledonian Railway Co.	Sir. J. Wolfe Barry, 21, Delahay-street, Westminster, S.W.	Mar. 28
A Two-Floored Shed, North Quay of New Dock	do.	do.	do.
Timber Platform, North Side of the Tongue	do.	do.	do.
Offices, Latrines, Urinals, etc.	do.	do.	do.
Foundations and Rafts for Crane Roads, etc.	do.	do.	do.
Forming and Ballasting Sidings, Roads, and Quays, etc.	do.	do.	do.
Water Mains, Hydrants, etc.	do.	do.	do.
MAKING-UP CARRIAGEWAY OF WOODLAWN-ROAD	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	do.
Private Street Works	Sale U.D.C.	W. Holt, Engineer, Council Offices, Sale	Mar. 29
Annual Contract for Materials	Normanton U.D.C.	A. Hartley, Consulting Surveyor, County-chambers, Castleford	do.
Materials, etc.	Hampton U.D.C.	Office of Council, Public Offices, Hampton, Middlesex	do.
Town Hall Tools	Montgomery Town Council	C. S. Pryn, Town Clerk, Montgomery	do.
Street-Plate Grinders, etc., for Widening Bridge	Wokington Corporation	W. L. Eaglesfield, Borough Engineer, Town Hall, Wokington	do.
Masonry, Abutments, Wing Walls, etc., for Widening Bridge	do.	do.	do.
Road Metalling	Newmarket U.D.C.	S. J. Eunion, Devo-chambers, Newmarket	do.
Two Filter Beds, etc., St. Clement, Cornwall	Truro Water Company	J. Mansergh & Sons, Engineers, 5, Victoria-st., Westminster	Mar. 30
Exposed Service Reservoir, St. Clement	do.	do.	do.
Cliff Lift on West Cliff, Bournemouth	Bournemouth Town Council	E. W. Lacey, Boro. Engineer, Municipal Offices, Bournemouth	do.
Additions, etc., to the Mechanics' Hall Buildings, Forres	Chester Corporation	J. Furzeat, Architect and Surveyor, Forres	Mar. 31
Tramways, etc.	New-Sarum Town Council	L. M. Jones, City Surveyor, Town Hall, Chester	do.
Fire Brigade Station and Fireman's Quarters	Sandwich Corporation	City Surveyor, Endless-street, Salisbury	do.
Road Materials	Greenock Corporation	A. J. Firby, Borough Surveyor, Sandwich	do.
Heating Town Hall, etc., Greenock	Barking Town U.D.C.	A. J. Turbhill, C.E., Master of Works, Greenock	do.
Painting Bridge and Voles, Barking and Bepton Light Railway	Warminster, etc., R.D.C.'s	H. L. Howard, Electricity Works, Earl-street, Barking	do.
Water-Supply Works, Clappan-slade	Burley-in-Warfedale Sew. Bd.	W. H. Stanley, Eng., Market House-chambers, Trowbridge	do.
Alterations, etc., to Sewage Disposal Works	Caledonian Railway Company	Halter & Machell, Engineers, Corporation-chambers, Dewsbury	April 2
Renewal of Bridges on Cleland and Mid-Caldar Lines	do.	District Engineer, 3, Germain-street, Glasgow	do.
Renewal of Bridges, Wistow and Gattues, Lines	Hants County Council	County Surveyor, The Castle, Winchester	do.
ADDITIONS TO SCHOOL, TITCHEN (SHOLING)	Beckenham U.D.C.	Council's Surveyor, Beckenham	do.
MAKING-UP ROADS	Crompton U.D.C.	Borough Engineer, Bromley, Kent	April 3
Swanage Library, Headland, Crompton	Crown Agent for Colonies	Office of Crown Agent, Whitehall-gardens, S.W.	do.
97,000 cubic ft. Oregon Pine	Epsom R.D.C.	T. E. Ware, Surveyor, Waterloo road, Epsom	do.
Materials and Carting	Lewisham Borough Council	Surveyor's Department, Town Hall, Calford	do.
Kerbing, Paving, etc., Part of Shell-road	Bromley Borough Council	Borough Engineer, Bromley, Kent	do.
GRANITE KERBS AND SETTS	Comuns. of H.M. Works, etc.	H.M. Office of Works, Storey's-gate, S.W.	do.
INSTALLMENT OF GILDFORD POST OFFICE	Regate Union	E. Peacock, Architect, High-street, Regate	do.
GENERAL HEATING OF WORKHOUSE, REDHILL	Bradford Corporation	E. E. I. Edwards, Whitaker-builds, Brewery-street, Bradford	April 4
Extension of Town Hall (second section)	Glasgow Corporatn. Tramways	46, Bath-street, Glasgow	do.
Stores	Northerumberland C.C.	J. A. Bean, County Architect, Moothall, Newcastle-on-Tyne	April 5
COUNTY OFFICES, MOOTHALL, NEWCASTLE-ON-TYNE	Brighthelm U.D.C.	W. Vanstone, Engineer, Palace-chambers, Paignton	April 6
WATER WORKS	Tadcaster R.D.C.	J. Simmons, Engineer, Bank-chambers, Doncaster	April 7
Allerton Bywater Drainage Work	Essex Sewers Commission	A. Havelock Case, Engr., Broad Sanctuary-chambers, Westminster	April 9
Outdoor Sluice and Culture, etc., Mouth of the Beam, Horticulch	Chestnut U.D.C.	J. Myrtle Smith, Architect, 8, Trafalgar-square, Chelsea, S.W.	do.
PUBLIC LIBRARY	Norwilt Asylum Committee	A. E. Collins, City Engineer, Guildhall, Norwich	do.
Heating, etc., at City Asylum Extension, Hillesden	Hants County Council	City Surveyor, The Castle, Winchester	do.
ADDITIONS TO SCHOOL, TITCHEN WOOLTON	Messrs. Budd & Co.	A. J. Stodman, Architect, South-street-chambers, Farnham	April 17
Church at Ash Vale, Surrey	Shildon Working Men's Club	Kirby, Son, & Brown, Engrs., Stow-chambers, Newport, Mon.	No date.
Coal-supplying Stage at Powell's Town Wharf, Newport	Leeds Corporation	A. Walker & Son, Ltd., 14, King-street, Leeds	do.
Painting Seven Houses, Headingley, Leeds	do.	Westall Colliery Offices, near Wakefield	do.
Twenty-five Cottages at New Crofton, near Wakefield	do.	R. Armistead, 8, Charles-street, Bradford	do.
Making and Sewering Scotchman-road, Manningham	Staveley Coal and Iron Co.	J. W. Hodgson, Architect, 65, Main-street, Shildon, R.S.O.	do.
Caretaker's House	Leeds Corporation	J. Parkinson & Son, Beamish-street, Newcastle-on-Tyne	do.
230 yds. of Railway Track	do.	Farks Superintendent, Municipal-buildings, Leeds	do.
100 yds. of Wrought-iron Underpinning, etc., East End Park	Staveley Coal and Iron Co.	C. Markham, Broad Oaks Works, Chesterfield	do.
Five Wrought-iron Hand Gates	Wem R.D.C.	P. R. Francis, Surveyor, Waulley, W.C.	do.
Furnace Casings and Columns, Gas Tubing, etc.	Education Committee	F. W. Roper, 9, Adam-street, Adelphi, W.C.	do.
Grants, Basalt and Slag, and Cartage	Crewe Co-op. Fndly. Soc., Ltd.	Geo. Baines & Son, 5, Clement's-ann, Strand, W.C.	do.
ERECT. OF PUB. ELEMENT. SCHOL. KINGSTON-UPON-THE	do.	do.	do.
CONGREGATIONAL CHURCH, SOUTH NORWOOD	do.	do.	do.
ADDITIONS TO CENTRAL PREMISES, MARKET-ST., CREWE	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
* ARCHITECTURAL ASSISTANT	Corporation of London	22. 10s. per week	Mar. 26
* ASSISTANT EXAMINERS IN PATENT OFFICE	Civil Service Commission	Not stated.	April 5

AUCTION SALES.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
* GAS ENGINE AND MACHINERY, ETC., 242, COMMERCIAL-ROAD, E.—On the Premises	Norman & Son	Mar. 19
* DEAIS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Siu	Mar. 21
* LIFORD, FREEHOLD BUILDING LAND—At the Mart	C. C. & T. Moore	Mar. 23
* ROADS, SEWER AND DRAIN, HARROW	Allen & Row, 283, West End-lane, West Hampstead, N.W.	Mar. 26
* FREEHOLD VILLAGES, ETC.—Torrington Hotel, Kettering	Charles Spartow & Co.	Mar. 26
* FREEHOLD CORNER SITE, OLD KENT-ROAD, S.E.—At the Mart	Douglas, Young, & Son	Mar. 28
* FREEHOLD FACTORY SITE, PECKHAM PARK-ROAD, S.E.—At the Mart	do.	do.
* FREEHOLD WHARF PROPERTY, PECKHAM PARK-ROAD, S.E.—At the Mart	do.	do.
* BUILDING SITE, HAYMARKET, S.W.	May & Rowden	Mar. 29
* FREEHOLD FACTORY SITES, NEAR HAVES STATION—On the Estate	Woods	do.
* SHOPFITTERS, ETC. STOCK, 9A, VALLANCE-ROAD, E.—On the Premises	William F. Luing, Surveyor, Waulley, W.C.	do.
* LINDSAY BAKINGSHIRE, FREEHOLD ESTATE—At the Mart	Alfred Savill & Sons	Mar. 30
* 300,000 HARD CLAMP BRICKS—Station Brick Works, West Hoothly, Sussex	J. R. Thornton	Mar. 31
* FREEHOLD BUILDING LAND, SHEERNESS—At the Mart, E.C.	Tuckett & Son	April 2

* Those with an asterisk are advertised in this number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xix. Auction Sales, xxx

TENDERS.—Continued from page 303.
NETHY BRIDGE.—For water supply works, Nethy Bridge Special Water District, for the County Council of Inverness-shire, Mr. Gilbert, engineer, The Square, Grantown. Quantities by the engineer:—
 L. D. Smith, Grantown-on-Spey £800

NOTTINGHAM.—For house, Edwaton-hill, Nottinghamham, Messrs. A. R. Calvert & W. R. Gleave, architects, 18, Low-pavement, Nottingham:—
 F. W. Thompson & Son £1,372

POOLE.—For erecting a new secondary school at Seldown, for the Education Committee. Mr. G. A. Bligh Livesey, architect, Fir Vale-chambers, Old Christchurch-road, Bournemouth:—
 Sons £11,400 0 0
 George & Harding 10,847 0 0
 W. E. Jones & Son 10,798 0 0
 W. Hoare 10,729 0 0
 Jenkins & Sons 10,318 0 0

PWLLHELL.—For constructing a main sewer, sea-outfall, and other works, for the Corporation. Mr. W. T. Douglas, engineer, 15, Victoria-street, Westminster, S.W. Quantities by engineer:—
 R. H. B. Howett & Sons, Ltd. £9,109 4 9
 Neak, Ltd. 10,938 11 6
 J. H. Macdonald 8,063 0 0
 W. F. Facey 10,679 5 5
 Brebner & Co. 10,643 9 2
 W. Westwood 7,943 5 6
 P. Edwards 9,637 0 9
 J. R. Riley 9,511 11 9
 G. Bell 8,308 2 6

PLYMOUTH.—For the erection of a bridge to connect the main block with the special block at Salisbury-road school, for the Education Authority. Mr. H. J. Snull, architect, 11, The Crescent, Plymouth.—

W. E. Blake, 23, Salisbury-road, Plymouth... £200

SEAFORD.—For drainage works on the L.B. & S.C. Railway Co.'s works, for the Urban District Council, Messrs. Pollard & Tingle, engineers, 31, Old Queen-street, Westminster, S.W.—

J. Jackson £453 0 0 G. Napier & Son £210 10 0
W. Young 450 0 W. L. Walls & Co.,
R.W. B. Neal, Ltd., 300 0 Exmouth... 150 0
J. G. Porter 243 0 J. Carley 148 15
H. A. Chambers 233 5

SKEGNESS.—For sewers etc., Lifford-avenue, Marine-avenue, and Trafalgar-avenue, for the Urban District Council. Mr. R. Hudson, Surveyor, Skegness. Quantities by Surveyor:—

Parker & Son £273 14 6 J. J. Turner & Sons £167 2 6
A. E. Palmer 246 18 0 G. G. Dunkley 240 10 0
Hardy, Bates, & Co. 187 1 5 W. H. Hill, Skegness? 148 14 11
G. W. & H. Holmes 169 14 3

SOBERTON.—For building an engine-house, boiler-house, machine-shop, coal-storeroom, chimney-shafts, superintendent's house, cottages, and other works at Soberton, Hants, for the Gosport Waterworks Company. Mr. E. T. Hildred, A.M.I.C.E., Engineer.—

R. H. B. Neal, Ltd. £8,208 J. Crout £5,205
H. Jones 5,845 H. Stevens & Co., 5,350
Playfair & Toole 5,838 J. Hunt 5,345
C. M. Dash 5,805 Jenkins & Sons, 5,287
H. I. Sanders 5,577 Ltd. 5,287
J. H. Vickers 5,600 H. Sweetland 5,065
F. Orkio 5,640 F. Osmann, South- 4,989
C. J. Lear & Sons 5,682 ampbur?
J. Crockerell 5,550

SOUTHWICK.—For private street works and improvements, Gordon-road, George-street, etc., for the Urban District Council. Mr. G. W. Warr, Surveyor, Council Offices, Southwick. Quantities by Surveyor:—

J. Whitting J. Jackson £1,880 11 0
J. Parsons & Sons 2,097 0 0 C. S. East- 1,368 0 0
C. H. King 1,961 8 9 bourne? ..

TOTTENHAM.—For the erection of a school to accommodate 1,630 children, on the Belmont-road site, West Green, for the Tottenham Education Committee. Mr. C. E. T. Laurence, architect, 22, Buckingham-street, Adelphi, W.C.—

Table with 3 columns: Name, Amount, and Description. Includes entries for A. J. Bateman, H. J. Carter, Chessum & Sons, etc., totaling £212,311 3 11.

SOUTHEAST-ON-SEA.—For proposed alterations and additions to No. 1, Marine-terrace, for Mr. P. Zanich, Mr. Charles Cooke, architect and surveyor, Tower-building, High-street, Southeast-on-Sea:—

F. P. Guiver £129 F. & E. Davey, Ltd.,
A. B. Wilm 383 Southeast-on-Sea? .. £373

WALSLEND.—For erecting a mortuary and funeral, Portage-place, for the Corporation. Mr. G. Hollings, Borough Surveyor, Corporation Offices, Walslelend:—

J. T. Charlton, Elsdon-road, Gosforth, Northumberland £330 4 3

WITTON.—For alterations, repairs, colouring, painting, etc., at Witton Hall, for the Aston Guardians. Messrs. C. Whitwell & Son, Birmingham? £448 5

WORKINGTON.—For erecting new co-operative stores at Bridgfoot, for the Beehive Co-operative Society. Messrs. W. G. Scott & Co., architects and surveyors, Victoria-buildings, Workington:—

Builders: Wilkinson & Miller, Workington £216 0 0
Joiner: J. Steel, Workington 179 12 6
Slater: T. Mandle, Maryport 44 0 0
Plasterer: J. Lawson & Sons, Workington 71 0 0
Painter: W. Wildridge, Workington 20 8 6
Plumber: D. M. Walker, Workington 27 13 0

WORKINGTON.—For works at four houses in Hope-street, Messrs. W. G. Scott & Co., architects and surveyors, Victoria-buildings, Workington:—

Builder: T. Brown, Workington £280 0 0
Joiner: R. Douglas, Workington 133 0 0
Slater: E. Barrow, Workington 34 16 0
Plumber: D. M. Walker, Workington 24 10 0
Plasterer: Kaberry Bros., Workington 57 10 0
Painter: W. Wildridge, Workington 15 0 0

WORKINGTON.—For alterations and additions to the Beehive Co-operative Stores in Vulcan-lane, Messrs. W. G. Scott & Co., architects and surveyors, Victoria-buildings, Workington:—

Builders: Wilkinson & Miller, Workington £48 10 0
Slaters: J. Lythgoe & Sons, Workington 11 6 10
Plumber: W. Stewart, Workington 28 10 0
Plasterer: J. Lawson & Sons, Workington 35 0 0
Painter: K. Hodgson, Workington 16 14 0

WORKSHOP.—For erecting an operating-room at the Kilton-hill Infirmary, for the Guardians. Mr. T. Webster, architect, Market-street, Workshop:—

T. H. Harrison £167 8 0 G. G. Middleton £144 0 0
G. Wright 167 0 0 J. Doncaster 141 10 0
Bowles & Son 150 0 0 C. Hett & Sons 130 0 0
C. A. Leverton 148 12 6 Dennis, Oil, & A. Chadwick 148 0 0 J. Doncaster? 137 0 0

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The Builder.

VOL. XC.—No. 3294.

MARCH 24, 1905.

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Blebo House, Fifeshire (Two Views).....	Mr. James Findlay, Architect.
Hackney Central Library Competition: Selected Design.....	By Mr. H. A. Crouch, A.R.L.B.A.
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Notes in New Zealand.—II.



FROM Dunedin to Christchurch, if the weather be fair, is an easy one-night trip by the good coasting steamers which ply all round New Zealand. The harbour of Christ-

church is Port Lyttleton, a landlocked bay of considerable extent, surrounded by treeless steeply sloping hills. In a hollow of one of these is the small town of Lyttleton, its houses perched picturesquely on the steep hillside. Below, on the only level ground, are the railway yards, from which the wharves jut out into the water. The train almost immediately enters a long tunnel, and when it regains the light of day the suburbs of Christchurch commence. The contrast to Dunedin is striking. As far as the eye can reach not a single break in the level plain is visible, except occasional houses and trees, till in the far distance a faint outline of white and grey is detected. At first the stranger thinks them clouds, but on close observation they are seen to be snow-capped mountains, a spur of the fine main range of the country. Between is a great expanse of some of the richest agricultural country in the world, the celebrated Canterbury Plains. Seven or eight miles from Lyttleton, Christchurch is reached, the station being at the southern end of the city, and the first impression is one of disappointment. Commonplace

buildings surround the railway, and there is nothing to catch the eye or excite the imagination. Even the few domes and towers that exist seem lost. Hence when one gets to know the city and its surroundings their charm is all the greater.

As Dunedin was founded by Presbyterian Scotchmen, so Christchurch was settled by Established Church Englishmen, and the influence is marked even to the present day. The ecclesiastical tone permeates its fine educational buildings, University schools and museums, its Law Courts, municipal offices, and even affects many of the private dwellings of the well-to-do. But there it ends. In the business quarters modernity is paramount, though even so there is a faint recollection of some of the more up-to-date of the country towns of the midlands. The chief discordant note in the English symphony is the newly-completed Catholic Cathedral (see lithograph plate), which in size quite dwarfs its earlier Anglican brother, but of these more anon. It is a sign of the mixture of races and of the presence of the genial and irrepressible but devout Irishman.

The city proper is nearly a mile and a quarter square, surrounded on the north-east and south by wide avenues called the Town Belt, and on the west is bounded by the fine public domain of Hagley Park. The city's centre is a large open space, a Greek cross in plan, and the rest of the area is sub-divided by wide straight streets into rectangles, relieved by the pretty little winding river Avon, which

meanders through its heart from south-west to north-east, and bisected by a tram-line and main street, which traverse the city diagonally from south-east to north-west. The Avon is the chief jewel in the Crown of Christchurch, for its waters are clear and uncontaminated, and its banks are formed into charming public gardens bright with the greenest of grass and the gayest of flowers, and backed up by some of the more important public buildings. Many of the streets are also planted with trees, notably the Belts, and the northern end of Antigua-street, with its fine avenue of elms; but even more might be done in this direction with advantage.

The Anglican Cathedral (see plate) occupies, as is natural under the circumstances, the finest site in the city, viz., one half the central square, and is thus well open to view on all sides, and forms, in addition, the terminal point of the vista of the chief cross street from east and west. To English eyes it merely gives the idea of a large parish church, but if it is remembered how small was the population when it was projected, then the faith and liberality of its founders are deserving of the most sincere respect. They meant to do their best and to get the best, and so commissioned the late Sir Gilbert Scott to prepare the design, which is of the usual cruciform type, with north and south porches. From the large piers at the crossing it is evident that Scott intended a central tower, which would have had a much finer effect than the almost detached tower and spire at the north-west angle now existing. The lower part of the



Fig. 1. Canterbury College and Museum, Christchurch, N.Z.

spire is of stone, but two-thirds of the way up the colour abruptly darkens, and one learns on inquiry that the rest is in metal. Earthquakes even in the South Island of New Zealand are not infrequent, and twice has the top of the spire been shaken down—hence the present makeshift. To the same ever-present danger the abandonment of the central tower is no doubt attributable; but it is much to be regretted that, though this could not have been safely erected, yet the alternative of a timber-framed and metal-covered central lantern was not adopted. It would have suited the site far better than a detached tower out of centre with everything. It is, however, a fine church of its kind, and the interior is impressive, but it is easy to see that the somewhat ornate western narthex is by another hand, as also the transepts and the apsidal choir. The former may have been designed by Scott but detailed locally; the latter look as if they were wholly of local origin, as the scale of the windows and features is not in harmony with the rest of the building, being too coarse and bald. Internally, also, the apse is bare compared with the nave, and the aisles to the latter are disfigured by a garish-coloured glazed tile dado that is quite out of harmony with the stone walls and undecorated timber roof.

Flanking the Cathedral on the right and left are Dalgety's florid Renaissance stoue-faced office building and Warren's quieter but cement-coated hotel. Adjoining the latter is one front of the Lyttleton Times office, a vigorous modern design of free Renaissance type, with a ground story of grey stone and an upper one of white stone and red brick. The arched ground floor and pier treatment above, with an emphasised centre, are decidedly sensible and satisfactory. Another pleasing but low square one-story building is the Bank of New Zealand on the south side of

the square. It is of much older date, a quiet correct classic design, with four Corinthian attached columns and entablature marking the centre of each face, and its reticence serves as an excellent reminder that an excess of strenuousness is no more pleasing in buildings than in people. At the south-west corner of the square a large block of business premises in course of erection give promise of being effective, but they look as if built primarily for revenue. The large semi-arches of the second-story suggest the idea of a hall at that level. Except the Australian Mutual Provident Society's office, there are no other buildings in the square of any architectural merit, but when the time comes to pull them down their sites will offer very fine opportunities to the architects of the city: may they have the skill to use them right worthily. In that case Christchurch will possess a city centre that the inhabitants of many older and larger cities might envy. In the open spaces, besides ample roadways, there are at present only one fountain and basin, one statue, and some flowers and grass. What an opportunity exists to turn this fine area into an architectural and botanic triumph, if the city fathers could only be inoculated with the idea that colonnades, shelters, fountains and statues, trees, shrubs, and flowers should be co-ordinated in one complete conception worthy of the future of this prosperous town. But the trams would have to be taken severely in hand, and the traffic so arranged that it would pass around and through the square, and not turn it into the mere tram shunting-yard it bids fair to become.

In strolling around the business streets near the Cathedral-square some very fair specimens of architecture may be noted. One of the most recent is the office of the Christchurch Meat Company, a two-story building in brick and stone, with a large

cove finely carved with a ship motif and a richly-foliated frieze. The central bay gives piquancy to the otherwise flat front. The New Zealand Loan and Mercantile Agency Company's three-story stone building, in round arched Gothic à la Waterhouse, belongs to an earlier period, but is good of its kind, as are also the temporary premises of the National Bank, a Renaissance design with a Doric porch and Ionic order above. The new permanent premises for the same institution are, however, a sad contrast, the exterior showing a commonplace two-story treatment, and inside one-story the full height. Another new bank building is that for the Bank of Australasia (see plate), which is an attempt at being up-to-date, in the later English Renaissance, but is much too ornate to be wholly satisfactory. Amongst the warehouses, that of Messrs. Sargood, Son, & Eweu is noticeable for its deeply-recessed windows and generally good warehouse character, but the very wide ground floor openings make the entrance in contrast look pinched, and the centre gable is too sharply pitched to quite harmonise with the other lines of the front. Shop architecture shows very little that is out of the common, but Ballantyne & Cosgrove's may be noted as evidencing more thought than usual in connexion with the treatment of large surfaces of glass, one of the most difficult problems an architect has to solve. Not far away, in a small triangular space left at the junction of the diagonal street with one of the gridiron series, there is a small clock-tower, which at once arrests the attention of an Englishman. The upper part is of sheet and wrought iron, and very well designed in the prevalent Gothic of thirty or forty years ago. The lower part is of very ordinary design in stone, and is provided with a drinking fountain. The story goes that one of

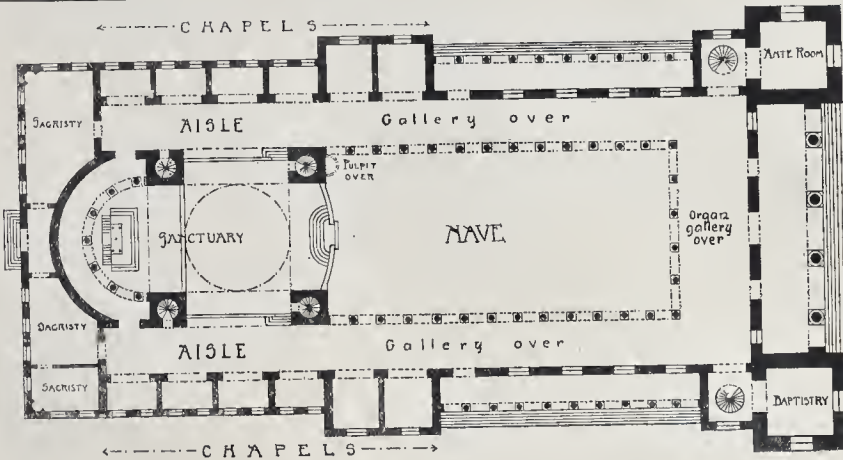


Fig. 2. Sketch Plan of Catholic Cathedral, Christchurch, N.Z.

the Premiers purchased the upper part *en bloc* second-hand, and the Borough Engineer erected the stone lower story. If not true the story is, at any rate, *ben trovato*, and one feels it ought to be true, to explain the anachronism. Going eastward from the business quarter in search of the Canterbury Hall one passes a small new hotel (the "Provincial"), in red brick and white stone, which is noticeable for its quiet, sensible, and almost plain treatment of red brick and white stone in the Free Renaissance manner—a very pleasant exception to the usually too pronounced efforts of hotel architects. The Canterbury Hall, again (see plate), is in the same materials, but shows more effort, and the twin towers, twin pedimented projections, and small central feature, to say nothing of the balconies, are somewhat disturbing. But, on the whole, it is better than many another building of the same class, and, as the result of a competition, is not to be too severely criticised, for "the man in the street," even in Christchurch, still likes a good deal of show for his money.

This failing is also the dominant note in the large new Roman Catholic Cathedral just completed, which is nevertheless the most important building in Christchurch, so far as size is concerned. Indeed, it is a wonder how so large a structure could have been erected entirely in stone for 46,000*l.*, the sum it is reported to have cost. In the description published in the local papers on the occasion of the opening it is mentioned that the design had to be cut down to reduce expense. This is patent everywhere, and the cutting down process has been so severe as to be ruthless. The conception—said to be based on the Church of St. Vincent de Paul at Paris—is a fine one, and, apart from some faulty detail, the building would have been a worthy monument of the Catholic Church if carried out with reasonable solidity. But the walls are too thin, and this alone gives the building a starved and pretentious appearance. When, however, details are examined, and we find that the staircases are of the cheapest cast-iron stock circular pattern, that visible abutments to the arches of the crossing are non-existent, and that

the ceiling of the nave and the dome and semi-dome of the sanctuary are of thin but over-ornate stamped steel sheets with nothing behind them, then the conviction is forced upon one that it would have been better to be content with a smaller and less ornate edifice built on sounder lines. The sketch plan (Fig. 2) gives a rough idea of the general arrangement. Above the narthex is a spacious organ-gallery, and over the aisles other galleries, as in some of the Early Roman Basilicas. The close spacing of the columns is also Basilican, but the colonnaded apse and whispering-gallery under the dome are features of later date. Apart from the faults just mentioned and minor ones of detail, the interior is a fine one, and is, on the whole, more satisfactory than the exterior. The difference in scale between the upper stage of the western towers and the portions below is so marked as to make one think the architect must have been coerced into a modification of his original design, and the way in which the drum of the principal dome is splayed out into the square is crude in the extreme. The transepts, again, are attached to the nave instead of supporting the dome and crossing, and thus intensify the weakness of the supports of the latter. As to materials, the walls and features are wholly of soft white Oamaru stone, with Timaru blue stone plinths; the roofs are covered with red tiles from Marseilles, on Oregon timber rafters. The domes are covered with copper, the flat roofs asphalted, and the floors are of concrete. The greatest length is 210 ft., the width, 106 ft.; the height to the top of the dome, 135 ft.; while the nave is 92 ft. 7 in. by 42 ft. 6 in. by 48 ft. in height. On leaving the edifice and passing through Cathedral-square one's final thought is that, after all, the far smaller but well-built Anglican Church quite holds its own in every way, and is indeed much to be preferred to its more pretentious rival.

The group of buildings which, however, give a special *cachet* to Christchurch have not yet been referred to. Most of them, such as Canterbury College, the Museum (Fig. 1), the Boys' High School, the Normal School, and the Law Courts, have been built a good many years, and

they are all in the domestic Gothic manner of the latter half of the last century, and in general fair specimens of the style. The Museum especially is very thorough, the whole of the interior, which is mainly of wood, being well detailed. One cannot help feeling that, however suitable such buildings may be in England amongst historic surroundings, they are somewhat out of place in a new country of wider spaces, more open outlook, and in many ways more advanced thought. The people, their institutions, and their politics are really very modern, and some form of Renaissance would, therefore, be more in harmony with their ideas. Loyalty to the ideal set up by the founders of the province has hitherto kept them faithful to the accidentals associated therewith, but now that Christchurch is more cosmopolitan than Anglican it would be well to give up what has already been abandoned in England. This has been done in the commercial quarter, but that the old idea still persists the new municipal buildings are evidence. They are well designed in brick and stone, but, while the windows are mullioned, there is a breadth and simplicity in detail that is lacking in the more archaeological older work. The Law Courts in the same locality look quite fussy in comparison, though they are undeniably picturesque in outline, and charmingly situated amidst grassy lawns near the winding Avon (see plate). The modern spirit is also in evidence in the hospital. Commenced a good many years ago, its Gothic half-timbered open corridors and some of the buildings are charmingly quaint, but it has evidently been found that they do not suit modern requirements, for in the newer wards a more modern form of Renaissance has been adopted. One great advantage, however, in a Colonial City like Christchurch is that this change of idea and change of style strikingly shows history in the making, and so gives it an interest that is unique in the Britain of the south.

The conservative instincts of the well-to-do section of the citizens are also evidenced in their domestic architecture, which is much more English in type than in any of the other cities of New Zealand.

On the western side of the town, near Hagley Park, and beyond it in the leafy lanes and roads of Fendalton and Riccarton, many charmingly-designed dwellings are to be seen, some few of which might have been transported almost bodily from the neighbourhood of an English country town. But the prevalent type leans more to single than to two or three story houses, and the roof coverings are usually of iron, while the walls are mostly of weatherboard. Here, again, local conditions have modified the type aimed at. In the first place the people generally are so prosperous that the shortage in domestic help is very pronounced, and hence a single-story cottage is much preferred to a two-story dwelling, as being more easily worked. Then the prevalence of earthquakes, usually not very serious but quite sufficient to cause alarm and sometimes damage, makes a wooden building covered with light sheets of corrugated iron preferable to bricks and tile or slate. On this point cost also is a factor, as wages are very high and the hours of labour short. But to maintain as far as may be the tone of an old country town, these suburban dwellings, especially the more recent ones, are painted a deep dull red, roofs and all. Amongst the leafy trees and abundant vegetation this looks exceedingly well, and in winter time also, when the houghs are bare, the warm colour would be equally pleasant. Of course, the majority of the older dwellings are of the usual commonplace weather-board Colonial type, and some are truly awful examples of misplaced ingenuity, with their sham rusticated quoins and other wooden imitations of stone features; but it is to be hoped these are now things of the past. There is, however, only one really vulgar dwelling in the whole of the city, and that is very large and very aggressive amongst its small cottage surroundings, and reminds one very much of a *nouveau riche* cotton-spinner's house of twenty or thirty years ago in a Lancashire manufacturing town. Most of the dwellings are small, but for absolute compactness a little week-end cottage on the sea coast is remarkable, and may even be suggestive to home readers, so a sketch plan is here given (Fig. 3). It measures over all 22 ft. by 16 ft., and may surely be regarded as the irreducible minimum. Being only intended for summer use there is no fireplace, and cooking is performed on an oil-

stove in the little kitchen, about the size of a small pantry. The beds for the husband and wife are bunks one over the other, like those in a ship's cabin, and visitors (of one sex) may be entertained, as, in the living room, the settees by day form beds at night. With this unique example one may take leave of Christchurch, a city which does not impress one at a first glance; but, like everything that possesses real charm, it grows upon one daily, so that when the time comes to leave it is with sincere regret and a firm belief that it will progress in the future as it has done in the past, and that the ideals of its founders will be realised, if not in the exact way they intended, yet on stronger, fuller, and broader lines, and permeated by the same high principles that inspired them.

NOTES.

An interesting conference in regard to the Garden City, as it is called, at Letchworth, took place last week. It was perhaps a little too academic in character, the most practical thing which was said being the statement of Canon Rawnsley that the bubble of cheap cottages had been pricked, and that those built at Letchworth for 150*l.* would really cost far more if built by an ordinary landlord. It has not redounded to the credit of those who have charge of the Garden City that they should have induced so many persons to visit the city to view these cottages, when, in fact, their cost if built under ordinary circumstances would be greater than 150*l.* We trust that the idea of the Garden City itself, factories and dwellings in close proximity in a semi-rural district, may have better results than the Cheap Cottage Exhibition. As we have more than once said, its results are likely to be beneficial in an indirect rather than a direct manner, namely, by making local authorities more careful in regard to open spaces, the planting of trees, and so forth. At present the tendency of manufacturers to place buildings at the Garden City seems but slight.

OWING to the universal employment of double-track permanent ways on all main line railways in this country, and the

rigid precautions adopted on the few single-track lines which are in existence, the latest catastrophe in the United States conveys no moral to us so far as concerns railway working. It is very evident, however, that the occurrence on the Denver and Rio Grande Railroad, in Colorado, ought to serve as a serious warning to American railway proprietors and managers. Until the proprietors adopt the most desirable precaution of providing separate tracks for up and down traffic the safety of the travelling public must depend absolutely upon the efficiency of the safeguards provided by the management to prevent trains running in opposite directions from colliding end-to-end, as happened on the Rio Grande Railway. The general manager of that line is said to attribute the collision to a "misunderstanding of orders by the engine-drivers of both trains." So far as can be judged from the reports available, it would appear as if the two trains were started on their death-dealing career under the control of drivers who had certain discretionary orders, which one or both of them failed to apply in a judicious manner. Surely American ingenuity ought to be able to devise a system of signalling by which continuous control could be exercised over trains on the road. If not, American railways should send deputations of their chief officials to study British methods of operation, and we feel sure that, if willing to learn, they would very soon find out how to obviate the constant accidents which are so common in the United States. The terrible fire which followed the Colorado disaster furnishes for us one more reminder of the absolute necessity for non-combustible rolling-stock, which indeed ought to be made compulsory by Act of Parliament.

THIS HONOUR JUDGE BRAY has had to determine an important point under the Workmen's Compensation Act as to whether timber stacked in a yard constitutes a "warehouse." The yard was 11 yds. by 24 yds., bounded on two sides by walls of neighbouring houses 25 ft. in height, and enclosed at back and front by fencing 12 ft. high. The County Court Judge held this yard, with some 80 tons of deals stacked in it, not to constitute a warehouse. Considerable difficulty has been experienced in determining what is a "warehouse" within the meaning of the Act, and two of the tests which have been applied are:—Is the store used for wholesale purposes or merely ancillary to retail business? Is the warehouse covered in? In the present case the yard fulfilled neither condition. Ninety per cent. of the sales were retail, and the yard was open to the sky. Neither of these tests is, however, satisfactory, and it is to be hoped that the promised Government measure will deal with this question. The amendment proposed by the Departmental Committee would place the matter beyond doubt. It was suggested that the Act should extend to employment "on or in or about the storage of goods for sale or safe custody by way of trade or for purposes of gain."

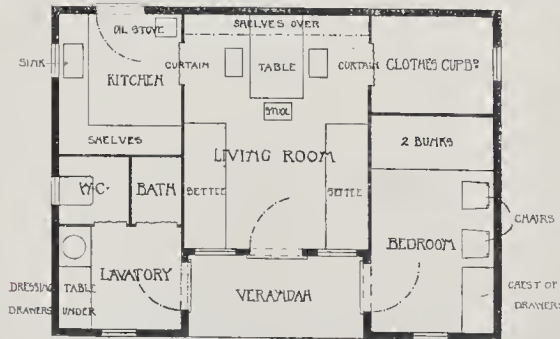


Fig. 3. Sketch Plan of Cottage near Christchurch.

Claims against Tube Railways. A CLAIM was brought last week before the High Bailiff for Westminster and a special jury by a leaseholder of certain premises in Long Acre, with sixty-eight years of the lease to run, for £2,000, or 1,400% compensation for interference with the subsoil against the Great Northern, Piccadilly, and Brompton Railway Company. Counsel for the railway company asserted that this was the first claim ever brought against a tube railway company by a leaseholder, and he was prepared to argue before another Court that there was no right to claim compensation at all. The public have, however, been deprived of hearing this question argued, for the jury having heard the evidence decided that no damage had been sustained by the claimant. The railway ran 120 ft. below the surface of the roadway, beneath 78 ft. 6 in. of solid London blue clay. The tube railways are under special conditions as to compensation, since it was decided in Committee that a general clause should be inserted in their Bills dealing with the time within which such claims can be made and the character of the damage which can be made the subject of a claim. Ordinarily no claim will lie against a railway company for damages caused by its working as apart from its construction. On this question see our Note, May 17, 1902.

Radial Trucks for Tramway Cars. It is well known that when a four-wheel truck is passing round a curve considerable grinding takes place between the leading outer wheel flange and the rail. This action has been generally attributed to centrifugal force alone, but that is probably not quite the correct view, as Professor Carus-Wilson demonstrated in his recent lecture to the members of the Tramways and Light Railways Association. The natural tendency for a truck with a rigid wheel-base when passing a curve is to roll straight on in the direction of its wheel-base, thereby giving rise to an additional force which, when the speed is small, assumes large proportions as compared with the centrifugal force. The obvious remedy is to pivot the axles on the principle of the bogie. But there are objections to this form of apparatus which account for the attempt made to secure radial action with only one axle on each truck. Professor Carus-Wilson described and illustrated several types of radial trucks which are being tried in various parts of the country. At present it does not seem to be conclusively established that radial action can be secured at the low speed necessary when curves are being negotiated, although it has been stated that at Chesterfield the trucks actually radiate at car-speeds of less than three miles an hour. It should be noted in this connexion that the desideratum is an apparatus actually capable of radiating, and not merely a "flexible" truck that can be forced by the grooved rails to accommodate itself to the track. Action of the latter kind may cause as much grinding as would result from the use of a rigid wheel-base truck. Radial types of truck are now being tried upon upwards of thirty tramway systems, but so far with inconclusive results. It may be hoped, however, that the experimental working will before long

indicate the direction in which success may be finally attained.

THE growth of motor-car Motor Vehicles, traffic can be gauged by the figures issued from time to time in connexion with their licences. The figures now published by the Public Control Committee of the London County Council for January give the total number of cars registered in London as 9,049, and of cycles 5,138. These figures show an increase of 990 motor-cars and 330 motor cycles in four months, the figures up to September 30 of last year having been respectively 8,059 and 4,808. We are glad to observe that the motor cycles do not increase as quickly as motor-cars, as these cycles add to the dangers of the streets far more than any other conveyance, and provide a method of locomotion which should be discouraged in a city.

Concrete-Steel Workshop Buildings. ATTENTION is drawn in a paper read by Mr. E. N. Hunting before the American Society of Mechanical Engineers to the advantages of reinforced-concrete for the construction of modern factory buildings. After pointing out the strength, fire-resisting qualities, durability and economy of this material, the author selects for detailed description and illustration a workshop, 160 ft. by 102 ft. wide, erected in Pennsylvania. The main conditions specified for this building were:—(1) That it should be absolutely fireproof; (2) that it should be built at a minimum cost; (3) that provision should be made for heavy cranes; and (4) that the design should have some artistic value. Several useful drawings are given of the columns, beams, crane runway, and arched roof construction, and the value of these illustrations is much increased by the fact that they have figured dimensions in every case. The photographic views are not very convincing as to the artistic merits of the structure, but in other respects it seems to be quite satisfactory. The cost per cubic foot is stated at 1-625d., and as the rate of insurance was reduced to 1s. 3d. per 100%, it may be considered that the fire-resisting qualities of the building are all that could be desired.

Action of Sea Water upon Concrete. INVESTIGATIONS conducted into the causes leading to the failure of concrete in dock works have abundantly established the fact that when Portland cement concrete is sufficiently permeable to permit sea water to act continuously throughout its mass, the cement will become disintegrated and ultimately be destroyed as the result of chemical action. Mr. J. Watt Sandeman, M.Inst.C.E., is an acknowledged authority on concrete, and a pamphlet recently written by him possesses special value for the reason that it contains, in concise form, directions for making concrete capable of retaining permanent stability in docks, piers, and other structures exposed to the action of sea water. As pointed out in a recent "Note," the essential quality of concrete to be used under such conditions is impermeability. Mr. Sandeman now gives clear instructions for insuring this essential. We do not propose to quote figures here, but can sum up the points necessary for success in a few words.

First, the proportion of the cement in the mortar must be such that all voids in the sand are entirely filled; and, second, the proportion of mortar to aggregate must be sufficient to fill the voids in the aggregate and to surround all the particles. To satisfy the first point the percentage of voids in the sand must be ascertained. To satisfy the second point the percentage of voids in the aggregate must be known, and the reduced volume of mortar, as compared with the original separate volumes of cement and sand, must be ascertained. Those who wish to save themselves trouble will find the tables prepared by Mr. Sandeman of service; they contain standard proportions for qualities of concrete, with and without "displacers," for special parts of dock and pier works, for ordinary marine works and reservoir walls, and for land works where impermeability is not essential. Altogether fourteen different types of concrete are tabulated, and the pamphlet concludes with a convenient method of ascertaining the weight and cost of various mixtures.

Economies in Electric Lighting. THE paper by Mr. G. Wilkinson which was read to the Leeds local section of the Institution of Electrical Engineers is a useful and instructive one. He describes how consumers in many cases fail to obtain the full advantage of the electric power which they pay for in their meter bills, and he suggests that central station engineers should study carefully the private installations they supply, so as to ensure that their consumers get the amount of light to which they are entitled. Mr. Wilkinson's method of certifying lamps is useful, but we think the system adopted in Bradford of supplying free lamps is preferable. The cost to the supply company is only a small fraction of the receipts from meter bills, and the supply of free lamps can be used to induce consumers to pay their bills promptly. For instance, at Bradford, the cost of the 14,000 lamps distributed last year was only 3 per cent. of the total receipts, and it was stated in the discussion that the bills were paid with gratifying regularity, as the consumers felt the loss of free lamps much more keenly than losing the small discount formerly given. In America the custom is to supply new lamps whenever they are required, and the engineers are careful to supply the best on the market. Lamp-makers complain that the pressures of supply in this country are not sufficiently varied, so that those lamps—technically known as "outfalls"—which are not of the proper efficiency at the standard voltage, are unsaleable. This may explain possibly the large percentage of unsuitable lamps sometimes found in a private installation. Mr. Wilkinson stated that he recently found in a public building eighty 32-candle-power lamps, which consumed about 40 per cent. more power than the average lamp. Replacing them all by more efficient lamps effected a saving of more than 100% per annum.

The Warning of the Law Courts. WE are glad to see from a reply given by Mr. Lewis Harcourt last week to Mr. Arnold Herbert, M.P., that the Office of Works is at last going to have the corridors

of the Law Courts which adjoin the Chancery Chambers and the Admiralty Registry heated. Although space was left when the Law Courts were built for warming these portions of the building, no heating system has yet been carried out. In no other country would such extraordinary want of care be found, since the omission to heat these passages causes great inconvenience, as well as immense waste of fuel in the adjoining rooms. The tendency in America and on the Continent is to overheat public rooms, but in this country we often have run into the opposite extreme. That main corridors in public buildings should be warmed in winter by hot air or water cannot, we think, at this time of day be doubted.

The Sanitary Condition of Stafford District. DR. MAIR'S Report to the Local Government Board on the "Sanitary Circumstances and Administration of the Rural District of Sleaford" discloses an exceedingly bad state of things in regard to drainage and water supply. In a few cases houses in villages are not provided with drains at all; slops are then thrown upon the garden, or into a roadside channel or ditch. Where house drains do exist, or are believed to exist, very little indeed is known of their course and character, and it was very rare to see any provision for their ventilation. The sewers which have been provided in many of the villages are either road drains constructed of agricultural pipes, or sewers which have been constructed of glazed earthenware pipes purposely to receive sewage. With only three exceptions, the contents of these sewers are allowed to discharge direct into the nearest available ditch, stream, or beck. In some cases, the water of the stream into which sewage is so allowed to discharge is used for drinking purposes by the inhabitants of the same village; in other cases the water is so used by the inhabitants of a village or villages lower down in the course of the stream or beck. In a district where most if not all the streams are more or less polluted with sewage, and where the ground in the neighbourhood of houses is liable to soakage of excremental and other refuse matters, it is clear, says Dr. Mair, that the drinking water supply of the inhabitants should be made secure against contamination. Some of the villages are mentioned which possess excellent water supplies, obtained by means of deep bores into the Oolite; but all the others in the district are dependent for drinking water upon private surface wells or upon streams, polluted as before described. In regard to this question of water supply Dr. Mair asked the Chairman of the Rural District Council why a certain village had no water supply like the villages on either side of it; "he said he supposed that the reason was that the village had not asked for it; and on inquiring what would lead a village to ask for it, he informed me that practically it would be either scarcity of the existing supply or an outbreak of enteric fever," a reply which certainly needs no comment.

A Celebration at Ely Cathedral. THE Dean and Chapter intend to celebrate this year the 800th anniversary of the consecration, on October 17th, 1106, of Ely Cathedral. The first church appertained

to the abbey founded in 673 by Etheldreda, daughter of Anna, King of the East Angles, and wife of Egfrid, King of Northumbria, for monks and nuns, and dedicated to the Blessed Virgin Mary, of which she became the first abbess. The Danes destroyed the greater portion of the monastery two hundred years afterwards. Some monks who escaped from the massacre partially restored the buildings; in 970 King Edgar sold the Isle of Ely to Ethelwold, Bishop of Winchester, who rebuilt and endowed the abbey for an abbot and regular monks. Henry I. gave Richard, tenth and last abbot, permission to establish a see at Ely, and in 1107 Hervey, expelled by the Welsh from his see at Bangor, was appointed as first bishop of a diocese which then included the whole of the county of Cambridge, taken out of that of Lincoln. At the suppression of the monastery, re-dedicated to SS. Peter and Etheldreda, Henry VIII. converted the priory church into a cathedral dedicated to the Holy Trinity, and endowed it with the site and the revenues, in part, of the dissolved religious house. Simeon, ninth abbot, laid the foundation of the present cathedral in 1081, upon a plan which his brother Walkelin adopted, with the addition of a crypt, at Winchester. In the presbytery is the shrine of the foundress, of whom the Anglo-Saxon Chronicle relates that in the year 673 Saint Etheldreda began the minster at Ely. For particulars of the fabric we may refer our readers to Mr. D. J. Stewart's article—one of our "Cathedral" series—with plans, views, etc., of April 2-9, 1892, and the illustrations we published on July 21, 1888 (interior of one of the small western transepts), February 16, 1901 (Galilee porch), and October 18, 1890 (the prior's door).

THE Ecclesiastical Commissioners have sealed and presented to Parliament a scheme framed, in pursuance of the Union of Benefices (Metropolis) Act, 1860, for uniting the benefice of St. Peter-le-Poor, Old Broad-street, and St. Benet Fink with that of St. Michael, Cornhill. To the new rectory the Drapers' Company have nominated Canon G. C. Bell, formerly headmaster at Marlborough. The proceeds of the sale of the site and materials of the church of St. Peter-le-Poor are applied under the scheme towards the erection of two, or three, new district churches, provision being made for grants in aid of the services and fabric funds of the churches of St. Michael and All Hallows-on-the-Wall. The church of St. Peter-le-Poor was rebuilt in 1791-2 after Jesse Gibson's designs in the classic style, upon a circular plan, with an internal diameter of 56 ft.; the organ, by Green, 1792, was enlarged and improved by Castello thirty years ago. Wren's church of St. Benet Fink, or Finch, stood in Broad-street Ward, near Finch-lane, on a site between the present Bank of Australasia, Threadneedle-street, and the Royal Exchange. It was finally dismantled in December, 1845, when the monuments were removed to St. Peter-le-Poor. The stone tower, being similar in design to the brick tower of St. Benet, Paul's-wharf, was surmounted with a lead-covered swelling cupola carrying a lantern.

THE large rooms of the Institute of Painters in Water-Colours. Water-Colours are a snare to them. There is not the quantity of good work forthcoming that is necessary to fill the walls, and one has to run the gauntlet of a whole tribe of mediocrities to come at the few things really worth looking at. If the exhibition were confined to the medium-sized room of the three it would be a much better one. Worse than mediocrities are such things as the fantasias of Mr. Hal Hurst, which are clever in a way, but a very bad way. Among the things that may be picked out as of more than the average level are Mr. Hait's "A Venetian Fruit Stall" (187), the most important and most successful water-colour, by him that we have seen; Mr. Winter-Shaw's "A September Evening" (197); Mr. Bernard Evans's "A Path Through the Woods" (201); Mr. J. T. Watts's beautiful little landscape "Birmingham Moor" (79)—the merits of this kind of work do not seem to be appreciated, or this would not be hung so high; Mr. David Greu's "Lighting-up Time, Whitty" (218), a careful working out of a difficult effect; Mr. T. Pyne's "A Sunny Morning" (226), a good example of the old style of carefully finished water-colour; and all of Mr. Frank Walton's set of pictures from Sark (306, 311, 314, etc.), which are really worth looking at carefully. Mr. John White, one of the best names in the Institute, is as excellent as usual in "Shades of Evening—Dartmoor" (324); then there is Mr. Weedon, one of the few remaining adherents of the School of David Cox, whose "Autumn Day on the Moors" (330) is in his best style. Mr. Cyril Ward's "A Valley in the South Downs" (346) is a good large landscape of the realistic type—what we may call a "conscientious" landscape; Miss Alice Hobson's "The Ruins, Bradgate Park" (388), is something more than that, and is one of the best drawings in the Gallery; she has a fine sky, too, in "Exmoor" (402). Miss Vaughan Jenkins exhibits a well-drawn interior of "Christchurch Cathedral, Oxford" (384), and another lady exhibitor, Miss Alice Squire, pleased us with two or three small landscapes representing different aspects of nature in Spring and Autumn. Mr. Murrings, whose name we do not remember before, is able in the foreshortening of horses, as in "On the Common" (86), but the colour is unsatisfactory. There is a certain amount of what we call the flattery of imitation; Miss Hagarty (128) and Mr. A. MacBride (275) are obviously taken by the peculiar manner of Mr. Paterson as recently exhibited at the older Society; and elsewhere we find a member endeavouring (not very successfully) to "do Alma-Tadema," as one may say. Mr. Nisbet's "Solitude" (462) is meant to be, and is to a certain extent, poetic, but perhaps a little stagy. Among other good names of exhibitors are those of Mr. Fulleylove, Mr. John R. Reid, and Mr. Ammonier; but none of them quite at their best.

MR. NELSON DAWSON'S show-room at 111, Jernyn-street, St. James's, is at all times a place of interest. At the present time some fine specimens of forged ironwork

of elaborate and interesting workmanship are on view. The largest exhibit consists of railings for a tomb, with a large memorial cross in bronze. The sides are divided into panels decorated with rose designs; the ends are similar with the panels decorated with lilies. The work in these is very vigorous and fine, and there is a beautiful little group in the cross entitled "Charity." There is perhaps a lack of what we may call architectonic grip in the design, and a feeling of smooth roundness in detail, which prevent the whole from being as successful as it might otherwise have been. Mr. Nelson Dawson has been influenced by "L'Art Nouveau," and we hope he will return to the severer restraint in line, in form, and in detail, of the older work; a restraint which produced the extraordinarily rich and beautiful work to be seen in the galleries at the Victoria and Albert Museum. A little bronze, "The Light of the World," daintily set in marble, is very beautiful, and there are besides many useful and ornamental objects in metal-work which will stand the hardest wear and give pleasure to the eye besides.

Those who care about preserving the architectural character of a great monumental work (but a small minority, we fear, in this country) may now have the satisfaction of seeing that Waterloo Bridge has been freed from the disfigurement of the wretched commonplace lamp standards which the engineering department of the London County Council was allowed to place there, without the slightest consideration for the architectural character of the structure. These are at last removed and replaced by standards of the original fine and monumental design. The immediate moving influence with the London County Council in making this change was the strong representation made by the Architectural Vigilance Society, but we think it is only just to ourselves to record that the Society's action was due in the first instance to the Editor of this journal, who brought the matter under their notice, and but for whose initiative the shop-pattern lamps might be there still. It is gratifying to find that the Bridges Committee of the County Council seem at last to have recognised that the design of the lamp-standards has some relation to the design of a bridge, and it is to be hoped they will not again give an engineer a free hand to supply details of this kind without any reference to architectural style.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The usual fortnightly meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, Mr. E. T. Hall, Vice-President, presiding.

The Chairman said they would all be sorry to hear that the President continued to be very ill. He had now been in bed for three weeks, but they would all hope he would be present at their next meeting. Mr. Belcher himself was exceedingly sorry that he was unable to be present.

The Late Mr. Bartlett.

Mr. Alex. Graham, Hon. Secretary, said he regretted to announce the decease of Mr. William Giles Bartlett, who had been a Fellow for forty-eight years, having been elected an Associate in 1858 and a Fellow in

1869. His son, Mr. Sidney Francis Bartlett, he was glad to say, was now a Fellow of the Institute. On the occasion of the funeral the previous Thursday a wreath was sent on behalf of the Institute in sympathy with the relatives of their deceased colleague.

The Strand Further Improvement.

Mr. Maurice B. Adams asked why the Institute was not represented in connexion with the Strand further improvement memorial which had been sent to the London County Council that day. The Institute had taken a very prominent position with regard to the matter, and almost every society was mentioned in the memorial except the Institute.

The Chairman said the Council of the Institute did not think it wise to take part in the particular movement to which Mr. Adams referred, because they had made their own representations to the County Council, and had only quite recently been in communication with them in the direction that the Institute decided to take about a year ago.

Leadwork.

Papers were then read by Mr. F. W. Troup and Mr. Lawrence Weaver, F.S.A., on "Leadwork," the following being abstracts:—

Mr. Troup said that, as the architect had frequently to decide what metals should be used on a building, it was imperative he should know the peculiar properties of each, and why lead ought to be used in one case, cast-iron in another, and pewter or copper in a third. To bring out the most prominent qualities of lead—viz., its durability at ordinary temperatures, its ductility, its exceptional weight, and its low melting-point—the lecturer compared it with other metals in common use, showing its advantages for open-air purposes over copper, tin, zinc, iron, etc. Lead required, however, great care and judgment in its use. As regards the material as now supplied—milled lead and cast sheet—milled lead is a dull and pasty material compared with lead run out in the old way by casting the molten metal on a sand-bed to the actual thickness required for use. Cast sheet can be had in the open market at the present day at a rather higher price than milled sheet of the same weight. For a flat lead roof, often liable to be walked upon, there is not much to be gained from using cast sheets. The surface texture of the cast sheet, however, is worth making some slight sacrifice to obtain, especially if the old-fashioned open roll or flat well-roll can be used. Either of those joints is preferable to the usual modern roll with its wooden core. The wood roll has to be large, and therefore clumsy, else leaks arise from capillary attraction between the sheets. The open roll has not this defect, but cannot stand under much foot traffic. When lead is used in a spire or turret it is certainly worth while to use cast sheet. Even with a wooden core in the rolls the cast sheets do not cause suction to such an extent as milled lead. The natural surface of the lead as it is cast is the best to use as the exposed surface in a roof or elsewhere. When there is ornament of any sort to be cast with the sheet, then the under or sand surface must be exposed. This can be as rough as you like for roofs or rain-water heads, and a coarse sand may be then used for the casting bed. But for things which come close to the eye, or which may be handled, a much finer sand should be used. More care is then required in the casting to provide for the escape of the steam formed by the molten metal on the damp sand. For a "repeat" ornament or for casting letters and figures for dates a lead mould can be used. This is easily made, and lasts for a long time, but a brass or cast-iron mould is more permanent. For knobs and finials it is possible with a lead or brass mould to fill it with molten lead, and after two or three seconds empty out the interior un-solidified lead, giving a hollow casting without the trouble and expense of making a core as for a brass or iron casting.

For decorative forms the lecturer counselled restraint; lead was so easy to twist and turn. The designer should never forget his material while designing on paper; even in modelling the final material must never be lost sight of. It is quite possible to make a casting from a single pattern in several different materials, but to take full advantage of the best that can be got out of each material that original pattern ought to be varied in each case. For a plaster cast, for example, moderately high relief may be had; but it should be soft in

contour, and there is no special reason for economy in material.

In lead, however, there is reason for economy of material, and one can have finer lines, and can reckon on bending, soldering, or even to some extent bossing up the casting after it is made. There are several other ways of ornamenting lead. It is very easy to make fretwork patterns for ventilating panes in windows, or as a valance round a leaded dormer or door-hood. This is best done with chisels and gages on a block of lead. Lead can also be incised, and the incised lines filled with various coloured mastics in letters or other shapes. One of the most gorgeous possibilities for decoration in lead is to be had by tinning the metal in some design of ornamental or figure decoration and then glazing over the tin surface with transparent colours.

In the Middle Ages the chief method of working lead and using it in buildings was simply to take the plain cast sheets, and, after cutting it to the outline as near as might be, and in convenient size for handling, to dress, boss, and beat it up to the shape required. Sometimes these forms were carried on wooden cores; at other times on a framework of iron, or were simply fixed by iron hooks and brackets on the timber framing. This art is as dead as Queen Anne. It is a personal art, like sculpture—very often it was sculpture—and no amount of designing by another for the craftsman to execute will do much to restore it. The art has been so long divorced from the craftsmanship, and the teaching of tradition so long deserted, that their reunion is hardly a matter to be accomplished in a single generation. We can but live in hope.

Mr. Lawrence Weaver took for his subject the earlier lead spires. Lead, he said, had no nobler use than in the covering of spires, for spires were the greatest concession that Gothic architecture had made to constructed beauty and symbolism. The lead spire has a character all its own, and maintains its character of a spiritualised roof more intelligibly than a stone spire can do. The white, almost glistening patina which comes with age on lead, where the air is not befouled with smoke, makes the spire stand like a frosted spear against the sky, and the slight twists, which almost every timber spire has taken, give a peculiar sense of life. These were refinements which did not fit in with Mr. Goodyear's theories. Dealing with the history of lead spires, and discussing the question of origins, the lecturer quoted the classification of spires given by Mr. Francis Bond in his "Gothic Architecture," and gave his reasons for offering the following classification, based on Mr. Bond's but corrected:—

PATELESS SPIRES—

- I. *Collar-type*—e.g., Ryton.
- II. *Broach-type*—e.g., Braunton, Barnstaple, Godshaling, Ickleton, Swymbridge, Almondsbury.
- III. *Pinnacled-type*—e.g., Long Sutton, St. Nicholas, and Aberdeen.

PARAPETTED SPIRES—

- I. *Collar-type*—e.g., St. John's, Perth, the tower of which has a heavy over-sailing parapet, within which the spire stands.
- II. *Broach-type*—e.g., Hemel Hempstead.
- III. *Straight-sided type*—e.g., Harrow, Chesterfield, Minster, Great Baddow, Much Wenlock, Wickham Market.
- IV. *Spirelets*—e.g., East Harling, Wenden Ambo, Swaffham, Hitchin, Sawbridgeworth, and Ash, Kent.

A certain difficulty arises in the definition of lead spires owing to the somewhat loose use of the word "broach." What the lecturer called the "collar-type" is sometimes called "broach," but incorrectly. The essence of the broach he took to be that the filling-in between the angles of the tower and the diagonal faces of the spire shall be of pyramidal form. The influence of the stone broach on the form of the lead broach may be admitted without suggesting that the lead broach was a slavish or unoriginal copy of the stone broach. It was a question of carpentry. The construction of the collar-type is more congenial to wood than is the broach. The octagonal framing calls (but not very urgently) for strutting at the base. In the broach the main framing is strutted by single timbers running through the diagonal faces of the octagon; and this is not so satisfactory as the double strutting of the cardinal faces, which obtains in the collar-type. From the

weathering point of view the lecturer considered the stone broach to be as efficient as the collar-type, and he felt strongly that the broach was far the more attractive. Having given details and brought out the chief characteristics of examples of the different types classified, the lecturer made some remarks by way of constructive criticism. His illustrations, he said, had shown how beautiful lead spires can be and are. The lead gave the architect no trouble: he gained infinite variety of surface by different arrangements of the rolls; he outlined great cartonnages on the faces of his spires (as at Chalons-sur-Marne) and blazoned them with gold and colours: he wanted the metal-cased architecture of the poets, and he got it. His difficulty was that he could not keep it. The timber framing was always liable to destruction by fire. To-day, however, there is an alternative. Our spires can be built in steel and sheathed in lead, and will defy the flames. Here is one field where steelwork may come into its own, may come faithfully and gracefully, may be the metal bones of a metal architecture. The lecturer claimed for it that it preserved the initial idea of a spire, that it is a glorified roof; that the lead surface gives opportunities for colour treatment that a stone spire cannot give. Had the medieval architect found the material to his hand, we should be pointing to-day to his leaded steel spires as notable examples of the Gothic spirit. In conclusion the lecturer showed a design for a leaded steel tower done by Sir Charles Nicholson to illustrate his suggestion. The design, he said, was instinct with the poetry and mystery which are the characteristics of great architecture. He could only hope that some ecclesiastical Mæcenas would be found for whom Sir Charles could materialise this dream church encrowned with lead.

Lieut.-Colonel Prendergast, in proposing a vote of thanks to the readers of the papers, said the meeting had given the greatest satisfaction, as it was a little out of their usual groove. He doubted if there were many even there that night who knew much about leadwork in its artistic sense, and yet there were few great architectural works throughout Europe which were not much indebted to the leaden statues and lead works with which they were surrounded. The uninitiated, the idle, and the careless did not know the immense value of lead when used architecturally. He did not pretend to be an architect, but he had been an honorary member of that Institute for many years, and had a great love for art, and he never went to Westminster without wondering that this country, which in Westminster Hall had one of the most interesting and remarkable halls in the world, had left it standing in front of the great abbey with such a ramshackle roof, instead of replacing it with a glorious leaden roof. It was perfectly astounding to him that a great country which professed to have some love of art and of architecture should be unable to realise that a splendid building like this was absolutely ruined for want of a leaden roof. The great architect who built the Houses of Parliament never meant that the hall should show itself, but for some reason his plans were altered, and, as the nation had chosen to have the hall exposed, they ought to make it what it should be. With reference to the spire of Chesterfield Church, he had for the last fifty years been trying to find out the reason for the twisting, and the conclusion he had arrived at from all the information he could get was that the thing was deliberately done.

Mr. H. V. Lanchester seconded the motion, and said he would like a little more information with reference to the tinning or the application of other metals to lead. He would also like to know a suitable method for putting lead on construction. He did not think that Mr. Troup need plead the cause of lead to any architect, for they all liked it and realised the fine conjunction it made, particularly, with Portland stone. He did not think any two dissimilar materials like lead and Portland stone ever produced such harmony. He should like to know if they could get a thoroughly fire-proof construction, such as concrete or ferro-concrete, and attach lead in a satisfactory way. It seemed to him that it would be possible, but Mr. Troup had more experience than most of them, and they would like his views on the matter.

Sir Charles Nicholson asked what timber was used at Chesterfield. Was it oak? He had always understood that the cause of the twisting of the spire was that green timber was used, and it occurred to him that possibly a good deal of elm might have been used for some reason or other. They all knew that elm was a timber very apt to twist and curl up, and a simple explanation like that might possibly account for the twisting of the spire.

Mr. C. Harrison Townsend said that reference had been made to one who was well known as having helped very greatly to revive the interest in their own time in the craft of working in lead—he referred to Professor Lethaby; but he thought Mr. Lethaby would be the last to deny that there was an earlier worker in the field, whose interest also showed itself in working in lead, more or less elaborated, in his architectural work. He referred to Mr. Eden Nesfield. Some of them would remember his earlier works, and those who, like himself, were privileged to work alongside him would remember particularly how keenly he sought to revive the interest in lead at a time when it was simply used for plumbers' work. He remembered one work, which he believed was at Balbacombe, where Mr. Nesfield introduced lead cornices, with moulded and cast figures supporting them at intervals, and a lead parapet divided into panels, each panel being enriched with a different motif. This was done at a time when his fellow architects did not dream of using lead for anything but to cover a flat roof which they did not particularly draw attention to the work of one whose work he felt had not received the recognition that it should have received.

Mr. Maurice B. Adams said that he had occurred to him to use uralite where lead and iron came together. He did not know whether Mr. Troup had ever thought of that, or whether anyone had so used it, but he thought that the necessity of keeping lead away from iron might be met by using strips of uralite, which was extremely hard, and could be used like wood. Uralite was composed of asbestos, consequently no chemical action could take place between the iron and the lead when it was employed to insulate the two materials. He threw it out as a practical suggestion which he was intending to try himself. It was well to keep such new materials before one, and he could imagine a spire of steel or ferro-concrete where the metal would crop up towards the surface, and where it would not be wise to use lead without some intervening material. The necessity of protecting lead against the action of oak was never more demonstrated, if he remembered rightly, than in the new lantern over the crossing of Ely Cathedral, because in a short time after that was put up the structure was so disintegrated that it had to be practically re-erected.

Mr. E. W. Hudson said he had been specially interested in the remarks referring to the crocketed work and ornamental work on spires, and trusted that they would be illustrated, for they were much less known than the twisting and ordinary broach spires. He was particularly interested in that of East Harling, and in the drawing of Sir Charles Nicholson it threw a light on what had long been a problem to him. Stowe in his account of the House of the Knights Hospitallers in Clerkenwell described the tower and spire as being "a great ornament to the City, the like of which he had never seen; graven, gilded, and enamelled." It materialised him for a long time as to what the material could be, but when he saw the drawing of Sir Charles Nicholson and the inlay which Mr. Troup had made it struck him that they had the explanation now. With regard to steel covered with lead, that might be a very honest structure, but he hoped they would never see a repetition of what they saw at Rouen and at Cologne, where cast-iron was used. Mr. Lethaby's work had been mentioned, and in his book they had some views of fonts and of other things which were not supposed to be fonts—they were small lead vessels, the use of which apparently he did not remember them, and he was able to tell what they were. When the Templars' goods were seized in the Temple in 1507 by order of the King, amongst the inventory of goods were items of lead—"one lead, 40s.; one lead, 30s.;

and one lead, 10s." He had never been able to make out what they could be. They could hardly be ingots, but it struck him they might be something in the nature of cisterns or tanks, because 40s. was a considerable sum in those days, and "odd pieces" at 8d. each were noted. They were found in the brewery, and whether lead was used for such purposes in a brewery would be interesting to know. In interments also they had instances where an abbey had been buried, and lead been used not only for the ring, but also for the patten, chalice, and mitre, and these were covered with gilt and colour in a very elaborate way. This was a novel way of using lead, and the colouring and enamelling seemed noticeable as a way of cheaply honouring the dead.

The Chairman said the practical details which Mr. Troup had given them were of great value, and the beautiful enamelling he had shown was very interesting. The art had almost died, but he hoped it might revive again, because it contained in itself a permanent decoration far better than many of the enamels which they had seen, like that of the drinking fountain of Westminster. Mr. Weaver's paper was most wittily delivered, and was a very poetic paper dealing with a very poetic subject. As the paper was confined to spires, he naturally did not refer to the many other ways in which leadwork had been used for decorative treatment. He was aware that it was a moot question whether the Palace of None-Such had its decoration in leadwork or plaster. They knew that some of the beautiful lead cisterns were quite works of art, and displayed an architectural or craftsmanship knowledge on the part of the plumber which was highly commendable. With reference to the use of lead and steel, there must be some disconnecting material, or they would get galvanic corrosion, which would probably create very grave evils. Personally, he generally put felt between the materials, which was a very safe non-conductor, and he did the same when using oak. Reference had been made to Chesterfield. They had heard of eccentric architects, but he could not imagine any architect wanting to design Chesterfield spire in the way they saw it to-day. It was, of course, interesting, because it was so very absurd and because it stood without falling.

The vote of thanks having been passed, Mr. Troup said that, with regard to Mr. Lanchester's question as to tinning, he had a description from an old French book, which ran as follows—"When the plumbers wish to tin sheets of lead they have a tinning furnace full of hot charcoal, on each side of which a man stands holding up and heating sheets of lead. Leaves of tin are laid over these, and as the sheets get hot and the tin melts the tinning is accomplished by rubbing and spreading it over the surface with tow and resin." This was from a XVIIIth century book, and the process was really like tinning a saucapan. Burges also gave a description of how tinning was done when the lead was *in situ*, because it was not necessary that the work should be done in the workshop. There was another way in which it could be tinned ornamentally. This was to cover the lead with plumbers' soil and scratch out the parts they wanted to tin. It could also be done by laying brown paper cut out in a pattern over the lead. Then they applied the tin to the lead, and it adhered only to the parts not covered with the brown paper. That was the way in which some part of the roof of Hatfield House had been ornamented, so said Mr. Lethaby. There was no great difficulty in fixing lead upon other things besides woodwork. Of course, the milled lead was lighter than the old cast lead, which could be hung to pieces of iron. They frequently supported lead with iron hooks, and without the protection of felt or anything else. So long as there was no leakage so that water came in there was no great harm, because the galvanic action did not take place when the two metals were dry, and, of course, where the wet did come in felt would not be much good. When oak was used it was almost impossible to keep the acid from the lead. They could paint it and varnish it, but the acid came through almost anything, and seemed to seek for the lead. He did not think there was any way of getting over that difficulty except by washing the acid out of the oak before using it. He should think that uralite would be a very good basis for

lead, but was probably unnecessary in cast lead, because cast lead was so much stouter, and would hang on a framework instead of having to be supported all over the roof. In French cathedrals the boarding was not continuous, and this had the further advantage of allowing ventilation. With modern lead it would probably sag unless continuously supported. As regarded ironwork as a framework for roofs, the whole of the roof of Chartres Cathedral was ironwork, and the sheets simply hung between the ribs of iron. It was not lead at all, but was simply a skeleton of cast iron, and could easily be covered with lead if there was any desire to do so. As to the question of lead for tanks in breweries, he thought it would be rather dangerous to use lead, because the acids from the materials used in brewing would attack lead. The French Government had a regulation which prohibited the employment of more than one-third lead in pewter, so as to avoid the possibility of lead poisoning.

Mr. Weaver said that, as to the twisted spire at Chesterfield, he did not think that anyone could possibly desire to perpetrate such a gigantic practical joke, but, as a matter of fact, Chesterfield was not the only spire that twisted, for there was a little spire at Walsingham, in Norfolk, which also had a twist. He did not know what the timber work at Chesterfield was. As to the intermediate material between steel and lead, he thought urdite would do, and, indeed, there were plenty of materials which would do. The main thing was that the material should not burn. He quite appreciated what Mr. Townsend had said of Mr. Nesfield, but what he appreciated about Mr. Lethaby was that he was the only person who had written a book about leadwork. Mr. Lethaby in his book referred to a vessel, which he called Anglo-Saxon, which had triangular forms on two and two iron handles. He did not think this was a font, and it was probably a large salt of a monastery. There was a small vessel in Gloucester Cathedral, and he could not imagine what it could be. It was too large to be a vessel for the ablution of Mass, but it might possibly be a stoup. As to the question of interments, there were a large number of patters and chalices of lead, but he did not know of a mitre before; they were simply put in in the ordinary way of swinding the dead. They could make a patten or chalice of lead and gild it, and a long way off no one could tell it was not gold, and so they got the benefit of being generous without the cost. From the very earliest Egyptian times these votive offerings had invariably been swindles. There had been very many lead pectoral crosses found, and in the times of the Black Death, when people died rapidly, everyone had a pectoral cross, which were nearly always of lead. When they were dealing with the site of Christ's Hospital recently Mr. Hilton Price came on a gigantic find of lead crosses, none of which were in the least bit decorated. They were simply pieces of lead chopped out of a sheet. The friars doubtless died in large numbers, and the pectoral cross was simply chopped out roughly, without the faintest attempt to ornament.

The Chairman announced that the next meeting would be held on April 2, when Mr. W. Ammoner and Mr. A. W. Martyn would read papers on "Wood-carving."

BRITISH SCHOOL AT ROME.

The third open meeting of the above school was held on March 12, and was attended by a considerable number of British residents in Rome and foreign scholars. Professor Gardner opened the proceedings with a paper upon "Copies of Statues on Coins." He began by pointing out the value of the representations of works of sculpture upon coins, and noticing the conventions which are found in them, and which must be taken into account. He proceeded to illustrate his remarks by reference to two particular statues—the Artemis Laphria at Patre and the Themistocles at Magnesia. The former was mentioned by Pausanias as having been brought to Patre from Calydon by Augustus after his depopulation of the latter city, and as being the work of two Naupactians—Menechmus and Soidas. Upon a series of coins of Patre of the imperial class

reaching from Nero to Caracalla was an almost identical figure of Artemis, sometimes vouchsafed for by the inscription "Diana Laphria," but unmistakable in itself. The coin showed us a copy of the cutter's statue was in itself almost certain, and the association with it on one coin of the well-known Aphrodite of the Acropolis of Corinth, left practically no doubt on the point. It had been objected that the statue as represented on the coins was of a later period than that to which belonged the sculptors to whom Pausanias attributed it; but the objection probably rested upon a misunderstanding, and both sculptors and statue might be fairly assigned to the middle of the Vth century B.C.

The statue of Themistocles, set up soon after his death in the market-place of Magnesia, in Ionia, was represented on a coin struck in the reign of Antoninus Pius. He is seen nude, standing to the left, with a patera in his right hand and a sheathed sword in his left. Before the hero is a burning altar, in front of which lies a slain bull. It seemed probable that an actual copy of the statue might be recognised in a figure now in the Glyptothek at Munich, which was formerly in the Villa Albani, and which generally bears the name of "A Heroic King," though attempts had been made to see in it a Zeus—wrongly, in all probability, inasmuch as a Zeus with short hair (which this figure has) would be most unusual in the first half of the Vth century B.C., to which the original of this figure must be assigned. In pose and type the Munich statue and the figure on the coin correspond fairly closely; some archaeologists maintained that the sheath in the former was a modern restoration, but, even if this was so, it was difficult to see why the restorer (who could not have known or used the coin) should have introduced it unless he had some authority to go by; and in period the two were contemporaneous, which gave the identification a high degree of probability.

The second paper was read by Mr. A. J. B. Wace, Librarian of the School, on "Some Late Roman Historical Reliefs." He first considered the six late reliefs that form the frieze of the Arch of Constantine; these he divided into two sets, which were distinguished by some slight stylistic differences, and by the fact that in the first group of three the original head of the Emperor had been carefully chiselled away, so as to be replaced by another. Of the other three, two showed no Emperor at all, and in the third the Emperor's head, though badly damaged, had never been altered.

The first group he attributed to Diocletian, who was the last Emperor to celebrate a triumph (503 A.D.), and whose building activity in Rome was considerable, and the scenes on these reliefs—a triumphal procession, a *congratium*, and a speech from the Rostra—were, or could be, all connected with a triumph. Of the other three reliefs, one probably represented the defeat of Maxentius at the Pons Milvius, and another the battle of Verona—Constantine's two decisive victories in the Italian campaign of 512 A.D. The third, a conventional triumph, might have been made as a pendant to the corresponding relief of the first group. These reliefs were thus to be considered Constantinian.

He next dealt with the sculptured base of the obelisk of Theodosius at Constantinople. This base consists of two large marble blocks, the lower one cut so as to form a smaller cube resting on a larger one. This block was originally intended to carry the obelisk, as shown by the representations on two of its sides of the transport and erection of the obelisk itself; but from the Greek and Latin inscriptions on its other two sides it was plain that the obelisk, though brought to Constantinople some time before, was erected for the first time only under Theodosius. The upper cube of this block, which was decorated merely with grooved ornamentation, has had its corners cut away and replaced by blocks of granite set with mortar. From the dowel holes visible on the upper surface of the lower cube it was plain that the granite blocks and the grooved ornamentation, which had been much cut away, were covered by facing slabs of marble.

The upper block of the base carries the four bronze blocks on which the obelisk actually stands. Directly underneath one of these bronze blocks the corner has been repaired, clearly after the block was first

carved, since, though some of the representation was continued on the restoration, the rest was not. Thus it might be assumed that this upper block was not originally intended as a base for the obelisk, and was already sculptured when put into its present position, being damaged in the process. It was necessary, in order to protect the reliefs upon it, to lift it by clamps under its four bottom corners, and to allow of the removal of these when the upper block was dropped into position on the lower the four corners of the upper cube of the lower block were cut away. This assumption, that the two blocks of the base were not made for one another, was strengthened by the fact that on two sides the upper block overhung the lower. We had therefore to consider the reliefs on the upper block at least as pre-Theodosian. In the scenes which represent the Emperor and his family in the Hippodrome the figures were usually identified as Theodosius, the Empress Flaccilla, and his sons Arcadius and Honorius. But the figure called Flaccilla wore the same dress as the other three, and had no feminine characteristics. Therefore the conclusion that the block is pre-Theodosian was strengthened, and we might take the four male figures to represent Constantine and his three sons; and the style of the heads on these reliefs agreed very well indeed with the extant portraits of the Constantinian period.

THE FURTHER STRAND IMPROVEMENT SCHEME.

A MEETING of signatories to the memorial to be presented to the London County Council for a review of the planning of the Strand between St. Martin-le-Strand and St. Clement Danes was held at Burlington House on Monday, Sir Edward Poynter, President of the Royal Academy, presiding.

Mr. Mark H. Judge, hon. secretary of the Further Strand Improvement Committee, said that the County Council were about to consider a scheme for dealing with the Aldwych site, and if the recommendations of the Improvement Committee of the Council were carried it would be impossible to adopt the proposals which the signatories to the memorial advocated. It was of the greatest importance, therefore, that they should make another attempt to get the Council to revise the frontage line, and to set back the line of the Strand on the north side between the two churches, so that the roadway may have its natural course direct to and from the Courts of Justice.

The Chairman stated that the reason which had actuated the Royal Academy in taking the lead in the matter was that previous memorials to the County Council seemed to have received but scant attention. As strong representations from individual members of the Academy had been set aside, it seemed but right that the Academy should take action in its corporate capacity, and he was in a position to say that the memorial had been unanimously adopted as expressing the views of all the members. He hoped, therefore, that this expression of the Royal Academy's sympathy with the memorial might finally have some effect on the decision of the Council. He believed that if the County Council could be convinced that there was a public advantage to be gained outside the financial considerations, they would be willing to provide for a noble thoroughfare in the most conspicuous part of the metropolis. After the handsome way in which the County Council had met him in the matter of preserving the view from Richmond Hill, he could not believe that that body were oblivious to considerations of beauty or the desires of the public. This was quite as important a matter as the Richmond Hill view, and he wanted the County Council to feel that there were questions of economy that might rightly be subordinated to higher considerations.

The Earl of Plymouth moved:—
"That, in the opinion of this meeting, the memorial of the Further Strand Improvement Committee, the Royal Academy of Arts, and other corporate bodies makes a clear case against the plan adopted for the building land between Aldwych and the Strand, and that the London County Council be requested to receive a deputation charged with the duty of presenting the memorial."

He said he feared there were still people who held that aesthetic considerations were not to be taken seriously when they went beyond utilitarian interests, but they should recollect that they were now dealing with a scheme of London improvement larger than a

any which had been undertaken since the Great Fire of 1666, and that the untold millions of people of the years to come would assuredly hold the present generation responsible for any blot which might impair the dignity and architectural effect of the Strand. They were accustomed to look with shame and some contempt on the lost opportunities and shortsightedness of their predecessors; therefore, surely they would not be led into committing the grave error of failing to enter a very earnest and solemn protest in a matter of this kind before it was too late. They had been told that to adopt the prayer of the memorial would mean a loss to the ratepayers of a sum which had been put as high as 350,000*l.*, although he did not believe it, but he did believe that the ratepayers in the future would suffer no serious damage by the laying out of a great thoroughfare from Buckingham Palace to St. Paul's on lines sufficiently large, as befitted the greatest city in the world.

Mr. Harold Cox, M.P., in seconding the motion, said they had an opportunity of doing something to-day which would be the pride of Londoners for all time.

Mr. Frederick Harrison stated that he was the Chairman of the Improvements Committee of the London County Council which in 1892 brought up the original Kingsway scheme, and he knew that in those days the Council never contemplated any narrowing of the Strand, as was now proposed. If the Council adhered to their plan it would wantonly mar the grand effect of the perspective view from east to west.

Sir Aston Webb, R.A., Sir William Richmond, R.A., and Mr. Hamo Thornycroft, R.A., cordially supported the resolution, which was carried unanimously, and, on the motion of Sir Henry W. Lawrence, seconded by Sir William Chance, the President and Council of the Royal Academy were cordially thanked for the support they were giving to the movement.

The memorial has been signed by the President and Council of the Royal Academy, by the President of the Council of the Institute of Bankers, by the President and Council of the Civil and Mechanical Engineers' Society, by the President and Secretary of the Council of the Surveyors' Institution, by the Chairman and Secretary of the Arts Club, by representatives of the metropolitan borough councils of Bermondsey and Fulham, the Civil and Mechanical Engineers' Society, the Fabian Society, the Clinical Research Association, and by a long list of peers, members of Parliament, artists, men of science, and others who have joined the Further Strand Improvement Committee.

The memorialists say that they feel that the persistent and widespread condemnation of the shape which has been given to the portion of the Strand between the churches of St. Mary-le-Strand and St. Clement Danes makes it their duty to bring the subject again before the Council. They urge that the representations of the Royal Academy have hardly received the consideration they deserved, and they state that the Gladstone memorial, now erected at its allotted point, intensifies the need of the alteration for which appeal is made. This monument, it is pointed out, is so placed that it makes the eastern end of the site between Aldwych and the Strand still more awkward to eastward traffic. The memorial proceeds:—"To state concisely our objection to the plan adopted, it is that, between the two churches, the north side of the Strand, instead of being planned so as to give the roadway its natural course direct to the Courts of Justice, deviates some 60 ft. towards the south, thus forming a barrier between the portions of the Strand east and west thereof. Our reasons are that (1) we consider the plan is in itself an ugly, distorted figure; (2) when buildings are erected on the site, these will obliterate from the west the view of the Courts of Justice and the church of St. Clement Danes, and from the east that of the church of St. Mary-le-Strand; (3) being at an angle encroaching upon the church of St. Mary-le-Strand, the buildings will mar the beautiful aspect of that church from wheresoever viewed; (4) the angles of the roadway are awkward and dangerous to traffic. We submit, therefore, that the matter should be considered from the points of view not only of what is for the moment financially desirable, but also of what is

befitting the dignity of the capital of our Empire." The memorialists further contend that the alteration is essential, and, moreover, would materially enhance the value of the frontage, thus to some extent compensating for the reduction of building area. The memorial concludes:—"As pointed out in the report of the Royal Commission on London Traffic, Paris, New York, Washington, Berlin, Brussels, Vienna have streets finer than any that London can show. We ask—Is London, by want of determination to overcome minor difficulties, to refuse this opportunity of showing itself in reality an Imperial city, a worthy capital of a world-wide Empire? We are unwilling to think so, and trust you will seriously reconsider the plan as at present adopted, and grant our appeal."

MONUMENT TO THE LATE MR. LEANING.

The monument here illustrated, to the memory of the late Mr. John Leaning, has been put up in Norwood cemetery.

It is in one block of Hopton Wood stone, and has been executed by Mr. Nathaniel Hitch from the design and details by Mr. H. P. Burke Downing.

We are very glad to illustrate a memorial to a man whose memory we honour; but we may observe that the text forming part of the inscription, if intended as a citation from the authorised version of the Bible, is incorrect; the sentence runs, "do it with thy might," not "with all thy might." It means the same thing, of course; but the quaint simplicity of the authorised version is preferable.



Monument to the late Mr. John Leaning, in Norwood Cemetery.
Mr. H. P. Burke Downing, Architect.

CARPENTERS' HALL LECTURES :

THE YEOMAN'S HOUSE IN ENGLAND.

The fifth of the present series of free lectures on matters connected with building arranged by the Carpenters' Company was given on Thursday last week at Carpenters' Hall, London-wall, by Mr. E. Guy Dawber, who took for his subject "The Yeoman's House in England."

In some preliminary remarks, the lecturer said he would take the opportunity of thanking Mr. Batsford, the publisher of the series of volumes on old cottages and farmhouses, for his kindness in lending the photographs and for the use of his books for the occasion. Proceeding, he said that architecture was so interwoven with the life and history of a people in all the great changes that nations underwent that it was expressed in the buildings of their time. In the Middle Ages and down to the XVIIIth century architecture, or building, as it is better called, was always influenced by local conditions, and the character of the work was much the same all over the country. It was really a product of evolution, growing out of the inherited knowledge of the wants the builders had to satisfy and the natural material at their disposal, and the first need was shelter. The original classes into which primitive man was divided were hunters, shepherds, and agriculturalists, and the buildings which each would require were characterised by their several occupations.

The lecturer described the sort of dwellings used by these classes—i.e., caves and rocks, tents, and the hut—and he gave a brief account of the gradual evolution of the house from prehistoric times. The central room or hall was the keynote to the plans of houses, both great and small, in this country for centuries, and if we remembered this fact it was easy to trace the development of the plan throughout the Middle Ages and down to the XVIIIth century. Up to the Reformation, or dissolution of the monasteries in Henry VIII.'s reign, most of the workers on the land were accommodated in convent buildings or beneath the roofs of the great land owners, whilst the numerous hospitals or beds-houses afforded shelter for a number more, and small individual houses were practically unknown. But when the change of ownership came at the Reformation an immense impetus was given to agriculture, and the building of houses, both great and small, became a necessity. Houses were no longer built for defence, as it was from this period—about 1550—that the greater part of the timber and stone houses and cottages in England were constructed.

The architecture of the larger houses lay in a category somewhat by itself, and doubtless owed much to foreign influence and execution, so that it must be amongst the smaller and more homely buildings standing modestly by the wayside that we must look to find work conceived and carried out by native hands, and the period in which we found the most representative types would be in the years between 1580 and 1680. A yeoman as we understand it to-day was a freeholder, a man who owned and usually himself cultivated a small landed property, and thus had an interest and stake in the welfare of the country. We must recollect that in those days houses were handed on from father to son, and were often occupied for generations by the same families. Perhaps we did not sufficiently realise that it was this old architecture that had made our country so picturesque and had added so largely to the quiet beauty of our villages and hamlets, for the forms and colours of old English cottages and farmhouses were almost always pleasing in themselves, and in harmony with their surroundings. Again, the geological formations of this country not only gave a distinctive character to the districts which they compose, but also to the buildings themselves, and where we found the materials that nature provided used there, without doubt did we see the most beautiful architecture, because it was the most appropriate. The chief feature of building generally in the olden times was suitability to its purpose and the use that was invariably made of the local materials at hand.

The lecturer said he should endeavour to show how much the materials of which the houses were built influenced their construction and design. Of course, we must recollect

that the builders had none of the difficulties to contend with that are ever present to-day. Drainage and sanitation were practically unknown as we understood them; water supply and the consequent introduction of pipes inside the house, together with the complications of modern requirements, were non-existent, so that when examined in detail they were found to be simple, both in plan and arrangement. The houses were mostly placed in such positions as would shelter them from exposure to the weather and give ready access to such roads as then existed. This, however, was by no means always the case. Apparently no attention was paid to the question of aspect, or as to whether the position commanded good views. No doubt a great deal of the charm of these old houses was due to the fact that they were nearly always self-contained, for the first thing that struck us was the absolute simplicity of the plans. The bulk of the larger ones had now been converted into two or more separate dwellings, and, though many of these later alterations appeared at the first glance to have changed the original plan, it was easy to reconstruct it. As single houses they consisted of two or three rooms on the ground floor, with one—the living-room—generally larger than the others, the most usual plan being practically a continuation of the old mediæval one—an oblong living or common-room in the centre, with offices or chambers at either end or forming wings; sometimes the wing was built at one end only, but more frequently the plan was symmetrical. A beautiful, though much mutilated, example still remains in the manor-house at Patten-den, Kent, which dates from the early part of the XVIIth century, having been built for the standard-bearer of Henry VIII. Beyond the actual rooms themselves there was nothing—no store cupboards or conveniences of any kind—and everything was contained within the four outer walls. The smaller houses generally had but one outer door, but as they grew in size and importance two, and sometimes three doors were not unusual, and it was only since these houses had been converted into cottages that other doors and windows had been inserted, such as were never found in the original buildings. In the farmhouse at Bissington, in Oxfordshire, this was clearly seen.

The houses were always planned one room in thickness, so that they could be roofed in a single span, and so avoid any complications with internal lead gutters and flats. When more accommodation was needed they were at first lengthened, then made L, E, or H shaped, with a central block and projecting wings, but, however large the house, always retaining the single-span roof. The stairs generally ascended in the middle of the house directly from one or other of the living-rooms, and frequently by the fireplace, and contained in as small a space as possible. They were often circular in plan, and in some of the oldest houses were in stone, with a central post or newel similar to those in a church tower—an instance of the manner in which old traditions lingered in country places. Oak was the other material used, with a series of winders round a centre post, and generally cramped and awkward to get up and down. Sometimes these staircases were in turrets projecting from the main building, finished at the top with a conical roof.

The two great features of domestic architecture, more particularly in a climate like our own, were the roof and the fireplace. Most of the fireplaces, those in the living-rooms especially, were very large, frequently 6 ft. and upwards in width; they were not high—some 4 ft., or 5 ft.—with the head formed either of stone (as at Plas Mawr, in Conway, and Boswick Hall, in Westmorland) or spanned with a plain lintel of oak or arched in bricks. When the fireplaces were large on one or both sides seats were often arranged just wide enough for a person to sit down comfortably. Some few inches up on each side there were places hollowed out to take the elbows, or else to stand a cup or mug on. Sometimes cupboards were fitted in, and occasionally there were small windows to light the angle. The chimneys were quite one of the most important elements in the external effect of many of the houses. The liberal use of materials in their construction, the simple yet bold way in which they spring in rich, clustering shafts from the ridges or gable

ends, was always an attractive feature, and one that greatly enhanced their beauty. The variety of plan adopted was almost endless, and the utmost ingenuity seemed to have been exerted in their arrangement. They were placed generally at either end of the building, or they rise in a mass from the centre of the roof, and as if the old builders disliked too much uniformity. When the latter plan was adopted we notice various projections and setting forward, many without apparent reason, except the love of novelty and change, as at Eastbourne, near Midhurst.

In those parts of Sussex and Kent where stone was quarried many of the cottages were built of it, but here, as in other districts of England, the builders were confronted with the difficulty of carrying up the stacks above the roof line in stone. The nature of the stone was such that it did not lend itself to the customary separate shafts, such as were seen throughout the Cotswold and Northampton districts, formed of thin slabs set on edge one over the other. To build them in the ordinary stone walling would have made them too cumbersome and bulky, so before leaving the roof the stone was abandoned and brick unreservedly used as a substitute. Hence we frequently saw in this part of the country the pleasing combination of the base of the stack, which generally projected from the face of the wall, being of stone, and the shafts above being in brick, as at Eashing Park, Ford Mill, near Wrotham, Penshurst, Wickhambreux, and Bean Lodge Farm, near Petworth, and Craven Arms. Now, in the stone districts the chimneys were always placed centrally over the ridge or on the apex of the gables at either end (as at Broadway), or when the stacks were at the side of the building then one smaller roof connecting them with the main one. The base of the chimney was invariably square until it cleared the roof, then the flues were built separately, either square or diagonally, in clusters of two, three, or four, always made of slabs of stone (as at Medford House, in Gloucestershire), about 3 in. or 4 in. thick and 8 in. or 10 in. deep, standing on edge and breaking joint over each other, and tied together at the top by a moulded cap of some simple section, as at the court-house at Painswick, in Gloucestershire. The ingenious way in which these chimneys were managed, whether of stone or plain, un-moulded bricks, always excited a feeling of admiration, for, simple as they were, they possessed a breadth and sense of proportion sadly lacking in cottage chimneys of the present day. It was, however, in the arrangement of the roofs that these old builders excelled, always bold in outline, simple in plan and arrangement, and generally unbroken in their surface and treatment; they sheltered the whole house, and conveyed at once a kindly feeling of homeliness. In the tiled roofs of Kent and Surrey hips perhaps were more frequently met with than gables, and hardly a roof seemed complete without them, but directly we got into the districts where stone-walling and mullioned windows were used gables were more noticeable. If we analysed any of these roofs in order to discover what constituted their charm we found that they resolved themselves into very simple forms, but the masterly way in which in almost every instance the grouping and disposal of the gables, chimneys, and dormers was managed was worthy of our admiration. Dealing first with the stone buildings, the roofs were nearly always treated in the same way, having a slope of about 55 deg., and being hung with stone slates (the only material available) graduated in thickness and size from the eaves to the ridge, and crowned on the top with a stone cresting. In the example from Painswick we saw the effect of material upon design and construction, and how these builders realised that one was dependent on the other. The nature of the stone of which the slates were made—in the Cotswolds, at any rate—limited them to certain sizes, so that the stone roofs of flatter pitch covered with large and heavy slates found in Sussex and the north of England were quite unknown here.

If the angle of the roofs was flattened the slates would have to be larger, otherwise they would not keep the wet out, so after finding the pitch at which they had least strain on the pins and were most weather-proof, the old slaters never varied it. The valleys were formed of the same slates, in

a wide sweep with no hard line of demarcation where the roofs intersect, all laid in regular formation and ranging with the ordinary slating, as shown in Callowell Farm, near Stroud. Owing, doubtless, to the difficulty of getting lead in these country villages the builders did without it, and their houses, as mentioned before, were always roofed in a single span, and no lead gutters or flats were needed. Hips or any cutting or mitring of the slates were absolutely unknown in a genuine stone-roofed house, and we, therefore, invariably found the gables with the slates carried out over them, as at Back Edge, in Gloucestershire, or finished with a coping, as in Moor Hall, Stroud. The old craftsmen could do almost anything with their stone slates; the clever way in which the outside eaves were roofed, or over the circular outside staircases with pointed roofs, and again in the beautiful dove-cots, of which so many still remain scattered about the country, was truly remarkable. The dove-cot from near Cirencester was a very typical example. In Cheshire and Lancashire and Yorkshire, and parts of Sussex and Somersetshire, where the stone slates were very large and heavy, the pitch of the roof was flattened, for it would be impossible to cover with heavy stone slates steeply sloping slides, where all the drag and strain would be on the pegs and laths. Doubtless some of the roofs of the houses in the south-east of England which were now covered with red tiles and had such a beautiful effect were once hung with stone, as many of the buildings were of earlier date than the roofs.

Tiles were not generally used in England until the XVIIth century, owing to the scarcity of coal and the difficulty of burning them. For the same reason bricks were not employed extensively for building before Henry VIII's reign, though, of course, the art of brick-making, so commonly used by the Romans, was never lost in England. Formerly bricks were much thinner than they are at present, and there was little to distinguish them from tiles. The old red tiles we found on the roofs of these buildings were thicker and more unevenly burnt than our modern ones of to-day; they were, of course, all made by hand, and the holes for the pegs or nails were not so accurately placed, and, being hung on oak riven laths instead of sawn straight ones, the irregularity of the tiling and the texture of the surface produced a softness and delicate play of light and shade that was very pleasing. This effect could be seen on the roof of the cottage at Mayfield. Thatched roofs, which were probably a survival of the earliest form of roof covering, were frequently met with, and here the hips treatment was even more prevalent than with the tiled ones. There was no doubt that these old houses gathered a great deal of their charm and simple picturesqueness from the fact that the roofs were so unbroken in their surface and treatment and though the little use to which the space inside was devoted and the apparent wastefulness of their construction would appal the modern builder, yet it was this evident disregard of economy that made them so effective.

Quite apart from anything else a roof of high pitch gave a character and dignity to the building it covered which was distinctly pleasing. The roofs of all these old houses were so satisfactory as they seemed to grow naturally from the walls below, and whether of stone, tile, or thatch, being of the local materials made them seem part of the actual landscape.

Timber-built Houses.

As to timber-built houses, broadly speaking, as they resembled each other to a certain degree in plan and elevation, so they did in their construction, which was simple in the extreme. The author then gave the following description of these houses:—

"The plan was first set out, and a base or foundation-wall built, generally of brick or stone, high enough to keep the wood all well above the ground, as at Boughton, in Kent. Into this sill-piece heavy story-posts of timber were fixed upright about 7 ft. or 8 ft. apart, those at the angles being larger and formed of the butt of a tree placed root upwards, with the top part curving diagonally

outwards to carry the angle-posts of the upper story, as shown in the view of Stone Hill Farm, Chiddingfold, where also the typical Sussex stone slates can be seen. Upon these main posts beams were laid across the building, projecting forward some 18 in. in front of the framing below; into these beams others were connected longitudinally, and to these again the floor joists were tenoned, projecting the same distance as the main beams. The framing of the upper story then followed that of the ground floor, excepting that the plate or sill was now laid on the ends of the overhanging timbers. In the XVIIth century the ends of the joists were often covered with a richly-moulded (and carved, as at Lenham) fascia; but later this was abandoned, and the ends of the joists were merely rounded off. The projecting stories of these timber houses, which, with their quaint and decorated fronts and many gables are so beautiful, were not born of a mere freak or an artist's fancy. They were copied from the town houses, and these overhanging stories were intended for use—namely, to give shelter from the sun or rain to the stalls and books and to the goods displayed in the streets; and though there was no actual need in the country for such projections, the custom was adopted until it became almost traditional. The house in its first stage was a mere timber skeleton or "carcass," as it was then called, and until the framing was well advanced had to be staged or propped up from the outside—the slats to receive these stays are still showing in the larger timbers of many of the houses. The spaces between these main uprights were then filled with windows or timber framing, the latter generally about 8 in. or 9 in. apart, the closeness of the timbering being an indication of early work, and it was not until later that they were set further apart and curved and shaped braces introduced. Though the general character and appearance of these Kent and Sussex houses bears some resemblance to those of Shropshire and Cheshire and the West of England, the elaborate panels, filled with curved braces and cusings, so typical of the latter districts, are seldom seen in Kent, though there is a somewhat isolated example at Mayfield, in Sussex. These were contrived by using the bent and twisted pieces of wood obtained from the smaller branches and fitting them into the panels formed of the upright and cross-rails. It has been suggested that the prevalence of this kind of ornament was due to the shape the trees assumed from the force of the wind which is so frequent in the West of England, and which bent and distorted the trees, and so supplied many more crooked than straight branches. I have some typical examples from Little Moreton Hall, Cheshire. These houses were chiefly built of oak, which generally shrinks, and, as their construction depends in great measure upon the security of their mortises and tenons, when the joints shrank apart or decayed and the buildings settled they were, in order to keep out the weather, either plastered all over on the outside, hung with tiles, or covered with deal boarding—indeed, very many of the tiling houses one sees throughout Sussex are the old XVIIth century timber-framed ones in a new shell, as at Goudhurst, in Kent. The windows, as a rule, in the timber houses were small, with moulded frames and mullions, and filled with lead lattice-glazing. Sometimes they were treated as oriels, swung forwards on richly-moulded sills, supported by cut and shaped brackets. An effective arrangement was to place a bay window carried out on the first floor only, as at Chiddingstone, but more frequently taken up from the ground and under a gable which projected forward and overhung it, as at Beckley. The large boards and finials to these gables were always decoratively treated, and many still remain. At first they were merely stout boards cupped or shaped at the edges, and later ornamented with perforated tracery and carving, as at Eynsford and Cranbrook; a beautiful example is still to be seen in the High-street at Burford, in Oxfordshire."

The Stone Districts.

Turning again to the stone districts we found the walls of the houses always built of stone never less than 18 in., and often considerably more than 2 ft. in thickness; they

were built of either rubble in thin layers, or in deeper courses of dressed stone, or in larger blocks of dressed stone, the character of the walling depending in great measure upon the way in which the stone came from the quarry. In Wales and Westmorland the nature of the stone was reflected in the walling, as at Plas Mawr and Ambleside.

In the XVIIth century the employment of the stone lintel was universal, and one was struck by the almost entire absence of the arch in these buildings—externally the openings were never made wider than the stone would carry, and stout oak beams were laid across the door and window opening inside. The four-centred door head out of one stone was the commonest treatment, at first steep in outline as at Laverton, then shallower, until eventually it became the flat lintel. Occasionally the doorways were sheltered with a projecting hood, on moulded brackets as at Chalford Hill, but in the stone districts a point to be noticed was the absence of porches so common in timbered houses. The doorway, or entrance, had always been the centre of attraction, and that upon which the best workmanship was most often found, for if there were no ornament anywhere else it was generally here that some effort was made. It was always in the doorways, fireplaces, and memorial tombs in the churches that the old builders tried to exercise their ingenuity and originality, and where one would notice the influence of change of style and fashion as at the Warren Farm. The proportion of the doorway also greatly affected its character, a wide and low opening conveying a sense of welcome and comfort that was seldom obtained by a tall and narrow one.

The windows, again, were always stone mullioned, filled with lead-latticed panes and wrought-iron casements, and, whether in stone or wood, were nearly always treated in the same way, 12 in. to 16 in. wide between the mullions, and in the small houses with seldom more than one light high. The number of lights in nearly every instance diminished in each succeeding story. On the ground floor the windows had four or sometimes six lights, with a heavier central mullion, the next story would have three, and in the gable would be two. It was the invariable practice to lessen the number of lights as the windows ascend into the gables. The reason for this might have been owing to the dearth of glass in the XVIth and XVIIth centuries, which in these small houses would doubtless govern the size of the windows, those in the living-rooms being generally the largest. Indeed, the smaller the window as a rule, the older the house. Before the time of Henry VIII. glass windows were rare except in churches and important houses, and when it eventually became cheaper the fashion arose of making the windows as numerous and large as possible.

The symmetrical disposition and squareness of the plans and the way in which they were roofed enabled the windows to be easily arranged to come centrally under a gable in every case, as at Tocknell and Whittington, a treatment also met with in the timber and brick built houses.

In the stone houses the windows were always placed on the outer face of the wall, so that inside the deep recess gave that delightful sense of comfort and warmth only obtainable when thick walls were used. Bay windows were not of very frequent occurrence in these small houses, but in the towns and villages they were sometimes used with very happy effect, as at Duddington, in Northants. Where the frontage to the street was very narrow the entrance was placed in the centre with a bay window on either side terminating in gables above, as at the Swan Inn at Lechlade, in Wilts, and at Campden, in Gloucestershire, where we find an almost similar treatment, but without the bay windows. No description of the windows would be complete without speaking of the dormers, the most characteristic feature of these stone houses. Their origin arose in the following manner:—The buildings were generally roofed about 12 ft. or 15 ft. above the ground, or some 4 ft. above the bedroom floor. This did not give sufficient height for the windows to be placed under the eaves, and, as the bedrooms were always constructed partly in the roof, it was necessary to carry

up the side wall and form smaller gables with windows in them which thus become dormers, as at Santbury. The lead laticed glazing of all these houses forms quite an integral part of their construction, and the mullioned window without its accompanying small panes of glass was but a sorry sight.

In the early houses we found the panes based upon a variation of the diamond and the square, sometimes very small and intricate, but always such as the village glazier could cut and put together. Towards the close of the XVIIIth century the rectangular oblong panes became very popular and continued down to the end of the XVIIIth century with but little change. The leading of the small panes of glass enabled the texture of the masonry walls to be carried, as it were, through the windows without a break, getting a continuity of surface that was very pleasing, and which these old builders thoroughly appreciated, as at Broadway. The mistake so often made to-day was in glazing windows with a single sheet of glass, producing a cold effect inside, and breaking up the exterior with cavernous spots of black, and emphasising the openings in a manner which was never intended. In these houses the rooms were generally about 7 ft. or 8 ft. high, or even less, for so long as a man of average height could walk about without knocking his head against the ceiling everyone was satisfied.

In many of the houses one or more of the rooms had the open-beamed ceilings richly moulded and sometimes curved, but as time went on this delightful treatment died out and square beams and joists were used, to be finally superseded by the plain plaster ceilings. The main beams were often placed in the rooms without the least regard to the position of the windows and fireplaces over which they happened to come.

Mr. Dawber then briefly described one or two houses—i.e., at Aston Subedge, Gloucestershire, and the farmhouse at Willersey, and, in conclusion, he referred to the obliteration of the older cratis (which could not be sufficiently deplored), and the building by-laws (which had been responsible for the decline of much local building and tradition). In conclusion, he said—"Is it out of place to raise a plea on behalf of these eloquent though silent witnesses to the craftsmanship of our village ancestors, and to urge that those who had the care or reparation of old cottages and farmhouses should treat them with a gentle hand and more tender regard? Unfortunately, many are being swept away, and the dwellings of our forefathers, so closely interwoven with the life and history of the country, and possessing such an intensely human interest, are being rapidly destroyed, in some cases to make way for what can be regarded as but doubtful improvements. Go where we will and contemplate any old building untouched by the hand of the restorer, and it is impossible not to be impressed by its beauty and subtle charm—the mullioned windows and laticed panes, the roof a kaleidoscope of varied colours, the venerable walls covered with lichens, the absence of any ostentatious or unnecessary ornament, and the wonderful feeling of homeliness that pervades every feature—all combine to produce the essence of simple and beautiful architecture. I would not suggest that, merely for the sake of their antiquity or picturesqueness, unhealthy or insanitary houses should be retained, but I would most strongly urge that where it is possible to save them we should hesitate before breaking any of the few remaining links that bind the villages and country towns of to-day with the interests and associations of the past."

On the motion of Viscount Dillon, who presided, a hearty vote of thanks was accorded to Mr. E. Guy Dawber for his excellent lecture and series of beautiful views. A vote of thanks was also tendered to Viscount Dillon for taking the chair.

VESTIGES OF BERMONDSEY ABBEY.

The further demolition of the houses in Grange-walk includes the two which mark the site of the East Gatehouse; in one of them were fixed what are believed to be the gate-hooks—the gatehouse remained until 1760. A ground plan, published by Wilkinson in 1820, and described as being from an original drawing taken in 1679, plots the buildings as

they stood nearly 140 years after Sir Thomas Pope had pulled down the abbey church together with most of the conventual buildings. At the west end of Grange-walk is plotted the East Gatehouse, giving access into the Base Courtyard. Next, north, to the East Gate is "the Bakehouse"; between the Bakehouse and the west end of Long-walk is shown "where the Mansion House stood," with its "Gallery"—these being on the east side of the Base Courtyard, side Bermondsey-square. To the south of Grange-walk are the "Highway leading to the Grange," "the Stable-yard," with its "Pond," and "Coney-grew" (sic). Excavations made in November, 1902, for the South-Eastern Railway Company's working class dwellings disclosed what were considered to be fragments of the substructure of the chancel of the abbey church on the north side of Long-walk, and, in Abbey-street, in 1903, several skeletons, and two stone coffins containing human remains. Sir Thomas Pope, Treasurer to the Court of Augmentations, used materials of the church and other buildings for his house, whereof the gardens, orchards, pasture lands, etc., covered about 20 acres. T. H. Shepherd's water-colour drawing, made about sixty years ago (now in the Crace Collection), shows the old stones in the walling of Bermondsey House which, after Pope's death at Clerkenwell Priory in 1559, was, with its pleasure, acquired by Thomas Ratcliffe, Earl of Sussex, Lord Chamberlain, who lived there in high state. His widow, Frances, daughter of Sir William Sidney, died in 1589, and founded Sidney-Sussex College, Cambridge. Pope founded Trinity College, Oxford. The Crace Collection contains also C. I. M. Whicello's original drawing (engraved by Wilkinson, 1820), of the North, or Great, Gatehouse, at the north-west angle of Bermondsey-square, which survived until 1806, when Abbey-street and most of the square were laid out. Just beyond stood the West Gate, where is now Bermondsey New-road. Over part of Long-walk, and between Long-walk and Grange-walk, stood a palace of William I., his successor, and our earlier Plantagenet kings. The Domesday Survey cites Bermondsey, in Brixton hundred, as held by the King, and before him by Earl Harold, and as having a new and handsome church. William II. bestowed the royal manor upon the priory which Aylwin Child established there in 1082 for Benedictine monks from the Cluniac Priory De Caritate sur Loire; at Richard II.'s request Pope Boniface IX. erected, 1399, the priory into the Abbey of the Holy Saviour, which attained to great opulence and power. After Abbot Wharton's surrender in 1538 the site was granted, July 8, 1541, to Sir Robert Southwell, Master of the Rolls, who, on August 30 of that year, conveyed the property in fee to Sir Thomas Pope and his wife under a sale, afterwards confirmed by letters patent. The monks built for their tenants in Southwark a church which, at the Suppression, was converted into the parish church of St. Mary Magdalene. The church, rebuilt in 1680, was restored by George Porter in 1830, and altered and decorated by Mr. E. Crosse eight years ago; the graveyard, 1½ acres, was laid out as a public recreation ground in 1886, at a cost of 1,500l., borne by an ordinary vestry rate.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The tenth meeting of the session was held at No. 18, Dutton-street, S.W., on Wednesday, March 14, under the chairmanship of Mr. F. W. M. Womacott, when Mr. Geoffrey Lucas read a paper on "Inexpensive Cottages," of which the following is a summary:—

"Inexpensive cottages—a delightful ideal—are also a necessity. There is little doubt that a great change is coming in the placing of the population on the land, with our increased facilities of transit and communication. The factories and the workers must be moved into the country, the workers living within easy distance of their occupation, and enjoying home-life amid the countryside. The most important thing is a good living-room, with sheltered door, and fireplace containing the cooking range well away from draughts. A wide and sunny

window is essential. The external door is better if shielded by a porch. The minimum size, for a cottager with wife and three children, is about 14 ft. by 11 ft. Probably it will be better to screen the stairs off from the sitting-room, in spite of the loss of the picturesque effect in the interior. The height depends on the requirements of the local by-laws, otherwise a height of 7 ft. 3 in. to 7 ft. 9 in. is sufficient. A portable range, with boiler if a constant service is available, set in a brick chimney breast, finished with a fair face, and provided with a shelf above shoulder-height, is a good arrangement.

A chamfered wood picture-rail, set just under the ceiling line, saves much knocking about of walls, as do wood linings to the windows.

A wood floor is more comfortable than tile, and should be finished with a square wood skirting, 5 in. high. Whitewash or cream colour wash is a good wall finish, but tenants usually prefer colour-wash or paper; and, it may be added, sash-windows to casements. A simple dresser is an essential fitting. I do not think a parlour is a necessity for labourers, but may be so for artisans. It can, however, be kept quite small, a minimum size being 10 ft. by 8 ft., fitted with a fireplace and finished like the living-room. Adjoining the living-room is the scullery, say, 8 ft. by 8 ft. minimum, containing sink, at least 30 in. by 18 in., with draining-board and tap and a plate-rack. The copper may have a ventilating hood over it. Shelves for saucepans are a necessity. It is doubtful if a bath is required at all, but, if so, it can be put in the scullery, and hot water drawn from the copper. If possible, the bath should be screened off with a wooden screen, as is cleverly done in Mr. F. Troup's cottage at Letchworth. The combined fitchener and copper and the tip-up bath are both excellent fittings, but their cost is a large item in a cheap cottage. The ladder should be large, with wide shelves, and ventilated by air-bricks. The sash-frame should be fixed and partly filled with fly-wire instead of glass.

The coal-hole should hold at least a ton, and may very well be lowered a step, and open out of the scullery. An outside shed for storage is useful, almost essential. Earth-closets should be as simply fitted as possible: seat with pail under, an earth-bucket and shovel being sufficient. Water-closets are but little trouble, and the by-law requiring an outside window can often be got over. The stairs should be from 2 ft. 4 in. to 2 ft. 6 in. in clear, and may be as steep as 8 in. rise and 8½ in. tread. Three bedrooms are the minimum required by decency for a family, though it is difficult in a single living-room cottage to find space for them on the first floor. One room may be quite small, and need not have a fireplace. The landing is sufficiently lit by a fanlight over one door. Generally speaking, a southerly aspect is best, but an east and west aspect is also good. Casements cost less than sashes, and are more sympathetic for cottage work. Wood-skirtings fitted in behind, are good in practice, also tiles, but these are more costly. Matchboard partitions to bedrooms are not sound proof and patent partitions are economical only when used in large quantities. Lugged-doors are good, but liable to sag. No architraves are needed if the linings project to stop the skirting. Bricks seem to be the best and cheapest materials, at least for use in brick districts. Drainage is the most expensive, if necessary, item in a cottage. A cheap and effective system has yet to be devised. Joint drainage, if allowed, effects a great saving. The best sink-gulleys are those with a deep-set grating, the lead waste delivering vertically over this. The rain-water is best collected in rain-water butts or open iron cisterns."

After making some suggestions in regard to exterior treatment, Mr. Lucas said that in regard to the question of village street architecture, continuous lines of houses, instead of detached houses, led to dignity, and he instanced such towns as Blandford and Baldock. Economy in cost was a gain to be considered. In conclusion, he said that the design of inexpensive cottages was well worth doing by architects.

The discussion was opened by Mr. H. G. Collins, and continued by Mr. Drummond and other speakers. A good many practical points were brought out, such as the demand

still found in some districts for brick ovens for bread making, or, as in the west country, earthenware ovens. The use of breeze concrete for wall-plates was a good suggestion, and one or two speakers said that a fillet at chair height saved damage to walls.

Mr. Maurice B. Adams, in summing up the discussion, criticised the many sets of plans shown on the walls, and considered that modern work showed a very great advance in practical qualities, consideration, and value of textures. He thought that all new materials should be carefully considered, but agreed that, so far, brickwork had held its own for external walling. He then dealt with the difference of habits which led to the distinction between the labourers and artisans' homes. Mr. Clough's cottages, with their mansard-roof construction, were instanced as a typical example of economy in building, the Kentish type of high-pitched roof being the opposite extreme. Two of the newer materials were mentioned in bitumen paint for ironwork, and the roof-proof stains for external woodwork, both being commended. The use of aralite on an iron framing was noted for workshop construction.

The Chairman announced that the next meeting would be held on Wednesday, March 28, at 7.15 p.m., at the Law Society's Hall, in conjunction with the Law Students' Debating Society, when a paper would be read by Mr. Wm. Woodward, F.R.I.B.A., on "The Legal Ownership of Architects' Drawings."

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. Evan Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Lambeth Borough Council 5,000*l.* for contribution towards purchase of certain land at Denmark-hill; Poplar Guardians 61,000*l.* for poor law purposes; and St. Marylebone Borough Council 48,545*l.* for electric lighting.

Further Strand Improvement.—The petition presented by the Further Strand Improvement Committee, and referred to on another page, was sent to the Improvements Committee.

Secondary Schools.—The following recommendations of the Education Committee were agreed to:—

"That it be referred to the Education Committee to report as to the steps necessary for the acquisition of sites as follows:—

(i.) In the south-west of London, for the accommodation of the dual school now carried on by the Battersea Polytechnic; (ii.) at the north of London, for a new boys' school; (iii.) in Paddington, for the accommodation of the mixed school now carried on at the London County Council Paddington Technical Institute; (iv.) in North Islington, for a new girls' school; (v.) in the south-west of London, for a new girls' school.

That the Governors of the Adeley and Stanhope School (Deptford) be asked to submit plans for the erection of additional classrooms and an additional art room.

That, subject to the Governors of the Aske's School for Boys (Deptford) notifying the Council of their willingness to erect a new block of school buildings out of the funds of the foundation, an equipment grant of 1,000*l.* be offered to them, and that they be informed that the Council will consider the question of increasing its maintenance grant when the new block shall have been completed.

That, subject to the Governors of Aske's School for Girls (Deptford) deciding to increase the accommodation of the school, an equipment grant of 500*l.* be offered to them, provided that the work is put in hand at once and completed to the satisfaction of the Council.

That, subject to the Governors of Camden School for Girls (St. Pancras, N.) deciding to extend the school buildings, an equipment grant of 8,000*l.* be offered to them by the Council, provided that the work is put in hand at once and completed to the satisfaction of the Council.

That the Governors of the Central Foundation School for Girls (Whitechapel) be asked to submit proposals for the enlargement of the accommodation of the school out of the funds of the foundation, and that, subject to the Council providing that the work is put in hand at once and completed to the satisfaction of the Council, they be offered an equipment grant of 400*l.* in connexion with the enlargement, provided that the work is put in hand at once and carried out to the satisfaction of the Council.

That an equipment grant of 500*l.* be offered to the Governors of the Stepmay and Bow Foundation in connexion with the rebuilding of the Coopers' Company's School (Mile End), provided that the work is undertaken at once and completed to the satisfaction of the Council, and that they be informed that the Council will consider the question of increasing the maintenance grant in connexion with the rebuilding of the school.

That the Governors of the Grovecoat Hospital (Westminster) be informed that the Council will

consider the question of increasing its maintenance grants for the year 1907 on the completion of the extension of the buildings now being made.

That the Governors of James Allen's School (Dulwich) be asked to submit proposals for the extension of the school buildings in order to reduce the size of the classes, and that an equipment grant of 400*l.* be offered to the Governors in connexion with the enlargement, provided that the work is put in hand at once and completed to the satisfaction of the Council.

That the Governors of the Latimer Upper School (Hammersmith) be asked to submit, at an early date, plans for increasing the accommodation of the school at the expense of the foundation.

That the Governors of Farmer's School (Bevis Green, N.E.) be asked to submit proposals for the enlargement of the school, or for the removal of the boys' school to a more northern part of the county. That the Governors of the Owen's School (Bevis Green, N.E.) be asked to submit proposals for the enlargement of the accommodation of the school out of the funds of the foundation, and that, subject to the proposals being approved, they be offered an equipment grant of 500*l.* in connexion with the enlargement, if carried out at once to the satisfaction of the Council.

That the Governors of the Roan School (Greenwich) be offered a grant of 6,000*l.* in connexion with the erection of new buildings, provided that the work is commenced at once and completed to the satisfaction of the Council.

That the Governors of St. Mary's College (Paddington, N.) be informed that, subject to their undertaking to obtain the premises of the Kensington Park High School, and thus increase the accommodation of their school by September, 1906, the Council will consider the question of increasing its maintenance grant.

That the Governors of St. Olave's and St. Saviour's Grammar School (boys) be offered an equipment grant of 2,000*l.* towards the cost of extending the accommodation of the present building, on condition that it is taken in hand at once and completed to the satisfaction of the Council.

That the Governors of St. Olave's and St. Saviour's School (girls) (Bermondsey) be offered an equipment grant of 1,500*l.* towards the cost of extending the accommodation of the present building, on condition that the work is put in hand at once and completed to the satisfaction of the Council.

That the Governors of the Whitechapel Foundation School (Whitechapel) be asked to submit proposals for enlarging the school on the falling in of the lease of premises adjoining the school, and that an equipment grant of 500*l.* be offered to them in connexion with the enlargement, provided that the work is put in hand at once and completed to the satisfaction of the Council.

That the Governors of the William Ellis School (St. Pancras, N.) be asked to provide two additional classrooms, and new desks.

That the Governors of the Lewisham Grammar School (Lewisham) consenting to enlarge the accommodation of this school to the satisfaction of the Council, they be offered a grant of 6,000*l.*

General Lines of Buildings in Fulham-road and Fulham Park-road.—The Building Act Committee reported as follows:—

"On May 3, 1905, we reported that a successful appeal had been made to the Tribunal of Appeal against the certificate of the architect of the Council, acting in the capacity of the superintending architect of metropolitan buildings, defining the general line of buildings on the south side of Fulham-road, westward of Munster-road. We have now to report that on December 22, 1905, the superintending architect defined the general line of buildings on the western side of Fulham-park-road between Fulham-road and Landridge-road, and that an appeal was made against his certificate, and that on January 23, 1906, the Tribunal of Appeal reversed his certificate and decided that there was no general line of buildings on the western side of the street leading from Fulham-road to the junction of Fulham-park-gardens and Fulham-park-road. His decision is that, except in so far as the provisions of section 13 of the London Building Act, 1894, as to the prescribed distance may apply, there is nothing to prevent the erection of houses on the site in question close up to the public way. In order that the effect of these decisions of the Tribunal of Appeal, which enable the applicants to build very considerably in advance of the lines defined by the superintending architect, may be clearly understood, we have given instructions for a cartoon to be prepared and hung in the Council chamber.

Mr. Cobb asked why the case was allowed to go by default, and why the borough council was not informed that the Council intended to take no action.

Captain Hemphill said that the case did not go by default. There was a decision on the report of the superintending architect defining the line, and it was not usual for the Council to appear on such occasions. In nearly all cases, whether the Council was right or wrong, the Tribunal allocated the costs against the Council.

Mr. Phillips more said that the Council did not appear at a party to the appeal, and consequently the Tribunal was not able to pile up the costs against the Council.

Colonel Rotton asked if it was true that the Tribunal was habitually unfair to the Council. That seemed a very serious statement to make, and if the statement was true and the Tribunal was in the habit of piling up the costs against the Council, then it would be necessary to get another Tribunal. (Several members: That is what we want.) The state of affairs was very unsatisfactory. Captain Hemphill said there was no reason

why the borough council should not, if they had desired, have taken action in the matter. As to the Tribunal, he did not intend to say that they were habitually unjust to the Council, but their decisions had been in the great majority of cases against the interests of the public and in the interests of the people who appeared before the Tribunal against the reasonable and fair decisions of the Council.

Holborn to Strand and Southampton-row—Tramway-subway and Paving, etc., Works.—The Highways and Improvements Committees recommended, and it was agreed, that additional expenditure not exceeding 550*l.* be sanctioned in respect of the employment of a resident engineer and of clerks of works in connexion with the execution, under the direction of the Works Committee, of the paving and tramway-subway, etc., works in the Holborn to Strand and Southampton-row improvements.

Encroachment on Land, Mansell-street.—The Improvements Committee reported as follows:—

"In connexion with the Mansell-street improvement terms were agreed for the purchase of the portion of the site of the Swan public-house, abutting on the building on the opposite side of the road, and not, as arranged, 50 ft. from the front of the forecourt. The encroachment on the land purchased for the improvement was 2 ft. 3 in. while the area of the land which has been encroached upon is about 63 sq. ft. We have agreed with the owners of the property for the frontage to the Swan public-house, that when the premises are rebuilt the frontage shall be set back to the proper line without further compensation. This will result in a profit of about twice the *pro rata* cost of the land which has been unlawfully built upon, and is calculated on the basis of the total amount payable to the owners in respect of their interest in land and the disturbance to their trade. We recommend that the arrangement under which, in consequence of an encroachment upon land acquired for the widening of Mansell-street, 500*l.* has been deducted from the compensating payable to the owners of the Swan public-house, No. 94, Mansell-street, be confirmed.

After discussion, the matter was referred back to the Committee.

Site for Sub-Pire Station.—The Highways Committee reported, and it was agreed, that the estimate of expenditure on a capital account of 10,000*l.*, submitted by the Finance Committee to cover the cost of acquiring the property in Gray's Inn-road, submitted to the Highways Committee on January 25, 1906, be approved.

Holborn to Strand—"Morning Post" Premises.—The Improvements Committee recommended, and it was agreed, that the approval of the construction of vaults in Aldwych, Wellington-street, and Exeter-street at the Morning Post premises be confirmed; and that the construction of a lift in a recess on the Exeter-street side of the building and of an opening in the footway in Wellington-street as shown on the plan be sanctioned.

Goldsmiths' College.—The following recommendations of the Education Committee were agreed to:—

"That the estimate of expenditure on maintenance account of 4,000*l.*, submitted by the Finance Committee, in respect of the grant of that amount for the maintenance of day and evening classes at the Goldsmiths' College, be approved.

That, subject to suitable arrangements being made with the University of London for the conduct of the school of art at the Goldsmiths' College on sufficiently practical lines to meet the views of the Council, the Council do express its willingness to contribute for the present a grant not exceeding 1,000*l.* a year for the maintenance of the day and evening classes therein.

That the department of mechanical and electrical engineering and the classes connected with the building trades now conducted at the Goldsmiths' College be removed as soon as possible to a new institution, and that it be referred to the Education Committee to consider the advisability of the provision of such institution as near as may be to the New Cross or Lewisham Junction railway stations.

That arrangements be made by the Council for the provision of evening classes either in the new institution referred to in resolution or in a separate institution in the neighbourhood of New Cross.

That pending the provision of other suitable accommodation, the Council do make a grant to the University of London for the actual cost of conducting the evening classes in mechanical and electrical engineering and the building trades at the Goldsmiths' College, such grant not to exceed 2,000*l.* a year."

Stepney Jewish School.—The Education Committee reported that on February 21, 1905, they decided to ask the trustees of the

Stepney Jewish School (Stepney) to join with the Council in making application to the Board of Education for a scheme dealing with the management of the school trust. The trustees have now forwarded their application, which is as follows:—

(i) For permission to contribute the Rothschild fund, £3,000, towards the cost of building an assembly hall, new classrooms, and making improvements in the existing building, which would include the alterations required by the Council.
(ii) The trustees propose to add to the school site a piece of freehold land which is stated to be the property of the committee.
(iii) The trustees also propose to provide from their own funds an additional sum of 4,000*l.* towards the buildings and improvements."

The Committee recommended, and it was agreed, that, subject to the plans of the new buildings and alterations being approved by the Council, and to provision being made in the scheme as to the amount of the income of the fund (when replaced) which should be paid to the Council under sect. 13 of the Education Act, 1902, the trustees of the Stepney Jewish School (Stepney) be informed that the Council has no observations to offer on the proposed application to the Board of Education for a scheme.

The Tribunal of Appeal under the Building Act.—The Building Act Committee reported that they had had under consideration a letter from the Home Secretary forwarding, for the observations of the Council, a copy of a letter received from the members of the Tribunal of Appeal constituted under sect. 175 of the London Building Act, 1894, asking that the rate of remuneration granted to them in respect of their services may be increased. In accordance with the terms of sect. 179 of the Act, the Home Secretary in 1894 decided that the members of the Tribunal should be paid by fees, and fixed the amount of the fees at three guineas for the first hour and two guineas for each subsequent hour of each day's sitting of the Tribunal, and in 1895 it was laid down that such remuneration was limited to the sitting of the Tribunal in its judicial capacity. The amount of the fees then fixed has remained unchanged up to the present. The members of the Tribunal ask that the rate of remuneration may be increased to five guineas for the first hour and three guineas for each subsequent hour or part of an hour, and that each member should receive a minimum fee of twelve guineas in respect of each appeal when an appointment has been fixed, whether the case is argued before the Tribunal or not, and further that such fees should be paid whether the members of the Tribunal are acting judicially or not, provided they are employed in the work of the Tribunal. The Committee proceeded:—

"It is stated that the maximum amount earned by any member of the Tribunal during the ten years inclusive was 940*l.*, which was paid in respect of 103 sittings of which were settled without being heard and the average amount received in respect of the ninety-eight sittings of an average duration of 2*h.* 15*m.* was less than four hours was 9*l.* 12*s.* This amount appears to us to be sufficient even if the members are prevented from making professional appointments on the days fixed for the hearing of appeals. The increased number of appeals which may be made under the London Building Act (Amendment) Act, 1905, is advanced by the members of the Tribunal as one reason why the rate of remuneration should be increased. It is, of course, impossible at the present time to form any opinion as to what the number of appeals under the new Act may be, but we are of opinion that, should the number be large, it would probably be found advisable for the Tribunal to sit at stated intervals, and if necessary to continue the sittings from day to day until all the cases then before them had been settled. Should this be the case, and assuming that the sittings lasted six hours each day, the average remuneration for each member would be about thirteen guineas, and we are, therefore, strengthened in our opinion that the present scale of fees is adequate."

The Committee recommended accordingly, and the motion was agreed to.

White Hart Lane Estate.—Erection of Shops.—The Housing of the Working Classes Committee recommended, and it was agreed:—

"That tenders be invited from selected firms for the erection of four shops fronting Fordship Lane at the south-western corner of the White Hart Lane estate; that bills of quantities be not prepared and that the form of contract be provided that payments to the extent of 80 per cent. of the work done be made to the contractor in fortnightly instalments upon the architect's certificate, that a further 15 per cent. of the bills of quantities be paid on the completion of each shop, and that the remaining 5 per cent. be paid within one month after the completion of each shop, subject to any liability as to the maintenance of the buildings."

Portion of the Crescent Site.—The Improvements Committee reported as follows:—

"We have had before us a proposal for a lease, for ninety-nine years, at a rent of 55,000*l.* a year, of the central portion of the crescent site formed in connexion with the Holborn Strand improvement. The site has an area of about 123,350 sq. ft., and lies between Aldwych and the Strand, being bounded on the east and west by the 50 ft. approaches which it is proposed to form to connect Strand and Aldwych. It has frontages of about 636 ft. to Aldwych, about 413 ft. to the Strand, about 236 ft. to the approach on the west side of the site, and about 231 ft. to that on the east side. The proposal has been made by Mr. L. Wornser on behalf of a syndicate who have prepared a scheme for developing the site as a whole. A company is to be formed for this object with a capital of 1,000,000*l.*, and arrangements have been made for underwriting nearly the whole of this amount. From inquiries made through the Council's bankers, we are satisfied that the necessary capital will be forthcoming, and that the financial position of the underwriters justifies the Council in favourably considering the present offer."

It is proposed to erect on the central portion of the site a stone building of commanding architectural features. This building will contain large galleries for use in connexion with a permanent exhibition of arts and manufactures; it will also contain a theatre, a concert hall, and a restaurant. Beyond the central block of buildings the site will be inclosed by shops with basements ground floors, and two floors above. There will be seventy-eight shops on the ground floor and seventy-eight on the first floor, while the second floor will be let for commercial purposes. The promoters have undertaken to spend not less than 500,000*l.* in the erection of these buildings. They state that negotiations have already been commenced for letting portions of the buildings, and that they have no doubt as to the disposal of the whole to substantial tenants. There will be no large open spaces, the shops and the central building then that which is necessary to provide for the access of light and air. The plans, elevations, and specifications of all the buildings will be entirely subject to the Council's approval.

The lease will be in the Council's usual form, subject to such modifications as may be necessary for the special underwriting, and will give the Council entire control as to the uses to which the buildings will be put and also the right of re-entry, if the buildings are put to any other use than that sanctioned when the lease is taken up.

We recommend that, subject to the terms and conditions of an agreement to be prepared by the Council's solicitor, the central portion having an area of about 123,350 sq. ft. of the crescent site, formed in connexion with the Holborn Strand improvement be let for a term of ninety-nine years at a rent of 55,000*l.* a year on an agreement for a lease to Mr. L. Wornser, on behalf of a syndicate which has been formed for dealing with the site; and that the Improvements Committee be authorised to complete the matter on the basis (i) that one year's peppercorn be allowed, and that the rent for the second and third years be at the rate of 27,500*l.* a year; (ii) that one year's ground rent (55,000*l.*) be paid to the Council upon the signing of the building agreement, and that this sum be forfeited to the Council in the event of the promoters not taking up their lease; (iii) that no public drinking bars be allowed other than those proposed to be used in the theatre during the performances, and that these be subject to the usual requirements of the Local Chamberlain, and that the sale of alcoholic liquors be restricted to the central building and to the courts and verandahs forming part thereof; (iv) that the buildings be erected in accordance with plans to be approved by the Council and that a sum of not less than 500,000*l.* be spent in the erection of such buildings; (v) that no deviation from or abatement of these plans be made without the previous sanction of the Council; (vi) that the Council reserves the right to terminate the lease at any time and to enter into any possession of the site and of the buildings erected thereon if, without the previous permission of the Council, such site or buildings be put to any other use than that sanctioned by the Council when the lease is taken up; and (vii) that no part of the site or of the buildings thereon be sold without the sanction of the Council."

Mr. Hubbard, the Chairman of the Committee, said that they had had a petition presented from the Royal Academy; there had been previous petitions of the same character, and the Council had always decided to take no action. With regard to the previous scheme, that was an offer for an option of a lease without a deposit, but in the present scheme they had a definite offer for a lease, with a deposit of 55,000*l.* upon signing the agreement. The other scheme involved a licence for the whole of the central building, grounds, and terraces, but now the licence would be only for the restaurant in the central building and in the open courts, or verandahs, where food would be served, and these would be much smaller than the open spaces in the previous scheme. There would be only one theatre, instead of two, and there would be two-story shops with one floor above, and no promenades on the roofs of the shops, as was proposed in the former scheme. The area of the open courts would be restricted to a minimum compatible with the access of light and air, and, owing to the number of shops being increased from about sixty to 176, the Council would have increased security for its ground rent. Another important matter was that, whereas in the former proposal there was no fixed amount for the

expenditure on the buildings, the Committee had now secured a minimum expenditure of 500,000*l.*

Mr. Howell Williams congratulated the Committee upon having made such a good bargain.

Sir Melville Beachcroft, while joining in that congratulation, stated that there was a very strong feeling about the alignment, and an influential committee had been formed with the object of getting a better architectural view of the Law Courts. He proposed, therefore, to ask the Council to add the following words to the recommendation:—"And that the building line at the south-east end be such as the Council may determine, having regard to the alignment which the Council may fix hereafter."

Captain Swinton seconded the addendum, remarking that if this proposal were accepted it might be possible to get an adequate view of the Gladstone statue.

The Chairman ruled that Sir Melville Beachcroft's amendment was out of order, as it would increase the cost of the improvement, and must, therefore, be dealt with as a separate recommendation.

The recommendation of the Committee was then, without further discussion, adopted with only one dissentient.

Road Widening, Old Brompton-road, Kensington.—The Improvements Committee recommended, and it was agreed, that expenditure not exceeding 2,265*l.* be sanctioned in respect of the widening of Old Brompton-road near Summer-place; that consent be given under sect. 72 of the Metropolitan Management (Amendment) Act, 1862, to the widening executed by the Council of the Royal Borough of Kensington.

The Council adjourned at 7.30 p.m.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

- Lines of Frontage and Projections.**
- Norwood and Wandsworth.**—Buildings on the south side of Lancaster-road, Norwood, between Chatsworth-road and Dalmore-road (Mr. C. J. Bentley for Mr. L. S. Rogers).—Consent.
- St. Pancras, West.**—The erection of an illuminated sign at No. 292, Easton-road, St. Pancras (Mr. A. Monigetti).—Consent.
- Lewisham.**—Retention of two projecting shops at Nos. 17 and 19, Louisa-vaile, Lewisham (Messrs. Blake & Dannatt).—Consent.
- Wandsworth.**—A flight of steps in front of the Southfields Baptist Chapel, Wimbledon-park-road, Wandsworth (Mr. R. H. Weymouth).—Consent.
- Woolwich.**—Bay windows in front of Nos. 20, 26, 28, and 30, Beechhill-road, Eltham (Mr. J. J. Bassett for Mr. A. Cameron Corbett).—Consent.
- Woolwich.**—Bay windows in front of Nos. 1 and 7, Glenchiel-road, Eltham (Mr. J. J. Bassett for Mr. A. Cameron Corbett).—Consent.
- Woolwich.**—A porch to a house to be known as "Dulce Domini," on the western side of Cleantius-road, Shooter's-hill, Plumstead (Mr. A. A. Beard).—Consent.
- Deptford.**—Ten one-story shops at the junction of Horstead-road, Arica-road, and Revelon-road, Brockley (Mr. A. H. Kersey for the trustees of the late Robert Kersey).—Refused.
- Battersea.**—A porch to a proposed new church on the east side of Alreburg-gardens, Clapham-common (Messrs. Kelly & Dickie for the Rev. G. Grady).—Refused.
- Marylebone, East.**—An iron and glass shelter to the premises of Messrs. Waring, Limited, Oxford-street, St. Marylebone, on the east side of Binstead-street (Mr. R. F. Atkinson for Messrs. Waring, Limited).—Refused.
- Width of Way.**
- Dulwich.**—A building on the north side of Grace's-news, Camberwell-grove, Camberwell, with the forecourt boundary fence at less than the prescribed distance from the centre of the roadway of the street (Mr. A. W. Osborn, for Mr. J. F. Chiverall).—Consent.
- St. Pancras, East.**—A two-story building at the rear of No. 8, Rochester-square, Kentish-town, to abut upon Rochester-place at less than the prescribed distance from the centre of the roadway of that street (Mr. T. B. Westcott for Mr. W. Baskwill).—Consent.
- Stepney.**—A wood and glass roof over a portion of the yard at the rear of No. 52, Mile End-road, Stepney, at less than the prescribed distance from the centre of the roadway of Cecil-street (Mr. W. E. H. Crawley for Messrs. Franks & Simons).—Consent.

Holborn to Strand.—Letting of the Central

Camberwell, North.—Houses on a site on the east side of Elmington-road, Camberwell, with the forecourt fences at less than the prescribed distance from the centre of the roadway of that street (Mr. W. M. Proudfoot for Mr. S. F. Cope).—Refused.

Kensington, South.—The retention of an iron forecourt railing in front of No. 22, Aubrey-walk, Kensington, at less than the prescribed distance from the centre of the roadway of the street (Messrs. Selby and Kissingbury for Mr. A. Withers).—Refused.

Width of Way, Lines of Frontage and Projections.
Islington, North.—A library building with projecting porches on the east side of Holloway-road and south side of Fieldway-crescent, Islington (Mr. H. T. Hare for the Islington Metropolitan Borough Council).—Consent.

Width of Way and Space at Rear.
Bethnal-green, South-west.—A building at the corner of old Nichol-street and Clancey-street, Bethnal-green (Mr. C. R. Peters).—Consent.

Width of Way and Construction.
Woolwich.—Three temporary wood and iron sheds at the Borough Council's Callis-yard Depot, Woolwich, at less than the prescribed distance from the centre of Callis-yard (Mr. J. Rash Dixon for the Woolwich Metropolitan Borough Council).—Consent.

Lines of Frontage and Construction.
Rotherhithe.—An iron gangway to connect Hay's Wharf and Wilson's Wharf, over the public right of way leading from Battle-bridge-lane to Battle-bridge-stairs, Rotherhithe (proprietors of Hay's Wharf).—Consent.

Rotherhithe.—A wood and iron chute of a temporary character to connect Hay's Wharf with Wilson's Wharf, over the public way of Battle-bridge-lane, Rotherhithe (the proprietors of Hay's Wharf).—Consent.

Space at Rear.
Hampstead.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building, to be known as No. 8, Froggatt-terrace, West End-lane, Hampstead, with an irregular open space at the rear (Mr. R. L. Pearce for the Middlesex Building Company, Limited).—Consent.

Deptford.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of buildings on a site at the junction of Horstead, Africa, and Revelon-roads with irregular open spaces at the rear (Mr. A. H. Kersey for the trustees of the late R. Kersey).—Refused.

Cubical Extent.
Strand.—A building on the site of Nos. 132-135, Long-acre, to exceed in extent 250,000 cub. ft., and to be used for the purposes of a motor carriage works, repair shops, and showrooms (Mr. W. Woodward for Messrs. Slatter & Son and Mr. W. H. Eastgate).—Refused.

Height of Buildings.
St. George, Hanover-Square.—That the application of Mr. C. L. Morgan, for the London, Brighton, and South Coast Railway Company, for an extension of the period within which the erection of an addition to the Grosvenor Hotel, Victoria-station, Buckingham-palace-road, Westminster, was required to be completed, be granted.—Agreed.

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

Fifty Years Ago.

FROM THE *Builder* OF MARCH 22, 1856.

TYNDALL'S-BUILDINGS is a court containing twenty-two houses, of which the society have obtained possession of seventeen, including the two shops in Gray's Inn-lane, one on each side of the archway, and will presently have the rest. The houses are all front, few of them having even the smallest outlet, and are in the most miserable state of dilapidation. The shutters and doors are broken; from most of the windows projects a well-known apparatus for drying the day's "wash"; the pavement is broken and out of level, retaining decomposing matter to contaminate the air; while the basement story of nearly all the houses is filled with fetid refuse, of which it has been the receptacle for years. In some of the houses it would seem scarcely possible that human beings could live: the floors are in holes, the stairs broken down, and the plastering fallen; nevertheless, they are densely peopled, and as much rent is paid for the rooms as ought to obtain for the tenants decent accommodation. In one the roof has fallen in. It was driven in by a tipsy woman one night, who

sought to escape over the tiles from her husband. Listen to the conversation, if so it may be called, of those inhabiting it: you will find it in keeping with the disordered, disrupted, disreputable locality: notice the faces that press against the window-pane, or come out in to the doorways as a stranger passes round the court; you will find them altogether in accordance—as the house, so the inmates. Three or four years since, several of the cellars were inhabited, the place was ill-drained, cesspools were in the dark underparts. The police have since then interfered, and the drainage has been slightly improved. The condition, however, is still bad enough. Take, for example, one of the houses as a specimen of the rest. Entering the doorway, we were shown a narrow staircase, dark as night, broken and shaky, down which we groped with bent back and much difficulty. At the bottom a glimmering light showed a water-barrel which would hold fifty or sixty gallons at the most. It was at this time not eleven o'clock in the morning, and the water was all gone, and this was not to be wondered at, when we found that this barrel was the only supply furnished for two houses, which, at the lowest calculation, contained a population of 100 persons old and young—this to serve for all purposes of cleanliness and domestic use. In this dim underworld was also the only convenience provided for the same number of persons. The smell was abominable. The owners of such places, as we have before observed, say:—"People of this sort are naturally dirty, and it is useless to do anything with them." We would ask in reply, "How is it possible that good habits can be acquired under such circumstances?"

Illustrations.

PALAZZO AVIGNONESI, MONTE-PULCIANO.

THE Palazzo Avignonesi was built by Giacomo Barozzi, of Vignola, during the latter half of the XVIIth century. The building looks well in execution, being situated upon the angle of the main thoroughfare (a very steep hill) of Montepulciano, a small town in Central Italy, about 2,000 ft. above sea level.

The ground floor rooms are vaulted over, and, although now used as a granary, still retain very good frescoed ceilings and walls. The sections show the curious arrangement of window seat and step up so often used in Italian houses.

The upper floors have been reconstructed, and are now used as flats, although the facade remains untouched. The coat of arms over the doorway is that of Cardinal Roberto Bellarmine, being probably added after the completion of the building.

LIONEL U. GRACE.

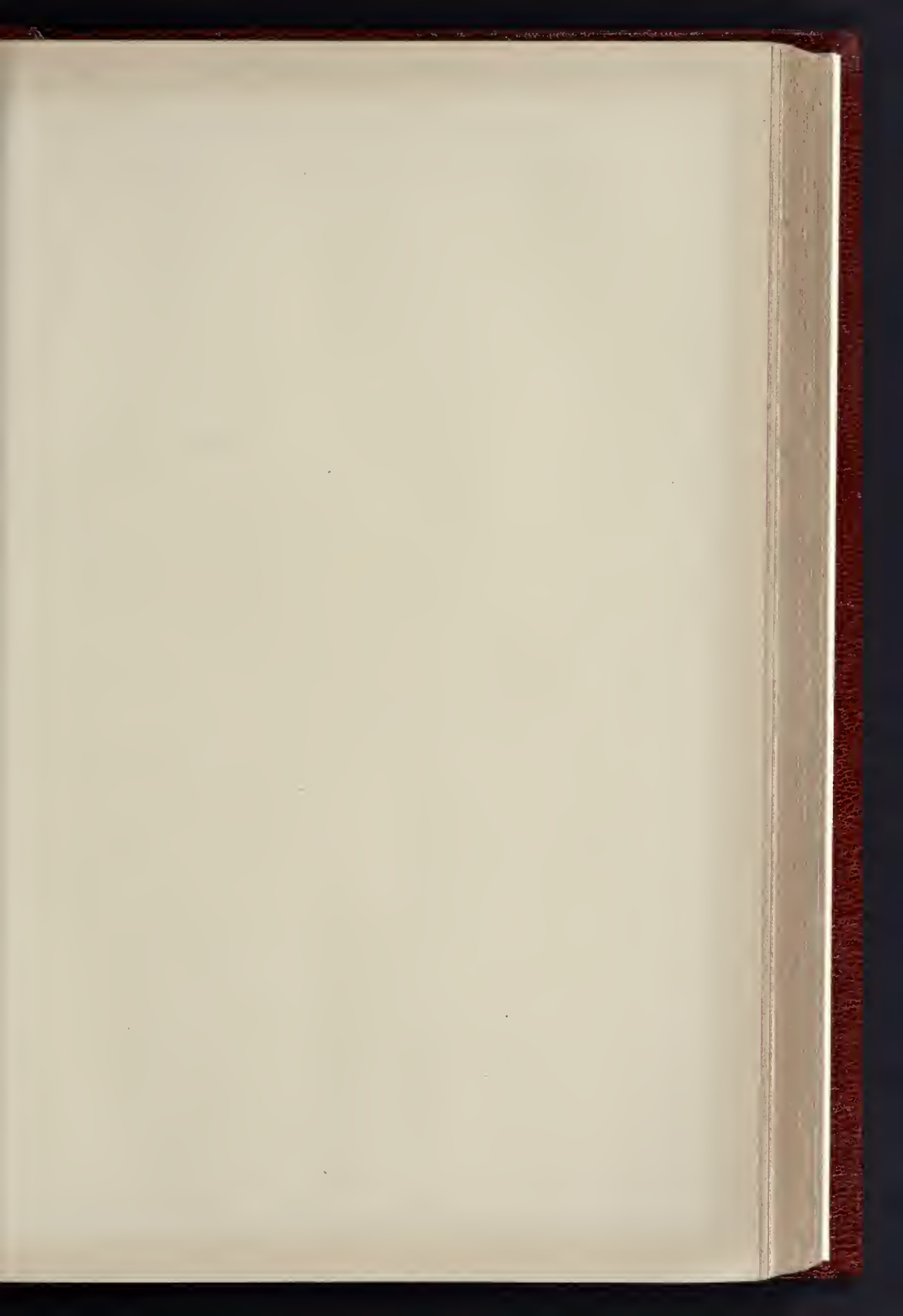
BLEBO HOUSE, FIFESHIRE.

THESE illustrations show additions which have been made to Blebo House, Cupar, Fife.

The house, which stands on a very finely wooded site, is of a simple Classic design typical of Scotch mansion houses about the middle of the XVIIIth century, and is built of local yellow sandstone. The additions have been carried out in the same stone, and the roofs are covered with green



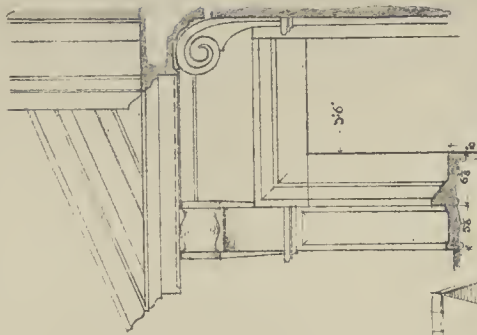
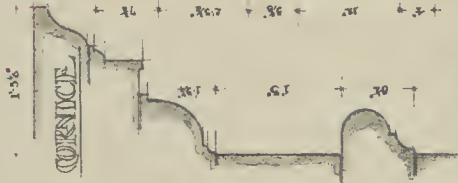
Blebo House, Fife. Plan.



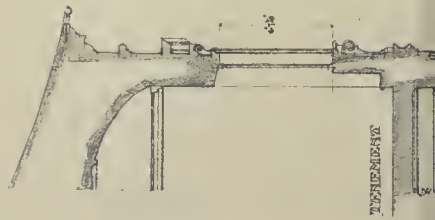
THE BUILDER, MARCH 24, 1906.

RALAZZO AMIGNONESI
Nº 37 VIA CARIBALDI
MONTEPULCIANO

VIGNOLA ARCHT.
MEASURED & DRAWN JULY 1904
Jonal & Co. Ltd.

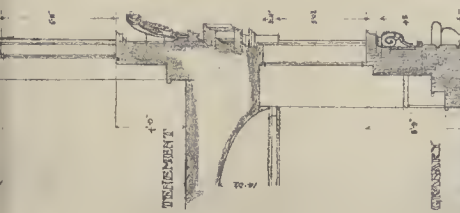
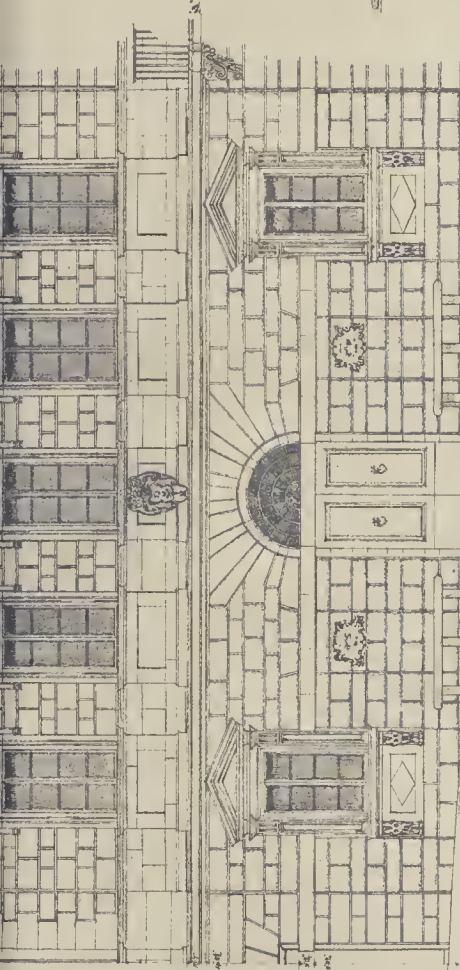


WINDOWS
2ND FLOOR

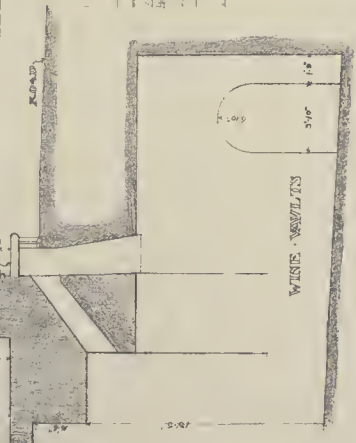


TERMINI

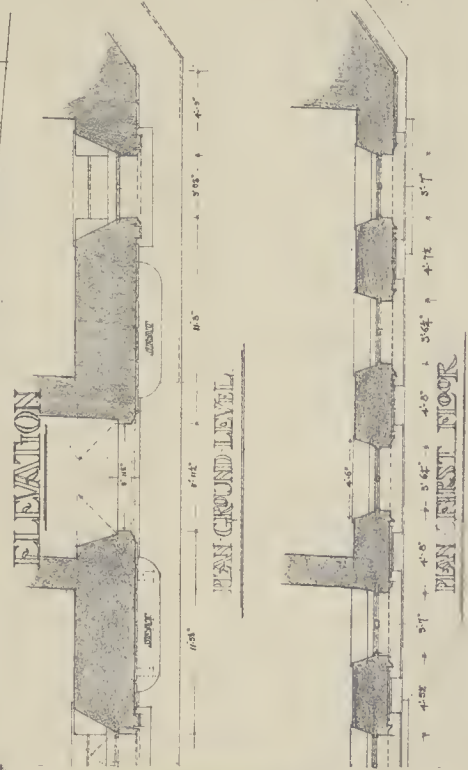
WINDOW
PIECER



ELEVATION



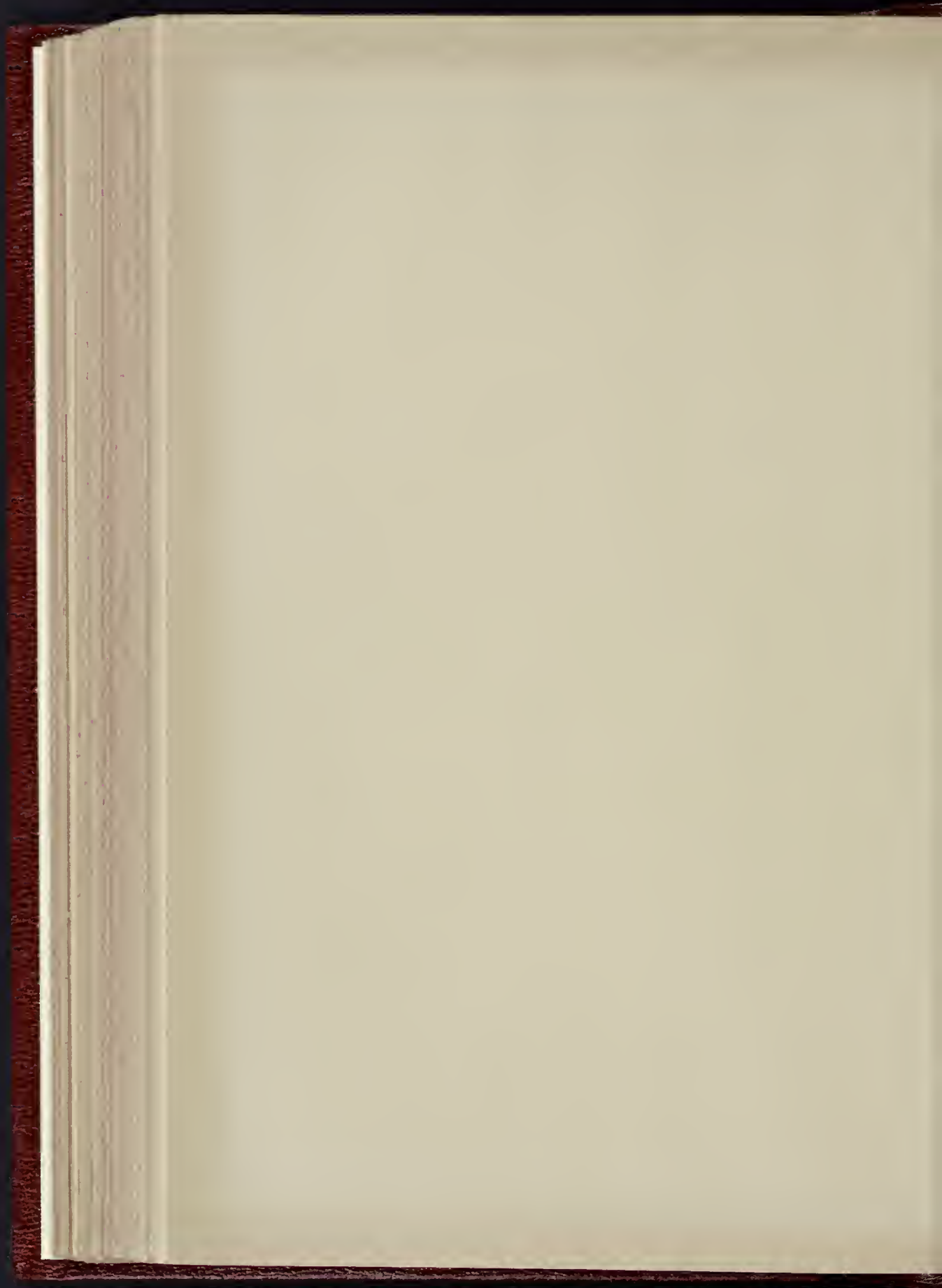
SECTION

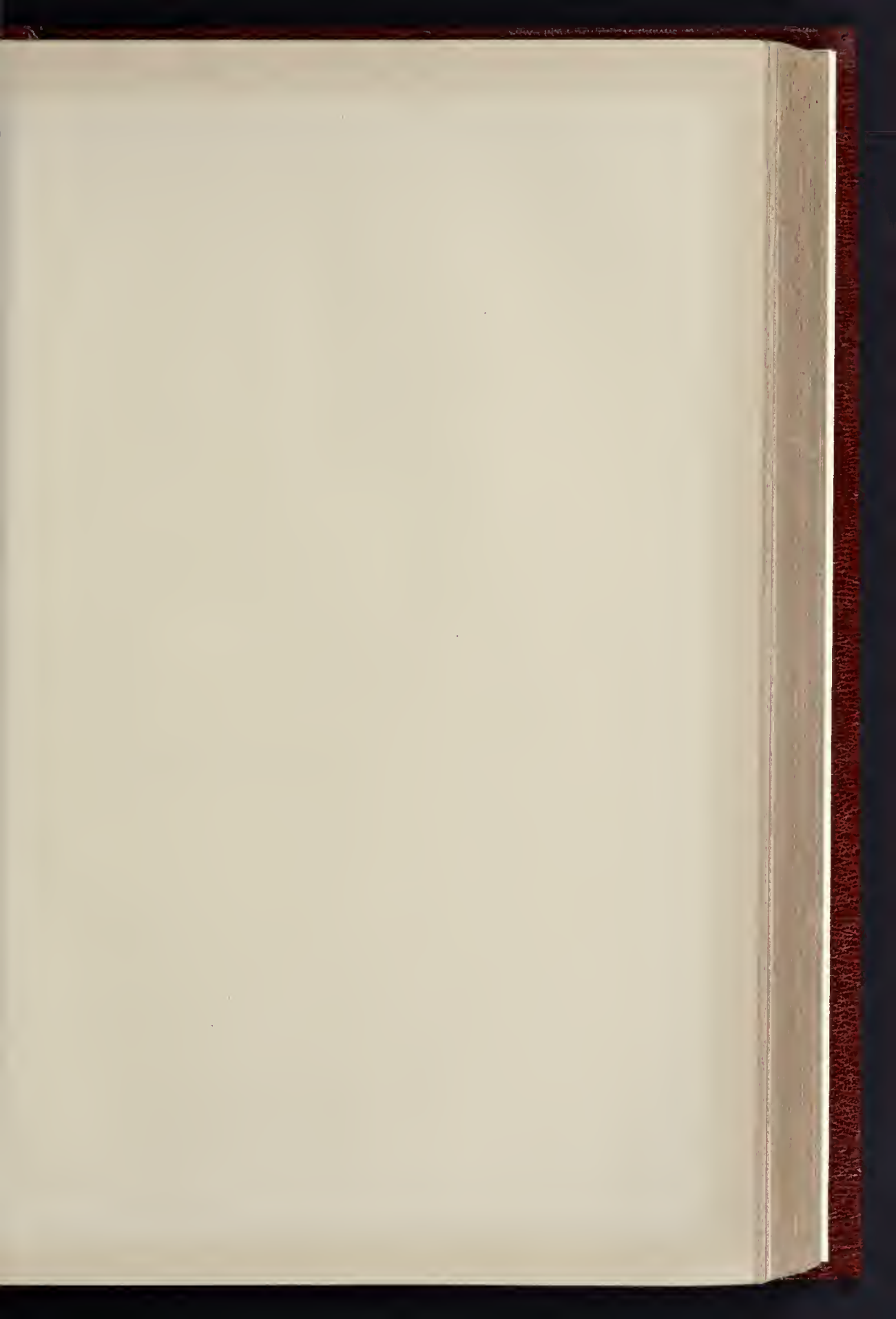


GROUND FLOOR

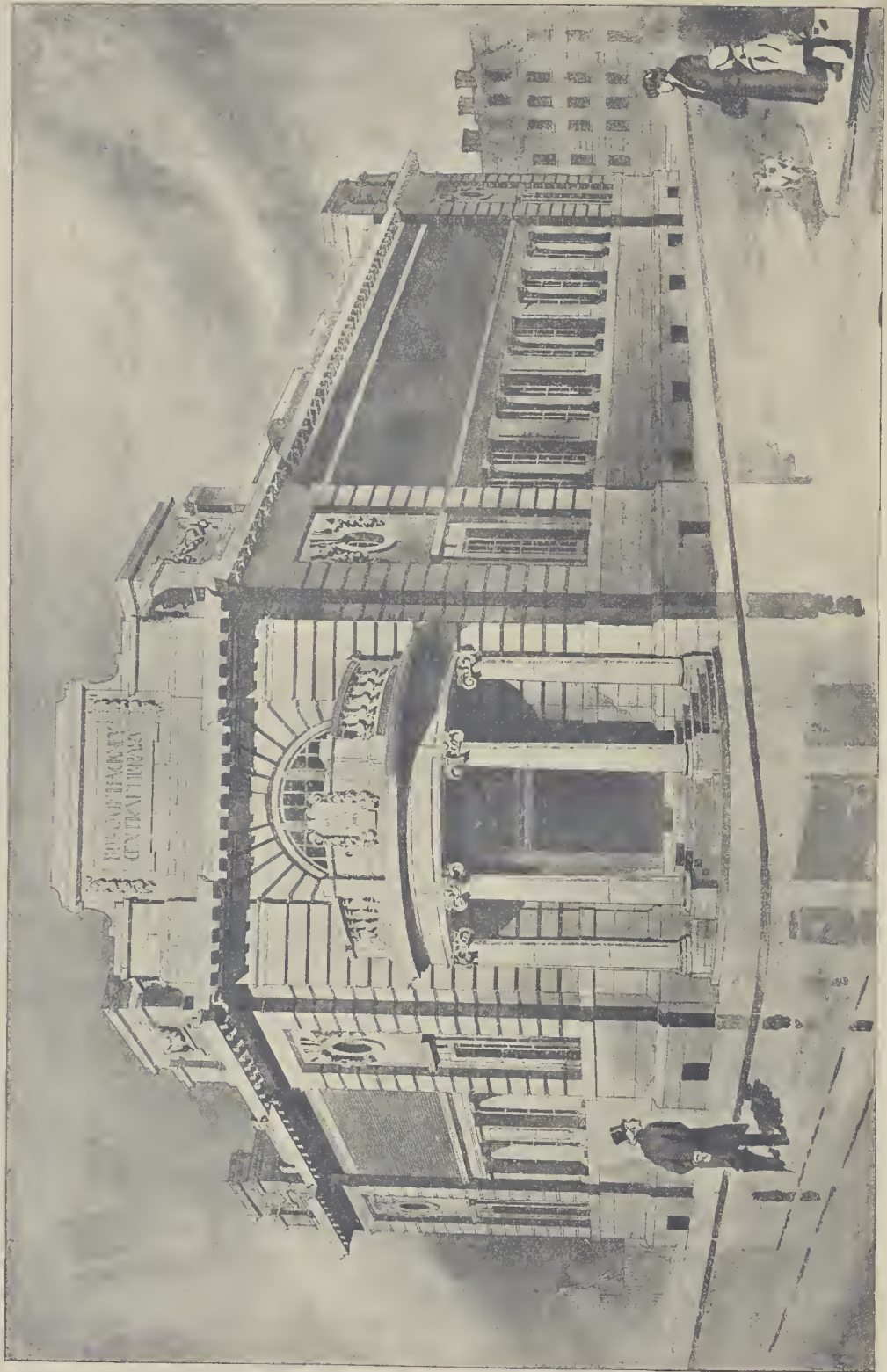
WINDOVS

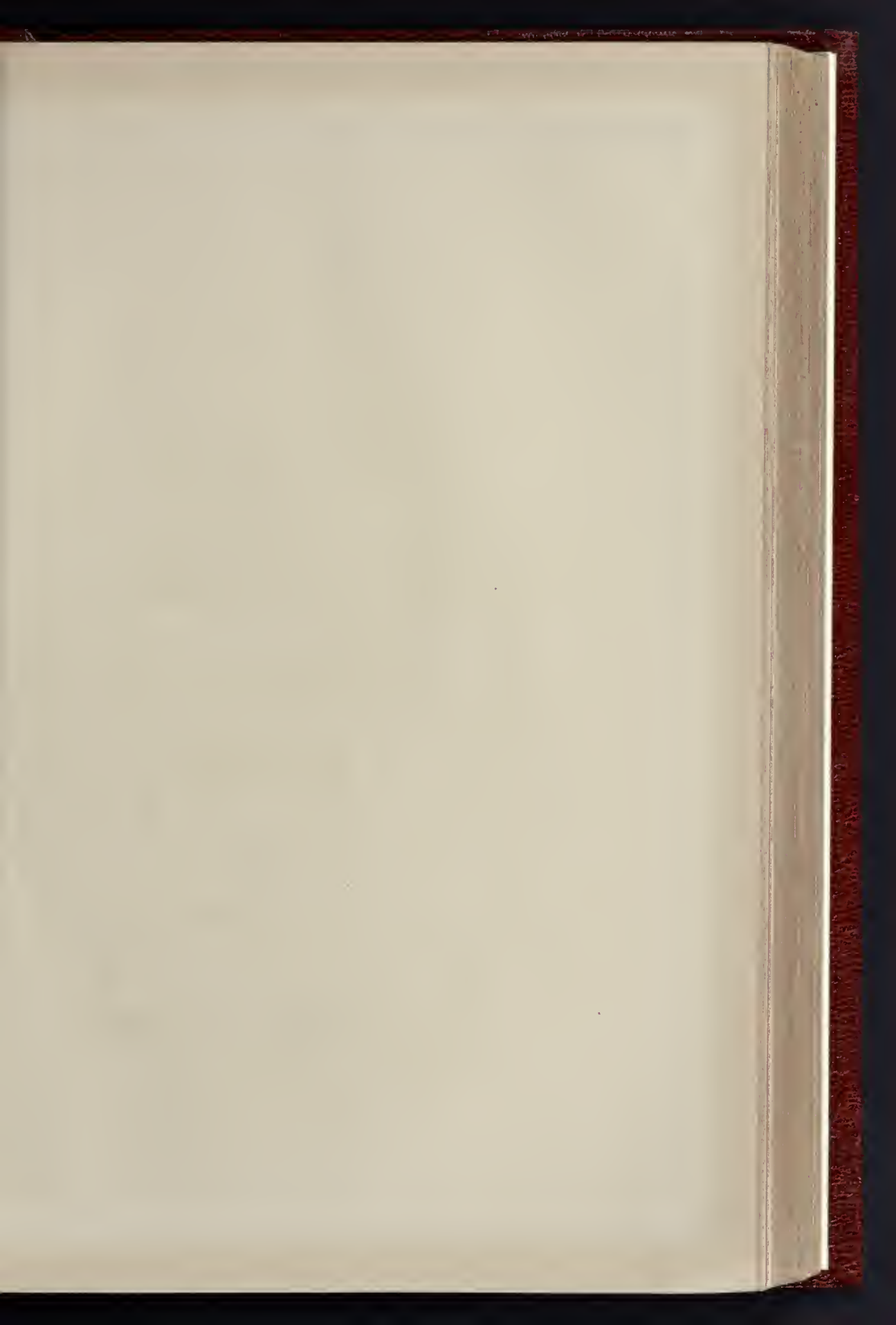
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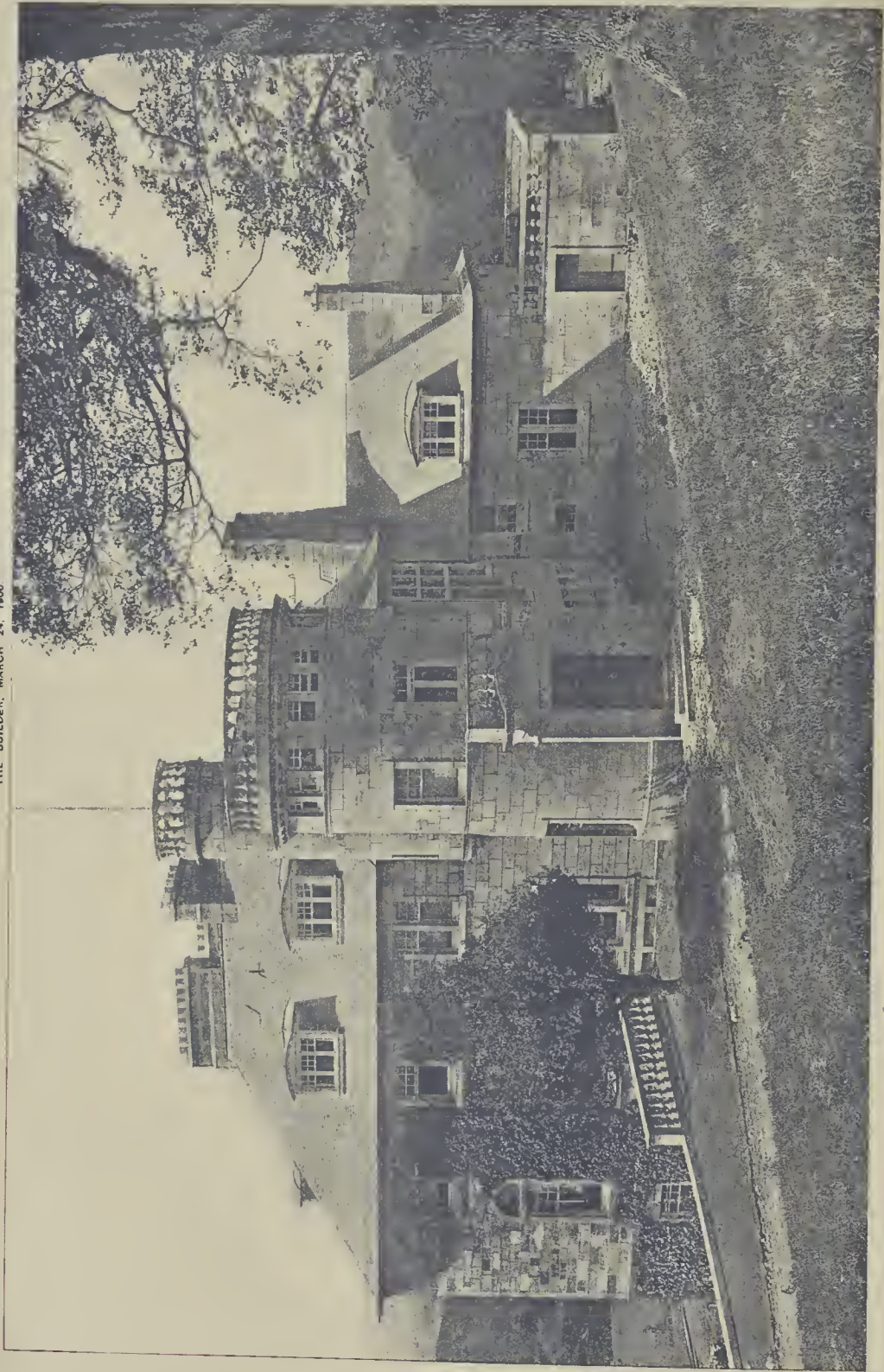


THE BUILDER, MARCH 24, 1906.



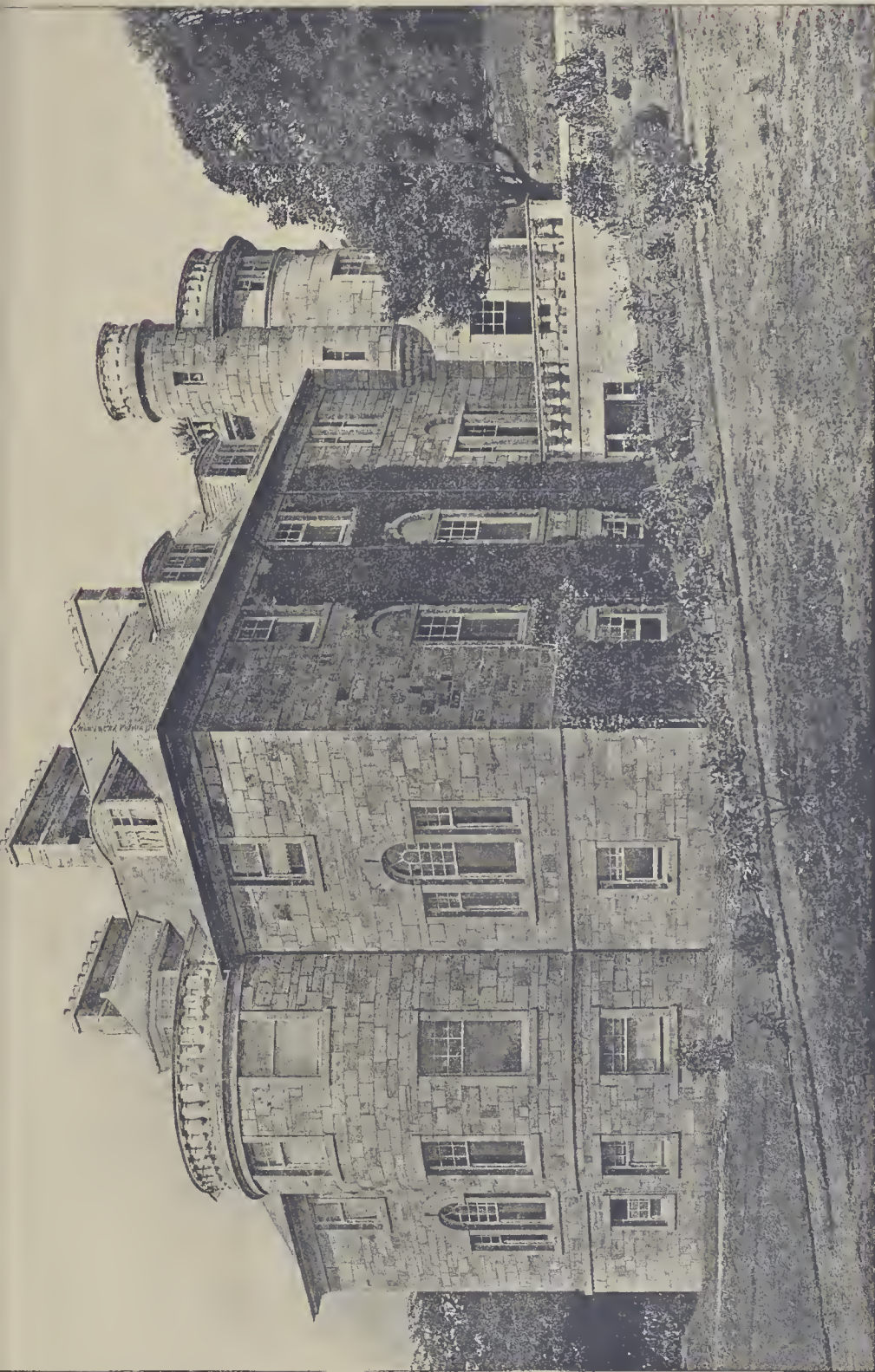


THE BUILDER, MARCH 24, 1906



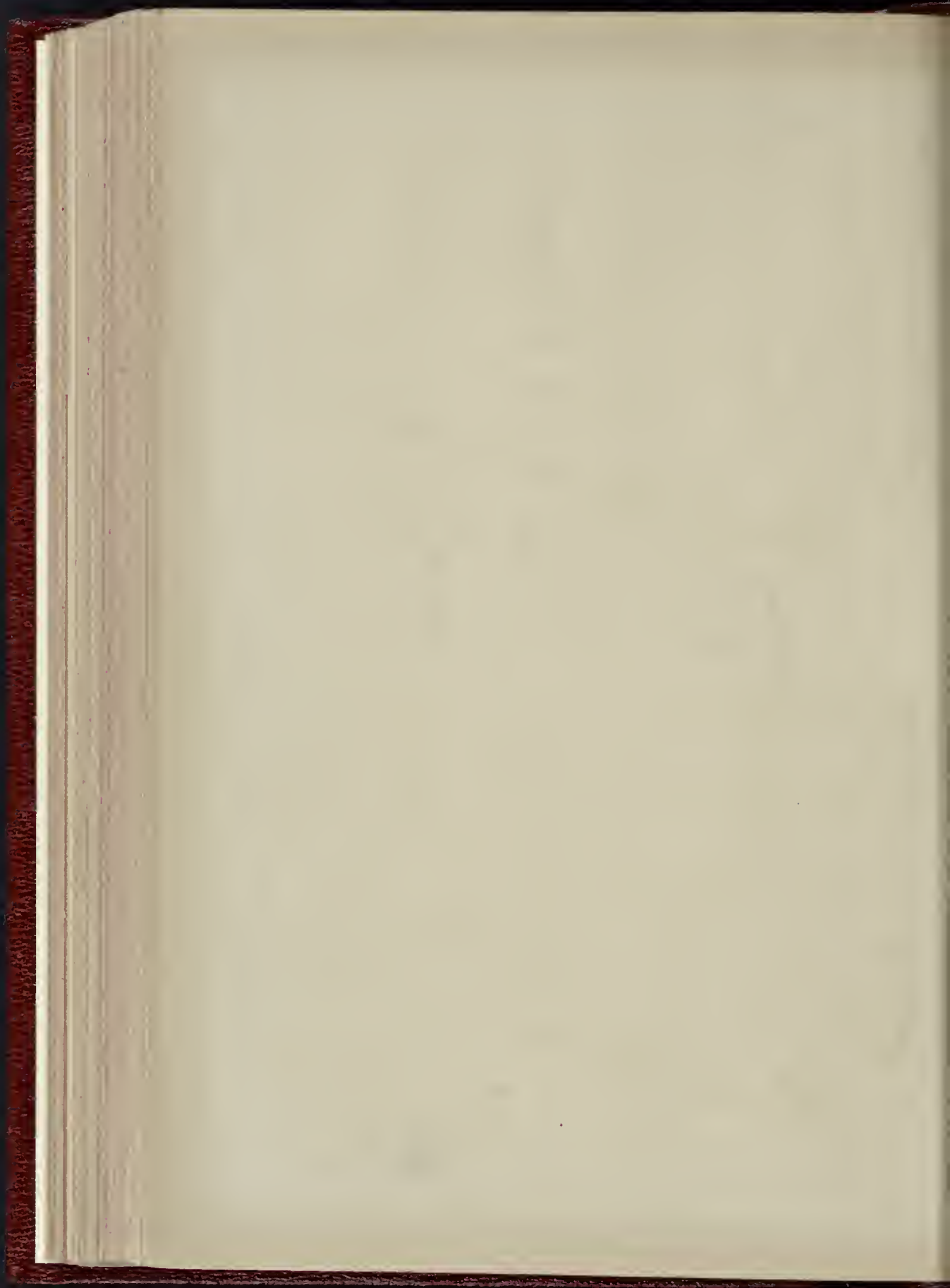
BLEBO HOUSE, FIFESHIRE.—MR. JAMES FINDLAY, ARCHITECT.

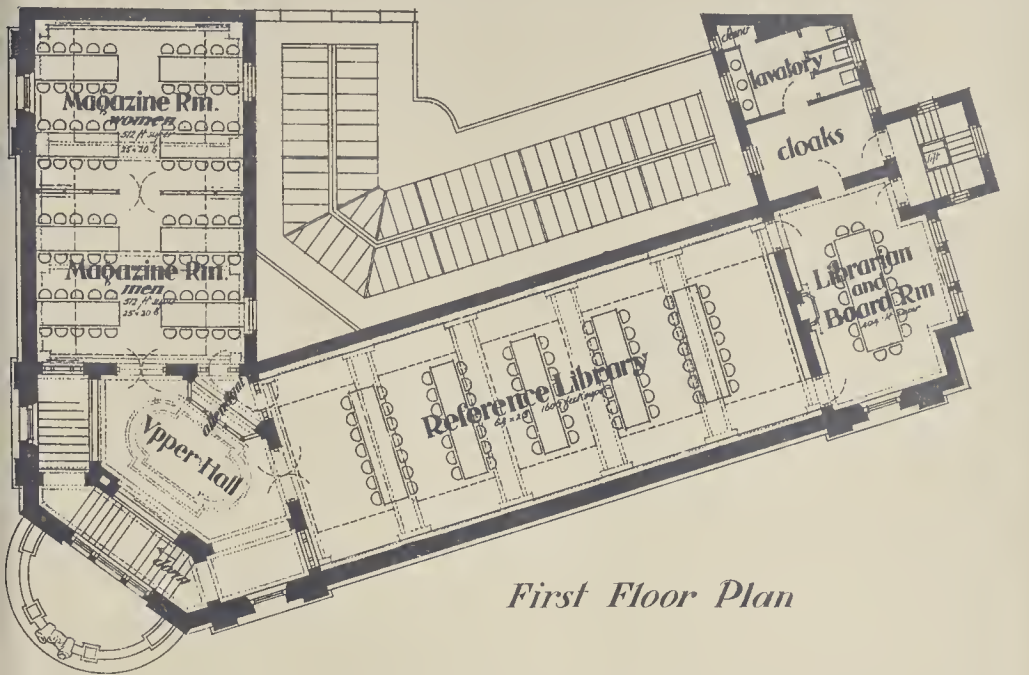
INK PHOTO, SPRACUE, C. L., 4 & 5 EAST HADDING STREET, LONDON, E.C.



INK PHOTO-GRAPHE S.C. L. 4. 5 EAST-WINDING STREET PETERHEAD E.C.

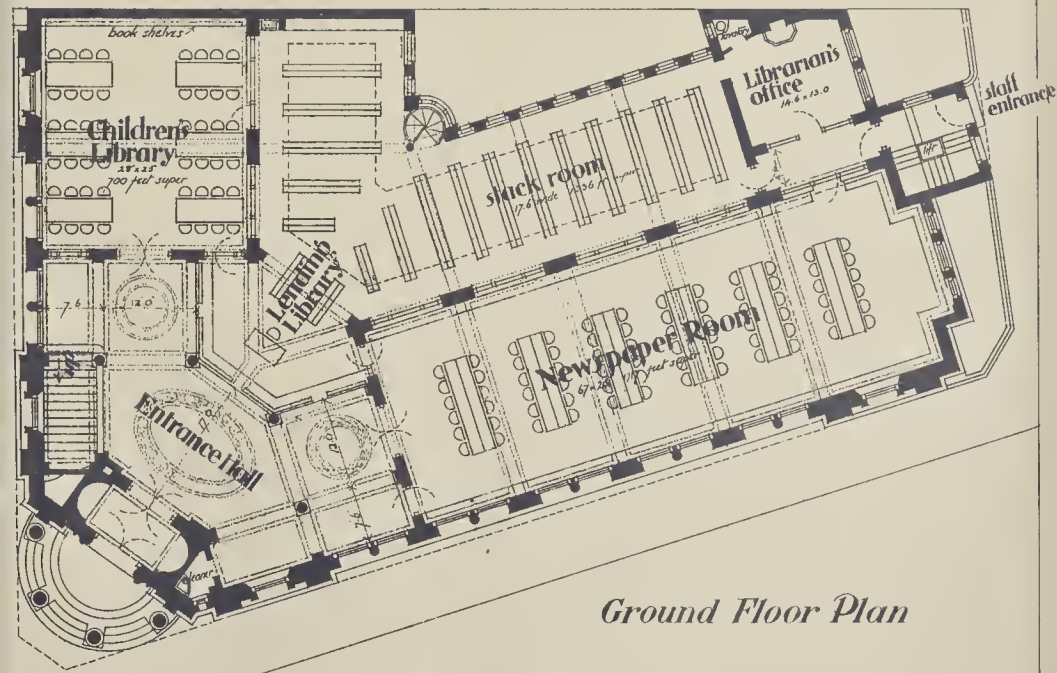
BLEBO HOUSE, FIFESHIRE.—MR. JAMES FINDLAY, ARCHITECT.





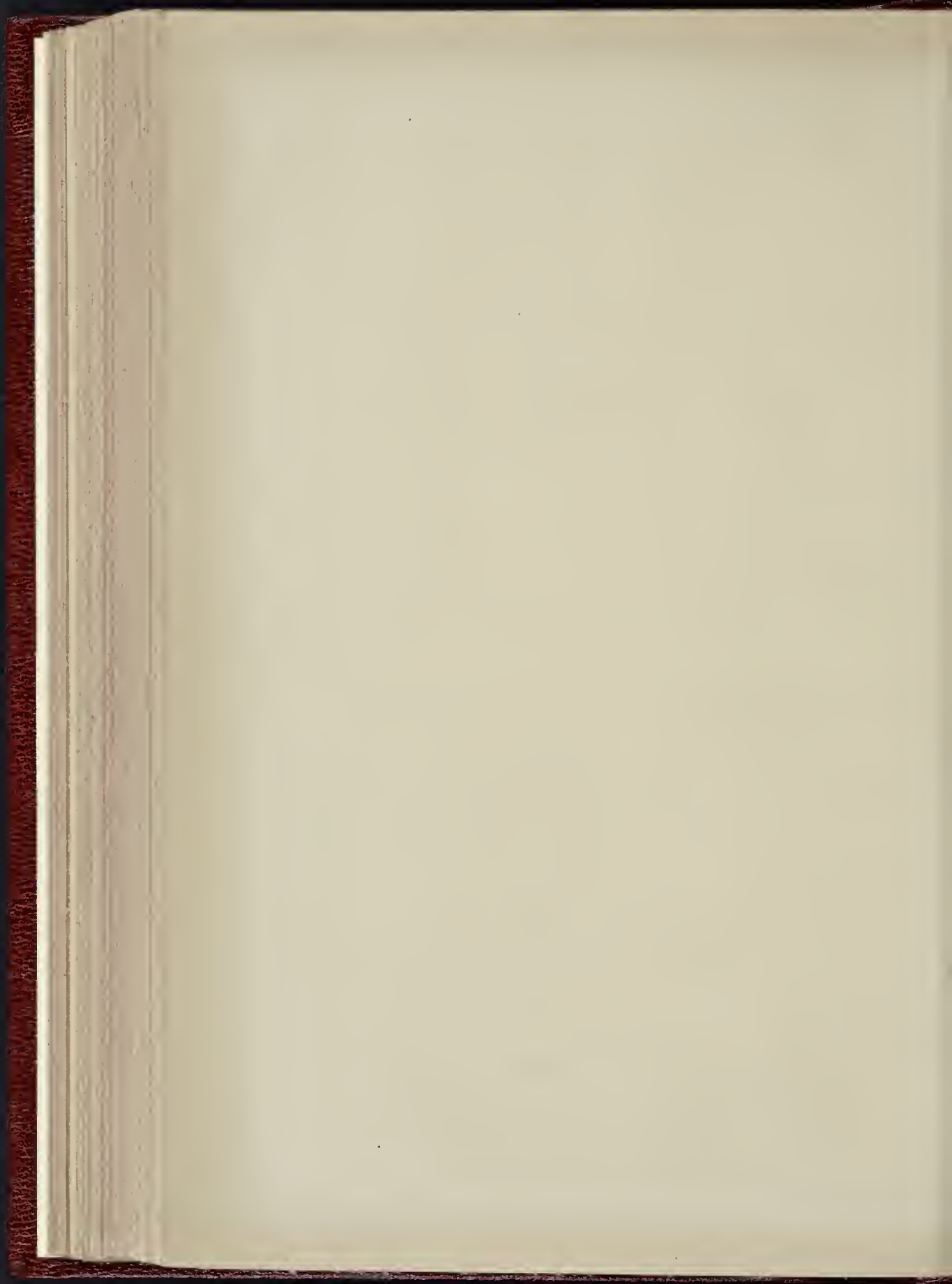
First Floor Plan

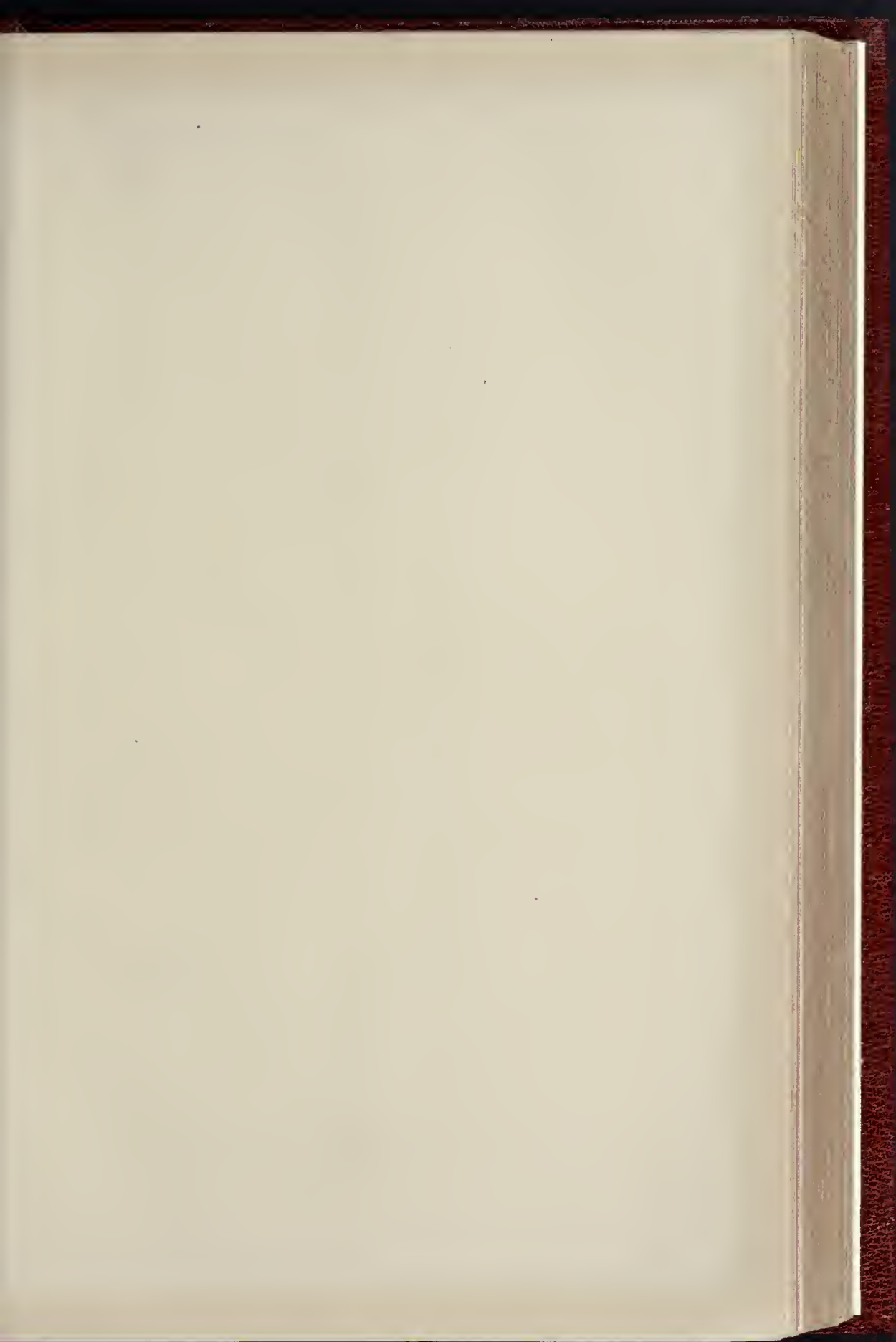
Scale of 10 5 0 10 20 30 40 50 Feet

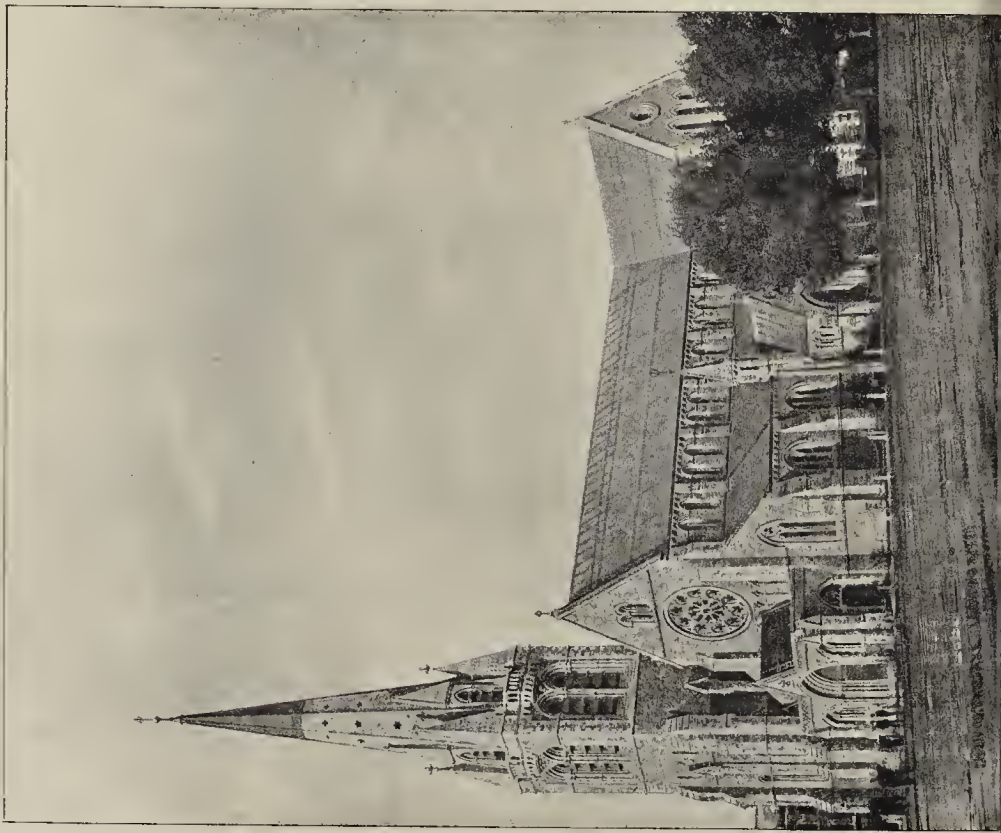


Ground Floor Plan

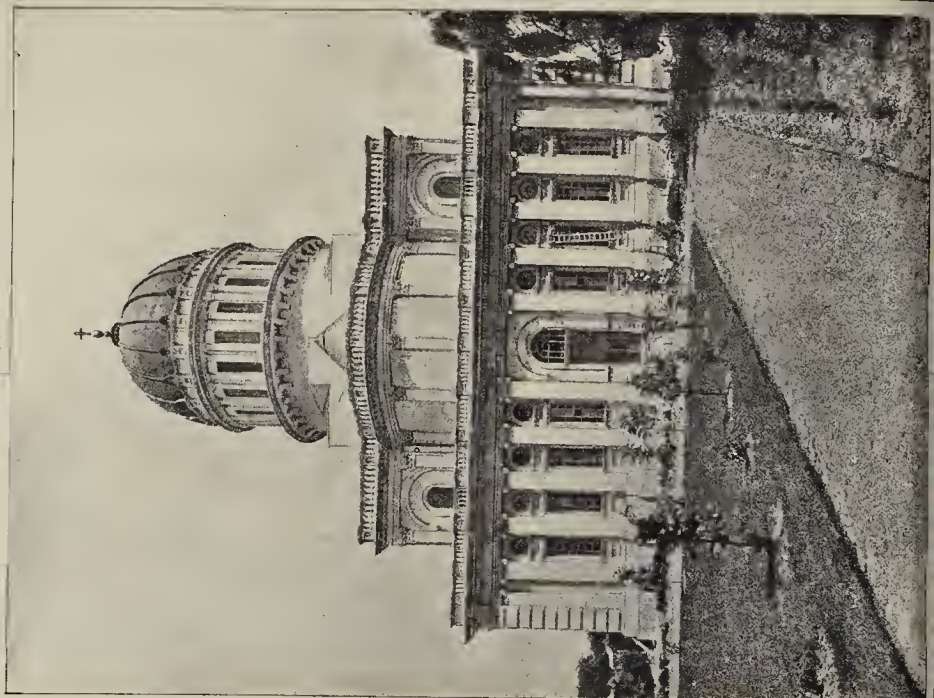
INK PHOTO, SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE, E.C.



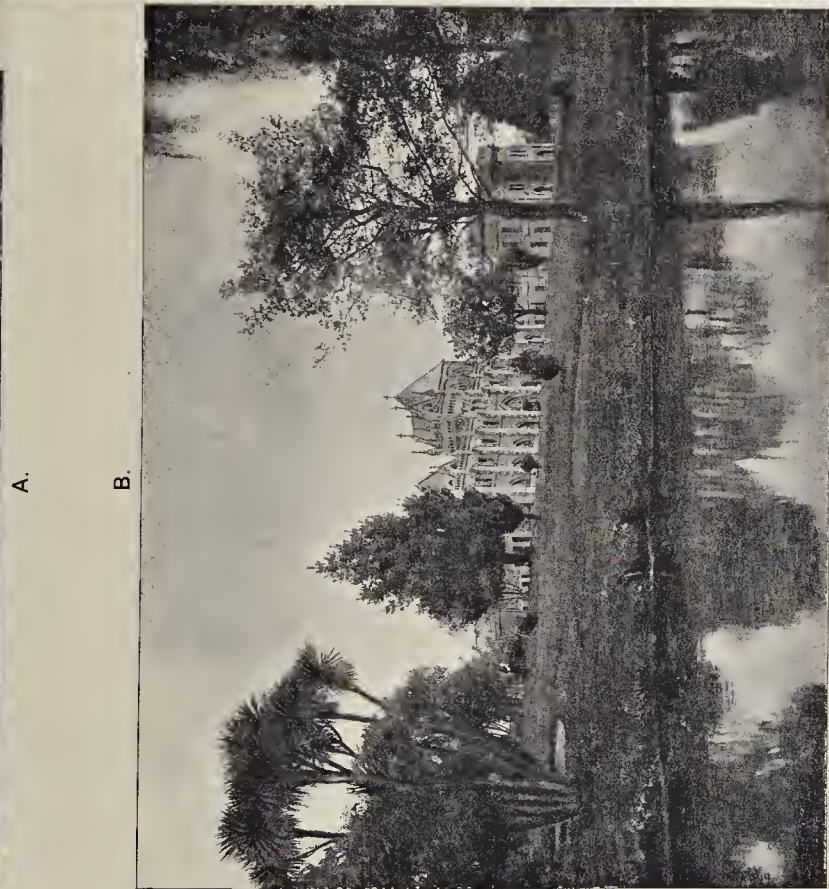




C.



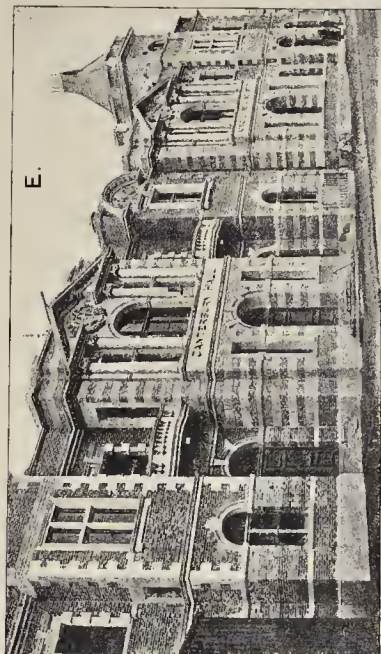
A.



B.



D.



E.

A. Christ Church Cathedral.

B. Supreme Court (on the Avon).

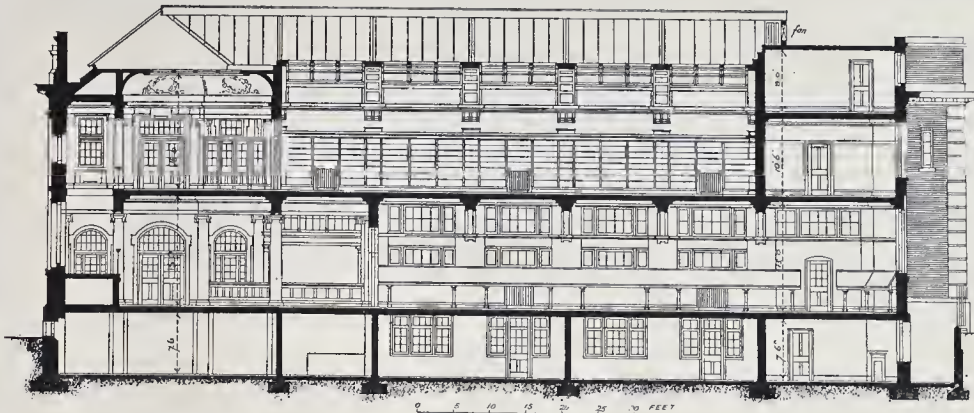
E. Canterbury Hall.

C. Catholic Cathedral.

D. Bank of Australia.

INK PHOTO SPRAGUE & C. L. 4 3 EAST HARDING STREET FETTER LANE E.C.

BUILDINGS IN CHRISTCHURCH, NEW ZEALAND.



Design for Hackney Central Library. Section.

Westmorland slates, while the inside finishings are executed in fumed oak and pitch-pine.

The architect is Mr. James Findlay, of Dundee.

HACKNEY LIBRARY.

This design, which was placed first by Mr. J. W. Simpson, the assessor, in a recent open competition, provides accommodation for a central library which it is intended to erect at the corner of Mare-street and Paragon-street, Hackney.

The form of the plan is determined by the lines of the site, and an endeavour has been made to obtain complete supervision, by a small staff, not only of the reading-rooms but also of the public stairs and entrance. Efficient natural lighting and cross-ventilation have also been aimed at.

It is intended to face the building with Monks Park stone and red bricks, while the construction will be fireproof throughout.

The architect is Mr. Henry A. Crouch.

BUILDINGS IN CHRISTCHURCH, NEW ZEALAND.

THESE illustrations, taken from photographs, are given in connexion with the first article in this issue, to which the reader is referred.

Architectural Societies.

MANCHESTER SOCIETY OF ARCHITECTS.

The eleventh meeting of this Society was held last Tuesday evening, and was presided over by Mr. Paul Ogden, F.R.I.B.A., who, after a few preliminary remarks, called upon Mr. Charles Swain to read a paper entitled "The Development of Plan." The lecturer dealt at length with the subject, and showed how in the modern planning of ecclesiastical, public, and domestic buildings there is a development from the crude design of the early and medieval times. The lecture was illustrated chiefly by plans of the XVth century. The Chairman, in his summing-up remarks, cited further instances which clearly showed a development of plan in accordance with the views of the lecturer. Mr. Ogden felt that the books dealing with this subject were in many cases mere pretences, for they only gave plans without showing their development to that stage.

Books.

A History of English Furniture. By PERCY MACQUOID, R.I. London: Lawrence & Bullen, Ltd.; New York: G. P. Putnam's Sons, 1905.

The second volume of this sumptuously-illustrated history commences with that period of activity in furniture production following upon the death of Oliver Cromwell in the middle of the XVIIth century. The period dealt with is spread over about eighty years, called by the author the "Age of

Walnut." Walnut-trees appear to have been planted in great quantities in Elizabeth's reign, and the wood was for some time only used as a decoration in conjunction with oak; it was much used for furniture on the Continent, and by the Restoration was in general use in this country as a suitable framework for upholstered furniture. When large pieces of furniture were made throughout of walnut it is probable that the wood was imported, as in the case of oak wainscot panelling in Elizabethan times. Oak still held its own for constructional purposes, walnut being venerated to its surface with applied mouldings in the same wood. It is not easy to find a more beautifully-marked wood than English walnut, the one objection to its use being its liability to decay by worm if neglected; this defect is probably the weightiest of those reasons which led our ancestors to adopt mahogany in its place. As a reassurance to the lovers of walnut furniture, we would point out that mahogany is also liable to decay by worm if not carefully cleaned at intervals with paraffin oil. Chapter I. contains matter relating to chairs and cabinets of the Restoration Period, a period remarkable for the fine combination of carving and turnery; the later chairs aim at graceful combinations of the lines of the various parts rather than richness of ornament, or where richness of ornament is aimed at it is obtained by velvet and silk covers of fine design. The third chapter deals with the early marquetry work of the last quarter of the XVIIth century. Mr. Macquoid shows by illustration that in cutting their marqueterie patterns the ground was not wasted; two chests of drawers are shown of the same design in which the dark wood cut away forms the ground in one and the pattern in the other. It is difficult to discriminate between foreign and English marquetry; there is no doubt much that is regarded as foreign work was made in this country, and Mr. Macquoid mentions several characteristics of the English examples. Chapter IV. deals with stools and settees; the latter show some of the most beautiful designs in structure and material of any class or period in the history of furniture. The damaske and velvets made for the purpose are most rich and fanciful in design and colour, the turning and carved scroll-work and the lines of the compositions bold, graceful, and delicate; here and there extravagance may spoil the effect as in the settee, Plate VI. As a general rule the pieces are wrought to the highest pitch of perfection; figures 71 and 72 are examples of this. The chapter also includes an account and many illustrations of the silver tables, mirrors, and furniture that were in vogue in Charles II.'s time; the custom of overlaying furniture with silver was fortunately knocked on the head by a tax on plate imposed by William III. in 1696, when no doubt great quantities of Charles II. silver furniture disappeared into the melting-pot. The next extravagance was that of Grinling Gibbons in the XVIIIth century. Both

in technical excellence and beauty the wood-carving of this period excels anything produced in other countries, though it lead to no advance in construction; the realism of the decoration is out of place in serviceable pieces of furniture. It is at this juncture that the beneficial influence of architects like Sir Christopher Wren began to be felt in furniture design. Chapter V. deals with chairs and the latter marquetry, and Chapter VI. with lacquers, which became a fashionable form of decoration in the XVIIIth century, practised both by professional artists and amateurs. Chapter VII. deals with bed-enormous structures, some near 20 ft. high, hung with the richest velvets. Beds were considered by far the most important furniture in the room, and were specially described in wills of the period. The remaining chapters bring us down to Queen's Anne's reign, a prolific period of production, united with saneness of taste. They show the development of the cabriole leg and the ball-and-claw foot, the illustrations of which prepares us for the third volume, which is to deal with mahogany furniture.

Cassell's Building Construction. By Professor HENRY ADAMS, M.Inst.C.E., etc. London: Cassell & Co. 1905.

TO THE various text-books on building construction this new work is a welcome addition. Originally issued in weekly parts, the treatise now appears in the form of a handsome volume of more than 550 pages, illustrated by 2,300 blocks and twelve full-page coloured plates. The first thing to strike the eye in a preliminary examination is the thoroughly business-like manner in which the author has set about his onerous task. No space is wasted by tedious preliminary observations, and from first to last everything said is to the point. Including a brief introduction there are twenty-two chapters, each divided into paragraphs with distinctive headings, which in many cases render unnecessary any reference to the index. The latter is a specially praiseworthy feature occupying sixteen pages, and containing nearly 4,000 references. The illustrations are, without exception, reproduced from line drawings and diagrams, many of them have figured dimensions, and wherever such treatment is suitable they are drawn in accordance with a uniform system enabling the reader to identify at a glance the chief materials of construction indicated. One disadvantage we must point out is that the coloured plates are not invariably bound in appropriate positions. For example, the plate illustrating the "Five Orders of Architecture" is in the chapter on "Foundations," 500 pages away from its natural place; "Window Sashes" occur among the illustrations relating to steel girders; "Open Timber Roofs" is in the middle of the chapter on "Plumbing"; and so on. The utility of the plates is further decreased by the fact that none of them bears any reference to the text, and we have not

observed any reference in the text to the plates. It rather looks as if the binders had inserted these plates on their own responsibility without waiting for proper instructions from the author through the publishers.

So much for the general characteristics of this volume, which produces a most favourable impression at first sight. More extended study of the contents certainly confirms this impression and leads to the final opinion that in his new work Professor Adams has collected an extraordinary quantity of sound and practical information dealing with materials and methods of construction and the principles underlying building practice. It may be, as the author modestly hints, that the quality of continuity is occasionally lacking in the text. But we have not observed anything of the kind that can be suggested as a defect. On the contrary, the concise and direct treatment of different points connected with each branch of work should be regarded as a recommendation. Architects and builders do not want to find practical instruction swimming in a flow of beautiful language from which it has to be fished out with persevering labour, and we feel sure they will appreciate to the full the manner in which Professor Adams has endeavoured to save their time and facilitate their studies in this encyclopaedic text-book.

Structural materials, such as timber, brick, stone, lime cement, sand, iron and steel are discussed under the chapters wherein the corresponding types of construction are considered. The materials in question are not dealt with exhaustively, the manifest object of the author being to content himself with the presentation of practical notes and hints, leaving readers who require other information to find it elsewhere. All the main branches of work comprised in building construction receive very ample treatment, in which the illustrations play no inconspicuous part. Plumbing and other branches of domestic engineering are more lightly treated, and here the reader finds just enough information to make clear the necessity for studying each of these extensive subjects by the aid of a special treatise.

Having covered the essentials of building construction in the manner generally indicated above, the author has selected some of the subjects for more theoretical consideration, as shown by the chapters on "Stress Diagrams for Roofs," the "Strength of Beams and Girders," "Struts, Stanchions, and Arched Ribs," and the "Stability of Walls," and he concludes the book by a series of illustrated notes upon "Architecture." The least satisfactory chapter is that upon "Bridges," a branch of work which scarcely belongs to what is commonly recognised as "building construction" and really requires an entire volume for anything like adequate exposition. The construction of brick and masonry arches is previously discussed in connexion with these two materials, and we are inclined to think that in future editions the chapter on bridges should either be omitted altogether or modified so as to refer only to such structures as architects and building contractors are called upon to design and build. The design of railway viaducts, large highway bridges, and suspension bridges cannot be satisfactorily expounded within the limits accorded in this text-book, and the space so occupied might be devoted advantageously to the more complete discussion of small timber and steel footbridges. The same remark applies to "Wooden Bridges for 100 ft. and 200 ft. Span," a class of structure which nobody is likely to want in the present day.

There is far too much material in this book to permit anything like detailed comment upon its contents. We have indicated its general scope and salient features, and will add that Professor Adams thoroughly deserves the thanks of architects and builders for this valuable work, and that students will find in it a most useful complement to whatever text-book on building construction may be already in use as the basis of their studies.

Proceedings of the Incorporated Association of Municipal and County Engineers. Vol. XXXI. (London: E. & F. N. Spon, Ltd. 1905.)

In the last volume of "Proceedings" issued

by this Association several of the papers appeal to architects and engineers generally. Mr. H. K. G. Bamford, F.C.S., in dealing with the manufacture and testing of Portland cement could not very well say anything of much novelty, for modern methods have been repeatedly discussed at great length within the last two or three years. His paper, however, is a useful and concise epitome of present practice. Mr. Philip H. Palmer, M.Inst.C.E., contributed a short paper on "Armoured or Reinforced Concrete," summarising some of the chief points connected with the combination of concrete and steel and giving some examples of construction. Mr. A. R. Galbraith, A.M.Inst.C.E.I., read a paper on "Reinforced Concrete Piling," which deserves special commendation for the thoroughly practical manner in which the subject was treated. In discussing the important question of "Rivers Conservancy" Mr. Herbert G. Coales, A.M.Inst.C.E., certainly rose to the occasion in a very satisfactory manner, his paper being one that puts the case for reform with conspicuous lucidity. Among other noteworthy contributions are those of Mr. Albert D. Greatorex, A.M.Inst.C.E., on "Suggested Amendments to the Model Building By-laws for New Streets and Buildings"; Mr. C. H. Cooper, M.Inst.C.E., on the "Adaptation of Highways for Modern Traffic"; and Mr. Joseph Owen, on "Tramway Permanent Way Materials and Construction." The volume contains other papers, chiefly of local interest, and is well illustrated by numerous plates of diagrams.

Industrial Efficiency: A Comparative Study of Industrial Life in England, Germany, and America. By ARTHUR SHADWELL, M.A., M.D. In two vols. London: Longmans & Co. 1906.

THE prosperity of a nation must largely depend on its industrial efficiency—in other words, on the capacity of its men and its machines for the work which they have to do. Such an examination, therefore, as that which Dr. Shadwell set himself to accomplish, and the results of which are contained in these two interesting volumes, is of the first importance. Scientific in intention, this book, when it is carefully examined, is somewhat loose both in analysis, reasoning, and conclusions, one, and the main one, of which is that England in some respects has been industrially outstripped by her rivals. But because a nation has been able to surpass an older society in some respects it gives no cause for fear, because industrial progress depends on many circumstances connected with climate and so forth. But unquestionably a perusal of this book will enable those who are interested in the subject which it treats to better understand some of the factors of international industrial competition. Some of these are personal, others political; some depend on education, and some on long-standing social conditions. The book is one to be read and to be pondered over.

BOOKS RECEIVED.

THE LONDON BUILDING ACTS, 1894 to 1905. By E. A. Cohen, Barrister-at-Law. (Stevens & Sons. 25s.)

THE ARCHITECTURAL ASSOCIATION SKETCH-BOOK. Edited by W. G. B. Lewis and Theodore Fyfe. Vol. IX. (The Architectural Association.)

MEDIEVAL RHODESIA. By D. Randall-MacIver, M.A., F.R.G.S. (Macmillan & Co. 20s.)

DORCHESTER (DORSET) WITH ITS SURROUNDINGS. (The Homed Association. 1s.)

REASON AS A BASIS OF ART. By C. F. A. Voysey. (Elkin Mathews. 1s.)

Correspondence.

FERRO-CONCRETE.

SIR,—The great interest that is now evident amongst engineers and architects in all that relates to this subject, owing principally to the enterprise of agents for several foreign systems of ferro-concrete construction, should not be allowed to obscure the work of a pioneer of the system, Mr. Hyatt, over a quarter of a century ago.

Those who are interested in the early history of the system should refer to the pages on

fire-proofing in a work on the "Fire-resisting Arrangements of Factories, Workshops, etc.," by B. H. Thwaites, C.E., published by Spon in 1882. The method of utilising concrete not only as a metallic preservative but also as an agent of compressional strength, is clearly shown, so that in simple justice to Hyatt his work should be remembered.

PULPITS AT RAVELLO.

SIR,—A correspondent kindly points out to me that the Latin inscription referring to the date of Duomo pulpit reads:—

... Lapis, Millenis, Bis Centum, Bisque Trisemis Christi Bissenis," etc.

"Thrice six" should, therefore, have been "twice six," making the date 1272.

It is also pointed out to me that authorities upon these matters are agreed that the pulpit in "San Giovanni Del Toro" is anterior to the one in Duomo, and probably dates from prior to 1154.

This may be a correct surmise, but for my own part I must say that, after carefully examining and comparing the two pulpits as to the treatment, design, and colour of the mosaic. I came to the conclusion that parts were either copied the one from the other, or were by the same hand, and since an artist of Nicolas de Bartolomeo's ability would hardly copy, I prefer to think that they are by the same man. Moreover, mosaic work at Salerno, etc., dating from 1150 (about) has quite a different appearance, upon careful examination and comparison.

LIONEL U. GRACE.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XI.
CUBE ROOT—HIGHER ROOTS.



WHILE most people are able to solve square roots with reasonable facility, there are many who cannot deal with cube roots without adventitious aid of some kind.

Architects and contractors generally have at hand in their offices mathematical tables facilitating the extraction of cube roots, but as calculations sometimes have to be performed without other appliances than a piece of paper and a pencil it is really desirable that the arithmetical process should not be entirely neglected.

The methods for extracting the cube root of a number are analagous to those for extracting the square root.

By the method of factors it is frequently possible to find the cube root of a number by mere inspection.

Thus it is easy to detect the fact that $216 = 8 \times 27$, and still more easy to recognise that $8 \times 27 = 2^3 \times 3^3 = (2 \times 3)^3$.

Consequently the cube root of 216 is seen to be $\sqrt[3]{(2 \times 3)^3} = 2 \times 3 = 6$.

Again, it is not difficult to see that 2744 is divisible by 8, giving 343 as quotient, which is divisible by 7 with 49 as quotient.

Then as $8 = 2^3$, and as $7 \times 7 = 7^2$, the cube root of 2744 = $\sqrt[3]{2^3 \times 7^2} = 14$.

Of course, the convenience of this method depends a good deal upon the readiness with which numbers can be split up into prime factors, and the extent to which analysis of the kind can be usefully applied depends a good deal upon the facility of the operator.

Example (1): Find by the method of factors the cube root of 13824.

Referring to the tests of divisibility given in Article X., p. 296, we find that 8 is a factor of 13824, as the last three figures are divisible by 8.

Therefore $13824 \div 8 = 1728$

As the last three figures of 1728 are again divisible by 8 we have

$1728 \div 8 = 216$.

We have already seen that 216 can be resolved into 8×27 .

Therefore the factors of 13824 are

$(8^3 \times 27) = (2^3 \times 3^3)$

and we get

$\sqrt[3]{13824} = \sqrt[3]{(2^3 \times 3^3)}$

$(2^3 \times 3^3) = 24$.

Example (2): Find by the method of factors the cube root of 4492125.

By the tests of division in Article X., p. 296, we find that 5 is a factor of 4492125 as the last figure is 5, and similarly is a factor of the two succeeding quotients.

Therefore

$5)4492125$

$5)898425$

$5)179685$

$5)35937$

Next adding the figures $3 + 5 + 9 + 3 + 7 = 27$, we find that 9 is a factor.

When 35937 + 9 = 3593.
As 3593 is obviously divisible by 3, we have
3593 + 3 = 1331.

As the difference between the figures in the odd and even places of 1331 = (1 + 3) - (3 + 1) = 0, we have 11 as a factor, and for the same reason as a factor of each successive quotient.

Thus

$$\begin{array}{r} 11 \overline{)1331} \\ \underline{11} \\ 11 \\ \underline{11} \\ 1 \end{array}$$

Collecting the factors ascertained above, we have

$$\begin{array}{l} 5 \times 5 \times 5 = 5^3 \\ 9 \times 3 = 3^3 \\ 11 \times 11 \times 11 = 11^3 \end{array}$$

and

$$\sqrt[3]{439:155} = \sqrt[3]{(5^3 \times 3^3 \times 11^3)} \\ = 5 \times 3 \times 11 \\ = 165$$

The general rule for the extraction of cube root by the ordinary method is as follows:—

Rule (1).—(a.) Mark off in groups of three the figures of the number whose cube root has to be found, commencing from the right hand, by dots or commas. If the number includes a decimal fraction, mark off the figures of the fraction in a similar manner commencing from the decimal point, and in cases where there are not enough decimals to complete the last period, add either one or two ciphers as necessary.

(b.) Find the highest figure whose cube does not exceed the first period of the dividend. The figure so found is the first figure of the required root or "quotient," and its square is the first "divisor." Denoting by the symbol (a) the first figure of the root, the first divisor = a².

(c.) After division of the first period append to the remainder the next period of the number or "dividend," and divide by a number consisting of the sum of the three following products:—

- (1) 300 × (quotient already found)²,
- (2) 30 × (quotient already found) × (new figure of quotient),
- (3) (new figure of quotient)³.

After division, bring down the remainder and proceed as before until the exact cube root or a sufficiently exact approximation has been obtained.

Note.—It will facilitate operations to remember that the form of successive divisors, expressed algebraically, is

$$\begin{array}{l} 300a_1^2 + 30a_1b_1 + b_1^2 \\ 300a_2^2 + 30a_2b_2 + b_2^2 \\ 300a_3^2 + 30a_3b_3 + b_3^2 \\ 300a_4^2 + 30a_4b_4 + b_4^2 \\ \text{and so on,} \end{array}$$

where the index figures against a denote the number of figures in the quotient, and the index figures against b denote the numerical order of the figure in the quotient.

Further, it will facilitate the determination of b in each divisor to employ a trial divisor consisting of 300 times the square of the quotient already found, or expressed algebraically, 300a², 300a₁², 300a₂², and so on.

Example (1): Find the cube root of 82312875 to three places of decimals.

After marking off the periods to the left of the decimal point, adding one cipher to complete the period to the right of the decimal point, and adding two complete periods of decimals, we proceed in accordance with Rule (1), as follows:—

$a_1 = \frac{81 \overline{)823,128,750,000} \text{ (93714)}}{729} = 93714$
 $300a_1^2 + 30a_1b_1 + b_1^2 = \frac{25119,94128}{7557}$
 $300a_2^2 + 30a_2b_2 + b_2^2 = \frac{2614279 \overline{)18771750}}{1826983}$
 $300a_3^2 + 30a_3b_3 + b_3^2 = \frac{263418811 \overline{)471797000}}{263418811}$
 $300a_4^2 + 30a_4b_4 + b_4 = \frac{26345816836 \overline{)10837819000}}{10538267344}$
 2994921656

The manner in which the various divisors (1) to (5) are obtained is given below.

$9^2 = 81 \quad 81$
 $300 \times 9^2 = 24300$
 $30 \times 9 \times 3 = 810$
 $3^3 = 9 \quad 9 \quad 25119$
 $300 \times 93^2 = 2584700$
 $30 \times 93 \times 7 = 19530$
 $7^3 = 49 \quad 49 \quad 2614279$
 $300 \times 937^2 = 263380700$
 $30 \times 937 \times 1 = 28110$
 $1^3 = 1 \quad 1 \quad 263418811$
 $300 \times 9371^2 = 26344692900$
 $30 \times 9371 \times 4 = 1124520$
 $4^3 = 16 \quad 16 \quad 26345816836$

Horner's method provides an expeditious alternative to the ordinary process for extracting the cube root of a number. To avoid a lengthy explanation this method is explained by the aid of an example in which we use the same number as in example (1).

Example (2): Find by Horner's method the cube root of 82312875 to three places of decimals.

After marking off the periods to the left and right of the decimal point and adding the necessary ciphers as in example (1), three columns are commenced for the convenient calculation of the successive divisors, beginning column I. with 1, column II. with 0, and column III. with 0. The number whose cube root is required forms a fourth column, but we have here placed the number and the successive processes of division first, and the columns wherein the successive divisors are calculated below the final working.

$81 \overline{)823,128,750,000} \text{ (93714)}$
 729
 2511994128
 7557
 2614279 \overline{)18771750}

	Col. (I.)	Col. (II.)	Col. (III.)
	1	0	0
I.		(¹) 9	(¹) 81 (1st divisor)
II.		(¹) 9	(¹) 162
		(²) 18	(²) 24300 (2nd trial divisor)
		(²) 9	(²) 819
		(³) 270	(³) 25119 (2nd divisor)
		(³) 3	(³) 828
III.		(⁴) 273	(⁴) 2504700 (3rd trial divisor)
		(⁴) 3	(⁴) 19579
		(⁵) 276	(⁵) 2614279 (3rd divisor)
		(⁵) 3	19628
		(⁶) 2790	263380700 (4th trial divisor)
		(⁶) 7	28111
IV.		(⁷) 2797	263418811 (4th divisor)
		7	28112
		2804	26344692900 (5th trial divisor)
		7	1124536
		28110	26345816836 (5th divisor)
		1	
V.		28111	
		1	
		28112	
		1	
		281130	
		4	
		281134	

The Roman numerals in the margin above, and the small index figures against some of the numbers under columns II. and III. refer to similar numerals and figures in the subjoined explanation.

I.—A. (1) The first period to be dealt with is 823, and as the cube next below this number has the cube root 9 we place the figure 9 as the first figure of the cube root or "quotient."

B. (2) We multiply the 1 in column (I.) by the first figure of the quotient and write the product 9 in column (II.)

(3) Next we multiply the product 9 by the first figure of the quotient (9 × 9), and write in column (III.) the product 81, which is the first divisor.

(4) Then after using 81 as a divisor we subtract the product, 81 × 9 = 729, from the first period of the number or "dividend," and bring down the next period.

II.—A. (1) We multiply the 1 in column (I.) by the first figure of the quotient and write the product 9 in column (II.) below the sum 9 previously obtained.

(2) Next we multiply the sum of the figures in column (II.) by the first figure of the quotient, 18 × 9 = 162; writing this number in column (III.), and adding in the sum 81 already there, we get the sum 162 + 81 = 243.

(3) Then we multiply the 1 in column (I.) by the first figure of the quotient and add the product 9 to column (II.), giving the sum 27.

(4) At the right of the 27 last written in column (II.) place one cipher, making the amount read 270; at the right of 243 in column (III.) we add two ciphers, making the amount read 24300.

(5) The number 24300 in column (III.) is now the trial divisor for determination of the second figure in the quotient. As the divisor evidently goes only 3 times into 94128 in the dividend we write 3 as the second figure of the quotient.

B. This figure 3 is used in the same manner as was the first figure of the quotient, as briefly indicated below.

(6) The 1 in column (I.) × 3 = 3 is added to 270 in column (II.), giving 273.

(7) Then 273 × 3 = 819 is added to 24300 in column (III.), giving 25119, which is the second divisor.

(8) Then using 25119 as the divisor, we subtract the product 25119 × 3 = 75257 from 94128 in the dividend and bring down the next period.

III.—A. To obtain the trial divisor for the dividend now to be dealt with, we proceed as in II. A.

Thus:—
 (1) 1 × 3 = 3 is added to the total of column (II.), giving 276.

(2) 276 × 3 = 828 is added to the total of column (III.), giving 25947.

(3) 1 × 3 = 3 is added to column (II.), giving 279.

(4) 279 with one cipher added = 2790, and 25947 with two ciphers added = 2594700.

(5) The trial divisor is 2594700, and indicates 7 as the next figure of the quotient.

B. The actual divisor is obtained as in II. B.

(6) The 1 in column (I.) × 7 = 7, which added to 2790 in column (II.) gives 2797.

(7) Then 2797 × 7 = 19579, which added to the number in column (III.) gives 2612479 as the third divisor.

(8) Then after using the divisor, we subtract and bring down the next period.

IV.—The operations in II. and III. are repeated, giving the divisor 263418811, as shown.

V.—The operations in II. and III. are again repeated, giving the divisor 26345816836, as shown.

From the above working and explanation it may appear at first sight that the extraction of a cube root by Horner's method is a somewhat complicated process. In reality, it is quite simple, but, as everybody knows, the explanation of a most simple thing is frequently a most complex operation. The apparent complication is further increased by the number of figures and the decimal fraction in the number chosen for example (2).

In order to illustrate the facility with which Horner's method can be used, we give below an example of evolution applied to a number such as architects may have occasion to deal with when separated from their accustomed hooks of reference.

Example (3): Find by Horner's method the cube root of 175616.

Col. (I.)	Col. (II.)	Col. (III.)	
1	0	0	175,616/56
	5	25	125
	5	25	50616
	5	50	50616
	10	7500	
	5	936	
	150	8436	
	6		
	156		

Therefore the required cube root = 56. In preparing columns (II.) and (III.) it will be found better to perform the various multiplications mentally, writing down only the results of the several additions. Similarly, in the columns devoted to the final working the Italian method of writing down only the differences may be adopted with advantage.

By these modifications the above workings would then appear thus:—

Col. (I.)	Col. (II.)	Col. (III.)	
1	0	0	175,616/56
	5	25	
	10	75	50,616
	156	8436	

Applications of Cube Root.

Example (1): Find the dimensions of a cubical tank capable of holding 2,000 gallons of water.

As 1 cubic foot = 6.23 gallons, we have
 $2,000 \div 6.23 = 321.02$, say 321 cubic feet.
 $\sqrt[3]{321} = 6.84$ ft., say 7 ft.

Then the inside dimensions of the tank will be 7 ft. x 7 ft. x 7 ft.

Example (3): Find the dimensions of a rectangular bin whose length, breadth, and depth respectively are as 3 : 1 : 1, and whose capacity shall be equal to 1 ton of Portland cement.

Taking the weight of Portland cement at 90 lb. per cubic foot, we have
 $\frac{10 \times 112}{90} = 24.88$, say 25 cubic feet.

Considering the specified proportionate dimensions it is evident that the bin can be divided into thirty-six equal cubical parts, each representing $\frac{25}{36} = 0.695$ cubic feet.

The sides of these small cubes will measure
 $\sqrt[3]{0.695} = 0.885$ ft.

Hence the dimensions of the bin will be:—

Depth = $(0.885 \times 2) \times 1 = 1.77$ ft.
 Breadth = $(0.885 \times 2) \times 1 = 1.77$ ft.
 Length = $(0.885 \times 2) \times 3 = 5.30$ ft.

Example (3): Find the inside diameter of a semi-spherical boiling pan with the specified capacity of 200 gallons.

Here $200 \div 6.23 = 32.1$ cubic feet.

The volume of a sphere = $\frac{4}{3} \times 3.1416$ times the cube of its radius.

Whence

$$r = \sqrt[3]{\frac{\text{capacity}}{4 \times 3.1416}}$$

As we are here dealing with a semi-spherical vessel we must double the capacity for the purpose of calculation.

Then the radius will be
 $\sqrt[3]{\frac{2 \times 32.1}{4 \times 3.1416}} = 2.5$ ft. (nearly).

And the diameter = $2.5 \times 2 = 5.0$ ft.

Higher Roots.

Methods exist for extracting higher roots, but they are not used in practice.

The following relations, however, should be remembered, as they can often be applied with convenience:—

- 4th root = $\sqrt{\text{square root}}$.
- 6th " = $\sqrt{\text{square root}}$.
- 8th " = $\sqrt{\text{fourth root}}$.
- 9th " = $\sqrt{\text{cube root}}$.
- 12th " = $\sqrt{\text{fourth root}}$.

THE T-SQUARE CLUB.—The T-Square Club held a concert last Tuesday at the Café Montic, when the chair was occupied by Sir Aston Webb. There was a good attendance, and the programme consisted of vocal and instrumental music by members of the club and others. During the interval, Mr G H Fellows-Pryne proposed a vote of thanks to the Chairman, and remarked that Sir Aston Webb was a man of many capacities, who entered not only into their work, but sympathised with and joined them in their lighter moments of pleasure. Most of his work had benefited by the influence of those present or kind words, and he (Mr. Pryne) asked them to accord Sir Aston Webb a hearty vote of thanks for spending the evening with them. The vote was carried with musical honours. Sir Aston Webb, in reply, said he had greatly enjoyed the delightful entertainment, and the obligation really lay on his side for the privilege of being present.

METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of the managers of the Metropolitan Asylums District was held on Saturday last week at the offices, Victoria Embankment.

New Central Stores.—On the recommendation of the Finance Committee it was agreed to apply to the Local Government Board for an order authorising the expenditure of a sum not exceeding 18,000l. on the erection of the New Central Stores, the money to be repayable within thirty years.

South-Western Hospital.—It was agreed, on the recommendation of the Hospitals Committee, to install warming apparatus in certain parts of the lower administrative block of this hospital. The cost is estimated at 230l., and the matter was referred to the Works Committee to be dealt with.

Caterham Asylum.—The Works Committee submitted a plan of a proposed upholsterers' shop at this asylum, and it was agreed to forward the plan to the Local Government Board for sanction.

South-Eastern Hospital.—On the recommendation of the same committee it was agreed that certain defective drains at this Hospital should be replaced with cast-iron drains at a cost of 950l., the work to be an "extra" upon Messrs. Godson & Son's contract for the reconstruction of the hospital.

Dareth Asylum.—The Asylum Committee submitted a lengthy report from the Dareth sub-committee regarding the proposed new workshops and fire-station at this asylum, the matter having been referred back to the Committee for further consideration last December, owing to the Local Government Board asking for further information. The sub-committee's report stated that the scheme provided for the following accommodation:—

On lower level—shops for upholsterers, shoemakers, painters, and plumbers. On higher level—shops for carpenters (industrial) and tailors, and for mat-making, brush-making and basket-making industries, a mess-room for artisans, five water-closets, a room for fire apparatus, and a fire-escape shed. The building would be on sloping ground, which would necessarily enhance its cost. It would be bisected by the main corridor at the northern end of the male staff blocks nearest to the training-school. A new and up-to-date fire-station was included in the scheme, this station being a very necessary proposal in view of the size of the whole institution.

It was proposed that the yard (both high and low level) should be covered in with a glass roof in order that patients could work out in the yard in mild weather; this augmenting the cost of the scheme very considerably.

Having regard to the importance of the industrial work now being carried on at Dareth under somewhat adverse conditions, it was imperative that properly-constructed workshops, sufficiently large to admit of an increasing number of persons to work therein, should be provided with the least possible delay, in order to ensure the continued success of the industrial operations now being carried on by a large number of patients under the supervision and guidance of competent trainers.

The cost of the building worked out at the low price of 6d. per cubic foot.

It was decided to forward a copy of the report to the Local Government Board.

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

International Congress of Architects.—A letter was received from the President and Secretary of the Seventh International Congress of Architects, London, 1906, inviting the Corporation to appoint two delegates to attend the Congress.

Tar Paving.—The City of London Schools Committee were authorised to renew the tar paving of the playground of the City of London School, at a cost not exceeding 400l.

Re-writing of the Guildhall.—Permission was given to the City Lands Committee to proceed with a further section of the work of the electrical re-wiring of the Guildhall, and to expend a sum not to exceed 500l. during the present year.

Improvement of the Guildhall.—Mr. William Rome moved that, with a view to restoring the Guildhall to its original beauty and impressiveness, it be referred to the City Lands Committee to consider and report on the desirability of removing from the walls and columns of the interior of the hall the plaster or stucco with which they have been incrustated and disfigured, and probable cost. Mr. Cooper hoped that it was not Mr. Rome's intention to deal with the interior of the Great Hall in the way he had dealt with the porch. Mr. Devereux Ellis said that the whole question was considered by the City Lands Committee in 1903. In reply Mr. Rome stated that the Guildhall porch excited general admiration among those who were capable of forming an opinion now that the

stucco had been removed. Mr. Seymour Lucas, R.A., had told the City Lands Committee that the Guildhall was one of the finest halls in the country, but that its beauty had been destroyed by plaster and stucco, the removal of which he strongly recommended so that the ashlar work beneath might be seen. The motion was adopted.

Obituary.

MR. HUNTER.—The death, on February 26, is announced of Mr. Adam Hunter. Mr. Hunter was taken into partnership in April, 1904, by Mr. J. M. Porter, under the style of Messrs. J. M. Porter & Hunter, of the Estate Office, Colwyn Bay, architects, surveyors, &c. The firm were architects of the Free Library in Woodland-road, Colwyn Bay, of a house and stabling at Groes Field for Mr. Richard Wood, and of a house in the same neighbourhood for Mr. G. Mould. A few months ago Mr. Hunter passed the Special Examination of the Institute of Architects, and his name was on the list for election as an Associate.

MR. T. BRETTELL.—On the 9th inst. the death was announced of Mr. Thomas Brettell, surveyor and mining engineer, which took place at his residence at Dixon's Green, Dudley, at the age of sixty-nine. The deceased gentleman was for several years surveyor to the old Sedgley Local Board.

General Building News.

WESLEYAN CHURCH EXTENSION, SOUTHAMPTON.—The memorial-stones of the extension of the Wesleyan church and school at Bevois Town have just been laid. The cost of the scheme is estimated at 3,000l. The school has already been improved and the accommodation is being increased, and the whole of the buildings will be modernised. The new buildings have been planned to harmonise with the present structure, and a guild-room, classroom, &c., have been so arranged as to form a connecting-link between the Sunday schoolroom and the church, which were formerly two separate buildings. They will be faced with red brick and Bath stone dressings, with pitch-pine wood block floors, cement dadoes, and plastered walls and ceilings. The porch on the Bevois Valley side will contain a new stone staircase to the gallery, and will be carried up to form a tower, terminating with a spire. The old vestries at the north end of the church have already been demolished, and the organ and rostrum have been removed. It is proposed to build a chancel, with Gothic arches between the choir gallery and the body of the church, the choir gallery is to be placed in the minister's vestry and the choir vestry. The church is to be re-seated throughout with modern seats of pitch-pine. The whole of the buildings are to be heated on the low-pressure hot water system, partly by pipes and partly by radiators, and the ventilation will be improved. The lighting is to be rearranged, and the buildings redecorated throughout. Mr. G. E. Smith, of Portswood, is the architect, and Mr. H. Jones the builder.

PARISH CHURCH, FORRES.—The new parish church at Forres was opened a short time ago. The building was erected from plans by Mr. John Robertson, architect, Inverness, and the following were the contractors:—Mason, Mr. Alex. Cameron, Inverness; carpenters, Messrs. A. & R. Dunbar, Elgin; slater, Mr. Davidson, Elgin; plasterers, Messrs. Angus & Rees, Forres; plumbers, Messrs. Boyne & Martin, Forres; painter and glazier, Mr. James Robertson, Forres; heating, Messrs. McKenzie & Moncur, Edinburgh; pulp, Messrs. Hardman, Powell, & Co., Birmingham; choir, chancel steps, and holy table, Messrs. Galbraith & Winton, Glasgow; baptismal font, Messrs. Stewart McLauchlan & Co., Edinburgh; organ, Mr. R. Lawton, Aberdeen; lectern, Messrs. Jones & Willis, London. The inspector of the works was Mr. J. W. Dorrell.

PRIMITIVE METHODIST CHURCH, ASHBY.—The foundation-stones of the new Primitive Methodist Church, on Burton-road, Ashby, were laid recently. The cost of the building will be about 2,500l. The contractors are Messrs. Orton & Son, Ashby, and the architect is Mr. Harry Smedley, of Ashby.

SECONDARY SCHOOL FOR GIRLS, MACCLESFIELD.

It is proposed to erect a new Secondary School for Girls in Fence-avenue, Macclesfield. From plans prepared by Mr. H. Bewick, county architect, Chester. PROPOSED RESTORATION OF SLK WILLOUGHBY CHURCH.—Mr. Hodgson Fowler, in a report on the condition of this church, states that new roofs are absolutely necessary, and he proposes to lower the aisle walls about 3 ft. 6 in., so as to get roofs of a moderate pitch. The colour was inside the church made of removing, and he proposes to lay a bed of cement concrete over the whole area, replacing the present stone flooring as far as possible in its present condition, and replacing decayed timber in the wooden floor with new oak.

The old oak seats with their richly carved bench ends need careful repair, and so does the chancel screen. These various works, with other repairs of masonry, glazing, and other fittings, are estimated to cost 2,810*l*. Mr. Hodgson Fowler has prepared the plans for the proposed restoration.

CHURCH RESTORATION, LINCOLN.—The church of St. Peter-at-Arches, Lincoln, was re-opened a short time ago after having undergone restoration. The work was carried out under the direction of Mr. Gamble (of Messrs. W. Scorer & H. G. Gamble, Lincoln).

VARIETY THEATRE, CAMBRIDGE.—The new Palace Theatre of Varieties in Botolph Claydon has just been opened. The seating accommodation is for about 1,400. Messrs. Owen & Ward, Birmingham, were the architects for the work.

CLUB PREMISES, BURTON.—The premises which have served the purpose of the General Post Office in High-street have been purchased with the object of forming club premises for the Unionist Party in Burton. The existing front of the premises will remain unaltered. The main portion of the ground floor area will be taken up by a lecture-hall, about 68 ft. by 26 ft. A refreshment bar is provided for this lecture-hall. The main staircase leads from the ground floor entrance-hall to the first floor only, on which are placed the billiard-room, reading or card room, a supper-room, and a bar. The top floor is reached by the steward's stone staircase, and provides a kitchen, scullery, two bedrooms, bath, lavatory, water-closet, pantry, and a private room for the secretary. There is a range of lavatories in connexion with the lecture-hall on the ground floor, and another for the billiard-room, etc., on the first floor. The lighting will be by electric lamps, and the buildings will be heated by hot water on the low-pressure system. Open fireplaces are also provided in the parlour and the billiard-room. Mr. A. Hodges for the general buildings; Mr. T. W. Biddolph, plastering; Messrs. T. Perkins & Sons, plumbing; Mr. H. Lea, painting; Mr. Thomas Jenkins, of Burton, is the architect.

PARISH ROOM, ST. LAWRENCE, IPSWICH.—A parish room has just been erected at St. Lawrence, Ipswich, at the rear of St. Stephen's parish-room, with entrance from St. Stephen's-lane. It is of red brick, and Gothic in style; the length of the main hall is 60 ft., and the width 27 ft. Messrs. Brown & Burgess were the architects, and Mr. Sidney Kenney the builder.

INSTITUTE PREMISES, WAKEFIELD.—Lady Constance Milnes Gaskell recently laid the foundation-stone of the Wakefield Social Institute. The scheme includes the provision of a lecture or concert hall to accommodate 200 persons, a billiard-room with three tables, a room for physical exercises, reading, writing, and smoking rooms, a small tea-room, and a refreshment buffet, as well as the main office. The work is being carried out from plans prepared by Mr. Abraham Hart, architect.

BANK PREMISES, YARMOUTH.—New premises have been erected on the Quay at Yarmouth for the National Provincial Bank of England. The architect was Mr. A. S. Hewitt, of Yarmouth, the general contractors being Messrs. B. J. Duggan, of Lowestoft, Mr. Potter, of Norwich, was responsible for the stone work; the ornamental plastering and decoration was by Mr. W. G. Crotch, of Norwich; the electric light installation by Messrs. Bowers & Barr (Yarmouth); the heating apparatus was supplied by Mr. R. A. Park (Yarmouth); the mosaic and tank floors were laid by Mr. J. E. Lott (London); and the furnishing of the manager's room, etc., was entrusted to Messrs. Palmer Bros., of Yarmouth.

RIVERSIDE DEPOT, SOUTHWARK.—Greenmore Wharf, Bankside, was opened by the Mayor of Southwark on the 10th inst. as a riverside depot of the Southwark Borough Council for the Northern end of the borough. It contains stables with forty-six stalls, two loose boxes, fodder store, a store for loose implements, and a cement store capable of holding about 100 tons of cement, offices, ballast bays, storage for vans, etc. The floor of the cement store is fixed at the height of a cart, so that the cement can be loaded in the cart without the necessity for being taken up to the stable buildings; there is also a basement and office facing Bankside. The cost of the work carried out, including the purchase-money of this portion of the ground, is 34,207*l*. 12*s*. 6*d*. Mr. Arthur Harrison, the Borough Engineer, acted as architect and quantity surveyor, and the builders were Messrs. Higgs & Higgel.

HYDRO HOTEL, RIPON SPA.—The plans of Mr. Sydney D. Kitson, M.A., architect, of Leeds, which were placed first in the recent competition by Mr. Woodhouse, of Manchester, the assessor, have been adopted by the directors of the Spa Hydro. The existing house of Elmersroffs has been taken as the nucleus of the scheme, and it is intended to produce two wings at an obtuse angle with the main point, thus catching all the south sun. The east wing, which will run parallel with the boundary of the Spa Gardens, will consist of one large room on the ground floor, some 70 ft. by 35 ft., the whole of which will ultimately form the dining-room. There will be a new service wing to the north, and another wing will be

thrown out at the back to form a Turkish bath. The roof of the existing building will be raised and modelled and surmounted by a balustrade and lantern.

ARCADE, NEWCASTLE.—An arcade is in course of construction in the triangular plot of buildings lying between Grainger, Market, and Grey streets, Newcastle. The plans for the work were drawn by Messrs. J. Oswald & Son, and the cost of the scheme will be about 40,000*l*.

HOTEL, ABERAVON.—The new Vivian Hotel, at Aberavon, which has just been opened, is situated in Victoria-road, Station-road, and Cross-road. Mr. Morgan Cox, Aberavon, was the builder, and the architect was Mr. Rowlands, of the firm of Messrs. J. P. Jones & Rowlands, Swansea.

THE WANDLE SCHOOL, WANDSWORTH.—The Wandle School, built by the London County Council at Dunt's Hill, Wandsworth, was opened for the admission of children last January. The school consists of two structures, one of three stories arranged for mixed departments, and the other a one-story building for infants. Accommodation is provided for 1,140 children. In the mixed school accommodation has been provided on the ground floor for 376 junior scholars in eight classrooms, and a central hall, 57 ft. 9 in. by 26 ft., together with the necessary cloak-rooms and lavatory accommodation. On the first floor similar accommodation is provided for a like number of senior scholars, while on the second floor are the drawing classroom and the science-room. The teachers have rooms provided for them on the mezzanine floor. The smaller building has accommodation for 388 infants in eight classrooms and a central hall, 54 ft. by 26 ft. 6 in. Cloak-rooms and lavatory accommodation for the children, and rooms for the headmistress and the teachers are also provided. Both buildings are warmed by low-pressure hot-water systems, with heating chambers in the basements; and they are ventilated by means of fresh air inlets in the eaves of the classrooms, and extracts at the ceiling levels. It is proposed to provide in the separate building in the boys' playground a manual training centre for forty students. The buildings are of simple design, with stock brickwork and red brick dressings, the doorways, balustrades, etc., being in Portland stone; they have been erected from the designs and under the superintendence of the Council's architect (Education), Mr. T. J. Bailey. The contractors are Messrs. Holliday & Greenwood, Ltd., whose tender amounted to 23,337*l*. The cost of the site, including legal charges, amounted to 3,800*l*., and the cost of furnishing to 850*l*., making a total cost of 27,987*l*.

Stained Glass & Decoration.

NEW ALTAR AND THRONE, EXETER.—The high altar and retables at the Church of the Sacred Heart, Exeter, have been completely transformed during the past three months. The retables, which was formerly built in a straight line across the sanctuary, has been taken down and reconstructed to fit the apsidal shape of the sanctuary. The old throne, with the canopy over, has been renewed, and the altar is entirely new. The tabernacle has been carried out by Mr. A. B. Wall, sculptor of Cheltenham, under the personal instructions and from the designs of the Very Rev. Canon Scoles and Mr. Raymond, joint architects, of Basingstoke.

Appointments.

AUCKLAND, NEW ZEALAND.—The appointment is announced as City Engineer, Auckland, at a salary of 1,000*l*. per annum, of Mr. W. E. Bish, Borough Engineer and Surveyor of Sudbury, Suffolk. There were a large number of applicants for the post.

ARMSTRONG COLLEGE, NEWCASTLE.—The Council unanimously appointed Dr. W. M. Thornton to the newly-established Professorship of Engineering at their meeting on March 19. Dr. Thornton is a Master of Engineering and Doctor of Science, Liverpool University College, and Doctor of Science, Victoria University, Manchester. When a student at Liverpool, 1892-6, he won the University scholarship for physics, gained the first places in "honours" for engineering and physics, and was a "special scholar" in electricity. He was during two years senior lecturer on engineering at University College, Bristol, and is the inventor of instruments for measuring and indicating the strength of electrical currents in cables, etc.

Sanitary and Engineering News.

SANITARY APPARATUS AND THE PUBLIC HEALTH ACT.—The decision in London and South-Western Railway v. Hills should be noted. The County Council has powers under sect. 39 of the Public

Health (London) Act, 1891, to make by-laws with respect to water-closets, etc., and the proper accessories thereof in connexion with buildings whether constructed before or after the passing of the Act. Under this section the authority had made a by-law (14) that "every person who shall intend to construct any water-closet . . . or to fix or fit in connexion with any water-closet any apparatus or any trap or soil pipe shall before executing any soil works give notice in writing to the clerk of the sanitary authority." The railway company had occasion to renew the pans and traps of certain closets constructed before the Act. The Court held that the by-law applied to the fitting of apparatus to existing closets as well as to those subsequently constructed.

THE REPAIR AND IMPROVEMENT OF DUNBAR HARBOUR.—The Town Council of Dunbar have resolved to employ Mr. W. F. Douglass, C.E., London, to prepare a report upon the best means of restoring that portion of the new harbour which has just fared so badly.

SEWAGE DISPOSAL, TEDDINGTON.—At the meeting of Teddington District Council recently Mr. M. Hainsworth, surveyor, presented a scheme for extensions and alterations at the sewage disposal works, and the scheme, which is estimated to cost 27,161*l*., was agreed to.

REFUSE DESTROYER, LIFFORD.—The refuse destructor which has been built for the King's Norton District Council at Lifford was officially opened on the 13th inst., although it has been in working order since October. The destructor has been built under the direction of Mr. Cross by Messrs. Heenan & Froude, of Manchester and Worcester. The building and machinery cost about 14,000*l*. The destructor is so arranged that the only outlet for the fumes and smoke is the tall chimney. The heat produced by the combustion of the dust and ashes is utilised for making steam, and it is expected that from this source there will be an income of 1,500*l*. or 2,000*l*. The clinker taken from the furnaces after combustion will be used for making roads and paving of the asphalt type.

PROPOSED SEWAGE DISPOSAL WORKS, IKESTON.—On the 13th inst. Colonel A. G. Darnton, R.E., Local Government Board Inspector, held an inquiry at Ikeston respecting a proposal to borrow 27,000*l*. for the purposes of sewage disposal. The Town Clerk said the question of adopting a new scheme of sewage disposal was one of urgency, as complaints had been made by the Derby and Notis County Councils as to the polluted condition of the Etwash, and an order of Court had been served to discharge a purified effluent into the river. Ikeston was expected to have the new works completed by 1910. Mr. Raikes (of Messrs. Wilcox & Raikes, engineers, of Birmingham) submitted particulars of the plans and methods proposed to be adopted.

IMPROVEMENTS, WARKWORTH HARBOUR.—The Warkworth Harbour Commissioners have had under consideration for some time a scheme of improvements for the harbour, and the result of their deliberations is that a scheme is about to be carried out, which has been drawn up by Mr. Sanson, the Harbour engineer. It is first of all intended to extend the south jetty to the south pier head, and to extend the south pier out a distance of 240 ft. seaward, parallel to the north pier, by which means it will be possible to obtain two extra feet of water on the bar, and thus facilitate the egress and ingress of vessels at the harbour. In addition to this a system of groins is to be established at the north sands in order to combat the inroad the sea has been making during the past year.

Foreign.

FRANCE.—A subscription is to be opened to raise a monument to Gambetta on the Place Gambetta, Paris. A committee has been formed to raise a monument at Nogent-sur-Seine to the memory of the sculptor Paul Dubois. It is to be carried out by his pupil M. Alfred Boucher. A committee has been formed with the object of ensuring the preservation of the sites and buildings of the pretty village of Gargilesse, and to oppose any alteration of its ancient picturesque quality.—The Municipality of Boulogne-sur-Seine are about to undertake the building of a Salle des Fêtes and a Cirque at Boulogne-sur-Mer.—The Municipality of Agen have opened a competition for rebuilding the theatre of that town.—The "Société pour le protection du Paysages de France" has communicated to the Municipality of Amnevy a resolution to the effect that, in case of the building of a Casino there, no portion of the lake nor of the alley of trees called the Albiqy should be interfered with. The Society has also passed a resolution to the effect that the route for the railway line from Paris to Chartres should be so laid out as to avoid injuring the district of Vaux de Cernay.—The works for the improvement of the port of Calais are shortly to be commenced, the total cost is estimated at nearly 4,000,000 francs.—For the first time this year, the New Salon is to have a section of music with a special

jury to decide on the awards. Eighty-six compositions have been accepted for performance between April 15 and June 30. The performances to take place twice a week, will be directed by M. Paul Viardot. —The General Council of the department of Lot-et-Garonne has voted for the rebuilding of the Hôtel de Préfecture at Agen, recently destroyed by fire, at an estimated cost of 870,000 francs. —Important works, at a cost of 2,100,000 francs, are to be undertaken for the improvement of the port of Bayonne, and for the cutting of two channels in the rocky bank of the Casquets. —A competition has been instituted, open to all French architects, for the erection of a new Hôtel de Ville at Fismes. —The Municipal Theatre of Saint-Germain-en-Laye is to be rebuilt on its present site, 300,000 francs are to be spent on the building, the design for which will be the subject of a public competition. —A competition has been opened for the erection of an Art-School at Nancy. —The Naval Museum Collection, hitherto at the Louvre, is to be transferred to the Invalides, where it will become an annex to the Military Museum. —A competition has been opened for the construction of a ferro-concrete bridge, 51 metres in span, over the torrent of the Vimpon, at Volonne, in the Lower Alps. —M. Goulier, Departmental Architect, has drawn out a scheme for the rebuilding of the Palais de Justice at Belfort. —M. Fornigé has prepared a scheme, to be submitted to the Commission des Monuments Historiques, for carrying out a restoration of the Roman theatre at Orange in such a manner as not to injure its archaeological value. He proposes only to build up rifts in the walls, to restore the gradins (the rows of seats), and the staircases which give access to them, and to re-cape the passages. He considers that this will fit it for the revival of classic drama, without any further restoration in detail. —A committee has been formed for the erection in Paris of a monument to Fragonard, of which M. Auguste-Millard will be the sculptor. —The jury in the competition opened for the construction of a group of school buildings at Franceville (Savoie-Oise), has awarded the first premium to M. Bassompierre-Seurin. —The death is announced, at the age of eighty, of M. Louis Leullier, formerly architect to the city of Amiens. Among other important works he completed the Hôtel de Ville of Amiens, and carried out a scheme for the water supply of the place. He was a member of the Société Centrale des Architectes. —The death is announced of M. Borrel, "architecte-correspondant" of the Department of Public Instruction, who took a considerable part in the architectural improvements of the towns of Brides, Salins, and Montiers, at which latter place he died. —The death is also announced at the age of 74, of M. Léon Painlevé, an architect who is credited with various discoveries in connexion with industrial chemistry; and also, at the age of 65, that of M. Edmond G. Andrieu, "architecte-expert" in legal matters.

SOUTH AFRICA.—At a recent meeting of the East London Municipal Council it was resolved that the Town Engineer, in conjunction with other officials, be instructed to prepare a plan of the site on the market square selected for the proposed market buildings, and all other particulars and conditions necessary for the purpose of enabling competitive plans to be called for the erection of the buildings in question, at a cost of about 20,000. —During the period December 16 1905, to January 13, 1906, forty-one building plans were under consideration by the Cape Town municipal authorities; of these twenty-three were approved, ten returned to the architects, and the remainder are under consideration. The approximate cost of the proposed work is 12,390. —The Building Committee of the St. George's Cathedral, Cape Town, have invited tenders for the erection of the superstructure of the eastern portion of the cathedral. —Mr. John Lyon has been awarded the premium for his design for new offices, to be erected in St. George's-street, Cape Town. —At Woodstock, near Cape Town, unusually rapid progress is being made with the storm water drainage scheme, which is being executed at an estimated cost of 70,000. —Speaking at the inauguration of a new congregational church at Booyens, Johannesburg, Lord Selborne said he regretted that the architects of South Africa so faithfully copied European models. He thought a country ought to have its distinctive architecture in the new world as well as in the old. He wished South Africa might have an architecture all its own. —The Grand Theatre, Bloemfontein, was recently inaugurated. It has been built from the designs of Mr. E. C. Choinier, architect, of Johannesburg. The contract for building was publicly tendered for, and tenders ranging from 30,000 to 42,000 were received. Messrs. Corlett & Jeddus, of Johannesburg, being the successful tenderers. The galleries are constructed on the cantilever principle. The theatre was built in fourteen months. —The foundation-stone of a new Government school in Johannesburg was recently laid by the Countess of Selborne. When completed it will provide accommodation for 312 scholars. The foundation

is of stone with brick plastered walls above. The school is built on a design prepared by the Public Works Department, and the work is being supervised by Mr. Gordon Russell, the local inspector of works. —Market buildings and town offices are to be erected at Klerksdorp, at a cost of 3,400.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. R. E. W. Berrington & Son, civil engineers, Wolverhampton, have taken into partnership Mr. A. G. Martin, and the practice will be carried on in future under the style of "Berrington, Son, & Martin." —Mr. George Bell, contractor, Tottenham, has converted his business into a company, and it will be carried on in future by and in the name of "George Bell & Sons, Ltd." Mr. Bell will continue to control the business, and his sons will be associated with him in its management. —Mr. Louis P. Casella (now Casella & Co.), scientific instrument makers and mechanical engineers, have removed from 147, Holborn Bars to 11-15, Rochester-row, Victoria-street, S.W. —The British Promethons Company, Ltd., electrical heating specialists, Kingston-on-Thames, are removing their works and head offices to Birmingham, and on and after the 21st communications must be addressed to them at Salop-street Works, Highgate, Birmingham. Their Birmingham telephone number will be 4236 Central, and their telegraphic address "Cooking, Birmingham." The firm will retain their London showrooms at 27, Ely-place.

STATUE OF THE QUEEN.—Mr. George Wade is commissioned to execute a statue of the Queen, which the governors and staff of the London Hospital desire to erect in the central garden, in celebration of the recent extension of the buildings and of Her Majesty's acceptance of office as President of the Hospital. The garden will be laid out and tended by the East London Horticultural Society.

BATHER MEMORIAL, MEOLE BRACE.—A memorial to the late Rev. Henry Francis Bather is to be erected at Meole Brace. It will take the form of a cross, fashioned upon the lines of some of the old existing preaching crosses. The whole will be of red magnesian limestone. Above, will rise an octagonal monolith shaft, moulded at its base, and surmounted by a carved capital of conventional foliage of XVth century type. Surmounting all will stand a cross, having foliated ends of red granite. Above, will be of the die stone, which will be of granite. The work is being carried out under the direction of Mr. H. H. Treasury, of Shrewsbury, Diocesan Surveyor of Litchfield, by Messrs. Harry Hens & Sons, of Exeter.

DANISH MONUMENTS IN YORKSHIRE.—Dr. G. A. Auden lectured on the 12th inst. before the Yorkshire Philosophical Society at the Museum Theatre, York, on "The Remains of Danish Sculpture in Yorkshire and Derbyshire." He said this was a much-neglected branch of art of considerable historical value. York and Durham possessed the best collections of pre-Norman crosses, dating chiefly from the VIIIth and Xth centuries. In York there was a strong Danish element, the city having been the centre of the kingdom of Northumbria. Eric, the last Danish King of York, being Eric Bloody Axe of Scandinavia. Incidentally, the lecturer remarked that the Yorkshire Danish monuments were largely aggregated in a radius of twenty miles around Leeds, Ilkley, Collingham, Thornhill, and Dewsbury. A notable example of the Danish cross was that found at Leeds Parish Church, representing the legend of Weland and the Swan Maidens. He observed that the term Runic cross was as a rule a misnomer, because a cross was not Runic unless it bore a Runic inscription. Dividing pre-Norman crosses into two classes, Anglian and Viking, the lecturer said the characteristic of the former (date 700-900) was that they were strongly influenced by the Lindisfarne school, by truly Celtic art, with vine scrolls as a predominant decorative motive. The Viking (900-1050) monuments were distinguished by zoomorphic designs. The interlaced work was less regular, and displayed a want of finish, the key pattern and spiral of purely Celtic work being absent. The lecture was illustrated by several views of Danish sculpture, some notable examples being found in York and Derbyshire.

LONDON BOROUGH COUNCILS AND WAGES.—At a conference of representatives of the London Borough Councils who met at Lambeth Town Hall last week, a resolution was passed by a large majority in favour of a minimum wage of 30s. a week for all employees of the borough councils. On the question of a forty-eight hours' week being put to the vote, it was lost.

MEMORIAL TO J. M. WHISTLER.—Nearly half of the estimated cost, 2,000l., is subscribed for the international memorial which it is proposed to erect in Cheyne-walk, Chelsea. M. Auguste Rodin is engaged upon the work, and a contribution

of 500l. will be made by the International Society of Sculptors, Painters, and Gravers. **ARTISANS', LABOURERS', AND GENERAL DWELLINGS COMPANY, LTD.**—The Board have decided to discontinue for a while building operations on the Leigham-court estate of 66 acres at Streatham-hill, as they consider that the whole of South London is greatly over-built, and a large number of houses are unoccupied. The company possess 3,000,000l., invested, for the greater part, in freehold property, having a resident population of more than 40,000 persons. During the past year the shareholders provided an additional sum of 100,000l., which has been devoted chiefly to the completion of building works at Noel Park.

OPEN SPACES.—The threatened disfigurement of Hindehead by telegraph posts is averted. The Postmaster-General, in response to an appeal made by the National Trust, has agreed to carry the proposed new trunk telephone line to Portsmouth along the railway between Witley and Haslehurst and so avoid Hindehead. In co-operation with the amended scheme the London & South-Western Railway Company have consented to their rights of maintenance. The Hindehead property, which belonged to the late Mr. Whitaker Wright's estate and includes the Devil's Punch Bowl, Witley, and Gibbet Hill, has been purchased by a local committee with the object of preserving it as a public open space; the common land extends over some 750 acres. —The Crown have bought 100 acres at Long Meadow, on the bank of the river Liffey, as an addition to Phoenix Park, Dublin. —Gifts have been recently made of 10 acres of Valentine's Park, Hford, by Mr. Holcombe to the Hford Urban District Council; of his shares in the Leach Woods Land and Company by the late Mr. A. C. Pass, of Clifton Down, to the Merchant Venturers, of Bristol, with the expressed desire that they should use the influence thereby acquired to preserve the lands adjoining the river Avon (held by the Company) in their present condition and maintain the plantations thereon; of about 1½ acres, at Hford, for a playground, by Mr. W. Cadbury to Stretchley Urban District Council; of a parcel of land by the late Mr. W. W. Warner, of Stanley House, St. Ives, to the St. Ives, Hunts, District Council; and by the Lightwoods Estate and Varley Woods Committee of 26 acres as a public park and playing fields to the Birmingham City Council, together with an offer of nearly 14,700l., already subscribed towards the acquisition of 94 acres in addition, in respect whereof the total purchase-money amounts to about 1,000l. —Sir George Meyrick has accorded his consent to the construction by the Bournemouth Corporation of a drive along the under-elf from the pier to Meyrick-road. —It is announced that Mr. Andrew Carnegie proposes to present to the University Court of St. Andrews University securities yielding 500l. per annum, for the upkeep of the recreation park, with the gymnasium and hall, which at an outlay of 15,000l. he recently gave to St. Andrews University. —The vendors of the finely-timbered estate, Whitton Park, near Hounslow, have agreed to suggestions made by the Metropolitan Public Gardens Association to reduce the price at which they will sell the property to 45 acres, conditionally upon its being converted into a public park, and the Twickenham Urban District Council have offered 3,500l. towards the required sum of 15,000l. —The Association have taken steps to save, if possible, the estate known as Boleyn Castle, Upton Park, which comprises a fine old garden.

—A faculty has been granted to the Poplar Borough Council for the laying out of All Saints' churchyard as a recreation ground; and the Southwark Borough Council have agreed to rent for 80l. per annum to the London County Council a space of 6,000 sq. ft. in King James-street as a children's playground. —The Royal Horticultural Society are now entrusted with the charge of examining candidates for appointment as head-gardeners in the London County Council parks and grounds.

BUILDERS' EXCHANGE, BIRMINGHAM.—An address on "Canadian Cities" was delivered on the 15th inst. to the members of the Birmingham Builders' Exchange by Mr. Peter Ball, the resident agent in Birmingham for the Commercial Agency of the Government of Canada. The members assembled in the Exchange Hall under the presidency of Lieutenant-Colonel Barnsley. Mr. Peter Ball, in the course of his address, traced the history of Canada from the time of the capture of Quebec from the French by General Wolfe in 1759, and subsequently he spoke of the Canadian cities and municipalities, and specially referring to Toronto, the second city in the country, as typical of the whole. He gave the area of the city, the population, the number of streets, and described the tramway system. The city owned the streets and the authorities conceded the tramway rights to a company for twenty-one years, when they could be purchased by the municipality. The company paid the city 160l. per annum per mile for the right to run the trams, and in addition a percentage of the gross receipts. Up to 200,000l. the company paid 1 per cent., for 200,000 to 300,000l. 10 per cent., for 300,000 to 400,000l. 12 per cent., for 400,000 to 600,000l. 15 per cent., and from 600,000l. upwards 20 per cent.

In 1895, when that arrangement was entered into, the city drew in percentage and mileage upwards of 27,000l., and in 1904 more than 64,000l.; while in the nine years the amount received was 360,000. The cost of living, the cost of schools, and other things was much less than in this country, the rents of houses were pretty much the same, the water rates were lower, and the gas charges were a little higher; but the light and heating qualities were very much better. At the close Mr. Ball was warmly thanked for his address on the motion of Lieutenant-General Phelps, seconded by Mr. Wm. Sapcote.

THE DISFIGUREMENT OF SCENERY.—In the House of Commons on the 14th inst. Mr. Kennedy asked the First Lord of the Treasury whether he would consider the advisability of giving the Board of Trade or local public bodies the control of trade advertising and issuing licences for the same; and, in view of the fact that many beauty spots are disfigured at present, and that the revenue was lost to the State, would he introduce legislation on the above lines. Sir H. Campbell-Bannerman: The questions raised by the hon. gentleman require a little more attention than I have been in a position to give them. I sympathise with his desire to prevent the disfigurement of beautiful scenery, but whether this can be accomplished by the methods suggested by the hon. gentleman I am not so sure.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on the 15th inst. at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W. The Rev. Canon N. F. Norman in the chair. The following objects were made in aid of the following objects, viz:—Building new churches at Barry, All Saints, Glam., 175l.; Summertown, near Oxford, 200l. for the first portion, and Well Hall, S. Luke, Eltham, Kent, 200l. For the first portion; towards rebuilding the church of All Saints, Woking, Northumberland, 25l.; and also enlarging or otherwise improving the accommodation in the churches at Bourton, S. James, Berks., 200l.; Lower Guiting, S. Michael, near Cheltenham, 100l., making in all 500l.; Southchurch, Holy Trinity, near Southend-on-Sea, 800l.; and Stonebridge, S. Michael and All Angels, Middlesex, 700l. In lieu of a former grant of 500l. A grant was also made from the special Mission Buildings Fund towards building the Mission Church of S. Mary, South Bernoldsey, Surrey, 500l. The following grants were also paid for works completed:—Polabrooke, All Saints, near Oundle, 300l.; Great Ellingham, S. James, Norfolk, 250l.; St. Mary's, Christ Church, 400l.; Hucknall, Hucknall, All Saints, near Mansfield, 400l.; Stanton Harcourt, S. Michael, near Oxford, 650l.; Ben Rhydding, S. John, near Ilkley, 2000l. on account of a grant of 2250l.; Beeston Hill, The Holy Spirit, Leeds, 2300l.; Tudhoe Grange, The Venerable Bede, Co. Durham, 3000l.; and Swanton, 2500l. In addition to this the sum of 2967l. was paid towards the repairs of seventeen churches from Trust Funds held by the Society. The Society likewise accepted the trust of a sum of money as a Repair Fund for the Church of S. Clement, City-road, E. The Annual General Court of the Society will be held at the Church House, Dean's-yard, Westminster, on Thursday, May 17, at 3 p.m., when the chair will be taken by His Grace, The Lord Archbishop of Canterbury, President of the Society.

LABOUR RETURNS.—The Labour Returns, though still showing an improvement in most trades, prove that the building trade is still affected by the depression from which it has so long suffered. The Memorandum of the Labour Department of the Board of Trade for February states that only a "seasonal" improvement had taken place and the rate of employment remained the same as in February last year. With this continued depression it is hardly surprising to learn from an article in the Board of Trade Labour Gazette, that the Distress Committees under the Unemployed Workmen Act report that the classes of workpeople most generally affected by distress are those connected with the building trades and general labourers. It is sad to see the high proportion of skilled artisans who are affected by the distress.

DISFIGUREMENT OF A STREET.—In the Parliamentary Papers last week Mr. Wiles, M.P., asks the Postmaster-General if he is aware that telephone poles are now being placed in St. Peter's-street, St. Albans, thereby disfiguring one of the most beautiful streets in the Home Counties, and, if not, will he institute an inquiry as to and amend the regulations for these poles.—Mr. Sydney Buxton, in reply, states that he is giving attention to the matter, and if a practical alternative route can be devised, he will be very glad that the trunk line should avoid St. Peter's-street. So far, however, the Corporation have been unable to obtain the necessary wayleaves for an alternative route.

ELECTRIC LIGHTING AND IMPROVEMENT SCHEME, STRATFORD.—On the 13th inst. Mr. H. Hooper, M.A., M.Inst.C.E., Local Government Board Inspector, held an inquiry into applications by the Town Council for sanction to borrow 18,7500l. for purposes of electric lighting and

9,258l. for works of private street improvements. The Borough Electrical Engineer (Mr. Ullman) gave figures as to the electricity scheme, which, he said, had been in existence since 1901. Mr. Campbell, the Borough Surveyor, gave evidence as to the proposed private street improvements. They included the making up of the following private streets: Tulleyne-avenue, Basil-avenue, St. Margaret's-avenue, Southchurch-road, Lady-smith-avenue, Landseer-avenue, Church-road, and Gooseley-lane.

MEMORIAL TO THE LATE DR. R. MILNE MURRAY.—A monument has just been erected in the Dean Cemetery over the grave of the late Dr. Robert Milne Murray. It is in the form of a Greek stele in grey granite, which rests on a rough-hewn base. The inscription is in raised bronze letters on the face of the shaft. The rough-hewn base bears an alto relievo portrait bust of Dr. Murray. The monument is from the studio of Mr. H. S. Ganley, sculptor.

STREET IMPROVEMENTS, DEVONPORT.—Mr. M. K. North, M.Inst.C.E., Local Government Board Inspector, held an inquiry at Devonport on the 13th inst. into the application of the Devonport Borough Council for sanction to borrow 2,251l. for works of private street improvements, and 5,051l. for the laying out of certain parks or recreation grounds. Mr. J. F. Burns, Borough Surveyor, explained that the amount of 2,251l. for works of private street improvements included the following streets and lanes:—Lane between South-street and Victoria-avenue, estimated cost, 1927 6s. 1d.; lane between Whittington and Amherst streets, 503l. 6s. 1d.; lane between Alma-road and Amherst-street, 790l. 16s. 10d.; St. Aubyn-avenue (section 1), 385l. 15s. 11d.; Coldrenick-street, 379l. 3s. With reference to the proposed recreation grounds the Town Clerk stated that the loan applied for was made up of 3,820l. for Keyham Barton recreation ground, 569l. for North Down, and 5000l. for Rocky-hill. The Surveyor explained that the area of the Keyham Barton Park was about 3½ acres. It was proposed to enclose the site and also to construct a promenade path 25 ft. wide on the top of the site, and to form narrower paths leading to the various entrances. The North Down site at Ford was set apart as a recreation ground for children, and was about 4½ acres in extent, and the area of the Rocky-hill site was just over one acre.

ROMAN VILLA, WEST MEON.—Mr. A. Moray Williams, of Bedales School, near Petersfield, has given the following particulars of the newly-discovered Roman villa at West Meon. The villa stands in Little Lippen-wood on the slope of a hill, about half a mile from West Meon Church. The chief features that have been determined at present are a block of six rooms, what is thought to have been a gateway on the east side, a double hypocaust in the south-west corner, and a buttress backing the wall to the block of rooms. One of the rooms, measuring 10 ft. by 33 ft., was paved plainly with red brick tesserae, and was perhaps too broad to form a passage. As a sleeper wall underlies the tesserae at 10 ft. from its west end, it may have been divided by a folding door or other partition. The base of a moulded column in its original position, with a coat of red paint still adhering to it, is completely visible, and traces of a similar column opposite indicate a doorway leading to Room 2. This room, which measured 21 ft. by 10 ft., was also paved with red tesserae, but with a border of white ones, and there were also sleeper walls indicating partitions or folding doors. Room No. 3 measured 21 ft. by 11 ft., and was paved with mosaic of a somewhat elaborate geometrical pattern of red, black, white, and blue. In the centre there was an octagon panel, which may have contained a figure, but it has been wholly destroyed. To the right of Room 2 was a room measuring 11 ft. by 19 ft., also covered with a mosaic pavement. This pavement is well preserved, and is very beautiful, if only from the fact of its simplicity. It is only geometrical in red, white, and black. The pavement has sunk considerably, and perhaps lies over a hypocaust. The other two rooms have not been yet fully excavated. At the south-west corner the hypocaust presented most unusual features. It was 21 ft. in length, and consisted of two chambers, each fitted with an apsidal termination. It cannot yet be said with certainty to which type this house belonged. It may turn out to be a small courtyard house, but it is quite possible that a corridor may be found. Near the spot was found an abundance of iron slag, which indicates the former existence of a smithy. Further excavations will be undertaken this summer on the spot, and the two mosaic pavements already found will probably be permanently preserved.

SHEFFIELD WORKMEN'S DWELLINGS.—Colonel Durnford recently held a Local Government Board inquiry into an application by the Sheffield Corporation for the approval of a scheme of providing new dwellings for persons of the labouring class. Mr. W. E. Hart, who appeared for the Corporation, explained that by a Provisional Order (1902) they were authorised to purchase or acquire a number of houses occupied by persons

of the labouring class in or near West-street, Shalesmoor, and Moorfields, and required in connexion with the proposed widening of those thoroughfares. This application was to provide as many new dwellings as should be deemed desirable in accordance with Local Government Board requirements, in view of the number acquired. The Council had felt for some time that there was no need for the provision of additional housing accommodation for the working classes in the central parts of the city beyond what was already provided, and inasmuch as there was power to accept a scheme for providing housing accommodation for a smaller number of persons than those actually displaced, the Council asked the Local Government Board to accept a scheme which provided re-housing accommodation for thirty-nine persons in lieu of the 170 persons who would be displaced. On a part of the Crofts area the Corporation had erected, with the approval of the Local Government Board, a block of tenements consisting of single-room tenements. They had to provide certain additional buildings with accommodation to the number of persons whom they were under an obligation to provide for, and it was estimated that these additional buildings would give accommodation to 175, or thirty-nine more than were required. It was this excess number of thirty-nine which the Corporation asked the Board to accept as an adequate re-housing accommodation for the persons dispossessed under the 1902 Order. In proof of the statement that there was no need at the present time for the provision of further housing accommodation for persons of the working class in the central parts of the city, Mr. Hart offered the following information:—Number of uninhabited houses, 92,225; number of uninhabited houses of the rental of 100 and under, 1,595; of the rental 100 5s. and under, 1,269; of the rental of 200 and over, 649; total uninhabited houses, 3,513. Evidence was given by Mr. C. F. Wike (City Surveyor).

EDINBURGH BURGH ENGINEER'S REPORT.—The report of Mr. James Massie, Burgh Engineer and Master of Works to the Corporation of Edinburgh, for the year ending December 31, 1905, has been issued. Mr. Massie deals in detail with the work undertaken during the year in connexion with sewers and drains and building operations. The total expenditure on "unemployed" on the works carried on amounted to 2,792l. for labour and material. The works on which they were engaged were principally drainage. It is mentioned that the lowering of the rate of pay from 2s. 6d. to 2s. a day did not appreciably affect the numbers who availed themselves of the work offered by the Corporation. The only work in connexion with the housing of the working classes that was in progress during the year was the reconstruction of the old properties at Greenside. That had proceeded more slowly than was anticipated on account of carrying out the work in small sections so as to cause as little hardship and inconvenience as possible to the tenants. Up to the date of the report, six blocks had been reconstructed; two were in the course of alteration and were approaching completion, while schedules for the reconstruction of other two blocks were being prepared.

Capital and Labour.

STATE OF THE BUILDING TRADES.—Employment in the building trades remained dull in February, but there was a slight improvement on the whole as compared with a month ago. It showed little change compared with a year ago. Returns received through the trade correspondent from 61 London employers showed that in the last week of February they paid wages to 10,445 workpeople of all classes, compared with 10,339 in January, and 12,086 in February, 1905. Employment generally in London was much the same as in the previous month, but worse than a year ago. Returns were received from Employers' Associations in 71 districts outside London, and in nearly all of these employment was reported as dull generally. Compared with a month ago, no change was reported in 55 towns, while in 8, including Birkenhead, Lancaster, Blackpool and Dublin, employment was better, and in 8, including Stockport, Gloucester, Rugby, Newport, and Aberdeen, it was worse. Compared with a year ago, employment was reported about the same in 42 towns, worse in 22 and better in 7.—Labour Gazette.

Legal.

MUNICIPAL BEQUEST FOR THE ERECTION OF MODEL DWELLINGS.

The case of *in re Sutton* deceased—Sutton v. the Attorney-General, came before Mr. Justice Warrington in the Chancery Division last week for further consideration,

The facts of the case were shortly these:—The late Mr. Wm. Richard Sutton, who died in May, 1900, by his will gave his residuary estate, valued at about 1,745,000, to the plaintiffs as his trustees upon trust to purchase or acquire from time to time freehold or copyhold land in London or other populous centres in England as sites for the erection of model dwellings and houses, and to build upon the sites model dwellings and houses to be called the Sutton Model Dwellings, for use and occupation by the poor, and to let the dwellings and houses to the poor at such rents (being below the full rents obtainable) as his trustees in their discretion should determine, the rents to be held for the purposes of the trust. The testator expressed a wish that some rent, however small, should in each case be reserved and paid and that no person should be allowed to live in the dwellings rent free. The present action was commenced in March, 1901, by the trustees, asking for administration of the trusts of the will, and an order was made directing the usual accounts and inquiries. The Master's Certificate found that there was standing in Court to the credit of the action about 750,000, there being about 1,000,000 still outstanding. The trustees wishing to commence the active administration of the charity by acquiring sites and proceeding with the erection of model dwellings as soon as possible, minutes of an order were settled on their behalf asking that a scheme for the regulation and management of the charity should be settled by the judge. The Treasury Solicitor, however, suggested that the matter should be referred to Chambers and the reference be stayed for two years, so that time should be given to consult the Local Government Board and other persons whose opinion might be valuable as to the mode in which such a charity could be administered. The trustees contended that a delay of two years would be unreasonable, and asked that the reference to settle a scheme should be immediately made. They also asked for power to apply 250,000 out of the sum in Court for the acquisition of sites and the erection of dwellings in one or two centres immediately.

At the conclusion of the arguments of counsel, his lordship declined to stay proceedings and referred the matter to Chambers for the scheme to be settled in the usual way. He also gave the trustees liberty to apply for leave to make a start before the general scheme was finally settled. Sir Robert Finlay, K.C., and Mr. Ashton Cross appeared for the plaintiffs; and the Attorney-General and Mr. R. J. Parker for the defendant.

ACTION BY BUILDER ON ARCHITECT'S CERTIFICATE.

The case of Capel v. Axton came before the Court of Appeal, consisting of Lords Justices Vaughan Williams, Stirling, and Fletcher Moulton on the 19th inst., on the plaintiff's appeal from an order made by Mr. Justice Sutton in Chambers.

Mr. Turrell, in opening the case, said the plaintiff appealed from an order of the learned judge confirming the order of the learned official referee. The point in the case was whether the learned official referee and the learned judge were right in striking out from the statement of claim that part of the claim which asked for a declaration. The action was brought by a builder under a building contract for moneys which had been certified by the architect, and the position taken up by the defendant was that he was not bound by the certificate which had been given by the architect. The learned counsel said that in drawing the statement of claim he found a clause in the contract that 5 per cent. of the amount certified for should be retained in order to see if there were any defects in the work appearing within three months. It was the ordinary retention clause.

Lord Justice Moulton said he understood the learned counsel wanted to add a declaration that the retention moneys had become due.

Mr. Turrell: Yes.

Lord Justice Moulton: How does the declaration help you—by putting to your credit the sum found due to you?

Mr. Turrell replied that the retention moneys were not due at the date of the commencement of the action.

Lord Justice Moulton: The other side do not refuse to allow the official referee to give you credit for what is due in fact?

Mr. Turrell: Oh, yes, they take up any defence they are entitled to take up! The only way I can get these moneys is by asking for a declaration that the moneys have become due.

Lord Justice Vaughan Williams: It is the only way you can get the moneys under this writ. If you wait until the time of retention comes to an end you can issue a fresh writ. The only point here is that you have found, now you have looked into it, that, having regard to the retention clause, you issued your writ rather too soon. You do not want to drop your writ, but you wish to keep it by asking for a declaration that these moneys you are entitled to, after they have served the purpose of being a security for the fund.

Mr. Russell Spokes, in answer to Lord Justice Moulton, said the retention money was kept for

three months in order to see whether any defects in the work appeared within that time. It was in the circumstances impossible to say that at the date of the writ the plaintiff had a right to the declaration. He submitted that the plaintiff had no right to put the defendant to the expense of the appeals.

Lord Justice Vaughan Williams asked Mr. Spokes if he disputed the validity of the certificate.

Mr. Spokes replied that he did because there was nothing in the contract which made the certificate final. He did not object to the official referee bringing the retention money into the account.

Lord Justice Vaughan Williams, in giving judgment, said he thought they ought to allow the plaintiff to amend. Mr. Spokes being willing that the sum in question should be brought into account, even though it was not due at the time the writ was issued, the costs of the appeal would be left to the official referee to deal with.

The other lord justices concurred.

BURSTING OF A WATER MAIN IN PICCADILLY-CIRCUS.

THE hearing of the case of the London Hydraulic Power Company v. the St. James's and Pall Mall Electric Light Company concluded before Mr. Justice Farwell in the Chancery Division on the 19th inst.

The question in the case was as to who was responsible for the mischief caused in the West-end by the bursting of a water main in Piccadilly-circus on July 10 last. Plaintiffs are the owners of the main, and defendants were alleged to have caused the accident by constructing an inspection-chamber or manhole, so that it rested on the pipe and transmitted to it the vibration caused by traffic above.

Sir Edward Clarke, K.C., in opening the case said that although the amount actually claimed by plaintiffs was under 200*l.*, a declaration was asked for which would affect other liabilities of a very considerable sum. The plaintiffs had about 150 miles of hydraulic mains in London, and supplied about 6,000 customers with power for lifts and other purposes. In 1888 they had a main through Piccadilly-circus, and in 1889 defendants, without informing plaintiffs, constructed a manhole, or inspection-chamber, over the main in such a way that two of the walls, 2 ft. 6 in. in diameter, rested on the pipe. It was a strong 6-in. pipe, the metal being 1½ in. thick. The pressure at which the water entered the main was 75 lbs. per sq. in., whereas it had been tested to bear a strain of 2,250 lb. The accident happened at about 8.15 p.m. on July 10, and it was not until midnight that the escape could be located, by which time the wood paving almost as far as Pall Mall had been ripped up, and another serious mischief done. Plaintiffs would prove that the breakage of the pipe was not caused by pressure of water. Defendants counterclaimed in respect of damage done to them in the matter on the ground that there was something faulty in the construction of the pipe. Defendants also alleged that a great deal of damage was due to delay in remedying the mischief after it was discovered. They would prove that everything possible was done at the earliest moment. The damages claimed, apart from the declaration, were in respect of relaying the main, and the cost of 300,000 gallons of water that escaped.

A number of witnesses gave evidence to the effect that there was no defect in the pipe, that the bursting was not caused by excessive water pressure, and that immediately the pipe burst prompt measures were taken to stop the outflow of water and prevent further damage. Various witnesses gave it as their opinion that the two walls of the inspection-chamber, which rested on the defendant's main, transmitted the vibration of the traffic overhead and led to the fracture of the pipe.

For the defendants expert evidence was given with a view to proving that there had been a subsidence in the neighbourhood which was quite sufficient to have caused the breakage of the plaintiffs' main. Several of the defendant's witnesses also stated that, having regard to the point at which the break occurred, it could not have been occasioned by vibration arising from the passing of traffic over the inspection-box.

In the result his lordship held that the plaintiffs had failed to prove that the bursting of the main was due to any act of the defendants, and dismissed the action with costs. On the defendant's counterclaim he entered judgment for them for 35*l.* odd with costs.

Order accordingly.

THE COMPOSITION OF MORTAR.

At the Greenwich Police Court, before Mr. Baggallay, on Wednesday last week, Messrs. H. & G. Taylor, builders, of 51, Boyne-road, Lewisham, appeared to summonses, issued at the instance of the London County Council, alleging an infringement of the by-laws under the Building Act in regard to the composition of mortar used by them in the construction of

certain houses in Boyne-road and Belmont-road, Lewisham. Mr. Baggallay appeared for the Council, and the defendants were represented by Mr. Macmorran, K.C., with whom was Mr. Curvingham Glen. The point in which it was alleged that the mortar did not come up to the by-laws was that it did not contain lime in the proportion of one part to three of clean sand or grit, and evidence was given by Mr. J. H. Coste, an assistant in the chemists' department of the London County Council, who had analysed a sample, to the effect that the proportion was much lower than this. He and other witnesses, who described the mortar as of poor quality, were cross-examined by Mr. Macmorran, with the view of eliciting that if the mortar had been made with the sand on the site, and measured with slaked lime, the proportion of slaked lime would have been one to three. Mr. Macmorran contended that there was nothing in the by-law to show that the proportion of dry lime to sand should be one part to three, and that it was the custom to measure the proportion of slaked lime. He contended further that the by-law was bad in point of law, on the ground of uncertainty, as it did not say whether the proportions must be of volume or weight, nor whether the lime, for the purpose of measurement, should be slaked or unslaked, while there was a difference of opinion upon the point. He quoted the Lord Chief Justice as deciding that the by-laws of a local authority must be free from ambiguity.

Mr. E. A. Gruning, F.R.I.B.A., a member of the Tribunal of Appeal, said he had inspected the houses, and found the mortar suitable. Some of the mortar was mixed in his presence, in the proportions of fourteen spadefuls of sand, thirteen of clinker, and nine of slaked lime. Mr. Max Clarke, F.R.I.B.A., said it was a common practice to take slaked lime in measuring the proportions for mortar, and Mr. F. W. Pott, general foreman in the employ of Messrs. Nightingale, and Mr. J. W. Reed, manager to Messrs. Holloway Bros., spoke to the taking of slaked lime for the purpose of measurement.

The magistrate said that there appeared to be no difficulty about the facts—the proportions of the materials used in making the mortar were three of other materials to one of slaked lime, and there was evidence of a practice of measuring it that way. Before more evidence was brought he would consider the legal question, and adjourned the further hearing *sine die*.

Patents of the Week.

APPLICATIONS PUBLISHED.*

3,619 of 1905.—Dr. H. COLOSEUS: *Manufacture of Cement from Furnace Slag.*

This relates to the method of the manufacture of cement from blast furnace slag wherein dissolved salts of calcium, aluminium, or magnesium are added to the liquid furnace slag, according to its composition, in such a manner that the cooled slag in a pulverised condition will harden to cement without further additions.

3,693 of 1905.—R. V. NOTLEY and W. T. P. TAYLOR: *Tops of Chimneys and Ventilating Stacks or Shafts.*

This relates to tops of chimneys and ventilating stacks or shafts, and consists of a dwarf self-flanching and weathering top, constructed with a square or rectangular flanch so shaped that it slopes at top from the centre of the chimney shaft towards its sides, or from the centre of the chimney stack, or from a line mid-way between two sides thereof towards one or more sides of said stack according to its position thereon.

5,608 of 1905.—J. SHRES and J. M. WOOLLER: *Machines for Dovetailing or Trimming Floor Joists.*

This relates to machinery or apparatus for dovetailing and trimming floor joists, consisting of a reciprocating frame actuated by suitable means and carrying a saw frame in which are two saws fixed at angles corresponding with the dovetail required to be cut; the said saws are caused to move to and fro during the cutting operation by means of suitably-arranged gearing crank mechanism and connecting-rod, which gearing is operated by hand. In close proximity to the saws a tool or chisel is provided suitably mounted in a frame and adapted to effect the cut by actuating the same downwards and vertically, by means of a weighted lever, which tool is employed for the purpose of cutting away the cut portions of the joist or portion between the angular or dovetail cuts, and thus forming a recessed cut or a complete dovetailed cut prepared for the insertion of or to receive a prepared or correspondingly-formed part of another joist.

6,650 of 1905.—S. KEMP-WELCH: *Method of, and Apparatus for, Cleaning Walls and other Surfaces.*

According to this invention, high-pressure steam is employed as a means of cleansing hard surfaces.

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

such as stone, brickwork, cement, wood, and the like. For this purpose a jet of high-pressure steam conveyed in a flexible or jointed pipe is applied, enabling the operator to direct the jet on any part of the surface to be cleaned. The high velocity of the steam, combined with the heat and moisture resulting from the condensation of the steam on the dirty surfaces, effectually and readily dislodges all dirt, leaving the surface in its original condition. In addition to the steam jet a spray of detergent material may be applied, such as soap, soda, or the like, prior to, or simultaneously with, the application of the steam jet.

7,155 of 1905.—W. E. DAVIS: Windows.
This relates to windows, and consists in the arrangement of two strips of leather or other material of a pliable nature, fitted at each side of the window-sash. The two strips are placed back to back at a slight distance apart, the bottom or short flanges, in case of the strips being turned up, being on the outside; these two parts are fastened to the frame of the door or window-sash, the fastening being made draught-tight. Small springs are fitted at each side to keep the long flanges together, the said strips being fitted to twice the depth of the window-frame. Then at each side of the window-frame is fitted, for the full depth of the window, a cast or stamped piece of material in the form of a letter T, having each of the short flanges either turned down or kept straight at the outer edges, in the case, when they are turned down, forming a groove at each side of the tongue. These tongues fit in between the two strips of leather, or other material of a pliable nature, fitted at each side of the window sash, the two top edges of the long flanges fitting into the grooves on the sash side of the T-pieces, if same are fitted, which are attached to the window-frame, thus allowing the window-frame to slide up and down as required.

7,938 of 1905.—E. SAVARY: Panelled Woodwork.
This invention relates to the construction of panelled woodwork, in which the various pieces may be fitted together and thus form a continuous piece or area of panelling without the necessity of hand labour thereon, except the labour necessary to fit together the pieces shaped as aforesaid, and so that this fitting may be done when the aforesaid panelling is being fixed to the surface it is intended to cover. The panelling is so designed and arranged that certain portions which form the styles and rails are grooved in such a manner that they may be secretly nailed and fixed to each other and to the area to be panelled, and at the same time the said grooves form an open mouth which facilitates the entrance into them of the panels. The styles and rails are also provided with tenons so formed that they exactly fit into the grooves which are also adapted to receive the panels.

8,323 of 1905.—SHARPE BROS. & CO., LTD., and N. E. COOKE: Overflow Chamber of Lavatory Basins and Baths.

This relates to a lavatory basin or a bath of the kind which is provided with an upright overflow chamber made integral therewith, and consists of a horizontal semi-circular or nearly semi-circular cover mounted on a central vertical pin at the front of the top of the overflow chamber, so as to turn about the pin and either close or open an overflow chamber, said cover fitting on a ledge at the top of the overflow chamber.

8,679 of 1905.—J. ARMOUR: A Detachable Device for Locking or Fastening Window-Sashes, and also for Enabling them to be Retained Slightly Open for Ventilation Purposes.

This invention relates to a detachable device for locking or fastening window-sashes. The upper sash is made with a sash plate having a keyhole or other slot therein and at the back thereof a square or cross-shaped slot or recess is made in the sash. The parting bead has a check or recess of any suitable length made in it. The locking device consists of a lever or bar which has a cross head at one end and a spring key at the other end, said spring key being capable of being pressed into a slot of the sash-plate and of being turned round by means of a cap made with a bayonet slot in which works a fixed pin on a casing surrounding the key spindle.

8,794 of 1905.—J. T. GINSON: Roofing Slates.
This relates to an attachment for roofing slates used for repairs, said attachment comprising a plate or holder secured to the upper end of the slate and having at its other end a spring clip to engage with a clip on to the upper edge of the lath when the plate is slipped into position.

9,306 of 1905.—W. GRIFFITHS: Show Stands or Brackets for Shop Window Dressing and the like purposes.

This relates to show stands or brackets for shop window dressing or the like purposes, comprising an arm or bracket, a sliding or movable carrier upon the said arm or bracket, and adjustable rods disposed in a star-like manner and passing diametrically through the said carrier. The carrier is made in the form of a circular cupped disc having a flanged open end. To the said flanged end are attached a pair of clip-like parts for sustaining the disc upon an arm or bracket which is detachably mounted on a suitable stand

or support in any ordinary manner. The disc can slide along the said arm or bracket for adjustment of its position as required.

9,967 of 1905.—V. PERRETT and L. PERRETT: Apparatus for Sanding the Surface of Partly-Finished Bricks or other like articles.
This relates to an apparatus for sanding the surface of partly-finished bricks or other like articles, comprising a box with open top, two separate compartments fixed upon the bottom of the box, their open ends extending up into the box, a fixed horizontal partition extending to the sides of the box and having openings fitted round the upper open end of the compartments, vertical plungers extending up through the bottom of the boxes into the compartments, a transverse lever pivoted to an arm below the box and having its ends jointed to the lower ends of the vertical plungers, platforms upon the upper ends of the plungers, and means to rise and fall alternately in the compartments by the oscillation of the lever, and a loose flexible diaphragm having its edge fixed inside the sides of the box resting and fixed upon the horizontal partition and having its loose part above the compartments and fixed to the edge of the platform at the upper end of the plungers, said means for causing the lever to oscillate upon its centre.

13,513 of 1905.—R. WHITEHEAD: Sash Fastener.
This invention relates to a method of jointing or locking the movable arm of a sash-fastener to the fixed plate without either pin, screw, or rivet. The arm has a short spindle attached to it which passes through the fixed plate and has a projecting part on its side at the bottom end, the fixed plate having a hole shaped to receive the spindle with the projecting part attached. When the spindle is inserted in the hole and the arm moved round the projecting part on the spindle is then on the underside of the fixed plate, and thus holds the two parts together in the same way that an ordinary key is held in a lock, and allows the arm to be moved sufficiently either way without coming unattached.

21,182 of 1905.—P. LÖSCHER: Trellis Work and Gratings Composed of Reeds, Canes, Wire, and the like.

This invention relates to trellis work and gratings composed of reeds, canes, wire, and the like, the characteristic feature being the fact that the longitudinal rods and transverse bars forming the trellis work or the gratings are fixed in apertures provided for that purpose in tubular bodies, such as tubes made of bamboo, wood, or metal, in which they are fixed by means of a wedge driven into the tubes.

21,496 of 1905.—W. L. MARCHAND: Wall Construction.

This relates to a wall construction comprising a plate with angular projections extending both vertically and horizontally, a second plate parallel with the first plate, bolts connecting said plates, a strip independent of said plates, and adapted to be supported between the inner and outer plates, and a series of cones depending from said strip and having vertical slits to straddle on said bolts, said bolts being removable and adapted to engage the upper end walls of the said slits, whereby the moulds may be removed from the wall after the blocks have been formed.

22,410 of 1905.—R. EVANS: A Down-Draught Preventer for Chimneys and Ventilating Shafts.

This relates to a chimney cowl or down-draught preventer, consisting of the usual body surmounted by a truncated cone secured to the said body so as to leave a space between it and the body, a cylindrical piece fixed at a short distance above the said cone, inside which is an inverted cone secured above a pipe, which connects the cylinder to the cone so as to leave a space between the pipe and the cylinder, and a number of vertical wings or flaps secured to the body and pipe beneath the said cone and cylinder.

22,602 of 1905.—A. THOMAS: Reinforced Concrete Buildings.

This relates to reinforced concrete buildings, and consists of a bonding device formed from a flat blank of metal with longitudinal slits so arranged that by suitably bending the strips a circular part is formed which embraces the tie rod, together with outstanding arms, which are embedded in the concrete to be strengthened, and with the tie rod. The arms can be bent at an angle to the tie rod, so as to lie at right angles to the shearing stress in the concrete. In this bending the arms will perform to be caused to twist somewhat about their longitudinal axis, so that the bending stress in the arms will be approximately diagonally through their section.

23,705 of 1905.—J. F. GREGORY: Shop Fronts, or the like.

This relates to a shop front, or the like, and comprises a window ledge which is open at the front end and is divided off at the back from the body of the shop or similar place by the use of a vertical front screen or window and by one or more high rearwardly-extending side-screens or returns, which partially enclose an accessible back space or area.

339 of 1906.—E. PRESTON: Adjustable Cramps for Use in Making Picture Frames and other Frames.

This relates to an adjustable cramp for use in making picture frames and the like, consisting of a series of four corner or mitre cramps having tubular or box-like guides or eyes at their corners, through which guides or eyes a tightening or cramping chain is threaded, the said chain being attached at one end to one of the corner or mitre cramps, the last-named corner or mitre cramp having attached to it a screw hook, which by a winged nut for adjusting the same, the hooked end of which screw hook engages with one of the links of the chain when the said chain has been tightened.

25,851 of 1905.—A. C. CUNNINGHAM: Caissons for Repairing the Bottoms of Floating Structures.

This relates to an under-water floating caisson, comprising an open-topped working chamber having a bottom and closed on two sides, said chamber being adapted to be entirely submerged and floated under the dock or other floating structure to be repaired, provided with means for exhausting the water therefrom, and having a shaft or shafts extending above the water level to permit workmen to enter the chamber after it is in place.

11,533 of 1905.—R. MIDDLETON: Arrangement of the Equipment for Jib Cranes for Derricking and like purposes.

This relates to the arrangement for jib for derricking and like purposes. The jib, pivoted at its foot to the mast in the usual manner, has its head attached to the mast by jointed links or side rods. These links or rods, which may be attached to any desired points on the mast and jib, are hinged or pinned together at any convenient point. This centre is attached preferably to a cross-head working in suitable slides fixed to the mast by a connecting rod. The cross-head is elevated or depressed in the slides on the mast by any suitable means, and thus the huge mass is made to ascend or descend accordingly, and so lengthen or shorten the distance, whereby the jib is caused to luff in or out as required.

13,989 of 1905.—R. DALE: Joints of Earthenware Drain Pipes.

This relates to the construction of water-tight joints between the ends of earthenware drain pipes, and consists in the use of a bitumen or bitumenised belt placed round the junction faces of the abutting ends, and an annular space formed between the collar and each pipe surrounding said belt, and filled with cement or the like.

16,017 of 1905.—J. A. SLOAN: Tiling.

This relates to the manufacture of tiling and consists of a tile having lateral projections defined by intersecting curves symmetrically arranged with respect to an axis, and ends defined by curves similar to, and continuous of, said first curves, said ends being developed by the revolution of the adjacent body curves of intersection.

16,082 of 1905.—A. WOLFF: Framework or Lathing for Use in Plastering Walls and the like.

The object of this invention is a framework, twined or woven from iron wire, to be used in building or isolating materials, especially for the coating or lining of walls, ceilings, and pillars. The characteristic feature of this framework consists in that the single wires are provided with lateral corrugations which secure the necessary space for the framework and the respective surface, and guarantee a solid hold of the coating material of the framework. When manufactured the netting is brought immediately from the twining machine on to rollers, which rollers are provided with length grooves or length rods, and which fit together, and thereby corrugate the wires of the netting.

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SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

March 9.—By FROGMORROW & Co. (at Matherdale).	
Matterdale, Cumberland.—A freehold and copyhold farmhouse and 16 a. 0 r. 34 p., including an allotment and six sties (in lots).....	£1,097
By HENRY BALL (at Kempton).	
Kempton, Bed.—282 and 284, Bedford-rd., f. y. 20, 16s.....	275
March 12.—By JONES, LANG, & CO.	
City.—36 and 37, New Broad-st. and 28, Broad-street-av., area 5,300 ft., building lease for 80 yrs., let at per annum.....	1,760
By KEMSEYS.	
Woodford Green, Essex.—High-rd., "Woodford Lodge" (building estate), area 6 acres, f.p. 6,000	
By SOUTHON & ROBINSON.	
Norwood.—9, Westow-hill (s.), est. 40, yrs., g.t. 6s., y.r. 70s.....	910
Croydon.—Wisebeach-rd., l.g. 10s., reversion in 58, yrs.....	200
Brixton.—37, Brixton-rd., est. 19, yrs., g.t. etc., 10s. 18s., y.r. 72s.....	330
By CLARKE, SON, & BOOTH (at Blakesley).	
Healdon, Northants.—A freehold farm, 107 a. 3 r. 32 p., y.r. 131l.....	2,750
Blakesley, Northants.—A freehold farmhouse and 33 a. 3 r. 37 p.....	1,800

March 12.—By C. H. BROWN.

Elmhurst—16, Colchester-st., ut. 27 yrs., g.r. 54. 10s., cr. 662	2415
6, Banksgard, ut. 22 yrs., g.r. 91, cr. 651	425
37, Cumberland-st., ut. 27 yrs., g.r. 85, cr. 1171	445

By DRIVERS.

Holloway—7, Tottenham-rd., ut. 51 yrs., g.r. 61. 6s., yr. 32	295
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By G. HEAD & CO.

Acton—208 to 211 (even), Acton-la., ut. 72 yrs., g.r. 25s., yr. 1002	625
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By SIMPSON & MOORE.

New Cross—16 and 18, Gellialy-rd., ut. 53 yrs., g.r. 10l. 10s., yr. 64	640
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By HUTLEY, SON, & VINE.

Tottenham Court-road—31, Tottenham-st., c., yr. 86	700
Hegent's Park—Redhill-st., Albany Wharf, ut. 12 yrs., yr. 1301 (including machinery, plant, etc.)	700
Holloway—Hungerford & Stoke, St. 8s., ut. 49 yrs., g.r. 11. 1s.	130
Kentish Town—Patshull-rd., L.G.R. 8l., ut. 55 yrs., g.r. 11	130
Highbury—22 and 24, Ewood-st., and 11 and 13, Myrtle-st., area 6, 600 sq. ft., yr. 67l. 12s.; also L.G.R. 3l. 12s., reversion in 2½ yrs.	650

By WILLIS, CROOKER, & LEE.

Rotherhithe—104, Paradise-st., l., w.r. 39l.	350
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March 14.—By HAROLD GRIFFIN.

South Lambeth—39 and 41, Goding-st., ut. 52 yrs., g.r. 16l., yr. 78s.	410
7, 9, and 11, Simpson-st., ut. 164 yrs., g.r. 15l., w.r. 88l. 8s.	145
Camberwell—69 and 61, Paulton-rd., ut. 61 yrs., g.r. 12l. 12s.	765
Battersea—1, Flough-rd., ut. 79½ yrs., g.r. 6l., yr. 35s.	240
2, Knox-rd., ut. 7½ yrs., g.r. 4l., w.r. 28l. 12s.	155
21, Grand-rd., ut. 41 yrs., g.r. 4l. 10s., w.r. 83l. 10s.	140

By W. MATRICE-JONES.

Somers Town—Clarendon-sq., etc., L.G.R. 300l., ut. 21 and 22 yrs., g.r. 124l.	2,000
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By THURGOOD & MARTIN.

Hyde Park—13, Old Queen's-ct., ut. 15 yrs., g.r. 6l. 13s., cr. 120l.	400
Oxford-street—7, Princes-st. (s.), ut. 11½ yrs., g.r. 40l., yr. 180l.	1,050
St. Bernard's Bush—4 and 8, Ledder-rd., l., w.r. 72l. 10s.	570
Croydon—High-st., Wrenote, l., p.	2,750
Norwood—1 to 13 (odd), Hollander-st., l., w.r. 145l. 12s.	1,200

By WINCH & SOSS (At Cranbrook).

Cranbrook, Kent.—Turk's Place Farm, 56 a.	1,740
Hartley, a plot of land in Cranbrook	150

March 15.—By JOHN BAKER & CO.

South Kensington—50, Hedcliffe-sq., ut. 68 yrs., g.r. 50l., p.	700
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By CURRIER & SOSS.

City—Little Britain, L.G.R. 45l., reversion in 46 yrs.	970
Fullam—566, King's-rd. (s.), ut. 45 yrs., g.r. 54. 13s. 4d., yr. 154	300

By GLASIER & SONS.

Holloway—103, Fairbridge-rd. (s.), ut. 76½ yrs., g.r. 8l. 8s., yr. 47l. 10s.	560
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By HATCH & HATCH.

Catford—167 and 169, Rushy-green (s.), l., yr. 235l.	3,950
Beckenhams—Kimberley-rd., l.g. rents 25l. 4s., reversion in 60 yrs.	500
Norfolk-ter., l.g. 15l., reversion in 90½ yrs.	390

By E. HOLSWORTH.

Hammermith—14 and 16, Dalling-rd. (s.), c., cr. 60l.	895
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By JENKINS, SONS & CO.

Brockley—21, Endwell-rd., ut. 69 yrs., g.r. 52. 5s., cr. 36l.	265
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By MARK LIELE & SON.

Bow—48, 49, 50, and 51, Merchant-st., l., w.r. 143l.	1,245
Barnsbury—31, Belitha-villas, l., yr. 50l.	725
Crouch End—105 to 113 (odd), Park-rd., c., cr. 112l. 9s.	1,180
266, Ferne Park-rd., l., cr. 50l.	550
Stroud Green—1, Nelson-rd., ut. 79 yrs., g.r. 11l., yr. 50l.	425

By STIMSON & SOSS.

Kennington—10, Hurley-rd., ut. 21½ yrs., g.r. 4l., yr. 35l.	220
23 and 24, Renfrew-rd., ut. 21½ yrs., g.r. 8l., rating to 12s., yr. 36l.	455
Walworth—70, East-st. (s.), l., yr. 85l.	500
Peckham—66, Hill-st., l., yr. 30l.	500
72, Lugard-rd., ut. 69½ yrs., g.r. 4l. 10s., p. 27 and 29, Queen-rd. (s.), ut. 77 yrs., g.r. 50l., yr. 130l.	325
Choburn-rd., l.g. 6l. 6s., reversion in 73 yrs.	1,090
Copson-rd., l.g. 12l. 12s., reversion in 74 yrs.	325
Camberwell—55, Westmacott-st., l., w.r. 36l. 8s.	385
Beckenham—Parish-la., l.g. 15l., reversion in 69 yrs.	325

By BACHELAR & SON (at Catford).

Catford—51 and 53, Perry-hill, l., cr. 103l.	810
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March 16.—By G. E. LERCK.

Highbury—Hornsey-la., "Chestnut Lodge," l., yr. 55l.	1,150
Hornsey-la., "Newlyn," l., yr. 145l.	2,150
Hornsey-la., "Cavendish," l., yr. 130l.	1,600
Hornsey-la., "Ivanhoe," l., cr. 130l.	1,775
71, Whitehall-pk., l., yr. 89l.	1,110

By WASTON & SONS.

Caledonian-road—2 and 3, Railway-st., ut. 38½ yrs., g.r. 10l., yr. 80l. 14s.	460
30, Story-st., ut. 38½ yrs., g.r. 6l., yr. 57l. 4s.	200
112, Bernerton-st., l., 38½ yrs., g.r. 5l., w.r. 63l. 14s.	170
5 and 7, Gilford-st., ut. 35 and 38 yrs., g.r. 12s., w.r. 122l. 4s.	300
Holloway—56 and 58, Alcon-rd., ut. 59½ yrs., g.r. 54. 5s., w.r. 59l. 16s.	320

By ORGILL, MARES, & CO.
City—Rood-la., "The Oriental" p.h., a freehold rent of 220l., reversion in 61 yrs. \$4,270
Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpected terms; p.a. for per annum; p.s. for years; l.a. late; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; g.d. for gardens; y.f. for yard; gr. for grove; b.h. for beerhouse; p.b. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, MARCH 23.
Architectural Association.—Mr. A. W. Soames, M.P., on "The London Club House of Last Century." 7.30 p.m.
Institution of Civil Engineers (Students' Meeting).—Mr. F. K. Stevens on "Waves." 8 p.m.

SATURDAY, MARCH 24.
Architectural Association.—Fifth spring visit, to flats in High-street, Kensington. Meet in Horton-street 1.30 p.m.
Royal Institution.—Professor J. J. Thomson, M.A., on "The Corpuscular Theory of Matter." IV. 3 p.m.
Royal Sanitary Institute.—A provincial sessional meeting to be held at the Town Hall, Leicester, when a discussion will take place on "Cremation," with particulars of the Leicester Corporation Crematorium. The discussion will be opened by Mr. C. Killick Millard, M.D., D.S.C., Medical Officer of Health, Leicester, 11 a.m.
Edinburgh Architectural Association.—Visit to the new premises of the Professional and Civil Service Supply Association, Ltd., 80, George-street.
Monday, March 26.
Surveyors' Institution.—Adjourned discussion on paper by Mr. W. Woodward on "The Means of Locomotion and Transport in London." 8 p.m.
Society of Arts (Continental Lecture).—Professor Vivian B. Lewes on "Fire, Fire Ejects, and Fire Extinction." III. 8 p.m.
Society for the Encouragement of the Fine Arts.—Mr. H. Beaton on "A Tour in Central France, including the Cathedrals of Bourges and Tours;" lantern illustrations, 8 p.m.

TUESDAY, MARCH 27.
Royal Institution.—Mr. J. E. Marr, M.A., F.H.S., on "The Influence of Geology on Scenery." II. 5 p.m.
Builders' Clerks' Benevolent Institution.—Annual Dinner, King's Hall, Holborn Restaurant, 6.30 p.m.
Institution of Civil Engineers.—Paper to be further discussed: "The Outer Barrier, Hotharrow Iron Mines," by Mr. H. Shottford Bidwell. 8 p.m.

WEDNESDAY, MARCH 28.
Architectural Association Discussion Section (Combined meeting with the Law Students' Debating Society, Law Societies' Hall, Chancery-lane).—Short Paper by Mr. W. Woodward on "The Legal Ownership of Drawings." 7.15 p.m.
Edinburgh Architectural Association.—Mr. J. Roxburgh Chapman on "Steel Building Construction; a Comparison of British and American Methods," illustrated by lantern slides, 8 p.m.
Society of Arts.—Mr. A. J. Martin on "Coal Conservation, Power Transmission, and Smoke Prevention."
Institution of Civil Engineers.—Students' visit to the Works of Messrs. Price's Patent Candle Company, Ltd., Battersea, S.W.

THURSDAY, MARCH 29.
Birmingham Builders' Exchange.—Mr. W. F. Goodrich on "The Goldfields of the City," illustrated by lantern views, 8 p.m.
Institute of Sanitary Engineers.—Mr. A. E. Abbott on "Heating and Hot Water Supply." II. 7 p.m.
Royal Institution.—Professor H. Hopkins, M.A., on "Internal Combustion Engines." II. 8 p.m.

FRIDAY, MARCH 30.
International Congress on School Hygiene.—Preliminary meeting of Second Congress, to be held in the Jehangir Hall of the University of London, South Kensington, 5 p.m.

SATURDAY, MARCH 31.
Royal Institution.—Professor J. J. Thomson, M.A., on "The Corpuscular Theory of Matter," Y. 3 p.m.

BEICKS, &c. (continued).

Best Glazed Bricks (continued)——	
Best Dipped Salt	5 3
Glazed Stretch-£ s. d.	
ergs and Header. 12 0 0	per 1000, at railway depôt.
Quoins, Bullnose, and Flats	14 0 0
Double Stretchers	15 0 0
Double Headers	14 0 0
One Side and two Ends	15 0 0
Two Sides and one End	15 0 0
Splayed Chamfered Squares	14 0 0
Second Quality White and Dipped Salt Glazed	2 0 0
Thames and Pit Sand	6 8
Thames Ballast	5 3
Best Portland Cement	24 0
Best Ground Blue Lias Lime 19 0	
NOTE.—The cement of Home is exclusive of the ordinary charge for sacks.	
Grey Stone Lime	11s. 0d.
Stourbridge Fireclay in sacks 27s. 0d.	per ton at rly. dpt.

STONE.

BATH STONE—delivered on road waggons, Paddington Depôt	1 6½
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½
PORTLAND STONE (30 ft. average)—Brown Whittled, delivered on road waggons, Paddington Depôt	2 1
White Basebed, delivered on road waggons, Paddington Depôt	2 2½
Elms Depôt, or Fimlico Wharf	s. d.
Anchorer in blocks	1 10
Greenhill	1 10
Darley Dale in blocks	2 4
Red Corsehill	2 2
Closworth Red Freestone	2 4
Red Mansfield	2 4
York Stone—Robin Hood Quality.	
Scrapped random blocks	2 10
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3
6 in. rubbed two sides ditto, ditto	2 6
3 in. sawn two sides slabs (random sizes)	0 11½
2 in. to 2 in. sawn one side slabs (random sizes)	0 7½
1½ in. to 2 in. ditto, ditto	0 6
HARD YORK—Scrapped random blocks	3 0
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8
6 in. rubbed two sides ditto	3 0
3 in. sawn two sides slabs (random sizes)	1 2
1 in. self-faced random flags	0 5
Hopton Wood (Hard Bed) in blocks	2 0
6 in. sawn both sides landings 2 per ft. super. del. rly. depôt.	
3 in. sawn both sides random slabs	1 0
2 in. do. 0 8½	

SLATES.

In. In.	£ s. d.
20x10 best blue Bangor	13 2 6
20x10 first quality	13 0 0
20x12	13 5 0
16x8	7 5 0
20x10 best blue Portland madoc	12 12 6
16x8	6 12 6
20x10 best Eureka	15 17 6
20x12	18 7 6
18x10	13 5 0
18x8	10 5 0
20x10 permanent green	11 12 6
18x10	9 12 6
16x8	6 12 6

TILES.

Best plain red roofing tiles	£ s. d.
Hip and Valley tiles	3 7
Best Broseley tiles	50 0
Do. Ornamental tiles	52 6
Hip and Valley tiles	4 0
Best Hasbun red, brown, or brinded do. (Edwards)	57 6
Do. Ornamental do.	59 0
Hip tiles	4 0
Valley tiles	3 0
Best Red or Mottled Staffordshire do. (Peach)	51 6
Do. Ornamental do.	54 6
Hip tiles	4 1
Valley tiles	3 8
Best "Bosman" brand plain tiles	48 0
Best Ornamental tiles	50 0
Hip tiles	4 0
Valley tiles	3 8
Best "Hartshill" brand plain tiles, sand-faced	50 0
Do. pressed	47 6
Do. Ornamental tiles	50 0
Hip tiles	4 0
Valley tiles	3 6

PRICES CURRENT OF MATERIALS.

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

BRICKS, &c.

Hard Stocks	£ s. d.
Rough Stocks and Grizzlies	1 4 0
Picked Stocks for Facings	2 15 0
Flettons	1 5 0
Red Wire Cuts	1 11 0
Best Facehand Red	3 12 0
Best Head Pressed Euabon Facing	5 0 0
Best Blue Pressed Staffordshire	3 15 0
Do. Bullnose	4 0 0
Best Stourbridge Fire Bricks	3 14 0
GLAZED BRICKS	
Best White and Ivory Glazed Stratchers	12 0 0
Headers	11 0 0
Quoins, Bullnose, and Flats	15 0 0
Double Stretchers	19 0 0
Double Headers	16 0 0
One Side and two Ends	19 0 0
Two Sides and one End	20 0 0
Splayed, Chamfered, Squares	20 0 0

WOOD.

Table listing wood prices: BUILDING WOOD, Deals, Battens, Second Yellow Deals, Fir timber, etc.

Table listing wood prices: JOISTS' WOOD, White Sea, Second white deals, etc.

Table listing wood prices: Yellow Pine, Danzig and Stettin Oak Logs, etc.

Table listing wood prices: Prepared Flooring, etc.

Table listing wood prices: JOISTS, GIRDES, &c. Rolled Steel Joists, etc.

Table listing wood prices: METALS, Iron, Staffordshire Crown Bars, etc.

METALS (continued).

Table listing metal prices: Iron (continued), Sheet Iron, Galvanized, etc.

Table listing metal prices: LEAD, &c. LEAD-Sheet, English, 3lb. and up, etc.

Table listing metal prices: ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES, 15 oz. thirds, etc.

Table listing metal prices: ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES, Hartley's, etc.

Table listing metal prices: OILS, &c. Raw Lined Oil in pipes, etc.

Table listing metal prices: VARNISHES, &c. Fine Pale Oak Varnish, etc.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications...

TERMS OF SUBSCRIPTION.

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TENDERS.

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

ABERGWILLI.—For erecting a dwelling-house at Colshill Farm, for Mr. William Williams, Cerhillian Abergwili, Carmarthenshire. Mr. God Protheroe, surveyor, Llanynoch, Carmarthenshire.— Mason's Work. L. Evans ... £170 10 0 T. Lewis, White D. Lewis ... 185 10 0 Mill, Abergwili* ... £126 10 7 D. Rees ... 160 0 0

ALNWICK.—For covered septic reservoir at Sturton Grange, for the Rural District Council.— C. Thompson & Son, Alnwick. ... £380 0 0

ANNAN (N.B.).—For erecting a hall and a vestry for Eskine U.F. Church, Mr. E. Tweedie, architect, Lydie-street, Annan.— H. Kerr & Son, Butts-street, Annan* ... £550

BAGTHORPE.—For erecting at Bagthorpe workhouse a sanatorium for females, for the Guardians. Mr. A. Marshall, architect, King-street, Nottingham.— J. G. Short, Sneinton, Nottingham*. ... £1,192 10 0 [Two tenders received.]

CARSHALTON.—For woodwork and kitchen fittings at the Southern hospital, Carshalton-on-the-hill, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief. Kirk & Randall ... £410 0 0 G. E. Wall's & W. Summerscales ... 327 0 0 & Sons, Ltd. ... 411 10 0 W. Johnson & Co., Dix, Jones, & Co. ... 395 0 0 L. H. Wards, T. Potter & Sons, ... 389 0 0 S.W.* ... 320 0 0 R. Lisle & Sons ... 345 15 0

CONSETT.—For Consett Baptist Church and Schools. Messrs. George Baines & Son, architects, 5, Clements-street, Strand, London, W.C.— Estimate A. Estimate B. Total.

Table listing tender amounts for Consett Baptist Church and Schools.

Accepted with modifications for estimate A.

DARTFORD.—For York-road girls' Council Schools, for Kent Education Committee.—

Table listing tender amounts for Dartford Council Schools.

TENDERS—Continued on page 335.

List of Contracts, etc.

CONTRACTS.

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

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Granite, Flints, etc.	East Grinstead U.D.C.	W. E. Woolmans, Eng., Coun. Offices, London-rd., E. Grinstead	Mar. 26
Cement Path Work	Gateshead Borough Council	W. Swelburns, Town Clerk, Gateshead	Mar. 27
Plumbing and Electric Lifts at Technical Institute	Belfast Library, etc., Com.	S. Stevenson, Architect, 55, Royal-avenue, Belfast	do.
Rebuilding part of Boundary Wall, Booth Town-road	Halifax Parks Committee	J. Lord, Borough Engineer, Town Hall, Halifax	do.
1,200 yds. of Unclimbable Iron Fencing	Mountain Ash U.D.C.	Surveyor, Town Hall, Mountain Ash	do.
Electric Lighting of Mountgomery-street, Housing Scheme Buildings	Dublin Lighting Committee	City Electrical Engineer, Fleet-street, Dublin	do.
Painting, etc., Methodist Free Church, Armsley		M. Akers, 101, Town-street, Armsley	do.
Yarn Church, New Vestry		Wright & Son, Surveyors, Lancaster	do.
Pumping Machinery for Artesian Well, Tiverton-road, Selly Oak	King's Norton, etc., U.D.C.	W. M. Binay, Consult. Eng., 23, Valentine-rd., King's Heath	do.
Smith & Ironfounders' Wk. for Steel Roof, etc., Stroud Grm. Well	Croydon Corporation	Borough Engineer, Town Hall, Croydon	do.
*COLLEC., REMOVAL, AND DISPOSAL OF HOUSE REFUSE	Whitson District Council	Council's Engineer, Public Offices, Doyne-road, Kilburn, N.W.	do.
*SURFACE WATER CULTURE, NR. GLADSTONE PARK.	do.	do.	do.
*BOUNDARY WALL, ISOLATION HOSE, GRDS., NEASDEN	do.	do.	do.
*ROADMAK. & PAV. WKS., CRICKLEWOOD & HARLESDEN	do.	do.	do.
*ERECTION OF NEW SCHOOL IN FULLEDGE	County Borough of Burnley	Borough Surveyor, Town Hall, Burnley	do.
Road Material and Carting	Whiston R.D.C.	E. J. Knappman, Surveyor, Delph-office, Whiston	Mar. 28
Stores.	do.	do.	do.
Alterations to Buildings, Baldwin-street, Bristol	Dunlop, Macleod, & Co., Ltd.	H. Williams, Architect, Alliance-chambers, Corn-st., Bristol	do.
Additions, etc., to Wrenbury School-buildings, near Nantwich	Chester Sub-Com. Nantwich	H. Bewick, County Architect, Newgate-street, Chester	do.
Granite	Hellaton R.D.C.	J. H. Douglass, Clerk, Market Harborough	do.
Alterations, etc., to Grammar School, Hipperholme		H. H. Nankwell, Surveyor, Vestry Hall, Bradford	do.
Stoneware Pipe and Surface Water Drains	Rochdale Paving, etc., Com.	Borough Surveyor's Office, Town Hall, Rochdale	do.
40 local yds. of Intercepting Sewer, etc.	Barrow-upon-Irwell R.D.C.	Mr. Hooley, C.E., Union Offices, Patricroft	do.
Improvements to Road between Miskin and Cornely-parc	Liaotrison, etc., R.D.C.	G. S. Morgan, Surveyor, School-street, Pootychill	do.
Stores, etc.	do.	do.	do.
Road Materials	Manchester Cleansing Com.	R. Williamson, Town Hall, Manchester	do.
415 yds. of 9-in. Sanitary Pipe Sewer, Brompton	Crabbrook R.D.C.	T. H. Crampton, Clerk, Crabbrook, Keat	do.
100 yds. of 6-in. Sanitary Pipe Sewer, Brompton	Northallerton R.D.C.	W. Fowie, Clerk, Northallerton	do.
1,600 yds. of Pipe Sewers, Washwood Heath-road, etc.	Birmingham Public Wks. Com.	T. Arald, Council House Birmingham	do.
Redrillio Gosholt Pollock-station	Northumberland Co. County	J. A. Bean, County Architect, Moot Hall, Newcastle-on-Tyne	do.
520 yds. of 9-in. Stoneware Pipe Sewer	Bradford U.D.C.	H. H. Nankwell, Surveyor, Vestry Hall, Bradford	do.
Granite Spalls	West Ham Guardians	F. E. Hinkley, Clerk, Union Workhouse, Leytonstone, N.E.	do.
Portland Cement	Guildford Town Council	C. G. Mason, Borough Surveyor, Tuo-gate, Guildford	Mar. 29
Road Materials	Guildford Corporation	do.	do.
Sewage Pumping Plant	Stockport Electricity Com.	A. E. Adams, Borough Engineer, Chippendale, Wilts	do.
Electric Motors	Castleford U.D.C.	W. Green, Surveyor, Castleford	do.
Improvements in Eastfield-lane, Castleford	Mossr. Fulb. & Dunlop	E. H. Bruton, Architect, 119, Queens-street, Cardiff	do.
Alterations to Premises, Duke-street and St. John-square, Cardiff	Croydon R.D.C.	H. M. Price, F.S.I., Town Hall, Croydon	do.
Street Works, Caudion	do.	do.	do.
Street Works, Sandestead	Lytham U.D.C.	A. J. Fries, Surveyor, Lytham	do.
Materials	Crutcheon Park Committee	P. K. Lewis, City Architect, Guildhall, Nottingham	do.
Creek Taxidling, Toulhouse, etc., Meadow's Recreation Ground	Ruislip-Northwood U.D.C.	W. Louis Carr, Surveyor, Council Offices, Northwood	Mar. 30
270 tons of Hard Clinker Ashes and 100 yds. of Lead Drain	Abenbury Municipal Charities	A. E. Allen, Architect, 31A, Bridge-street, Banbury	do.
Alterations to No. 13, High-street, Baobury	Salford Corporation	J. Witlet, Architect, Elgin	do.
Watering Greens of Moray Golf Course	North Riding County Council	J. Morgan, Engineer, Union Works, Town Hall, Salton	do.
Painting Two Bridges over the River Irwell	Hull Corporation	J. Coates Carter, Bank-buildings, St. Mary-street, Cardiff	do.
Hall and Assembly-room, Penarth	North Riding County Council	W. G. Bryliffe, County Surveyor, Northallerton	do.
Widening, etc., of Swanby Beck Bridge, Swanby	Hull Corporation	A. B. White, City Engineer, Town Hall, Hull	do.
Sewer between Lowgate and Quay-street	Atcham Guardians	W. L. Talbot, District Surveyor, Coldash, Newbury	do.
Additions to Workhouse, Atcham, Shrewsbury	Mr. G. H. Oldroyd	W. G. Scott & Co., Architects, Victoria-buildings, Workington	do.
Primitive Methodist Church, Ellenborough, Cumberland	do.	F. W. Ridgway, Architect, 11, Union-street, Dewsbury	do.
Alteration of the Hall, Gomersal, Yorks	Nottingham City Council	A. Brown, City Engineer, Nottingham	Mar. 31
Highway Repairs	do.	do.	do.
150 tons of Steel Tram Rails, and 21 tons of Fishplates	do.	do.	do.
250 Tramway Poles and Fittings	Essex County Council	P. J. Sheldon, Chief Surveyor, Chelmsford	do.
10,000 tons of Granite Setts	Essex County Society	Linton & Barker, Architects, Newport, Mon.	do.
Norway Granite Kerb and Setts and Yorkstone Edging	Derby Guardians	N. Twizel, Clerk, Poor Law Offices, Derby	do.
Golf Pavilion on Omgrove Down, near Bridgend	Bredwardine R.D.C.	H. B. Hamar Surveyor, Brecklands Hay	do.
Cleaning and Decorating Interior of Workhouse Chapel	Atcham Guardians	H. Thompson, Architect, Southgate-chambers, Elland	do.
Hawling Materials	Pocklington R.D.C.	T. Robson, Clerk, Pocklington	do.
Twelve Houses, Spring-gardens, Burnley-road, Sowerby-Brad	Croft R.D.C.	C. H. Leach, Clerk, Union Offices, Darlington	do.
Blue Stone and Slag	Cwmaman Coal Company	Morgan & Elford, Architects, 1, Jeffrey-street, Mountain Ash	do.
Broken and Unbroken Whinstone	Building Club	Mining Offices, Masteg	do.
Colliery Offices, Cwmaman, Aberdare	Barrow-in-Furness Corporation	Borough Engineer's Office, Town Hall, Barrow-in-Furness	do.
50 Cottages, Tonnadefald Estate, Nant-y-fallon, Maesteg	Whitby U.D.C.	C. Ford Whitcombe, Architect, Newbury, Broadheath, Worcs.	do.
Alterations, etc., to School Conventicles, Thwaite-street, etc.	Industrial Co-operative Soc.	F. Robertson, Sec., Carville-road, Walsend-on-Tyne	do.
Church Restoration, Cleve Prior	Bexhill Corporation	G. Hall, Borough Surveyor, Town Hall, Bexhill	do.
Converting Old Buildings into Stables, Spital Bridge	Faversham Corporation	S. F. Andrews, Borough Surveyor, 20, West-street, Faversham	do.
Six Houses in Flats, Station-road, Walsend	Brimley & Frodingham U.D.C.	G. Green, Surveyor, Council Offices, Frodingham, Doncaster	do.
Making-up Streets	Swinton & Pendlebury U.D.C.	H. Entwistle, Eng. & Surv., Coun. Offices, Swinton, Manchester	do.
Materials	Bognor U.D.C.	O. A. Bridges, Surveyor, Bognor	April 2
Flints, Gravel, Cement, Road Rolling, and Timber	Beckenham U.D.C.	Council's Surveyor, Beckenham	do.
*MAKING-UP ROADS	Newburn U.D.C.	R. Leverton, Delaware-road, Gainsborough	do.
Wesleyan Church and Schoolroom at Chilwell	do.	J. Platts, Architect, High-street, Rotherham	do.
Business Premises, Doncaster-gate and Wellgate, Rotherham	Pontypridd U.D.C.	T. Gregory, Engineer, Newburn	do.
600 cubic yds. of Concrete Walling at Bell's Close	do.	do.	do.
150 yds. of Iron Paving at Lemington and Newburn	do.	do.	do.
1,200 yds. of Paving at Lemington and Newburn	do.	do.	do.
Twenty-five Cottages at Rhyl-difen	Hambledon R.D.C.	P. R. A. Wilbushby, Surv., Dis. Council Offices, Pontypridd	do.
300 cubic yds. of heavy Retaining Wall, Pontypridd	do.	do.	do.
30 yds. of Face Wall, Tinsy-gate-road	do.	do.	do.
15 tons Cast-iron Cylinders and 280 tons Cast-iron Socket Pipes	Eastington U.D.C.	F. B. Grantham & Son, Engs., 23, N'umberland-av., London	do.
Smallpox Hospital, near Thornley, Co. Durham	Sharncliffe, Archer, Surveyors, Wellingborough	S. Stokes, Architect, Sedgefield	do.
2,000 yds. of Pipe Sewers, Higham Ferris, Northants	Sevoosaks R.D.C.	G. F. Carroll, Clerk, Sevoosaks	do.
Stoneware Pipe Sewer, near the Green, Leigh	Glasgow Tramways Com.	Purchasing Department, 45, Bath-street, Glasgow	April
Stores.	Sunderland Corporation	Borough Engineer, Town Hall, Fawcett-street, Sunderland	do.
Works and Materials	South Shields Corporation	S. E. Burgess, Boro. Engin. & Survey., Chapter-row, S. Shields	do.
Improvements at Hida Colliery Wagonway, Station-road	Ticehurst R.D.C.	W. N. Wood, Surveyor, Ticehurst, Sussex	do.
Materials	Gravesend Guardians	W. J. King, Clerk, Town Hall Buildings, Gravesend	do.
70 fathoms of Swedish Yellow Deal and Battens	Heme Bay U.D.C.	W. J. Palmer, Surveyor, Town Hall, Heme Bay	do.
Annual Contracts	Tenterden R.D.C.	W. H. Turner, District Surveyor, Tenterden, Kent	do.
Underdraining Water Supply Works, etc.	Woodhall Spa U.D.C.	J. E. Chattelton, Clerk, Church-lane, Horncastle	do.
Drainage at Workhouse	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
450 tons of Granite	Hackney Borough Council	S. E. Burgess, Boro. Engin. & Survey., Chapter-row, S. Shields	do.
*PAINTING, ETC., WORKS, N.W. FEVER HOSP., HAMPSHIRE	Monmouth Guardians	W. J. Daves, Engineer, 64, Victoria-st., Westminster, S.W.	April 5
Underdraining Water Supply Works, etc.	Fenton U.D.C.	A. J. H. Powell, Surveyor, Hereford and Moonmouth	do.
Materials	do.	S. A. Goodall, Surveyor, Town Hall, Fenton	do.
Macadam	do.	do.	do.
*ALTERS TO HEADING AND HOT WATER AT INFIRMARY	Kennington Guardians	Clerk to Guardians, Market-road, Kennington, W.	do.
*WATER WORKS	Brixham U.D.C.	W. Vanstone, Engineer, Palace-chambers, Fawcett	April 6
Broken Limestone and Gravel for Road Maintenance	Magor & St. Mellon's R.D.C.	L. Thomas, Clerk, Union Offices, Queens-hill, Newport, Mon.	April 7
Two Tip Wagons, Two Street Watering Vans, and Three Carts.	Burdorf Street Committee	Borough Surveyor, Town Hall, Bedford	do.
Stone, etc., and Cartage	Wrotham U.D.C.	A. J. H. Powell, Surveyor, Borough Green, Sevenoaks	do.
First Part of Observation Block at Dialstone-lane Hospital	Stockport Corporation	G. H. Brady, Arch., Boro.-chambs., St. Petergate, Stockpt.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Hauling Stone	Kington R.D.C.	F. Epton, Surveyor, Broxwood, Pembridge	April 9
Materials	Worley U.D.C.	J. A. Corson, Surv., District Offices, Hiltop-lane, Walsden	do
Extension of Heading in Well, Lining of Well, etc.	Hambleton R.D.C.	R. B. Grantham & Son, Engrs., 23, N. Thumberg-lane, London	do
PUBLIC LIBRARY	Cleehunt U.D.C.	J. Myrtle Smith, Architect, 8, Trafalgar-square, Chelsea, S.W.	do
Four Cottages, Breda	Hastings Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings	April 10
Gasholder, Tank, and Spiral-guided Gasholder	St. Neots Gas Co.	The Manager	do
IMPROVEMENTS to SCHOOL, DEITFORD, S.E.	London County Council	Education Offices (Archts. Dept.) Victoria-embankment, W.C.	do
Granite, Picked Stones, etc.	Bosmere and Clayton R.D.C.	G. Fluke, Surveyor, Red House, Coddenhall, Ipswich	April 11
Rail-road, Trinetriet	Rhoonda U.D.C.	Public Offices, Pentre	April 12
SUPPLY OF SHEET LEAD.	Hartley Wintney Union	Clerk to Guardians, Odham, Hants.	do
NURSES' HOME	Coventry, etc., Hos. Committ.	H. W. Chattaway, Architect, Trinity Church-yard, Coventry	April 23
RENTURE, ETC., CO. LEN. ASY. PARK, HEATH	Kent County Asylum Com.	W. J. Jennings, Architect, 4, St. Margaret's-stk., Canterbury	April 25
Three Circular Tanks, Cuckold, Condit, etc., Rhodet	Middleton Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton	April 30
Primitive Methodist Sunday-schools, Silver Lloyd Hill, Wortley		Davidson & Phillipson, Architects, Peard-bldgs., Nwct-on-T.	No date.
Wesleyan Church, Armlay		W. J. Morley & Son, Architects, 269, Swan-arcade, Braulford	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*CLERK OF WORKS	Fulham Guardians	£1. 13s. 6d. per week	Mar. 29
*ARCHITECT OR DRAUGHTSMAN	W. Snaxey, etc., Jt. Educ. Com.	120 <i>l.</i>	No date.

AUCTION SALES.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*FREEHOLD VILLAS, etc.—Torrington Hotel, North Finchley	Charles Sparrow & Son	Mar. 26
*FREEHOLD WORKSHOPS, HODDESDON—Bull Hotel, Hoddedon	C. H. Ashford	Mar. 28
*STOCK OF BUILDERS, etc., 34, TRANQUIL VALE, BLACKHEATH.—On the premises	Henry W. Flag & Son	Mar. 28, etc.
*BUILDING SITE, HAYMARKET, S.W.	May & Rowden	Mar. 29
*SHOPFITTERS, ETC., STOCK, 30, VALLANCE-ROAD, R.—On the Premises	W. F. Liang	April 2
*FREEHOLD BUILDING LAND, SHEERNESS—At the Mart, E.C.	Thicket & Son	April 4
*FREEHOLD PROPERTY, EUSTON-ROAD, N.W.—At the Mart	Edwin Fox & Bousfield	April 9
*THE HOLBORN TOWN HALL, GRAY'S INN-ROAD, W.C.—At the Mart	Jones, Lang, & Co.	April 10
*FREEHOLD BUILDING LAND, SYDENHAM—At the Mart	Belmont, Tewson, & Co.	April 11
*FREEHOLD BUILDING LAND, STAMFORD HILL—At the Mart	F. W. Hobson	April 18
*BRICKWORKS AND BUILDINGS AS GOING CONCERN—Bordon Camp, Hants	R. C. S. Evvett	April 20
*FREEHOLD BUILDING SITE, MILE END-ROAD—At the Mart	S. Walker & Son	May 4
*FREEHOLD BUILDING SITE, TOTTERHAM COURT-ROAD—At the Mart	Venton, Bull, & Cooper	do
*RESIDENTIAL ESTATES, ROUSTON PARK, NR. HARKOW—At the Mart	Driver, Jones, & Co.	May 8
*FREEHOLD RESIDENCE, ETC., ALDERSHOT LODGE—At the Mart		

* Those with an asterisk are advertised in this number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xviii. Auction Sales, xxviii.

TENDERS.—Continued from page 333.

DUDDLEY.—For erecting a galvanised iron cottage at the Infectious Diseases Hospital, Bawmer's Green, for the Corporation of Dudley. Mr. John Gannaway, Borough Surveyor, Town Hall, Dudley:—
Iron Buildings.
 Ginger, Lee, & Co., Longsight, Manchester* £135 0
Foundations and fittings.
 M. Round, New-street, Dudley..... 96 10

ENFIELD.—For making-up Leighton-road, Bush Hill Park, for the Urban District Council. Mr. R. Collins, Surveyor, Public Offices, Enfield:—
 T. Adams..... 2907 0
 J. Jackson..... £890 0
 Fry Bros..... 946 17
 E. J. Betts, Enfield
 Hardy, Bate, & Co. 925 12 | Highway*..... 885 0

GOLBORNE.—For enlargement of Golborne Church:—
 J. Ellison..... £1,668 0 0
 H. Owen & Co. £511 14 6
 Webster & Winstanley..... 1,020 0 0
 Sons, Atherton & Balshaw 1,013 10 0
 ton, Manchester..... 901 6 0
 J. Peet..... 1,002 0 0 | Chester*.....

GUILDFORD.—For eighteen semi-detached cottages on the Woodhedge Estate, for the Woodbridge Cottage Club. Messrs. Houlton & Houlton, architects, 145, High-street, Guildford. Quantities by Messrs. McEwan & Waghorn, M.Q.S.A.:—
 Chinchon A..... £8,550 0 0
 B. C. Hughes, £5,900 0 0
 C. Son..... £8,550 0 0
 A. & F. Gann..... 8,799 0 0
 W. Lawrence & Co..... 5,900 0 0
 T. G. Hawkins 6,790 0 0
 Mitchell Bros., 5,964 0 0
 R. Smith..... 6,790 0 0
 W. Lawrence & Co..... 5,875 0 0
 Sons..... 5,716 0 0
 G. Kemp..... 6,697 0 0
 Martin, Wells, & Co..... 5,670 0 0
 G. Willis..... 5,288 0 0
 R. Wood & Son 6,130 0 0
 A. Franks..... 5,262 16 6
 J. Smith & Sons 6,087 0 0
 Tribe & Robins & Co..... 5,250 0 0
 C. Ansell..... 6,000 0 0
 W. Mercer..... 6,000 0 0
 Hefer & Co. 6,000 0 0
 Guildford..... 4,950 0 0
 Tompsett & Co. 6,000 0 0
 Drowley & Co. 5,999 0 0
 * Accepted on reduction estimate, £4,418.

KENDAL.—For 900 yds. lineal of pipe sewers, for the Corporation. Mr. R. H. Cheas, Borough Engineer, Kendal. Quantities by the Borough Engineer:—
 R. Shuttleworth £321 11 6
 R. Woodburn..... 6,000 0 0
 W. Carradise..... 256 11 1
 Kendal*..... £240 13 6
 T. & W. Dirken 245 14 2

GURSHING.—For erecting twenty houses on Gorse-wald estate. Mr. C. T. Rutten, architect, Bank-chambers, Heathfield-street, Swansea:—
 T. D. Jones..... £4,600 0
 Fugs & Rosser..... £3,510 10
 A. & A. Thomas 4,300 0
 H. Billings..... 3,910 0
 W. Rogus & Sons..... 3,387 0
 Thomas & Jones 4,100 0
 J. Fry..... 3,380 0
 Thomas Bros..... 3,980 0
 B. & D. C. Jones 3,260 0
 W. Lacy..... 3,875 13
 T. Lewis, Ger. Morgan & Gough 3,990 0
 scion*..... 3,200 0

LEEDS.—For proposed new branch post office and sorting office, Hyde Park-corner, for Commissioners of H.M. Works and Public Buildings:—
 W. Wade & Co. £3,962 0 9
 Arncliffe & Hodgson & Co. £3,490 9 0
 W. Irwin & Co. Ltd..... 3,650 0 0
 T. Hannam & Sons..... 3,369 0 0
 R. Costain & Sons..... 3,596 0 0
 W. Wilson & Sons..... 3,337 0 0
 W. Nicholson & Son..... 3,591 15 5
 T. Blakey..... 3,235 0 0
 H. Atkinson & Sons..... 3,279 0 0
 J. Wood & Son..... 3,279 0 0
 Sons..... 3,579 0 0
 C. Myers & Sons 3,265 0 0
 W. H. Dewa & Co..... 3,240 12 6
 J. F. Wright..... 3,240 12 6
 W. H. Dewa & Co..... 3,569 0 0
 J. Pullan*..... 3,000 0 0

LONDON.—For the division of rooms, Lyndhurst-grove, Dulwich, for the London County Council Education Committee:—
 T. G. Sharpington..... £328
 J. Garrett & Son..... £218
 H. Herman..... 325
 H. Bragg & Sons..... 233
 W. Downs..... 309
 W. Johnson & Co., Rise & Son..... 292
 Ltd., Bellevue-road, H. Bouteau..... 272
 Wandsworth Com- H. Line..... 253
 mon*..... 193
 H. Line..... 249
 [The Architect's (Education) estimate, comparable with these tenders, is £295.]

LONDON.—For the erection of shops and flats at the corner of Weston-street, and Snowfields, Bermondsey, Messrs. Rings & Myers, architects, 21, Railway-approach, London Bridge. Quantities by Messrs. Campbell & Sons, 4, Finabury-circus:—
 Holland & Hannen £19,818
 Smith & Sons..... £18,214
 Spencer, Santo, & Co..... 19,300
 Putnam & Fother- W. Downs..... 19,140
 Ingham..... 17,973
 Cols & Sons..... 18,765
 G. Darlington..... 17,800
 Higgs & Hill..... 18,484
 F. & H. F. Higgs..... 17,260
 Holloway Bros..... 18,450
 Greenwood Ltd..... 17,181
 * Arrived late.

LONDON.—For external painting and repairs at the Norwood school, for the Lambeth Guardians. Messrs. Woodward, Brooks, & Latter, surveyors, 69, Kennington-oval, S.E.:—

E. H. Holtham.....	£1,762 17 9	.....	22s.
W. King & Son.....	1,090 3 0	.....	12
S. E. Moss & Co.....	998 10 0	.....	15
J. Mitchell.....	975 0 0	.....	20
J. H. Pincock.....	755 0 0	.....	12
Greenhill & Markham	735 0 0	.....	12
Hammill & Son.....	675 0 0	.....	12
H. Gent.....	665 7 0	.....	10
W. A. King.....	650 0 0	.....	10
J. J. Richards.....	648 0 0	.....	12
Crabb & Son.....	630 0 0	.....	8
Hibberd Bros., Ltd.	590 0 0	.....	10
R. Woolaston & Co.	590 0 0	.....	7
J. S. Penn.....	589 0 0	.....	5
Woolaston Bros.....	568 0 0	.....	6
G. A. Rowley.....	562 10 0	.....	10
A. Herdler & Co.....	548 0 0	.....	10
G. E. Berridge.....	545 0 0	.....	8
H. Bragg & Sons.....	541 0 0	.....	12
A. Porter.....	532 0 0	.....	10
L. Kazak.....	525 0 0	.....	13
E. McCarthy.....	499 0 0	.....	5
R. Brown.....	499 0 0	.....	6
W. Johnson & Co., Ltd.	458 0 0	.....	12
H. Smith.....	430 0 0	.....	8
W. Hussey, Remington Gore, S.W.*.....	337 0 0	.....	8

LONDON.—For improvements, cliff-top-hovs' and girls' school, Deptford, for the Education Committee of the London County Council:—
 Finesse Bros..... £10,788 0 0
 J. Longley & Co..... 9,792 18 0
 F. & H. F. Higgs..... 9,741 0 0
 W. H. Lascelles & Co., Ltd..... 9,703 9 11
 H. Lovatt, Ltd..... 9,533 0 0
 H. L. Holloway..... 9,525 0 0
 W. Harris..... 9,309 0 0
 Clarke & Bracey..... 9,297 0 0
 J. Appleby & Sons..... 9,271 0 0
 Kirk & Randall..... 9,198 0 0
 W. Downs..... 9,100 0 0
 E. Lawrence & Sons..... 8,998 0 0
 Treasure & Son..... 8,985 0 0
 T. G. Sharpington..... 8,984 0 0
 J. & C. Bower..... 8,887 0 0
 G. E. Wallis & Sons, Ltd..... 8,664 0 0
 T. D. Leng, Czar-street Works,
 Evelyn-street, Deptford*..... 8,631 0 0
 [Architect's estimate, comparable with these tenders, is £10,253.]

LONDON.—For roadworks, part of Londhurst-road, Lewisham, for the Lewisham Borough Council:—

Table with 2 columns: Name and Amount. Includes W. Pearce, Forest Hill, £966 and Queenborough Cement Co., Ltd., £318 10.

LONDON.—For side slot rails and bolts for the reconstruction of portion of first section of northern tramway lines, for the London County Council:—

Table with 2 columns: Name and Amount. Includes P. & W. MacLellan, Ltd., £3,640 3 and Steel, Peach, & Tozer, Ltd., £3,640 14.

NUNEATON.—For constructing a service reservoir, capacity 500,000 gallons, in Hennebique's ferro-concrete construction, for the Nuneaton and Chilverton Urban District Council. Mr. F. C. Cook, Waterworks Engineer, Council Offices, Nuneaton:—

Table with 2 columns: Name and Amount. Includes Hobrough & Co., £2,631 10 1 and Liverpool Hennebique Ferro-Concrete Contracting Company, Ltd., £2,575 0 0.

POOLE.—For two and three-quarter miles of 10-in. cast-iron main pipes, etc., for Poole Waterworks Company. Mr. H. F. J. Barnes, engineer, Towngate-street, Poole:—

Table with 2 columns: Name and Amount. Includes I. Deau, £4,260 0 0 and J. T. Whetnam, 4,022 0 0.

RHOS.—For sewage disposal works, Rhos, Wrexham, for the Wrexham Rural District Council. Mr. J. Price Evans, O.E., Argyle-chambers, Wrexham:—

Table with 2 columns: Name and Amount. Includes J. B. Woolley, £4,509 8 2 and I. Jenkins, 4,382 9 11.

ST. ALBANS.—For kerbing and paving footpaths, Fleetville, for Hertfordshire County Council. Mr. Urban A. Smith, County Surveyor, Hatfield:—

Table with 2 columns: Name and Amount. Includes J. Dickson, £384 5 0 and O. W. Mann, 361 7 6.

SLIGO.—For the erection of a new wing to the Ursuline Convent. Mr. P. J. Kilgallon, architect, Abbey Vals, Sligo:—

Table with 2 columns: Name and Amount. Includes D. McLynn, £3,557 and C. Connolly, £2,650.

STAFFORD.—For 6,800 yds. of sewers, etc., Tillington and Castle Church, for the Stafford Rural District Council. Messrs. R. E. W. Borington & Son, Engineer, Bank-buildings, Wolverhampton. Quantities by Engineers:—

Table with 2 columns: Name and Amount. Includes C. J. Nevitt, Ltd., £4,195 9 6 and F. Espley & Sons, £3,220 0 0.

SOUTHEA.—For girls' secondary school, Southsea. Mr. C. W. Bevis, architect, Elm Grove-chambers, Southsea. Quantities by Mr. C. W. Ball, Whittington-chambers, Southsea:—

Table with 2 columns: Name and Amount. Includes J. J. Jerome, £24,044 13 8 and W. T. Dugan, 23,769 0 0.

SWANSEA.—For erecting a dwelling-house in De-la-Beche-road, Skelly, for Miss Elizabeth Hodge. Mr. C. T. Ruthen, architect, Bank-chambers, Heathfield-street, Swansea:—

Table with 2 columns: Name and Amount. Includes J. Marles & Sons, £465.

SWINDON.—For two lodges and entrance gates, etc., at "The Croft," Swindon, for Mr. L. L. Morse, M.P. Messrs. Road & Osborne, architects:—

Table with 2 columns: Name and Amount. Includes J. G. Norman, £780 and Tydesman Bros., £590.

TATTINGSTONE.—For alterations and repairs at Tattingstone workhouse, for Samford Guardians. Mr. H. J. Wright, architect, 4, Museum-street, Ipswich:—

Table with 2 columns: Name and Amount. Includes W. Aldous, £325 0 0 and E. Bird, Ipswich, £265 10 0.

WAMBROOK.—For Wesleyan chapel at Wambrook, near Chard. Mr. E. A. Fryer, architect. Quantities by architect:—

Table with 2 columns: Name and Amount. Includes Harris & Woolcott, £530 0 0 and Parsons Bros., £500.

WESTCLIFF-ON-SEA.—For proposed restorations, additions, and alterations, "Doric Lodge," Westcliff-on-Sea, for Mr. Murray. Mr. G. Cooke, architect and surveyor, Southend:—

Table with 2 columns: Name and Amount. Includes F. & E. Davey, Ltd., £204 1 3 and J. C. Flaiknauff, £155.

WORCESTER.—For enlargement of Post Office:—

Table with 2 columns: Name and Amount. Includes G. Wells, £5,994 0 0 and Watts & Co., 3,885 6 8.

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The Builder.

VOL. XC.—No. 3235.

MARCH 31, 1906.

ILLUSTRATIONS.

Oak Screen, Charterhouse, London }
 Section of Charterhouse Hall }
 Plan of Charterhouse Hall }
 Details of Woodwork }

Measured and Drawn by Mr. A. S. Carter.

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The National Physical Laboratory.



FROM the Reports of the Executive Committee and the Director of the National Physical Laboratory it is evident that satisfactory progress is

being made in every direction at that valuable institution. In the record of work performed during the year ending December 31, 1905, the items more particularly affecting our readers are those mentioned below.

Wind pressure research has been confined mainly to observations of the resultant wind pressure on two rectangular plates of 50 sq. ft. and 100 sq. ft. area respectively, the data so far available indicating that for the same wind velocity the mean intensity of pressure is the same for a surface of 50 sq. ft. as for one of 100 sq. ft. area. Owing to the abnormal quietude of the atmosphere last year only ten days were suitable for the conduct of experiments, but it is hoped that the research will be concluded this year. Investigations into the resistance of iron and steel to alternations of stress have been completed, and the Report on this subject is nearly ready for publication. Sufficient data have been obtained to determine the breaking range of stress for one million reversals of stress in each of the material tested. In the Optics division of the Physical Department research was carried out on behalf of the Institution of Gas Engineers

into the relation between the candle-powers of the Pentane, Hefner, and Carcel standards of light used respectively in America, Germany, and Great Britain, and the investigation will be continued during the present year. The result of the comparisons ought to be of considerable value. Two investigations of great importance have been conducted in the Metrological division, the first being to determine, as far as possible, the difference in dimensions between shafts and bearings, and the tolerance on cylindrical machine work as found in actual practice, and the second a similar inquiry relating to screw threads. Much valuable work has been performed also in the Electrical and Metallurgical divisions, and in the Chemical Department.

The programme for the present year includes an investigation into the resistance of materials of construction to impact, as suggested in the discussion of the Sixth Report of the Alloys Research Committee at the Institution of Mechanical Engineers in 1904. A machine for the purposes of the research has been designed, and is now nearing completion. The wind pressure research will include tests upon models of a lattice girder and a roof, and it is hoped that sufficient data will be obtained to enable designers to predict the effect of the wind on open framework and roof structures. Further work may be undertaken with regard to the resistance of materials to alternating stress and to the properties of superheated steam. Various important points will receive attention in the Electricity Division of the Physics Department,

including the further investigation of light standards; while the Thermometry Metrology, and Metallurgy divisions will be equally busy.

One very satisfactory announcement made in the Report is that the Government communicated their intention in December last to grant a sum of 5,000*l.* for buildings during the year, and to increase the annual grant. But a still more gratifying piece of news is that the Chancellor of the Exchequer has recently announced his intention of making the building grant for the year 10,000*l.* instead of 5,000*l.*, as at first contemplated: The Goldsmiths' Company have also made a donation of 1,000*l.* to the laboratory for application to some specific object. Owing to the increased Government grant various additions to the buildings will be made at the earliest possible moment. We may mention that the new electrical buildings now nearing completion have been designed to accommodate all the electro-technical work under one roof. The eastern block, for photometric work, covers a ground area of 100 ft. by 25 ft., and consists of two floors, with the battery-room above; the other two bays run east and west, with north roof lights, each having a ground area of 120 ft. by 25 ft. One of these is arranged for testing direct and alternating current instruments and machines, and the other is sub-divided into two portions—one for resistance work and the other for heavy test work. In addition to the two main bays there is a smaller space for office, workshop, and store accommodation. The whole block of buildings

covers the greater part of the site between the Engineering and Physics buildings, and when completed in June next will prove a most useful and necessary addition to the laboratory.

ELECTRICITY METERS.

THE manufacture of electricity meters is now happily an important branch of the electrical industry, and the great majority of the meters in every-day use are thoroughly trustworthy. For this satisfactory state of affairs we have to thank the somewhat rigorous rules of the Board of Trade and possibly the able way in which manufacturers advertised the defects, generally by implication, of their rivals' meters. An immense amount of skill and patience has been devoted to the invention and perfecting of electric meters; in most cases unfortunately with a very poor return to the inventor. Almost every electric phenomenon has been utilised by the inventor as a principle on which to devise a meter. The rotation of mercury when placed on a magnet and traversed by a current does not strike one as a very suitable method of moving the counting mechanism of a meter, and yet tens of thousands of meters constructed on this principle are at present in operation. Some inventors also have managed to avoid the apparent necessity of a mechanism with index fingers actuated by toothed wheels. In the Schattner meter the diminution in weight of a plate of copper immersed in copper sulphate is measured, and in the Bastian meter the fall in level due to electrolysis of acidulated water contained in a graduated glass tube measures the consumption of the electric current.

Perhaps in no other field of industrial research has the labour of inventors so overlapped as in the devising of electricity meters. For this reason we welcome the important treatise on the subject by Mr. H. G. Solomon,* which has recently been published. It shows clearly what has already been done on the subject, and the youthful electrician will be able to find out for himself whether the device he is perfecting is original, and whether its performance is likely to rival in accuracy the many types of successful meters described in this volume.

To the non-technical reader and even to the electrician—if he be not already an expert in meters—there is much that will be quite unintelligible without hard thinking, and possibly a good deal of reference to mathematical works to relearn forgotten symbols and theorems. He will, however, be well repaid for the trouble, and it is no small satisfaction to the engineer to be able to see for himself the reason why meters must be connected in certain ways with polyphase networks rather than to take it on authority. The author is evidently thoroughly familiar with the German literature on the subject, but occasionally he follows German methods a little too closely. For instance, on p. 124, there are many neat trigonometrical theorems, but the whole page is quite unnecessary. The two wattmeter method has been already

proved on p. 121; it is, therefore, quite unnecessary to prove it again. The mathematical equations, however, given by the author are most important. As a rule they are omitted from electrical works written for the "practical engineer," although, judging by experience, the meaning of these equations is what the practical engineer needs and wants to know.

The author divides meters into three main classes—Continuous Current, Induction, and Tariff Meters. The first chapter gives a useful introduction to the subject. Perhaps it would have been better to make the explanations fuller. On p. 10, for instance, the reader naturally supposes that the voltage drop in the meter is a constant at all loads, and that the equations given apply to alternating current meters. He would also suppose that the pressure between the supply mains was always kept equal to the "declared pressure." As a matter of fact it is often above it, and so, notwithstanding the pressure drop in his meter, his lamps will be sometimes giving out more than their normal light. On the same page also, instead of saying "Assuming as low a shunt loss as 1 watt per 200 volts," it would be better to say, "Assuming that the shunt loss for a 200 volt meter is 1 watt."

The chapters describing the mechanical features in meter designs and on meter testing are excellent, and will prove most useful. The author has obviously been at great pains to collect accurate data about modern electric meters, and the numerous diagrams are clear and instructive. We can heartily recommend the book to meter manufacturers, central station, and consulting engineers, and all who require a thorough knowledge of the subject.

CHARTERHOUSE.

AS our illustrations this week consist entirely of measured drawings of Charterhouse Hall, a summary of the history of this ancient Institution, and the manner in which it came into being, may be considered to be not out of place under the circumstances.

Sutton's Hospital of King James in Charterhouse—"a master-piece," says Fuller, "of Protestant English charity"—has its origin in the benefactions of a Bishop of London and a Flemish retainer of Philippa the bride of Edward III. When the Black Death reached London Bishop Ralph de Stratford bought, 1348, some three acres, "No Man's Land," or Pardon Churchyard, then lying in St. Sepulchre parish between the present Sutton-street and Clerkenwell-road (Wilderness-row), and enclosing it with a wall dedicated it for burial of those stricken by the pestilence. Sir Walter de Manny, K.G., acquired from St. Bartholomew's Hospital the adjoining Spital Croft to the south, about 13 acres, for the same purpose. On the testimony of an inscribed stone cross he had seen on the spot Stow avers that more than 50,000 were buried there. As the plague abated Michael de Northburgh, Bishop of London, 1354-71, entrusted Sir Walter with the founding of a religious house on the ground, bequeathing 2,000*l.* to that intent. In the wall of the Registrar's

house were discovered, 1891, coloured portions of a tomb with a shield charged with de Manny's coat-arms. The wealthy Carthusian convent of the House of the Salutation of the Mother of God consisted of a prior, twenty-three monks, and lay brethren, who at the Suppression were treated with the utmost cruelty; some of them with Prior Houghton suffered at Tyburn in 1535-6. Having served for a short term, like the adjacent Priory of St. John of Jerusalem, for the King's equipments for the chase the buildings were granted in 1542 to Thomas Hall and John Brydges for their joint lives. The King then bestowed them upon his lord chancellor, Sir Thomas Audley, Lord Audley of Walden, who in April, 1555, sold Charterhouse to Edward, Lord North of Kirtling, co. Cambridge, who entertained Queen Elizabeth in November 23-8, 1558, on her way from Hatfield, and rebuilt the gate-house in Charterhouse-square. North sold it for 2,500*l.* to John Dudley, Duke of Northumberland, on whose attainer it reverted to him by grant of the Crown. By deeds of May 31 and June 7, 1565, Roger, second Lord North, conveyed the property for 2,820*l.* to Thomas, fourth Duke of Norfolk, and after his conviction and attainer, 1572, Howard House was returned by Elizabeth to his second son Thomas, Baron Walden, whom on May 4, 1603, James I. advanced Earl of Suffolk whilst sojourning there on his entry into London. The Earl of Suffolk, busy with the building of Audley End, alienated Howard House on May 9, 1611, to Thomas Sutton the opulent coal-miner and Master-General of the Ordnance in the North, who died on December 12—ever since commemorated as Founder's Day—of that same year. In that brief interval he made dispositions for the founding of a hospital for eighty brethren, a number since reduced, and a free school for forty poor children or scholars.

We there have a unique example in London of a nobleman's house in the XVth century, embracing the typical plan of St. Bruno's La Grande Chartreuse near Grenoble. Edward North pulled down the chapter-house and laundry to the east of the chapel, as well as the twenty-three cells—each consisting of a little two-storied house with pentises and garden, as we see at Mount Grace—about Great Cloister, now Upper Green, the boys' playground. Some traces yet remain in the cloister wall of a cell doorway and of the hatches through which the monks took in their food. Beyond lay north-west, some offices, the kitchen garden, and the two old graveyards; and north-east, the gardens overlooked from the terrace-walk on the east cloister, the Mount, and the Wilderness. The Wilderness, latterly covered with Foresters' Hall and other buildings, gave a name to Wilderness-row. Along the north-east side of Little Cloister wherein the stone-work has been covered with brick, stands the Guesten Hall; to the south-west is the small oblong Wash-house Court of or shortly before Prior Houghton's day, bearing evidences of much structural alteration. That corner of the convent constituted the lay-brethren's and the strangers' or visitors' quarters. In the wall of squared flint and stone next the gate-house are the remains of "Egipte fleysche kychyne"

* "Electricity Meters." By H. G. Solomon, A.M.I.E.E. London: C. Griffin & Co. 1906.

as plotted on a little-known XIVth century plan showing the windmill, brew-house well, old chapel (to the north), twenty-three cells, etc., drawn on the four skins of the parchment roll of a survey of the spring-heads, wells, and conduits belonging to St. John of Clerkenwell and the Charterhouse. The initials of the Duke of Norfolk with date, "T. N. 1571," are repeated in the carving of the Hall, wherein the brethren, familiarly known as "Cods," dine together; Sutton added the quasi-clearstory and new roof, as well as the music-gallery and screen, with some panelling, and the chimney-piece with a side gallery above. The fine late XVIth century staircase (see Mr. R. W. Paul's drawings in the *Builder*, May 22, 1886) ascends to the Presence Chamber or (old) Governors'-room, restored in 1838, which stands over the Fraternity, and has a mantelpiece and ceiling bearing the Howard coat-arms, and some contemporary tapestry. In the north aisle of the chapel is Sutton's tomb, with his effigy; Nicholas Stone's MS. account-book in the Soane Museum contains an entry:—

1615. Mr. Sutton's Tombe in the Charterhouse including Mr. Lawes mount, 4000.

The chapel has south and east walls of the choir of an early date, the ground ante-chapel and evidence, or monument, chamber above are of about 1509-10.

Preacher's and Pensioners' courts are by Edward Blows, who in 1825 rebuilt "Schoolmaster's House"; on the south side of Schoolmaster's-court is "Gownboys," by P. C. Hardwick, who also modernised the old school and the boys' hall. The "Grey Friars" and "Smiffes" of Trackcray migrated to Godalming in 1872. The Merchant Taylors Company paid 90,000*l.* for 5½ acres of ground and the school buildings, and in 1874 removed their school from Suffolk-lane, E.C., to the new buildings built by E. P. Anson for 500 boys on the western side of Upper Green; P. Anson converted "Gownboys" and "Schoolmaster's House" for class-rooms, adding a library and a lecture theatre to the latter. On June 11, 1898, we illustrated Mr. W. Hilton's Nash's designs for the headmaster's house and dinner-rooms in Rutland-place; in our columns of December 19, 1885, we printed an interesting letter from R. Herbert Carpenter, an old Carthusian, recounting his reminiscences of the school and other buildings as in his time, 1851-7; a view of the Charterhouse by Gainsborough is preserved in the Foundling Hospital.

NOTES.

ACCORDING to the Report of the Registration and remarks published in the last issue of the *Journal* of the Institute of Architects, and which we reprint on another page, the proceedings of the Registration Committee have resulted, not in the adoption of the exceedingly undesirable system of wholesale Registration, reducing architecture to the level of a business, but in what appears to us to be the best result which could possibly have arisen out of the recent disputations, viz.—the recommendation to obtain a legal status and a power of granting diplomas by the Institute to qualified practitioners in

architecture, who after a certain period must have passed through a definite course of architectural education "in a recognised school." We do not quite understand whether the latter sentence is intended to nullify the system of office apprenticeship, which in our opinion ought to be taken as constituting an education (if properly carried out on the part of both master and pupil); but in general the result of the Report would be to put the Institute of Architects in a stronger position before the public than it has hitherto had, and to secure whatever benefits, real or imaginary, were to be derived from Registration, without its concomitant evils. We must not be understood to say that we think even this movement to define and limit the art of architecture is in itself either desirable or necessary—the example of the engineering profession proves that it is not so; but it will have the indirect result of adding to the power and dignity of the Institute, and will practically supply the demands made by the Registrationist agitators in the least harmful manner; so that we hope it will be accepted as the ending of an acrimonious piece of polemics which has done little to advance the art of architecture. One thing the Registrationists may be sure of: that however they might obtain a majority of mere numbers, Parliament would never grant an Act in the face of the expressed opposition of a minority who would include nearly all the leading men in the Profession. We must add, however, that we object strongly to the proposal to change the title of "Institute" to "College," for which we can see no possible reason, and which is simply throwing away the prestige of seventy years attached to the title under which the Charter was originally granted.

The New Government Offices.

We presume that the question and answer in Parliament on Tuesday evening, in regard to the towers in the late Mr. Brydon's design for the Great George-street block of Government Offices, refers to the towers with cupolas which are seen at the back in our view of the design published in the *Builder* of March 25, 1899. It will be seen from that view that these are the most important exterior architectural features of the building, and that, as far as can be judged by that small scale perspective, they are features of very fine design and outline. It is now proposed to discontinue them for the present, and in any case to reduce their height, not as the First Commissioner assured the House, on any ground of economy, but because they would obstruct the light for the India and Local Government Board Offices on the north side of Charles-street "so as to render their already limited accommodation practically useless." Considerations of light are important, of course; but is not that statement a little exaggerated? At all events, if this alteration is to be carried out, we should like to know who is to re-design poor Brydon's towers. And then there are the corresponding towers towards Great George-street, where no question of light arises; are they also to be docketed to agree with the others? It seems to us that Brydon's design is in great danger of being maltreated, and deprived of one of its finest

features. When this kind of conscientious interference with the design of a deceased architect is once begun there is no knowing where it will stop; and we do not see that any absolute proof of its necessity has been given.

The Workmen's Compensation Act.

THE New Workmen's Compensation Bill was introduced into the House of Commons on Monday last and read a first time, after some speeches which might well have been reserved for the second reading. At present it is not possible to do more than indicate a few leading features of the new measure, and detailed examination of it must be postponed till the Bill is circulated. It is a consolidation as well as an enacting Bill. In other words, it will be a limited code of law on the subject of compensation. It includes more workers under the system of compensation, but it excludes workmen of employers of less than five workmen, with some exceptions. Small builders and contractors will apparently, therefore, be excluded. It is, on the whole, a further step towards a complete system of workmen's compensation, and was admitted by the Home Secretary to be a measure which hereafter, as has happened to its predecessors, would be enlarged. The system of insuring risks is now growing so largely that in time there will, no doubt, be a complete and universal system of compensation, the payment of which will fall on the insurance companies.

British Forestry.

IN view of the rapidly-diminishing sources of the world's timber supply and the corresponding increase of consumption, much attention has been devoted to the conservation of forests and woodlands by the Governments of the United States, Canada, France, Germany, Russia, Sweden, and other countries, as well as by private individuals interested in the timber industry. We have alluded more than once to the urgent necessity for similar action in the United Kingdom, and it is satisfactory that the question is at last about to be taken up, in conjunction with other subjects, by a Royal Commission. But inquiry by a body of the kind is notoriously extremely previous to beneficial action, and in this particular case we are merely about to inquire, while other countries are acting. As Sir Herbert Maxwell pointed out last week in his lecture at the Carpenters' Hall, Germany is sparing her own forests, knowing that in the future the price of timber must be enormously increased, and in that country the State forests are already returning substantial profits. It is quite a mistake to think that climatic and other conditions in the British Isles are unfavourable to forestry enterprise, and there is much to be said for the scheme outlined by Sir Herbert Maxwell for forestry under Government direction. It certainly seems ridiculous that the 2,700,000 acres of our woodlands in private hands should be a source of expense instead of yielding profits to the owners, with concurrent advantage to the country.

Niagara Falls.

A FEW days ago the Commissioners for the Queen Victoria Falls Park reported that the present abstraction of some

17,5000 cubic feet of water per second has made no appreciable difference in the aspect of the Niagara Falls, but they very reasonably expressed the opinion that it would be wise to take steps with a view to cancelling charters for water power in respect of which no works have been commenced. At present the existing charters represent an abstraction of 60,900 cubic feet per second, or more than one-fourth the normal flow over the Falls. Americans have been the chief aggressors in this matter, even on the Canadian side, where the only companies with intakes above the Falls belong to the United States. The necessity for preventing further injury is fully recognised by the United States and Canadian Governments, and it is probable that the deliberations of the International Commission will ultimately result in legislation of suitable character. So far, there appears to be a little difference of opinion between the American and Canadian members of the Commission, although fortunately both sides are agreed as to the desirability of limiting existing powers, and of adopting regulations to prevent further depletion of the water, and to maintain the beauty of the Falls.

THE restrictive legislation our manufacturers are now subject to is well illustrated by the case of *Rogers v. Barlow & Sons*. On an information preferred by an Inspector of Factories, the respondents, cotton-weavers, were proceeded against for employing a child during meal-times. The machinery had been stopped for the day at 5.30 p.m., and at 5.34 the child in question was wiping the oil from the spindles, a necessary operation when the machinery is stopped. The persons in charge after that summoned the employees to leave, and it was proved that this was the practice within five or ten minutes of the stopping of the machinery. The magistrates dismissed the information on the ground that the respondent had used every possible means to carry out the intention of the Act, but the Divisional Court have reversed this decision, and remitted the case to the magistrates to convict. It was urged for the respondents that even if a technical offence had been committed, it was too trivial for judicial notice. This is how it certainly strikes the lay mind, and a lay-man would like to know when the legal maxim *de minimis non curat lex* comes into operation. The case, moreover, seems distinguishable from that cited to the Court, *Prior v. Staithwaite Spinning Company*, because there the child was found working in his dinner-hour, whereas here work was done for the day, and the detention from the boys' tea amounted to four minutes. How are business men to carry on business with such legislation to hamper them, administered in a microscopic spirit?

THE complications connected with what we may term "underground London" are well illustrated by the case of *London Hydraulic Power Company v. St. James and Pall Mall Electric Light Company, Ltd.* The plaintiffs, acting under statutory powers, have a main running 5 ft. below the ground in Piccadilly, laid

in 1888. The defendants, acting under Provisional Order granted by the Board of Trade under the Electric Lighting Act, 1882, had in connexion with their electric plant constructed an inspection-chamber, and one side of the brickwork rested on the plaintiffs' main. This inspection-chamber was constructed in 1889 without the plaintiffs' knowledge. In July last the main burst and the plaintiffs, alleging this was caused by the defendants' manhole, were suing the defendants for the expenses of restoring the damage and the loss of water, and they further required a declaration that the defendants were liable to repay the plaintiffs any damages which the latter might be compelled to pay to other persons owing to the bursting of the main. The defendants, on the other hand, counterclaimed for damage done by the water to their plant. The substantial allegation on the part of the plaintiffs was that the damage, which was a transverse split, was caused by the vibration of the traffic over the manhole, which was communicated to the main; the defendants, however, alleged that the damage was due to subsidence. The evidence was very conflicting, but the defendants' witnesses were of opinion the fracture was not caused by the vibration; whilst the plaintiffs' witnesses could not say that subsidence was not a possible cause, and in the result the learned judge held that the plaintiffs had failed to prove their case that the defendants had become liable for a nuisance under sect. 17 of the Electric Lighting Act, whilst on the authority of the case *Midwood v. Mayor, etc., of Manchester*, a case we carefully considered in a Note, July 22, 1905, he held that the defendants could recover on the counterclaim as for a nuisance, the damage caused to their plant by the bursting of the water main.

EMPLOYERS should note the decision of the House of Lords in *Williams and others v. North's Navigation Collieries (1889) Ltd.*, on the Truck Act of 1831. Some workmen having been fined in proceedings under the Employers and Workmen Act, 1875, for absenting themselves from work in breach of contract, and an order having been made against them by the magistrates for three fortnightly payments to the employers of 10s., the employers paid the men their wages less the 10s. due to themselves. The House of Lords held that this deduction is illegal, as being contrary to the provisions of the Truck Act. The amount due to the workmen must be paid to them in the current coin of the realm without deduction. The judgment decides that the right of set-off mentioned in the Act is limited to a set-off in an action. It is curious to find such an apparently simple point coming to the House of Lords for decision some seventy-five years after the coming into operation of a statute, but that the statute does not admit of easy interpretation is proved by the fact that the Court of Appeal took an opposite view.

IF when determining the proportions of a column to be used in a building of several stories the total length be taken

into account without any allowance for the lateral support given by intermediate portions of the structure, the strength of the column will obviously be greater than that of a short column of one-story length proportioned by the formula applied to the first considered column. In other words, the effect of "continuous-column action" is disregarded. This is by no means necessary, and in the case of an axially-loaded column fixed at successive floor levels in a secure manner the same allowance might be made for increased resistance as for that of a continuous beam in comparison with a non-continuous beam. In practice, however, the lateral support afforded by the members connected with a column is not of particularly rigid character, and such members generally tend to cause non-axial loading. Consequently, if allowance be made for continuous-column action there must be suitable allowance on the other hand for eccentric loading wherever that is caused, in addition to proper consideration for accidental eccentricity due to variations in the quality of the material or to defects of workmanship. To arrive at an approximately true idea of the resistance afforded by a continuous column it would also be necessary to take into account the relative lengths in all stories of the building. For example, a 20 ft. free length of a continuous column in any given story will be stronger if the lengths in the stories above and below measure 14 ft. than if they were 20 ft. long. At present no convenient formulae exist for solution of the problem here indicated, although a theory has recently been propounded by Mr. E. F. Johnson in a paper read before the American Society of Civil Engineers. This communication fully deserves the attention of architects and structural engineers, and its value to general practitioners would be much increased if the author had concluded with a set of working formulae in a form convenient for everyday use.

THE useful paper read by Mr. C. P. Sparks to the Institution of Electrical Engineers last week, on the "Electrical Equipment of the Aberdare Collieries," proves that electricity is particularly adapted for lighting and power purposes in collieries. The group of mines supplied with power is situated about twenty miles north-west of Cardiff, and several of them had isolated direct-current plants before it was decided to build a central generating station for them all. The district served is eight square miles in area, and the power is transmitted by overhead transmission lines at 3,000 volts. The wires are as a rule supported on wooden poles, but where the stress is specially heavy lattice steel poles are used. To prevent any one climbing the poles they have barbed wires spiralled round them, and at 10 ft. from the ground there is a ring fitted with spikes. The overhead system extends for nearly nine miles, and over thirty miles of wire have already been erected. Special care has been taken to prevent any accidental contact from live wires. Wherever existing wires are crossed or in the neighbourhood of the collieries where there is traffic, guard-netting is

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used. Steel catchers are also fitted to each pole to ensure that a broken wire will be immediately earthed. By grouping the mines together a great economy in the working costs has been secured, the cost per unit consumed being about one-third of a penny. It is satisfactory to notice that the special advantages of three-phase current for colliery work are being appreciated by engineers. The three-core cables used in the mines are very substantial and are duplicated. They are almost absolutely safe, being covered with a Board of Trade "earth shield" of copper, a thick lead sheath, and a heavy armouring of galvanised steel wires over the lead. We are sorry, however, that overhead wires are used. We quite see that it would have been prohibitive to use three-core cable for the transmission lines as expensive as that used in the mines. We think that at the comparatively speaking low voltage used cable manufacturers could easily make a cheap type of three-core cable if a demand arose for it. The Board of Trade regulations might easily be relaxed with advantage for underground transmission wires in country districts.

The Starting of Electric Motors. In order to start the electric motors which are used in heavy mechanical work it is necessary to employ elaborate starting devices. These devices are often a source of trouble even in the hands of skilled attendants, and hence many inventors have tried with more or less success to make them entirely automatic. Professor Steinmetz, one of the best-known American electricians, has recently perfected an electrical device which entirely surmounts all the mechanical difficulties which have to be overcome in making an automatic starter. He has discovered a material—apparently either magnetite or a mixture of chromite of iron and magnetite—which gradually becomes a good conductor when heated by the passage of an electric current. The material is formed in rods, and is mechanically strong even at a red heat. When the switch is closed the magnetite rod allows only a very small current to pass owing to its high initial resistance. As this current gradually heats the rod its resistivity gets less, and so the current gradually rises with the temperature. When it is almost red hot it offers practically no resistance to the passage of the current. It therefore acts electrically in exactly the same way as the usual mechanical starting device of a motor acts as the attendant gradually moves the lever over the rubbing contact pieces. This property of magnetite can also be usefully employed in the starting of single and polyphase induction motors. Professor Steinmetz places magnetite washers between the copper bars and the end rings in the usual "squirrel-cage" armature. These present excessive rushes of current in the armature at the start, and at the same time very considerably increase the starting torque. When the motor stops the washers cool almost immediately, as they are in contact with a large metal ring which has considerable radiating surface. It can, therefore, be started again almost immediately

without risk. As there is an excellent prospect of power being obtained in London for motive purposes at very cheap rates in the immediate future, it is highly probable that large motors will be started by unskilled attendants, and so purely automatic starting devices of the Steinmetz type will be most useful.

Architects and Timber Specifications. We have received in a pamphlet form an article* on this subject, reprinted from the *Timber News and Sawmill Engineer*. The writer quotes, "from architects' specifications of recent date," certain clauses relating to the quality of Scandinavian and Russian timber, and points out that they are in many respects unreasonable or even impracticable. There can be no doubt that the timber clauses still used by some architects and surveyors are hopelessly out of date, and betray ignorance of modern conditions. Some of the ports from which the best timber was shipped thirty or forty years ago have now lost their pre-eminence, and from many new ports, which tap virgin forests, better and larger scantlings can be obtained. The port of shipment is, however, of very little moment, and may indeed be in a different country from the forest where the timber was grown. The writer of this note, when inspecting one of the sawmills near Sundsvall (a Swedish port), saw piles of yellow (red) deal which had been grown in Finland, but which would be shipped to our own country from Sundsvall. Then, again, we may point out that there is not any uniformity in the classification adopted by the various shippers. In some cases the timber may be shipped as "unassorted," while in others it may be sorted into as many as six different qualities. What is required in a specification is a clear definition of quality, and the clauses suggested by the writer of the pamphlet meet this requirement fairly and reasonably. The pamphlet is temperately written, and cannot fail to be of use in reducing or removing one source of friction between architects and builders. Perhaps the writer of it may be induced to issue a second article dealing with American pines and spruce and with hardwoods.

Stanley Abbey. Two MILES to the south-east of Chippenham was the Cistercian Abbey of Stanley colonised about 1154 by monks sent from Quarre in the Isle of Wight. The site, which belongs to the Marquis of Lansdowne, is an open field, and the buildings are indicated by mounds of earth in the middle of which is the level square of the cloister. The river runs on the north side, and part has been deflected by a straight ditch, which marks the drain of the Abbey. With the permission and kind loan of men from the owner, Mr. Harold Brakspear, F.S.A., of Corsham, has been able to make some excavations on the site. These were begun on the line of the eastern range, which from the church was over 200 ft. in length. The chapter-house is only 27 ft. wide, but was divided by two rows of marble columns, one of which was found as it fell and was a monolith 8½ in. in diameter and 6 ft. 2 in. long. There was also some of the

tile pavement and a coffin found *in situ*. Northward from the chapter-house was the dortor sub-vault, 27 ft. wide, divided into at least twelve bays by a row of octagonal columns down the middle, one of which, owing to being bedded in a cross wall, remains to its full height. Nearly the whole of the outer walls, so far as at present traced, have been entirely removed, and, this being the case, it is remarkable that the centre of the buildings remain as they fell. Work has now been started on the church, which has revealed large patches of the original tile paving, and it is hoped that in time the whole abbey may be systematically explored, and so add another apparently lost plan to those of Cistercian Abbeys in this country.

Turner's Drawings. It is satisfactory to find by the Report of the Trustees of the National Gallery that there is to be a chronological and descriptive catalogue made of the Turner drawings in the possession of the Trustees. It seems, however, that a private individual, Mr. A. J. Finberg, was the originator of this plan, for, after, on his own initiative, a careful examination had been made of the many drawings possessed by the Trustees, it was decided by them to entrust to Mr. Finberg the task of undertaking the above work. Mr. Finberg has for a number of years given much time, thought, and labour to the study of Turner's drawings, and it is to the credit of the Trustees that they have taken advantage of a capable worker for this special purpose when he—providentially as it were—turns up. It is to be hoped that no over-enthusiasm will cause Mr. Finberg to state doubtful dates or conclusions, but at any rate we congratulate him on so satisfactory a conclusion to his previous studies, and the Trustees on seizing their opportunity.

Water-colours by Mr. Sutton Palmer. THE three first numbered drawings in the collection of Mr. Sutton Palmer's water-colour drawings of Surrey subjects, at the Leicester Galleries, are well placed to attract the visitor, for they are all beautiful—"Twilight, Wotton" (1), "A Slope of Bluebells" (2), and "The Wey—near Ripley" (3)—the first-named in particular of exquisite beauty and finish, yet not over finished. As we go on we come on other beautiful drawings, but we realise that this accomplished water-colour artist has never yet settled on his style. "The Silent Pool" (12), one of the larger works, is what we call a scenic drawing—over-finished and rather like a stage effect; whereas "Frensham Common" and "The Great Pond, Frensham" (10 and 15) are in a far better and broader water-colour style, and No. 12 hardly seems to be the work of the same artist. We find a good many other beautiful drawings, and then in "Flanchford Mill" (45) we suddenly come across a mere piece of commonplace, and in "Spring Time" (56) we are reminded of Birket Foster. Among the best of those which represent the best side of the artist are the panoramic view of "The Vale of Albury" (62); "The Cloud" (30); "The Last Glow" (37); "Shere Heath" (42), which shows a fine sky; "From the Rim of the Punchbowl

* Published by Alfred Haworth & Co.

Head" (50); and "A Gravel Pit" (70). At his best Mr. Palmer is a really fine artist; it is curious that with these capabilities he should be content sometimes to relapse into the pretty commonplace of water-colour art.

At this Gallery in Bond-street there is on view a fine collection of etchings by Mr. Cameron, Mr. Alfred East, Mr. W. Monk, and other artists in etching. In the upstairs Gallery Mr. Ernest W. Haslehurst exhibits his collection of water-colours illustrating "The Thames—from Source to Sea," which are apparently being reproduced in colour to form an illustrative volume of Thames pictures. Their style of execution is well suited for colour reproduction, and has perhaps been dictated by this consideration; but among them are some which are very successful as water-colours—"Early Morning, Upper Thames" (23), "Cliveden Woods" (26), "Looking Southward to the Nore" (31), and others.

THE EXHIBITION OF THE ANCIENT ART OF THE MARCHES AT MACERATA.

I MENTIONED in my notice of the exhibition of ancient Abruzzese art at Chieti (*Builder*, December 23, 1905, p. 667) that a similar exhibition had been held at Macerata during the latter part of last summer, in which specimens of the art of the Marches—the district includes the provinces of Pesaro and Urbino, Ancona, Macerata, and Ascoli Piceno—were for the first time brought together.

The elements of which the exhibition was composed differed considerably from those which gave its main importance to that of Chieti; and, unlike the latter, it was associated with a modern industrial exhibition,* of which it only formed a section. Goldsmiths' work was far less prominent, and majolica was almost entirely absent—rather from lack of space, perhaps, than from any other reason, considering the celebrity which the productions of Urbino justly enjoy; though from an artistic point of view they might more correctly, it is true, be considered to belong to Umbria than the Marches. Pictures, however, occupied the predominant portion of the space, in strong contrast to what was the case at Chieti—and, indeed, what was seen of the pictorial art of the Marches was something of a revelation, so that it may be well to devote attention in the main to this branch of the exhibition.

The first room was devoted to works of minor importance, but the second and third formed the centre of interest, as in them the progress of the painter's art was illustrated step by step.† Though the condition of some of the pictures was not very good, they had at least not suffered from restoration.

The first stage was marked by some frescoes, transferred from the refectory of the Augustinian monks at Fabriano, and belonging to the municipality of that town. They date from the XIIIth century, and are almost "Byzantine" in style, with stiff, conventional figures and faces, and decorations and architecture in the backgrounds which recall those of slightly earlier mosaics, the latter revealing as yet no traces of Gothic, and being, it would seem, purely traditional.

The next step came with the works of Allegretto Nucci in the following century—in the usual early Umbrian style, still somewhat wooden, but making an attempt towards emancipation. Allegretto was the master of Gentile da Fabriano (1370-1423), no examples of whose work were exhibited. Progress was, however, somewhat gradual, and, in a large picture by Andrea da Bologna, from Fermo, painted in 1369, we find him simply

copying Nucci's work of forty years earlier. In the XVth century, however, the art of the Marches begins to develop on independent and interesting lines.

A Madonna in tempera by an unknown master, from Matelica, though pleasing, still shows much of the traditional restraint, but Antonio da Fabriano, in a *tavola* from Genga, painted on both sides, shows decided traces of Flemish influence, though, in his Crucifixion, from Matelica (1452), and his Death of the Virgin, from Fabriano, he is less progressive. Lorenzo Salmehi, of San Severino, whose works occupied the beginning of Room III., still clung to the old style; Lorenzo di Maestro Alessandro da San Severino marks a decided advance, and his works have quite an individuality of their own. There is much fineness and delicacy in the rendering of the details, though some of his works show a little stiffness (e.g., an otherwise beautiful Madonna, from the Collegiata at Pausula, bearing the date 1481); but the Marriage of S. Catherine, from Matelica, which belongs to the Confraternita di S. Angelo of that city, is an even more successful work, soft in colouring, and pleasing in expression, and of a style distinct from contemporary Umbrian work.

A contemporary of his was Alvise Vivarini (1464-1503), to whom are doubtfully attributed some figures of saints in richly-carved frames, from the cathedral at Pausula.

Carlo Crivelli, the Venetian (ca. 1430-1494), though he was active in the Marches, is not well represented—a small Madonna from his hand, in the gallery at Ancona and a large picture in several compartments in the cathedral at Ascoli (1475) were considered too precious for transportation—but there are some very good specimens of the work of his brother, Vittore (about 1485), among them a Madonna adoring the Child dressed in a splendid brocade robe, with winged angels' heads above her and a kneeling cherub at each side behind her, playing a violin and mandoline respectively, from S. Francesco at Sarnano; a Madonna and Child, with a saint in a separate compartment on each side, and the Crucifixion in the central compartment above, from Monte San Martino, bearing the date 1490; and several works from Ripatransone. Other contemporary painters, such as Pietro Alemanni and Stefano Folchetti of S. Ginesio, were less successful; but Cola d'Amatrice, the architect of the handsome facade of S. Bernardino at Aquila, also produced some good pictures. His style varied considerably; at first he copied the Crivellis, then developed a style of his own, while, in some of his works, the influence of Michelangelo may be clearly traced.

A few isolated works of Umbrian masters—Giovanni Santi, Timoteo Vite, and Raphael himself (the predella of a Madonna by Perugino, from S. Maria Nuova at Fano, belonging to the period when he was still under the influence of Perugino), came next, and the last few pictures in the room were works by Vincenzo Pagani (fl. 1529), which show the influence of Umbrian masters. The pictures in the later rooms, though belonging to collections in the Marches, were not the work of local artists, except for several Madonnas by Sassoferato (G. B. Salvi, 1605-1685), and included no works of first-rate importance, and belonged, for the most part, to the XVIIIth and XVIIth centuries. With the section of modern art I do not propose to deal.

The room devoted to sacred art contained some fine specimens of vestments, especially a part of the cope of Gregory XII., who died at Recanati in 1417, and many vestments from the cathedral at Ancona; there was also some good church plate, though neither so fine nor so extensive an exhibition of it as that at Chieti. Two fine processional crosses from Visso, of the School of Nicola di Guardiagrele, may be mentioned, and also some reliquaries given to the city of Sassoferato by Niccolò Perotti, the learned author of the *Corrucoipia*,* in 1473, and another given by Sixtus V. to Montalto, his native city, in coloured enamel (French work?) in high relief. The objects suffered, however, from lack of space.

The prehistoric antiquities of the Marches were fairly well represented; the museum of

Ascoli sent a selection of its finest objects, and various private exhibitors also contributed—two enormous bronze sacerdotal *fibulae* from Sirolo, about 2 ft. long, from which hung a large block of amber, were especially noticeable. The Roman antiquities were of less importance. There was also a large collection of statutes, deeds, etc., from the archives, and a room was devoted to works written or printed in the local dialect.

The exhibition was, on the whole, a considerable surprise, especially as regarded the development of pictorial art in the Marches; and its promoters deserve high praise for the energy they displayed. It was unfortunate, however, that no adequate catalogue was to be had during the exhibition. T. A.

A NEW MOVE IN THE ARCHITECTURAL PROFESSION.

A SPECIAL general meeting of the Royal Institute of British Architects will be held on Tuesday, April 3, at 8 o'clock p.m., to receive formally the Draft Registration Bill and the Report and recommendations of the Registration Committee adopted at a meeting on March 20 when it was resolved to recommend the Royal Institute to adopt the scheme outlined in the Report instead of the Draft Registration Bill already published. The following resolutions are to be proposed from the chair:—(1) That the Report and recommendations of the Registration Committee, dated March 20, 1906, be adopted; (2) that the Council be requested to take the necessary steps forthwith to apply to His Majesty the King for a revised or supplemental charter embodying the said Report and recommendations, and also as soon as possible to prepare and present a Bill to Parliament to give effect to the same.

The following is the Report of the Registration Committee:

"The Royal Institute of British Architects—The Committee have the honour to report that a Sub-Committee have held fifteen sittings, and have heard the evidence and views of twenty-four architects from various parts of England, Ireland, and Scotland.

As a result of their deliberations the Committee is impressed with the desire of many architects (especially those who are practising in the provinces) that a legal status should be given to only qualified practitioners in architecture, and they are of opinion that this can be met by applying to Parliament for a legal diploma of membership of the Royal Institute of British Architects, it being made compulsory that after (say) 1910 all architects, before receiving this diploma, must have passed through a definite course of architectural education in a recognised school.

The Committee believe that in a short time if this were done the holding of such a diploma would prove to be of professional value to all practising architects.

It is generally admitted by the advocates of the present draft Bill that the only chance of getting Parliamentary powers to carry out such a penalising proposal as the restriction of the title of architect would be (1) by placing the registration in the hands of a board partly composed of members outside the Institute, though it is suggested that the Institute should be largely represented; and (2) by exempting from its operations all the members of the Institutions of Surveyors and Civil Engineers. The Committee also generally admitted that the standard for admission to such registration would have to be a low one.

The Committee believe that unless the profession can approach Parliament with approximate unanimity there is little chance, in the present state of public business in the House of Commons, of getting any contentious measure passed.

The Committee therefore recommend that at present the Institute should confine itself to attempting to obtain Parliamentary recognition for its membership, an attempt which, they believe, would meet with very general support. Such State recognition would encourage education and raise the qualifications of architects, and would at the same time avoid the temporary necessity of granting a statutory title to unqualified men.

The Committee recommend that the title of the Institute be changed to that of the Royal College of Architects, and that a temporary third class of professional members be established.

As an appendix to this Report the Committee submit an outline of suggestions to give effect to the recommendations herein contained.

The Committee beg leave to state that this Report has been adopted by them unanimously at a meeting on March 20, 1906, at which the following members were present:—

Edwin T. Hall (Vice-President), in the chair.	J. S. Gibson, Alexander Graham (Hon. Secretary).
R. S. Balfour.	E. A. Gruning.
W. H. Atkin Berry.	G. H. Gouley (Bristol).
A. W. Brevill (Nottingham).	George Hubbard.
J. J. Burnet (Glasgow).	H. V. Lancaster.
J. C. Cackett (Newcastle).	A. N. Prentice.
W. D. Caroe.	G. H. Fellowes-Pryme.
T. E. Colclitt.	John Slater.
A. W. Cross.	Leonard Stokes (Vice-President).
E. Guy Dawber.	C. G. Townsend.
E. M. Gibbs (Sheffield).	Paul Waterhouse.
W. Gilliland (Belfast).	Sir Aston Webb.
	Edmund Woodthorpe.

* The good work done by the technical schools in drawing, woodcarving, etc., is worth mentioning.

† The Ministry of Public Instruction has, as in the case of the Chieti Exhibition, photographed all the more important objects.

* A Latin glossary, the first edition of which was published by Aldus in 1499.

The President, whose absence through illness was deeply regretted, together with Mr. T. Hare, unavoidably prevented from attending, have desired their names to be added to those appearing.

By order of the Registration Committee,
W. J. Locke (Secretary).

Appendix to the Report: Heads of Scheme for Raising Qualification of Architects.

(1) Revise the Charter, and (2) submit a Bill to Parliament.

Charter Revision.

(a) Change name to Royal College of Architects, and Local name: F.R.I.B.A. and A.R.I.B.A. to F.R.C.A. and A.R.C.A.

(b) Substantive provision—In future Fellows to be elected (1) after 1906 from those who have passed the Associates' Examination; or (2) by Council in special cases.

(c) To authorise the constitution of a scheme of education to be compulsory of all candidates coming in for examination after 1912.

(d) Create new subscribing class of temporary duration, without the power of voting, to be called "Members of the Club," at a low fee for adult household architects who are not eligible for F or A.R.C.A.

All members of allied or other societies of architects found eligible by the Council of the R.C.A., to be admitted as Licentiates without election. Admission to class in be closed within a year after the passing of the Bill.

All to sign declaration and obligation as to professional conduct.

(e) F., A., and L. to be defined as professional members.

(f) Disciplinary powers to be increased with power of appeal.

Bill to Parliament.

Declare it is in public interest that employers should be empowered to recognise architects who are recognised as qualified by a competent authority and those not so recognised.

Enact.

(a) Following the precedent of the Law Society, the Royal College of Architects (already recognised by Parliament as authority for granting certificates required by public surveys) before they can receive appointments be empowered and required, by its Council, to institute and supervise education and examination of architects for admission to the R.C.A. and to confer the titles F.R.C.A. and A.R.C.A.

Confirming all such present titles.

(b) Give statutory force to present charters.

(c) Localise scale of charges, to be charged by Privy Council, for all professional members of R.C.A.

(d) Municipalities and other public bodies acting in fiduciary position shall on the erection or alteration of buildings in cities or towns employ a professional member of the R.C.A.

(e) Amend clause (d) of the Bill to be introduced, but it is likely to commend itself to Parliament, and it follows a policy long supported by the Council and by a large number of the members of the Institute. At the worst it could be struck out of the Bill.

Memorandum to be Considered at the General Meeting.

In accordance with a resolution of the Registration Committee, the President appointed in October last a Sub-Committee, consisting of the following:—Sir William Emerson, Sir Aston Webb, Messrs. J. Slater and T. E. Colcutt on the one side, and Messrs. J. S. Gibson, A. W. S. Cross, W. H. Smith, and George Hubbard on the other side, with the President as chairman. Subsequently, owing to Sir Wm. Emerson's absence in India, Mr. E. H. Hall was nominated by the Committee to take his place, and the President's selection was subsequently confirmed by the Registration Committee.

At a meeting of the Sub-Committee, on October 25, 1905, the following procedure was agreed upon—viz., to summon twenty-four witnesses, comprising six metropolitan and six provincial architects, and a similar number of metropolitan and provincial architects holding the opposite view, the witnesses to be summoned to give their personal opinion on the question.

The first meeting for the examination of witnesses was held on November 22, and eleven subsequent meetings were held, when the following twenty-four gentlemen were good enough to attend and express their opinions before the Committee. Those in favour were Messrs. W. Gillibe Scott, H. A. Saut, Lewis Solomon, Ellis Marsland (Hon. Secretary, Society of Architects), H. W. Mills, F. R. Farrow, H. L. Goddard (Leicester), S. Perkins Pick (Leicester), H. Smith (Bristol), W. J. Gilliland (Belfast), W. S. Beaumont (Manchester), John Koppie (Glasgow); and against them Messrs. J. Macvicar Anderson, Professor Baresford Pite, Reginald Blomfield, A.R.A., Basil Champneys, H. H. St. B. Jackson, A. C. Hedfield (Sheffield), Professor Capper (Manchester), J. J. Burnet (Glasgow), J. A. Gulch (Kettering), W. M. Fawcett (Cambridge), and Professor C. H. R. Rely (Liverpool).

A short time was present throughout the proceedings to place the evidence on record.

The Sub-Committee then proceeded to consider the evidence before the Registration Committee. The general effect of the evidence may be briefly summed up as follows:—On the one hand it was strongly felt by the witnesses in favour of registration that the standard of architectural ability would be raised by instituting compulsory training and examination; and also it was thought that, in the interest of the public, it was the province only of those who had proved their competence by passing a qualifying examination should be legally entitled to call themselves architects.

On the other hand there was an equally strong feeling that the measure proposed would have a tendency to lower the art of architecture, and that, as the test to be applied must, in the opinion of many, be a low one, there would inevitably be a tendency to register very poorly qualified men; and that, though examinations might fairly test a man's constructive knowledge, they could not fix a standard in art.

It seemed obvious that with these strongly conflicting views there would be the greatest possible difficulty in obtaining Parliamentary sanction to the measure proposed, and the Sub-Committee, after due deliberation, therefore unanimously agreed to the terms of a Report, which was subsequently submitted to and approved at a well-attended meeting of the full Registration Committee held on the 20th inst. It was considered that, amongst the incidental advantages to be obtained by these proposals, and in addition to those mentioned in the Sub-Committee's Report, (a) it would ensure legal recognition of the Institute's scale of charges; (b) it would enable the Institute to deal more effectively with cases of disreputable professional practice; (c) and it would be likely to meet with the fairly unanimous support of the whole body of the Institute.

THE ARCHITECTURAL ASSOCIATION.

An ordinary general meeting of this Association was held on Friday last week at No. 18, Tufton-street, Westminster, Mr. E. Guy Dawber, President, in the chair.

In the unavoidable absence of Messrs. H. Tanner, jun., and A. Marjony Watson, the Hon. Secretaries, Mr. Francis Hooper read the minutes of last meeting and the nominations.

The Chairman said that they would all regret to hear that Mr. Watson had been obliged to resign his position as Hon. Secretary owing to ill-health. They were all sorry to hear this, and they would all wish to express their appreciation of what Mr. Watson had done for them in the past, and they hoped he would soon be recovered.

The Building Fund.

Mr. W. Kaula having been elected a member, the following further donations to the Building Fund were announced:—

Horace Cheston	£	s.	d.
Walter Gilbert (further donation)	2	2	0
F. Dare Clapham (double sub.)	1	1	0
V. T. Bolton	10	6	
W. Milford	10	6	
D. Newman	10	6	
H. K. Boreham	10	6	

Deceased Members.

On the motion of the Chairman, votes of condolence were passed to the relatives of the late Mr. Zephaniah King, Mr. Lancelot Simmons, and Mr. Frank Whittingham. Mr. King, he said, was a very old member, who joined in 1854.

Mr. Hooper announced that the Camera and Cycling Club would make an Easter tour to Winchester, commencing on Thursday, April 12.

The House List.

The Chairman then read the following House List for session 1906-07, remarking that it was open to any member of the Association to put forward any name for nomination before the meeting on April 6:—

As President, Mr. R. S. Balfour.
As vice-presidents (two to be elected), Messrs. Walter Cave and A. Needham Wilson.
As Council (nine to be elected), Messrs. Louis Amber, F. D. Clapham, E. Guy Dawber, J. B. Fulton, Theodore Fyfe, J. S. Gibson, W. Curtis Green, Arthur Keen, Arnold Mitchell, John Murray, J. N. Peckham, E. A. Richards, J. MacLaren Ross, J. Tatchell, A. Marjony Watson, R. Douglas Wells, R. F. Wheatly.
As hon. treasurer, Mr. Henry T. Hare; as editor of the *Architectural Association Journal*, Mr. Maurice E. Webb; as hon. librarian, Mr. E. Gunt; as hon. secretaries, Messrs. H. Tanner, jun., and C. Wainwright Smith. Other officers—Hon. solicitor, Mr. W. H. Jamieson; hon. assistant librarians, Messrs. H. J. Worror and Percy May.

The London Club-house of the Last Century.

The following paper, prepared by Mr. A. W. Soames, M.P., was then read by Mr. D. G. Driver, Secretary, in the absence of the author:—

"Man is said to be a sociable animal," says Addison in opening his 'Essay on Clubs,' and it seems indeed to have been the custom for men, and women also, to associate themselves together in clubs from a very early period of the history of the world. These clubs, however, in the early days usually partook more of the nature of religious or trade guilds than of the modern social club, although in ancient Rome instances of the purely social club are not wanting.

But, as far as I have been able to ascertain, the erection of buildings devoted exclusively to the use of a social club in England does not go further back than about the middle of the XVIIIth century. Before that date these clubs met in taverns or at coffee-houses, usually on fixed days, and they did not as a rule appear to have had any room or rooms reserved for their permanent exclusive use.

The earliest known club in London of the social type seems to have been the Broad-street, or Friday-street, Club, originated by Sir Walter Raleigh, which met at the Mermaid Tavern; and among others which sprang up later may be named the Green Ribbon Club (1675), which apparently was the first to provide permanent headquarters for a political party at the King's Head Tavern, at the south-west corner of Chancery-lane. In the course of the XVIIIth century we find that White's was founded, or re-founded, in 1750; the Cocoa Tree, 1746; Boodle's, 1762; Brooks's, 1764; and Arthur's, 1765. And these clubs, outgrowing the accommodation of coffee-houses or taverns, erected buildings for themselves. During the next half century only two clubs—and those of a different character—the M.C.C. (1787) and the Smithfield (1798) were founded, and it was not until the year 1813 that clubs began to spring up in any numbers in London. Between 1815 and 1852 no less than fourteen clubs were founded:—The Guards', 1813; United Service or Senior, 1815; Portland, 1816; Travellers', 1819; United University and Union, 1822; Athenæum and Oriental, 1824; Junior, 1827; Wyndham, 1828; Oxford and Cambridge, 1830; Garrick, 1831; Carlton and City of London, 1832. Following these, we find in 1857 the Reform and Army and Navy (or Rag), and in 1840 the Conservative Club. This may be said to terminate the earlier period of club building, as in the next quarter of a century comparatively few new clubs were founded; and indeed, the bulk of the newer clubs belong to the last twenty years of the century.

The evolution of the club-house, as might be expected, reflects changes in our social habits. Two, at any rate, of the older club-houses—the Athenæum and the United University—when built contained no smoking-room. It was not until 1857 that Thackeray succeeded in persuading the committee of the Athenæum to allow smoking on the premises. In the case of the United University it was found necessary to add a third floor in order to provide a smoking-room. This house, which was built by Wilkins, the architect of the National Gallery, has lately been pulled down, and a new club-house is being erected on the site by Mr. E. T. Blomfield, A.R.A. In a remote corner of the Oxford and Cambridge Club may still be seen the row of pegs on which the few members who smoked in the early days of the club used to hang their coats, which they wore when indulging in that pleasant, but then unpopular, habit.

The greater facilities for travelling of the present day have also had their effect on the clubs. Not only have they increased in number, but also in size, and within the last few years it has become usual for clubs to provide bedrooms for members, which was only the case in a few of the old clubs, where perhaps a dozen might be found; while the modern political club, such as the National Liberal or the Constitutional, with its 108 bedrooms, is really more like a hotel than the old-fashioned club. Consequently we find that, whereas the Carlton and Conservative Clubs have only one floor above the ground floor, the Constitutional runs into six stories and 200,000, while the Travellers' was built for the modest sum of 23,160*l.*, and the Athenæum cost no more than 34,239*l.* 2s. 6d.

Two circumstances may be noticed which had a considerable influence on the early clubs, the one beneficial and the other adverse. The removal of Carlton House, which faced the bottom of Waterloo-place, gave some excellent sites, now occupied by the Senior, Athenæum, Travellers', Reform, etc.; but, unfortunately, the period was one when exteriors were almost invariably rendered in stucco or cement, and this detracts seriously from the appearance of nearly all the older clubs.

The planning of a club-house, of the earlier type at any rate, given a well-lighted and sufficient site, is not a very complex problem, and it is one that gives excellent opportunities to the architect. The hall and staircase naturally play an important part in the design, but, with a few notable exceptions, the designers of our club-houses have not made the most of their opportunities in this respect. In many cases we find a spacious hall with an ample staircase, but

the effect of the whole completely destroyed by the approach being at one side of the hall, and not opposite the staircase. A notable instance is the United Service Club. The hall is central and on a vast scale, occupying indeed a very large part of the site, and a central flight of stairs rises boldly, branching right and left and returning on both sides to the first floor. But the approach to this hall is by dodging out of a corner of the outer hall or lobby at one side of the staircase, with the result that there is no vista, and the effect is absolutely lost. The same is very largely true of the other old service club, The Army and Navy (or Rag), which contains a large, florid staircase, similarly placed and planned, except that the central flight, instead of descending in an unbroken line to the ground floor, branches right and left shortly before reaching the ground, with a questionable effect. In the Conservative Club, also, the effect of a somewhat remarkable hall and staircase is diminished by a side approach in one corner of the hall.

As an example of how not to do it the Oriental may be cited. Here, again, we have an outer lobby, not particularly well designed, communicating near the corner again, with a central hall which is little better than a well, and has a poor geometrical staircase.

The Union Club has also a geometrical staircase, but the approach is better, and the space not so cramped. As, however, the main staircase ascends to the second floor, the well-like effect is not entirely avoided; and, indeed, there seems to be a good deal to be said for the plan adopted in many of the older houses of carrying the main stairs only up to the first floor, and reaching the second and upper floors, if any, by a subsidiary staircase.

At the Oxford and Cambridge Club an outer hall leads by thirteen steps into an inner hall, with stairs facing, but, as they are dog-legged, and the return flight cuts in half the large windows on the half-landing, the effect is far from good.

The hall of the Junior United Service is entered through a small glazed lobby, probably an addition to the original scheme, and immediately opposite is a very broad flight of stairs, returning dog-legged both ways; but the effect is much marred by coarse and heavy detail, and the dog-legged flights are not happy.

At the Reform the hall, of the *cortile* type, is very successful, but the stairs are almost concealed, and hardly enter into the design at all.

The Conservative Club possesses a fine hall, to which allusion has already been made. It is square in plan, and the stairs ascend through an archway in the middle of one side, but the distinctive feature is a coved circular gallery at the first-floor level, with a domed glazed light above. This gives four rather awkward spandril-shaped soffits to the gallery, but the effect is striking and distinctly good, though one could have wished for rather more refined detail.

The treatment of the stairs in the National Liberal Club is somewhat unusual. The site is of an awkward shape, and it was no doubt a matter of difficulty to contrive a stately staircase for so lofty a building of so irregular a plan. The stairs ascend round an oval well, and the result is not particularly happy.

The most successful treatment of the hall and staircase is found in the Athenæum. The plan is both simple and effective. The site is a regular oblong, about 103 ft. by 79 ft. This space is divided into three portions by walls parallel to the shorter sides, of which the middle part, occupied by the hall and stairs, is considerably the largest, and is roughly two-fifths of the whole. The entrance-hall, which is only one story in height, is divided by irregularly-spaced colonnades somewhat in the manner of a basilica, with a low segmental coffered ceiling over the nave and flat ceilings to the aisles. At the end of this hall, which is somewhat dimly lighted by windows alongside the main entrance, is seen a broad and lofty flight of stairs, branching right and left and returning on both sides, the whole flooded with light from above. This plan of lighting is very pleasing, and the effect of the whole is very good.

The lighting of large rooms 20 ft. high or

more is a matter of some little difficulty. The older architects for the most part frankly gave up any attempt to produce a window that would reach anywhere near the top of their rooms, and took refuge usually in a coved ceiling. As these clubs mostly occupy positions where there is a good light, and their rooms are not very wide, I am not sure that they were not right. Certainly the elevations gained in solidity and dignity by having sufficient wall space, where it is not frittered away or overloaded, and the attempt to use very large windows in the New University, Junior Constitutional, National Liberal Club, etc., is not so successful as to be likely to induce anyone to follow their example. In a few cases—e.g., Oxford and Cambridge and Junior Carlton—an additional height has been obtained by using round-headed windows. In one case—the 'Rag'—this difficulty has been met in another way. The ground floor rooms have a window of ordinary dimensions, surmounted by an entablature carried on engaged, rusticated columns, and above this a sort of fanlight, square-headed externally, but arched on the interior. The result is not pleasing; externally it suggests an entresol, and I do not think the interior is any the better for them.

The majority of the large rooms are, of course, lighted from the side, but the coffee-room at the Oxford and Cambridge (65 ft. 10 in. by 32 ft.) is lighted by lofty windows at both ends, a method of lighting which does not give a pleasing effect.

Some of the earliest clubs—e.g., the Athenæum and United Service—have the ground floor very little raised above the street level, but it was a very usual practice in later houses to raise the ground floor a few feet higher, and get a fairly well-lighted mezzanine to provide lavatories and offices.

One of the principal objects of the designer of a club is, of course, to provide three or four rooms on a large scale which shall have some architectural character and look comfortable within. I hold, then, that the ideal room for a club, whether it be coffee-room, drawing-room, library, or smoking-room, is one which provides a considerable number of nooks or recesses, where little coteries can assemble, or where a quiet table for reading or writing can be placed. Nothing gives an air of less comfort to a coffee-room than a bare space of straight wall with an interminable row of little tables set against it, all of the same size and shape. Therefore I would say to anyone who has the good fortune to design an important club-house, break your room up boldly into bays, with columns and ante of ample projection. An excellent instance of this is the library at the Travellers', the most charming room in any club in London. The dimensions are 65 ft. by 22 ft. 6 in. The central bay is end bays by three grouped windows, and the end bays by one each. Slender coupled shafts stand well away from the ante on pedestals connected to them, and some 7 ft. or more from the side walls. The entablature is returned across the room over these shafts, and the effect is most happy.

In Barry's later house, the Reform, we find a similar arrangement. Here the coffee-room and library are each about 117 ft. by 27 ft., and 20 ft. high, and are divided again into three bays and recesses at each end. But here, instead of a single entablature crossing the room, he has separated his bays by two entablatures about 10 ft. apart, with a soffit between at a lower level than single columns in ante and in the other on coupled shafts on pedestals standing boldly away from the walls. This arrangement gives additional nooks for small tables, and somewhat disguises the excessive length of the room in proportion to the width. Both rooms are very successful, and the library is second only to that in the adjoining house.

The L-shaped room was not employed in any of the older houses, but it is not to be despised for a club. A more sociable method of entertaining strangers is to allow them the use of the smaller arm of such a room, instead of relegating them to a badly-lighted and stuffy little back room, as is so often the unhappy lot in the older and less made an alteration to its coffee-room, and adopted this plan, and two good examples of L-shaped rooms are to be found at the Junior Carlton.

Time will not permit me to give more than a few notes upon some of the more important club-houses, and, indeed, an elaborate description of buildings whose appearance must be familiar to all would be a work of supererogation. Taken as a whole, I should put the Reform Club first in order of merit. The plan is very simple. The main building is a rectangle 120 ft. by 105 ft., and the interior is a covered courtyard, 56 ft. by 51 ft., surrounded by a colonnade of Ionic pillars on un moulded pedestals supporting a gallery, above which a Corinthian colonnade carries the roof. This arrangement gives a perfectly symmetrical, dignified, and spacious interior, but the effect is a little marred by the interlacing cove lantern light, apparently of cast-iron. The use also of scagliola for the columns and wall surface is to be regretted.

This plan relegates the staircase to a very unimportant place in the design. It is entirely included, and leads up through an arch opening in the middle of one of the shorter sides. The plans of the ground floor and first floor are almost identical. On the south there is on both floors a room about 117 ft. by 27 ft.; on the west one of 50 ft. by 25 ft., plus a 7 ft. recess; and on the north or entrance side and east or staircase side smaller rooms. As regards the exterior, the composition is of the simplest. The north and south elevations show three floors each of nine windows equally spaced, and of one design for each floor, bound together by mouldings and enriched bands, broken only by a central door on the north, while the side elevation shows eight windows, with the four middle ones grouped rather closer together. A bold cornice and rusticated quoins complete the composition. The result of the simplicity of the treatment and ample space of plain wall is to produce a building of which breadth and repose are the leading characteristics. It may be said by some that there is not enough window for our northern clime, but, as no room in the club is more than 27 ft. wide, they are, as a matter of fact, sufficiently lighted, and I, for one, am thankful that Barry kept his wall space as ample as it is.

Its neighbour, the Travellers', an earlier work of the same architect, has a frontage of 72 ft. to Pall Mall, and a depth of 104 ft., with light only to the back and front. The architect has dealt with this by placing his entrance at the west end of the façade; from an outer hall a corridor, broken up into three bays and lighted by an open courtyard, leads to stairs on the left and the coffee-room beyond. This is well managed, and gives a good vista, while the courtyard lights a small house dining-room on the other side, and there is a good morning-room to Pall Mall. Of the charming library on the first floor I have already spoken. The elevation to Pall Mall is very quiet, simple, and well-proportioned, and in treatment much resembles its neighbour. But it suffers from being in stucco and from the necessity of placing the entrance at one end. The elevation to Carlton House-terrace, with its three grouped round-headed windows, is not so successful, and does not merit the praise which has been bestowed upon it. It is said, with what truth I do not know, that the Pall Mall elevation was suggested by the Pandolfini Palace at Florence.

The Athenæum, by Decimus Burton, is, or was, another building simple and formal in character, but it has been ruined beyond redemption by the unfortunate addition of a third floor set back some 7 ft. or 8 ft. inside the main walls of the building. It surely should not have passed the wit of man to design a third floor without committing such an outrage upon an important building in one of the most prominent sites in London. The removal, too, of the balustrade surrounding the area can hardly be considered an improvement. The continuous balcony at the first floor level is one of the rather unusual features of this building, and the small windows contrived in the panels under the balcony towards Pall Mall are certainly not happy. On the whole the exterior, though well proportioned and refined in feeling, leaves one rather cold.

The Oxford and Cambridge Club, by Robert and Sydney Smirke, was built in 1836-7, and cost no more than 26,743*l.*, though the frontage is about 90 ft., and the L-shaped site is 130 ft. in extreme depth, the whole

of which, however, is not covered above the basement. It cannot be considered as particularly happy either in plan or elevation. The dog-legged stairs and end-lighted coffee-room have already been mentioned as not pleasing, but the other rooms are more satisfactory. The elevation is not particularly successful. Sculptured panels over the first floor windows hardly succeed in concealing the fact that there is a vast height of wall above the windows, of which the use is not apparent, and the long, vertical lines which they introduce detract from the solidity of the whole.

The Conservative Club shows a symmetrical facade, with small wings of slight projection, the northern containing the entrance and the southern a large bay window. The ground story is rusticated, and the central block has a detached Corinthian order above, and the whole is finished with a balustrade. It is a building of some dignity, and the front is one of the most successful. The plan gives a fine room to the front, and there is a spacious coffee-room behind.

The United Service Club occupies a fine site, and the main lines of the building are not bad, though not of any striking originality. Exception might be taken to some of the details, but the building has a massive air, and is not inappropriate to a club of warriors.

The designer of the Junior United Services has not attempted any symmetry in his main elevation, but, by boldly placing his main entrance out of the centre of the facade, has secured a fine room with a large bay on the east. The impression, however, of the whole is one of heaviness without dignity, and the end elevation to Regent-street, with its windows of varying heights and shapes, is particularly unfortunate.

The Army and Navy Club, by Parnell & Smith, was completed in 1851 at a cost of 54,000*l.* It owes some of its features to the Palazzo Rezzonico, on the Grand Canal in Venice, which was designed by Longhena in 1680, and owes its upper story to Massari sixty years later. The entrance in the side street enabled the architects to provide a fine room to Pall Mall, but the details of the interior are over-florid, and not in the purest of style. The exterior is not unimposing, but one could have wished for a little more plain surface for the eye to rest upon.

The Carlton Club occupies a fine site, with a light on three sides, like its neighbour, the Reform, and the building is an elaborate one—a little too elaborate, in fact—and is open to the same criticism as the last. The surface is worried and cut up till there is hardly a square foot of plain surface to give repose to the eye. The polished granite columns, too, afford an unpleasing contrast to the stone, especially as the surface of the stone-work is now unfortunately disintegrating badly.

The Junior Carlton is a building which has been completely remodelled. As originally designed by David Brandon, and opened in 1869, it showed a projecting portico, with the entrance at the east end and a corresponding bay at the western end. A few years later, however, the club acquired the site of the houses which then existed beyond it on the west, and the club was extended and entirely remodelled by Mr. MacVicar Anderson, and reopened in 1886. The entrance is now central, and the plan, which has been skillfully rearranged, gives spacious L-shaped rooms to the east both on the ground and first floors, and provides amply for all the needs of a large club. The elevations cannot be considered as satisfactory as the interior. They are wanting in style, and of no particular interest.

The Garrick is a club of modest dimensions. Though founded in 1831, the present building was not opened till 1864. It was designed by F. W. Marrable, and presents no very remarkable features in itself, though it contains an extremely interesting collection of pictures, mostly portraits of members and of theatrical celebrities. The site is cramped, and irregular at the back, and the architect was compelled to place his entrance out of the middle in order to get a good room to the front on the ground floor.

Of the huge buildings that have been more recently erected for political clubs, it is difficult to speak in terms of much commendation. The National Liberal Club has

certainly more architectural character than the Constitutional or the Junior Constitutional, but, while fully admitting that the site was a difficult one, it is impossible to avoid feeling that more might have been made of it. The tower at the angle suggests either a back staircase or a chimney, or both, and a treatment of the angle might have been adopted which would have utilised it as a good and characteristic feature internally as well as externally, as witness the New Gaiety Theatre.

The change in scale between the windows of the lower and upper floors is so great as to be disagreeable, and if the lower windows had not been so vast the building would have gained much in breadth. If, however, it was considered absolutely necessary to keep them so large, more subdivision by mullions and transoms would have brought the large and small windows into better relation with one another.

The Constitutional Club occupies perhaps an even more awkward site, and it has not been successfully dealt with. Terra-cotta, too, is a poor material for a building on so large a scale, but a better material would not have redeemed it. The Junior Constitutional cannot, however, be said to suffer from a poor material, nor does the frontage so precariously offer any difficulties, but a marble front will not carry off a poor design, and this one is quite wanting in breadth and dignity.

With regard to all these three, the question arises whether buildings so lofty and on so large a scale can be satisfactorily treated with gables. I am inclined to doubt it. More emphasis to the horizontal lines is, I think, required than can be obtained with such a treatment.

Before closing a somewhat rambling and discursive paper a word of thanks is due to the secretaries of the various clubs for their courtesy and kindness in affording me facilities for viewing the buildings and valuable information with regard to them—a courtesy which, I fear, is somewhat ill-requited by adverse criticisms upon some of the houses."

Mr. Arthur Keen, in proposing a vote of thanks to the author, said that he had been much pleased with the form and method of the paper, and the subject, interesting in itself, was treated from a wide and comprehensive standpoint. The author had avoided the trivial and minor matters which might have been touched upon, and had gone to the root of the matter. He remembered a paper by Mr. W. Millard, who warned his hearers to be careful of the bugbear of architectural detail, and he was undoubtedly right. In cases where the detail was weak or poor, it was apt to offend to such an extent that we were prejudiced against the building, which might be in all essentials entirely admirable. On the other hand, where the detail of a building was fine and interesting, it might divert our attention from perhaps serious defects in plan and disposition, and from the composition as a whole. The only regret about the paper that he felt was that the author had not shown illustrations of the buildings, which were very interesting, and plans and photographs would have added to the interest. Club buildings were great opportunities for architects, and opportunities which were offered to very few of them. They were generally erected on fine and important sites; they were large buildings, and simple in their parts, and one always imagined that the committee of a club wanted a dignified, quiet, and refined building, rather than one of pretentious character. One must feel a certain amount of disappointment in viewing London club-houses as a whole; several of them were fine opportunities thrown away, and the buildings were of very little architectural importance. Many of them were solid, imposing, and dignified, but dull to a degree. Leaving out of the question the XVIIIth-century ones, which were pleasing and interesting in their way, the only ones which could be considered fine architectural compositions were the Reform, the Travellers', and the Athenæum. As to the Athenæum, he supposed that it was a drawback that the building was fronted with stucco, but it was the fashion of the time, and one must not be too severe for that reason. Moreover the building was so well kept and looked after that we

could forget the fact that its front was stucco, especially as it was architectural to a degree and very fine in its proportions, and there was a homeliness and a picturesqueness about the building which were enhanced, he thought, by the paint and distemper with which it was treated externally, and at the present time the paint and distemper had been so well applied that the building was made particularly attractive.

Mr. Soames had spoken about raising the building by the addition of an extra story, and they must all regret that that was necessary to the done; but, assuming that it was necessary, he failed to see how it could have been better done. The alternatives presented to Mr. Colclutt, the architect, were very few. The walls might have been raised, or a steep-pitched roof might have been put on, which would have had the drawback of a large number of dormers for the purpose of giving light to the building. Considerable reserve had been shown in the way in which the architect had treated the problem, and addition was made as unobtrusive as possible. It was a difficult matter satisfactorily to add to a building by heightening it; it was easier to widen it. There was the Sun Fire Office in the City which had recently been raised, and no expense was spared to make a satisfactory addition to what was perhaps one of the best buildings in London. The top story was taken off, stone by stone; a second story was then put on to agree in character with the first story, and the top one was replaced as it was before. He felt that the particular charm the building enjoyed before was quite gone; it had previously delightful proportion, exquisite feeling, with a fineness of detail which was particularly pleasing, and which distinguished it from all other buildings in the City, and that all seemed to have gone, although the work could not probably have been better done. The addition of a story was a detriment as a rule, especially in the case of classical buildings, but he supposed such additions were necessary in some cases. Of the other clubs, he felt that the Reform came first among them; it was a magnificent opportunity, and it was finely dealt with. The fact that the building was on the shady side of the street was a drawback, but, apart from that, there was hardly anything about it which failed to please; it seemed to possess all the good qualities of fine architectural design—fitness for purpose and site, fine proportion, exquisite feeling, and scale throughout the front—and there was fine proportion between the voids and solids. The windows and interspaces were judged with admirable feeling, and the whole was extremely fine. As to some of the other clubs, he felt that there were many good opportunities which had not been made the most of by the designers, and one had an uneasy feeling that such opportunities would not come again, for it was rarely that such sites were obtainable; nowadays ground rent is so enormous that a building had to be increased in height to meet the ground rent, and a bank or an insurance office had to be provided on the ground floor. Moreover, nearly every problem offered to architects now was more difficult than in the XIXth century, and he did not know that even Sir Charles Barry, if he were to come back to life, would be able to erect a block of flats with much success. As to the National Liberal Club, he understood that all the main lines of the adjoining building had to be adopted in the club—all the main cornices and strings ran through continuously, and Mr. Waterhouse did not have a free hand, except at the corner, where he had the opportunity of carrying out that well-designed turret at the angle, which gave some scope for his imagination; but the key of the building was set by the adjoining premises.

Mr. Matt Garbutt seconded the vote of thanks. The author, he said, worked rather disparagingly to the terra-cotta of the Constitutional Club; but whatever the sins of terra-cotta, it did provide its own sunshine. Red terra-cotta on a dull day was effective, and we ought to be glad of that.

Mr. H. P. G. Mauld in supporting the vote of thanks, said he did not think that the author did sufficient justice to the authors of modern clubs, seeing what great difficulties they had to contend with as compared with the difficulties of architects of earlier clubs

buildings. In the older clubs, the requirements were to provide large rooms, which meant that the architect could retain the same scale throughout the building, but, in the modern clubs, there were large rooms on the ground floor and small rooms above, and there was a contrast in scale between the upper and the lower floors. The author was rather emphatic in condemning the modern elevations, but he did not say that the plans were often very good; he thought that all would agree that the plans were in many cases admirable, and fulfilled their purpose in a striking way.

The Chairman then put the vote of thanks to the meeting, and expressed regret that Mr. Soames was not present, and that there had been no illustrations to accompany the paper. He also referred to the great difficulty the modern architects of club buildings in London and big cities had to contend with.

The vote of thanks was heartily carried, as well as a vote of thanks to Mr. Driver for reading the paper.

It was announced that the next meeting will be held on April 5, when Mr. E. Greenop will read a paper on "Valuations, Compensations, and Light and Air."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

V.—FLATS IN HIGH-STREET, KENSINGTON.

AN important block of residential flats, known as Hornon-court, now in course of erection in High-street, Kensington, was selected for the scene of the fifth spring visit on Saturday, March 24, by the Architectural Association. The salient feature of the scheme lies in the fact that no effort has been made to overcrowd the site; but, on the contrary, some praiseworthy attempt is made in the spacious planning to give the building the idea of a bold architectural conception. A clear, regular site was at disposal, surrounded by streets, and, fortunately, the longest frontage, 242 ft., faces the High-street, which, with the average depth of 120 ft., produces an area nearly equal to three-quarters of an acre.

The ground floor and basement are utilised for shops or business premises, while the five upper floors are built as flats, of which there are fifty, of varying sizes. The shops extend over the full width and length of the ground; but the main group of flats is set back considerably from the noisy High-street, and connects two large wings extending the full length of the side streets. Two large enclosed terraces above the shops are thus formed, which Messrs. Daw & Son, the lessees, intend to lay out as gardens, the more important of which will have two fountains.

A large pediment is arranged on the central projection in the recessed front, built entirely of stone, and the only reason for its existence appears to lie in the desire to avoid all external expression in the central party-wall. In this, Messrs. Coleridge & Chesterton, the architects, have succeeded, but the result generally is to convey the idea of a large public institution rather than that of a collection of independent residential suites.

Portland stone is used on the ground story. The upper floors have all their dressings in "Palotte," a soft French stone which is said to harden with exposure, sufficient to withstand the action of the London atmosphere. The carvings and other enrichments are well done, the stone offering greater facilities than any other widely-used material. The upper wall surfaces are faced in red brick. The shop fronts below the main terrace have a stone cornice and balustrade, so that the usual effect of a large plate-glass window appearing to assist the support of a massive superstructure is here fortunately absent.

Steel construction is largely introduced. In this respect Messrs. Moreland have used solid wrought-steel columns in preference to cast-steel to ensure greater reliability and freedom from flaws.

MEMORIAL TO DEAN FARRAR.—The memorial which has just been erected on the south side of the nave of Canterbury Cathedral was executed by Mr. Albert B. Joy. It consists of a frame of grey marble of two shades, with a medallion portrait in Carrara marble of the late Dean as in middle life. The inscription bears an appropriate stanza quoted from "In Memoriam."

THE SURVEYORS' INSTITUTION.

AN ordinary general meeting of the Surveyors' Institution was held on Monday last at No. 12, Great George-street, Westminster. Mr. George Langridge in the chair.

The minutes of the last meeting having been read and confirmed, and some donations to the Library Fund having been announced,

Mr. J. H. Sabin resumed the details on Mr. W. Woodward's paper on "The Means of Locomotion and Transport in London," read before the Institution on March 12. He said he thought Mr. Woodward had almost overstepped the mark in attacking the London County Council and the British workman. They had before them at the present moment the completion of the London County Council's splendid scheme of a fine thoroughfare from Holborn to the Strand, and, after all, it was the British workman who put into form the creations of Mr. Woodward's brain. It was impossible to do away with the obstruction of traffic. That was a difficulty that had come to stay, and all that could be done was to modify it as far as possible. Obstruction in vehicular traffic arose either wilfully or unavoidably, and Mr. Woodward hit those responsible for it when he named the borough councils and those responsible for the streets, and the drivers of vehicles. He was passing along Albany-street recently in a motor-car, and found the road "up" close to a drinking fountain. Every driver of a horsed vehicle considered his horse in need of water, and drew up at the fountain, with the result that a great obstruction was created. This happened within 100 yds. of the police station, and should have been avoided. An order from the officer on duty would have prevented the obstruction, and he considered that it was possible by stopping this kind of thing to give some relief in crowded streets. What was wanted was a corps of traffic managers—a body of alert, sharp men who would see what difficulties arose, and act immediately. It would be necessary to have an Act of Parliament by which wilful obstruction could be avoided. There was a constant obstruction at the junction of Tottenham Court-road and Oxford-street, and quite recently, at the corner of Euston-road and Tottenham Court-road, he saw two brewers' waggons, one distiller's wagon, and two mineral water waggons making deliveries, and, added to this, a dust cart collecting house refuse. This, at 9.50 a.m., was a scandal. An alteration was needed in the hours of delivery, and should not be collected between the hours of 9 a.m. and 6 p.m. The traffic managers, he suggested, should be independent of police. There were narrow streets in which it was impossible to avoid delay, but even there it must be reduced as far as possible. There were very few main streets without other streets running parallel with them. Neither fast or slow traffic took these streets, and the traffic managers should have power to direct certain classes of traffic to them. There were, here and there, blocked ends to these parallel roads, and at a comparatively small cost it would be possible to remove the houses at the end and get a road through. With regard to trams, he could join issue with Mr. Woodward, because he found himself with the Advisory Board, who had just reported. It was said there were 350 miles of lines, but he did not know whether this referred to single or double lines. Even supposing it referred to double lines, it was not enough for it meant a mile of tramline to a square mile of street. Moreover, he had such a number of dead ends, which it was suggested should be joined up in the centre. But there was another method, and that was the introduction of circular routes. Under this system a car need never stop dead on its route except at the outer suburban end, and then a number of cars could follow each other without difficulty. If the Embankment were used as an exchange, there could be continuous services over the bridges. It seemed to him a lamentable thing that this was not done. He had occasion to visit Manchester recently, and the system in vogue there filled him with admiration. The cars followed each other with rapidity, and occasionally six cars cross roads they divided naturally, and disappeared without the least confusion or obstruction.

Mr. Hudson said he did not sympathise

with the previous speaker's condemnation of the police, who had only power to interfere with stopping places. Traffic certainly ought to take routes. He did not think Mr. Woodward's proposals would have the effect that was desired, and he was firmly convinced that nothing less than the re-alignment of our streets would affect the metropolis in a permanent way. What was done now should not be for this generation alone to carry out, but should be borne by two or three generations. People said: "Let posterity look after itself," but it must be remembered that what could be done now could not be done so easily some years hence. If, after the Great Fire, the metropolis had been replanned, or even had a plan of 120 years ago been carried out, we should be in a much better position to-day, and every year of delay increased the cost of reform. We must also consider the nature of vehicles. Mechanical traction was being extensively used now, and when horse omnibuses were superseded by motors, a quarter of the space would be gained, and a great deal of delay avoided. With regard to tramways, he thought municipal tramways should be checked, as motor-omnibuses were preferable. He would be very sorry to see tramways along the Embankment. The view along the Embankment from Westminster Bridge was very fine, and it would be unfortunate to see such a disfigurement. There was no objection to trams coming over the bridges. In Paris they did so without any aesthetic loss. He made a plea to everyone to do what they could to prevent a bridge being built through Temple-gardens, 600 yds. from Blackfriars Bridge. Overhead lines were undesirable. Anyone who had seen them in New York would know they would never be tolerated in London, because of trains passing in front of windows, the awful noise, and accidents. He believed that in New York they were about to be abolished. Mr. Woodward considered street refugees should be dispensed with, but with wide streets and fast-traveling vehicles, it seemed necessary to increase the number of them, for the people must be safeguarded. It had been suggested that there should be fixed stopping-places for stage vehicles, but he pointed out that the fewer the stopping-places the longer must the vehicle be kept waiting to let a greater number of people down, and so no time would be saved.

Mr. Walter Beer said he thought if any improvement could be effected, it was only by a bold and comprehensive scheme. It was not passenger traffic that required immediate consideration. We had about to come into operation a number of tube railways, and motor-omnibuses were being rapidly brought into service. We must, therefore, wait and see what improvement these would effect. It was vehicular traffic that required consideration. He was somewhat disappointed with the report of the Commission taken as a whole, for it did not contain an expression of opinion as to what should be done. It was only in the independent report of Sir George Bartley that one found any expression of opinion. He found, after giving a great deal of thought to the subject, that the only way in which the problem could be solved was by two main arterial roads north and south and east and west. He believed it had not been previously suggested that these roads should start in the country and finish in the country, or they would not have a sufficient collecting area to attract traffic and make the expenditure worth while. These roads must be carried at a high level through crowded areas, or else at congested places the traffic would be held up, and it would then not be worth while for a driver to go out of his way to get on the road. They must have railways along the route either under or overhead. The construction of the roads would displace a large number of people whom it would be impossible to rehouse in the neighbourhood, and these railways would carry them out in the country to their homes. Having made these railways at enormous cost, they would have formed a valuable route which would help to repay the cost. It would be necessary to acquire three times the width of road that was required, in order to recoup themselves, and, working in this way, recoupment came out nearly all right. He was firmly convinced there was no other means of relieving traffic but by main arterial thoroughfares, and they would pay their way.

See our issue for March 17.

Mr. Lynden Macassey remarked that a great distinction had to be drawn between what should and what could be done at present, and what could and should be left to the future. One had to satisfy oneself that the existing streets were used to their full capacity. They might find some cause of congestion and obstruction in the action of borough councils in divided streets. He had heard of a case where one council proposed making a shelter, to which the other council would not agree, and, as a consequence, a shelter, with only one side, was built by the council desiring it. Then these divided streets were broken up one side at one time of the year, and the other side at another time, as the respective councils thought fit. Then, where new estates are laid out, or streets made, one continually found that the roads were laid out at right angles to those on an adjoining estate, with no possibility of amalgamation into one arterial route. Tramways also were constructed so that changing became necessary, and this changing taking place on main routes caused delay and obstruction. Further, new railways were constructed without consideration as a whole, but each as an independent unit. With regard to streets, tramways, and railways, the first thing to do was to secure co-ordination. This must be taken in hand by some impartial and comprehensive tribunal. In France, when roads commenced to be laid out and railways constructed, they were part of a great scheme, and railways recently constructed were part of this scheme of years ago. Before any attempt was made to construct new streets and railways, there must be a tribunal to decide whether what was proposed to be done fully met the requirements. This tribunal should have advisory powers, and any new Bills should be referred to it for report. It should also have supervisory powers, and report on the shortcomings of various undertakings, and expose the action of local authorities in allowing streets to be constructed in haphazard ways, and in opposite directions. It should have some control over regulation of traffic, so that certain streets should not be used for heavy traffic at certain hours of the day. It should have mediatory powers. A great deal of trouble now was due to friction between various authorities, and if those differences could be reconciled a great improvement would result. The enormous advantage of such a tribunal was felt in Boston. Put it to work in London, give it a fair trial, and then see what really was wanted. He did not say many new streets were not wanted, but, before commencing, see that those already in existence were used to the best advantage, and find out exactly what and where new ones were required.

Mr. Assiter said he agreed with some of Mr. Woodward's conclusions, particularly with regard to the conservatism of Londoners. They would not take up any new scheme. He advocated measures that would give immediate relief rather than wait for those grand avenues which could not come for many years. When these new thoroughfares were constructed, the State should assist, London being already over-rated. Sir George Bartley struck the right note in saying that the streets were for London to carry out its trade, and they must be made to fit the trade, not the trade to fit the streets. Traffic must not, therefore, be restricted. The rules of the road should be enforced, and slow traffic made to take the sides of the road, as, in fact, it was supposed to do now, but did not. Carmen also drew up without regard to public convenience, and scavenging went on at all times of the day and made matters worse. He did not agree with Mr. Woodward's remarks on tramways. He thought trams, especially electric trams, were very useful on established routes. The cars were much quicker than the old horse cars, and with motor-omnibuses also on the road, we might hope for some improvement in the condition of the streets. Trams should not come into the central parts of London—certainly not surface trams, and underground trams should be for further consideration. In London we never did anything until we were absolutely obliged; warnings were neglected, and far-seeing people were regarded as revolutionists. We had to spend millions to do what might have been done at a small cost after the Great Fire, and now we were leaving things for our descendants to do in the same way. With

regard to the development of outer London, some supervision was desirable. Estates were regarded independently, each as an isolated scheme, and the only desire seemed to be to get as many houses as possible on them, and give adjoining owners as little opportunity as they could for getting out of their land. These works were carried out under the authority of local governing bodies, whose officials were frequently incompetent, and thus there was no continuity or comprehensiveness in the scheme. While we respected private interests, we must also remember there were public interests, and we must be careful to avoid in outer London the mistakes and difficulties of inner London. Country lanes in outer London were built upon without any attempt to widen or straighten them, and in thirty years' time these places would probably be densely populated, and have to be improved at enormous cost. There was a need for cross-country communication. When one got ten or twelve miles out of London, one had to go seven or eight miles to get a short distance across country. He suggested the formation of a central body to deal with the whole of Middlesex and those parts of Surrey, Kent, and Essex lying within twenty miles of Charing Cross.

Mr. Nicholson observed that there was a difficulty in regard to expenditure. If London called in State aid, why should not other large towns do the same? and if they did, we should have the cost taken off the rates and put on the taxes. One remedy was decentralisation, as far as factories were concerned. The head office of these concerns should remain in London because of telephone and other facilities which could not be had elsewhere. This would remove a great deal of obstruction to traffic. The suggestion as to directing traffic was a good one. Commercial vehicles and cabs carrying a passenger might go into the side streets. The advantages of tramways had been severely criticised, but other places found them to answer. Of course, if they were put in narrow streets the result would be confusion. They did not depreciate the property although they changed the nature of it. Trams should approach as nearly as possible the centre of London, and then connect with tubes. He considered the statement that motor-omnibuses were better than trams was open to question on account of the skidding of the former on wet roads. If suburban traffic was going to be diverted to omnibuses, special roads would have to be constructed for them. The dust from them would be unbearable, while the steel rails of trams would give no dust.

Mr. Penfold having spoken, Mr. Woodward replied. There were a great many people, he said, who thought that trams outside London would be beneficial. Tramways along the Embankment must not, however, be permitted. There would be conveniences, no doubt, but the splendid effect from Westminster Bridge of the great amphitheatre terminating in St. Paul's Cathedral would be ruined. He had no objection to horse trams or electric trams, but what he did say was that, although the policy of the London County Council five years ago in developing them was correct then, it was now open to question. He simply desired that they should now stay their hand and watch the effect of the motor-omnibuses. They would find, however, that, having made up their mind to incur this expenditure on tramways, the London County Council would do so. What was wanted was a traffic board consisting of practical men, independent of the London County Council, or any other body, with great powers to act at once.

It was announced that the next meeting would be on April 23, at 4 p.m., when a paper on "The Effect of the Education Act of 1902 on Rural Districts" would be read by Mr. J. Willis Bunn.

ROMAN CATHOLIC CHURCH, PUTNEY.—The foundation-stone of the new Roman Catholic Church of St. Simon Stock was laid by the Right Rev. Peter Amigo, D.D., Bishop of Southwark, on the 3rd inst. Mr. J. C. Radford prepared the plans. The building will be of stock brick, with red brick dressing and blue brick plinth. There will be an organ gallery over the main entrance and the baptistry, whilst on the outer wall of the building, and facing Hazelwell-road, will be a statue of the patron saint of the church. The cost will be about 3,000l.

THE INSTITUTE OF BUILDERS.

The twenty-second annual general meeting of the Institute of Builders was held at the offices of the Institute, 31 and 32, Bedford-street, Strand, W.C., on Wednesday, the 21st inst.

The minutes of the last annual general meeting were read and confirmed, and the Report of the Council was received and adopted, as also were the audited accounts and balance-sheets of the Institute General and Benevolent Funds for the year ending December 31, 1905.

In the annual Report the Council state that all proposed legislation affecting the building trade introduced into Parliament during the year has received careful attention and consideration, and in cases where the Bills have been carried efforts have been made to eliminate or modify clauses that were calculated to operate injuriously to the trade. A petition against the London County Council London Building Acts (Amendment) Bill was presented in concert with the London Master Builders' Association, and the Council specially mention the services rendered by Mr. W. Shepherd, who gave evidence before the Committee of the House of Commons. Proceeding, the Report says:—

"As the expenses in connexion with Parliamentary work and opposing measures which would injuriously affect the building trade (one of the special objects of this Institute as a representative body) are very heavy, and necessarily fluctuate in different years, it has been considered desirable, as the normal income of the Institute from its ordinary subscriptions is sufficient only to provide for the normal cost of administration, to establish a special fund to provide for the expenses attending Parliamentary proceedings and other exceptional expenses, and your President has issued a circular to the members asking for contributions to this fund. Your Council relies upon receiving a generous response to this appeal.

In consequence of a legal decision, which it was unfortunately established the extraordinary proposition that in reference to bills of quantities of omission was not an error, representations were made to your Council to amend the official form of contract so as to provide against any such interpretation. This proposal was in due course submitted to the Royal Institute of British Architects, who replied that, as in its judgment the clause in the contract (124) was perfectly clear, no alteration was desirable. As your Council was of the same opinion no further proceedings were taken.

At the request of the Royal Institute of British Architects two members of your Council have been appointed to confer with them on the subject of reinforced concrete, and two representatives have also been nominated by like request, to represent this Institute at the seventh International Congress of Architects of 1906.

A representative of this Institute has been appointed to attend the Congress of the Chamber of Commerce summoned to consider the proposed compulsory official audit of the accounts of municipal bodies. This is an important matter for the building trade, as, under existing arrangements, the real results of municipal trading are frequently not apparent, and much misapprehension exists as to the profit or loss involved in such enterprises.

As the present office accommodation is quite inadequate, and as on the expiration of the present lease an increased rent is required, your Council is acting jointly with the London Master Builders' Association in the selection of more suitable premises.

Members are reminded that the council-room of the Institute is almost always at their service for meetings or appointments, and the secretary will be pleased to make all necessary arrangements for their comfort and accommodation. Members from the provinces should especially find this to be of real service to them.

During the past year the following grants were made from the Institute Benevolent Fund:—(1) Builders' Benevolent Institution, 50l.; (2) Provident Institution of Builders' Foremen and Clerks of Works, 10l. 10s.; (3) Builders' Clerks' Benevolent Institution, 10l. 10s.

During the past year the Institute has had a good accession of new members. Your Council regrets to report the loss by death of Colonel Stanley G. Bird, C.B., Mr. Benjamin Hannon, and Mr. G. J. Lough. Colonel Bird was one of the founders of the Institute, and, in order to mark the distinguished services he rendered to the building trade, efforts are being made, in conjunction with other bodies interested, to raise a sufficient sum of money to endow in his memory a bed or cot at St. Mary's Hospital, with which Institution Colonel Bird was long associated.

Mr. Frank May, J.P., was elected by the Council to succeed Colonel Bird as Treasurer of the Institute and Trustee for the Institute Benevolent Fund. In accordance with the articles of association the President (Mr. Benjamin I. Greenwood), one Vice-President (Mr. Woodman Hill), the Treasurer (Mr. Frank May), one Auditor (Mr. J. Hill), and four members of the Executive Council (Mr. R. C. Foster, Mr. F. G. Minter, Mr. G. Kett, and Mr. G. E. Skinner) will retire, but are eligible for re-election.

The following elections then took place:—As President—Mr. F. L. Dove; Vice-Presidents—Messrs. W. F. Wallis and F. Higgs; as Treasurer—Mr. H. H. Bartlett; and as Honorary Auditor—Mr. H. A. Bartlett; the Executive Council (to fill vacancies caused by "rota" retirements) elected consists of Messrs. G. Kett, J. W. Lorden, J. S.

Holliday, F. G. Rice, E. J. Hill, T. Holloway, C. E. Skinner.

A vote of thanks was passed to the retiring President (Mr. Benjamin I. Greenwood) for his services during his year of office.

CARPENTERS' HALL LECTURES: THE NEGLECTED RESOURCES OF OUR BRITISH WOODLANDS.

On Thursday evening last week a lecture was given at Carpenters' Hall, London Wall, by Sir Herbert Maxwell on "The Neglected Resources of our British Woodlands." The Earl of Leonfield presided.

The lecturer said it was generally recognised that the resources of our woodlands had been sorely neglected in the past for a variety of reasons, but they were capable of slow development if they could be put under a sound system of management. The rapid diminution of the world's timber supply and simultaneous increase in the consumption had occupied the attention of the chief Governments in Europe. In Germany, where the average annual value of the forest products was estimated at twenty-two millions sterling, they had for some years past imported timber at the rate of four and a half million tons per annum, valued at nearly fifteen millions sterling. So long as Germany could obtain timber at a reasonable price abroad her people would spare their own forests, well knowing that the price of timber would enormously increase for every cubic foot. What had we been doing to meet the coming scarcity by developing our resources? We had not yet gone beyond the stage of inquiry. Certain schools had been established, it was true, but this was a mere nibble at a great question, and private enterprise was directly discouraged by the State in the rating of growing woodlands before one penny could be touched, and in the valuation of woods by the Death Duties Act of 1894.

The lecturer quoted the import returns for 1892 and 1893 to illustrate the large quantity of timber, paper, and paper materials (mostly made from wood pulp) imported into this country, and argued that much of that timber might have been grown in the British Isles. He also said that the Government should establish some source of sound information on the subject that the nation might obtain instruction and advice. It had been said that the climate and soil of Great Britain were unfavourable to profitable forestry, but this idea was groundless. He had laid a modest scheme before the Government for the investment of 10,000l. in State forestry, which, though favourably considered, had not been acted upon. One thousand acres might be purchased, even at twenty-five years' purchase, for 2,500l.; planting might cost 6d. per acre, or 6,000l.; preliminary expenses, 1,000l.—a total of 9,500l., and allowing 500l. for expenses and charges, made up the 10,000l. laid out in the purchase of suitable hill pasture. The annual expenses would be 650l. It was difficult to obtain any trustworthy returns of British forestry, for the simple reason that British forestry scarcely existed. He could produce only one example, and it showed that sound management would ensure profitable returns from British woodlands, even in the present haphazard condition of the home timber trade. He took the balance-sheet of the Novar Woods in Ross-shire, showing the profit and loss account upon 3,670 acres of woodlands during the years 1835 to 1899. The Novar Estate was distinct from other private properties in this country in that successive proprietors continued planting on a regular system from 1800 to 1850. Had this been continued we should have had an example unique in the United Kingdom of an extensive woodland arranged for progressive annual maturity. This system was suspended between the years 1850 and 1881, but was resumed in the latter year by the present proprietor. From the results we might expect that land worth at present from 6d. to 2s. per acre might be made to yield a net return of 2,024l., or 11s. per acre. If the State were to decide on an investment of 10,000l. a year in the purchase and planting of land, at the end of fifty years they would have made a progressive investment of half a million sterling. The property, which could be acquired on a rent basis of 2s. per acre, would yield 11s. per acre over the whole period—a rise in value of 550 per cent., and this estimated on the

supposition that the price of timber would remain stationary for half a century. In Germany there were 583,000 people in direct employment in the woods, supporting probably three million persons, and no greater boon could be devised than healthy and remunerative work in the country for British people, and in no part of Great Britain would forest growth be more profitable or flourish more vigorously than in Ireland. He should not recommend a large investment of capital, and probably not one landowner in a thousand could afford the necessary lock-up capital. The price of young forest trees in England was practically prohibitive, larch costing 12l. per acre. If forestry was ever to be a remunerative industry this obstacle must be got over, and he suggested co-operation and combination with proper business connexions for the disposal of produce. Young nursery stock could be bought abroad cheaper, and the woods should be placed under capable and well-paid men, whilst a form of limited liability company would escape from paying death duties.

Out of three million acres of British woodlands nine-tenths were in private hands, and if rendered productive, as in Germany, would return two millions a year net profit, or 6s. 8d. per acre. Owing to the failure of agriculture, the increase of rates, and the paralysing effects of the death duties, the time was at hand when woodlands must cease to be treated as ornamental luxuries or be allowed to disappear.

On the motion of Lord Leonfield, a vote of thanks to the lecturer was carried.

It was announced that prizes had been awarded for an essay on "The Treatment of Woods and Plantations from the age of twenty years to maturity, with full details as to thinning, marketing, and demand for various purposes at different periods of growth." The examiners (Mr. George Marshall and Dr. William Somerville) awarded the first prize of 20l. to Mr. Leslie S. Wood, of East Grinstead, and the second prize of 10l. to Mr. P. T. Maw, of Nutfield, Surrey.

THE BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

The 27th annual dinner of the Builders' Clerks' Benevolent Institution was held on Tuesday evening in the King's Hall, Holborn Restaurant, W.C., Mr. Howell J. Williams, L.C.C., President, in the chair. There were also present Alderman Evan Spicer, J.P., Chairman of the London County Council, and Messrs. J. A. Anderson, E. and R. Bartlett, J. Carmichael, Stephen Collins, M.P., L.C.C., H. J. Leaning, F. Higgs, F. T. Mullett, G. W. Humphreys, John Murray, M. Murphy, Alex. Ritchie, J.P., C.C., E. Smith, J.P., L.C.C., G. Sykes (of Messrs. Paterson, Candler, & Sykes, Hon. Solicitors to the Institution), W. T. Walker, and J. Austin, A.C.I.S., Secretary, and others, nearly 450 members and friends being present.

The loyal toasts having been honoured, Mr. J. A. Anderson proposed "Municipal Bodies." He thought it might be said without contradiction that in no other European nation did the civic spirit exist to the extent it did in our country, and we had reason to be proud of our municipal bodies, because they did unpaid work. The spirit which animated these municipal bodies throughout the country was one of absolute honesty and straightforwardness. With the toast he coupled the name of Alderman Spicer.

Alderman Spicer, in response, said that they were gathered together to assist the Builders' Clerks' Benevolent Institution, and when he remembered that the building trade and its allied trades in London represented something like 450,000 men, he thought that that was a very fair proportion of the inhabitants of this great metropolis. He was glad to be present because the London County Council employed directly a very large number of men—in fact, the Council was almost a building association. If there was anybody he sympathised with more than another it was the clerks of London, many of whom were badly paid, and there was very little cohesion amongst them. There was one problem which they as heads of firms had to solve, and that was, the clerk who, through misfortune, often not from his own fault, found himself out in the cold at the age of forty to fifty. He did not think that the

public realised how great was the work the London County Council did; that very day they had passed twenty-two reports of various committees, and the work the Council and other bodies did was often of very great importance.

The Chairman then proposed "The Builders' Clerks' Benevolent Institution," and said he was there for the purpose of reminding them of those who were less fortunate than others. He, as a builder of twenty years' standing, acknowledged with all heartiness the assistance he had received from his clerks and staff. Many prosperous firms today would not have been prosperous probably were it not for builders' clerks, who, perhaps, as time went on might need assistance, or they might pass away leaving widows and orphans unprovided for. It was a matter of great admiration to him that builders in the past had recognised that some such institution as this was necessary to meet the demands of those who were unable in time of stress and trouble to help themselves. Was the Institution to cease for the sake of funds? He was sure they desired to do everything they could for their less prosperous colleagues or assistants, and he made an earnest appeal to them for assistance to the cause of the Institution. The Institution started in a most humble way, and all honour to those who started it. It had grown greatly, and it now required an income of between 700l. and 800l. to keep it going. The annual subscriptions were supplemented by donations, but the work of the Institution ought to be extended to meet the most urgent cases that had been brought to the notice of the committee. The Institution was founded for builders' clerks, but he was told that the clerks did not support the Institution as they ought. Builders' clerks did not know at any time how the hand of prosperity might change, and they should do all they could to help the Institution. He suggested that the lifeboat method of collecting should be tried, and that every builder's office should have a little box so that the numerous callers should have an opportunity of making some contribution to the funds of the Institution.

Mr. E. Brooks, whose name was coupled with the toast, said they had to thank all those gentlemen who had presided, for many years past, on such occasions. The Institution required quite 800l. a year to carry on the work with their present pensioners, but there were some very sad and eligible cases which they should like to see enjoying the pension, and they hoped that the result of the appeal which had been made would enable them to go to election, and put their cases on the pension list. He should like to see the invested funds, which now amounted to 7,000l., greatly increased, but they should go on and do what they could for those who needed help.

Mr. Stephen Collins, M.P., then proposed the toast of "Architects and Surveyors." He said he agreed with a speaker at a previous dinner that architects were the aristocrats of the building trade. If the building was to be a success, and what every architect would like it to be, a thing of beauty if not a joy for ever, it depended upon the architect, and if he made his building a thing of beauty he was entitled to be called the aristocrat of the building trade. He did not think that there could be a greater pleasure in life to an architect than to watch a building grow from the foundation to the topmost stone. In London, architects had great difficulties to contend against; space was limited, and the streets were narrow. In the City, for instance, there were many beautiful buildings hidden in courts and alleys, and one could not stand afar off to see the beauty of them. St. Paul's Cathedral was hemmed in by warehouses, but Sir Christopher Wren desired it to have a great approach from the river, so that people could see it to advantage. London was being rebuilt to a large extent through the efforts of the London County Council, and he believed that the architects of the future would have greater opportunities of exercising their great talents. With the spread of education people were showing a love of the beautiful, and ugly buildings were being got rid of. With the toast he coupled the name of Mr. H. J. Leaning.

Mr. Leaning, in reply, said he was not

an architect, but he could endorse what had been said about that profession. They were men of high ideals, who were worth working for. At the present time there were a good many architects preparing designs for the International Peace Palace at The Hague, and he hoped that an English architect would win the competition. He had seen several of the designs, which were very noble conceptions. Recently a distinct step had been made towards registration, and that was a matter of importance to architects, surveyors, and others, and the attitude of the leading professional body had been so modified that registration was within the region of practical politics. Surveyors appreciated highly the help they received from builders' estimating clerks, and the best surveyors were those who had an opportunity of going through a builder's office and seeing the whole routine and becoming thoroughly acquainted with the state of the market, prices, etc. He felt that a London code of measurement was necessary, and, of course, the support of the builders was necessary in such a movement.

Mr. E. Smith, L.C.C., then proposed "Builders and Building Industries," and said that it might appear an extraordinary thing that the Chairman of the Works Committee of the London County Council should be asked to propose this toast, but really the Chairman of such a committee was the best person to do so, for having established the principle that it was desirable that there should be direct employment of labour, he felt that there should not of necessity be divisions between the builders of London and the Council, but that they should work in harmony and in a spirit of co-operation for the benefit of the community. In their difficulties with labour, the Council was indebted to the Master Builders' Association for invaluable assistance and advice, and to them they had never appealed in vain. While the Council was always ready to pay due regard to the representations of labour organisations, they refused to be governed and dominated by them, and were always ready to listen to the masters' representations on any subject germane to work they had in hand.

There was a spirit of healthy competition between the Council and the builders of London. The Council had nearly 4,000 men working in the Works Department, and his experience had brought him into touch with the great difficulties builders had to contend with. He wished London could be built over again; he felt that it would be rebuilt, and the London County Council had only started upon the work, though a good deal had been done during the last quarter of a century.

Mr. F. Higgs, in reply, said he thought that the Chairman had made a good suggestion as to the lifeboat boxes, and he would be glad to have one in his office, and at the end of the year he would add an amount equal to what was in the box. He was delighted to hear that Mr. Smith had said as to the Works Department not being a competitor with builders, though he should hardly have thought that was the case. The department employed 4,600 men, and he would rather have seen those men employed by those whose natural business it was to employ them. He thought the department ought to be members of the Association, as employers of labour, and pay their quota as such, seeing that they took advantage of the work the Association did in regulating trade affairs, etc.

The remaining toasts were:—"The Past-Presidents," proposed by Mr. Alex. Ritchie, J.P., and acknowledged by Mr. J. Carmichael; and "The Merchants and Visitors." During the evening subscriptions and donations to the amount of about 500l. were announced, including 100l. from the Chairman and 10l. 10s. each from the Institute of Builders, the Worshipful Company of Carpenters, W. Curling Anderson, and Messrs. Trollope & Colls.

COROT EXHIBITION.—The collection of pictures by Corot formed by the late Mr. Staats Forbes will be exhibited at the Leicester Galleries, Leicester-square, for a few weeks from Saturday, March 31, when it will be dispersed. The exhibition will include, in addition to twenty-two examples of Corot's art, a large number of representative pictures by the other painters of the Barbizon school—Daubigny, Diaz, Jacque, Dupré, Rousseau, and Troyon.

THE INCORPORATED INSTITUTE OF BRITISH DECORATORS.

The annual dinner of this Institute was held on Monday, at "The Trocadero," Piccadilly-circus. Mr. J. D. Crace, President, in the chair. There were also present—Messrs. E. Guy Dawber (President of the Architectural Association), Cole A. Adams, M. Cowtan, G. C. Haité, H. F. Hare, F. de Jong, W. Hayward Pittman, J. C. Nicholson, J. Scott, J. Sibthorpe, W. G. Sutherland, J. H. Turner, F. W. Englefield (Secretary), and others.

The loyal toasts having been honoured, Mr. Sutherland proposed the toast of "The British Institute of Decorators." In the course of his remarks, he said that the Institute was proposed by the late Mr. Thomas Bonner at the meeting at Manchester when the National Association of Master House Painters was established, and the aim of the founders was to institute a common meeting-ground of the three National Associations of England, Ireland, and Scotland, and to do work which the National Associations could hardly do, and to carry on educational work in the trade and craft of the decorator. Unfortunately, Mr. Bonner did not live after the establishment of the Institute, and the objects of the promoters had not been quite realised, though the blame for that did not rest with the Council or the officers, but with the members themselves. The progress and status of other institutes and societies was due to the realisation by the members of the capacity which their society gave them to work for themselves. He was afraid that some of the members had a nebulous idea that the Council in London ought to prepare some scheme which, without effort on their part, would confer some unheard-of benefits upon them. That was not the purpose of the Institute, which existed to provide a common ground where the members could meet and discuss questions as to the higher branches of education, etc., which would react on themselves and throughout the country. If the members would not work to this end, the Council could do very little. The aims of the Institute were good, and if members would take advantage of the means which the Institute provided for discussing questions which affected the welfare of the trade, then there would be a larger realisation of the hopes which they set out to accomplish. All great movements of advancement, if permanent, came from within. In Mr. Crace they had a gentleman who was intimately in touch with the practical side of the decorator's craft, and whose knowledge of all the ramifications of it in connexion with art, both past and present, was intimate and profound, and they hoped that he would long serve in his position of President.

Mr. Crace, in response, said he could endorse what had been said as to the objects of the Institute. The Institute existed for and by the members. There was no man who knew much about a subject who could not learn something from someone else. He had to confess that there was not enough individual initiative amongst the members themselves in dealing with questions which affected them. Subjects for consideration should not be limited to the art and craft of decoration; that art had many aspects—the practical, the artistic, and the intellectual, while there were the side issues of chemistry and materials.

The Chairman then proposed "The National Association of Master Painters," consisting of three branches—i.e., for England and Wales, for Scotland, and for Ireland. The Association had grown largely, as the result of the great energy and wholeheartedness of the Secretary who had organised it and infused life into the whole machinery; and also because it was a means of reinforcing the several legitimate interests from a business point of view. The Association was prospering also, because it had taken up technical and art education for the rising generation of house painters. The Association numbered some 2,000 members, and it was full of activity, and likely to continue for a long time.

Mr. Turner, President of the Association for England and Wales, in response, said that the three branches of the Association were doing good work in the matter of the education of the rising generation of painters, and he considered it the duty of master

painters to teach their apprentices and others the art or trade they followed.

Mr. Anderson replied on behalf of the Association for Scotland, and remarked that in his Association they were proposing to establish an exhibition of decorative art in order that the public might see the various adjuncts of the craft and the opportunities there were of making houses more comfortable and more beautiful.

Mr. Sibthorpe, who replied for the Irish Association, said that the reason why the Association had flourished was that it regulated trade relations between masters and their workmen, and as these relations and such a question as apprenticeship were felt to be pressing questions they secured a more ready interest from house painters throughout the country. The higher development of the master was not thought to be such a pressing need, and this, he thought, accounted for the comparative apathy shown in regard to the Institute, but he hoped that in the future the need of the work and influence of the Institute would be more realised.

The Chairman, in proposing the toast of "Architecture and the Arts of Design," said that the Institute had decided to offer medals for the encouragement of colour decoration, and on the reverse side of the medal was the inscription, "Decoration, the handmaid of Architecture," and that really expressed in a few words the real position of decoration. Decorators had a strong obligation to architecture, because the business of the decorator was to learn how to beautify architecture—not by the costly use of colour on some indefinite plan, but by so placing colour that he did the best for the architecture, and no decorator could treat architecture in the right spirit unless he had studied it. The first element of knowing anything about decoration was to know something about architecture. They as decorators were also indebted to other arts of design. Just as the study of architecture was the foundation of decoration, so the production of design in its various artistic forms was the essential of the execution of successful decoration.

Mr. H. F. Hare, who responded for architecture, said that the art of decoration in this country had been most shamefully neglected, and architects felt very much at a loss if they wished to introduce colour into their buildings, and they did not know where to go in order to get suitable suggestions as to the best methods of treating them. Architects themselves had not, as a rule, any definite and clear ideas as to schemes of colour decoration. Whether there was anything in our extraordinary English climate and in the greyness of our skies which militated against any clear conception of proper colour treatment he did not know, but certain it was that in England we had very few examples of successful colour decoration. One of the directions in which the Institute might exercise its useful influence was in the education of the coming generations of decorators, and he gathered that they were instituting prizes, open to the whole country, for the best scheme of decoration of some building or part of a building. That was a very excellent proposal, and he suggested that, if possible, the drawings submitted should be publicly exhibited, for they would be of interest to architects and others. He also suggested that it would be an excellent thing if there should be some sort of condition to the award of the medals as to study and travel. He did not think that any student of decoration could do much good in his studies unless he travelled, for there were very few successful schemes of colour decoration in England. We were gradually coming to a better appreciation of architecture and the fine arts, and the public bodies and private individuals were more or less desirous of getting really good work. The decorator, therefore, should be prepared for more encouragement than he had received in the past. A little while ago he saw an exhibition of drawings and other things in a school of art, where there were some works by painter decorators—some very beautiful examples of graining and marbling, and he was much struck that a school of art should teach such an exploded craft as that of warbling and graining.

Mr. Geo. C. Haité, President of the Society of Designers, in replying for the arts of design, said that the question of design was of the greatest

national importance. It took a great deal of time to get people to realise that architecture was an art, and *the art*. But architecture was never in such a bad condition as design had been from the beginning, and he had tried to raise it from the position it was in, although the success had not been as great as he hoped yet to achieve. Architects were interesting themselves in colour and ornamentation and decoration, and that was a good sign, and also that painters were condescending to know something about decoration. The difficulty about colour decoration was that in this country we rarely ever had two days alike, whereas in Italy and Spain and elsewhere on the Continent we saw colour under the most favourable conditions of light. Moreover, there was the feeling in this country that strong colour would be detrimental to form; but that was a mistake, for strong colour did not destroy form if properly applied. The idea had been to have things in low tone; but what we wanted to get into homes as much as possible was the effect of sunshine, and in a country like England strong schemes of colour were very successful. As to design, the fine arts were the result of commercial prosperity, in which design took a prominent part, and if men were prosperous they bought pictures and decorated their houses. It was to be hoped that the country would see the great importance of design, but he must say that now there seemed to be no encouragement for the designer. There were schools in which good work was done, but was it possible for students to get at these schools that knowledge which came from the association with trades and those who used materials? He thought not, and his solution of the difficulty was that students, when they left the Government and London County Council schools, should go to a school of design, where they would have the tuition of men who had proved themselves to be designers worthy of consideration—men who, without degrading art, supplied the manufacturer and the trade with what was wanted.

The concluding toasts were "Our Guests," proposed by Mr. Pitman, and acknowledged by Mr. Nicholson, and "The Secretary," proposed by the Chairman, and replied to by Mr. Englefeld.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. Evan Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Battersea Borough Council 2,000*l.* for laying out of a recreation ground; Lewisham Borough Council 15,000*l.* for a street improvement; Mile End Old Town Guardians 1,420*l.* for poor law purposes; and St. Pancras Borough Council 12,100*l.* for electric lighting.

Schools.—The following recommendations of the Education Committee were agreed to:—

"That the resolution of March 14, 1905, so far as it relates to the approval of an estimate and the sanctioning of expenditure in respect of the acquisition of a site for the purpose of enlarging a school for mentally defective children, be rescinded.

"That the resolution of March 21, 1905, so far as it relates to the approval of an estimate and the sanctioning of expenditure in respect of the acquisition of a site for the erection of a school for physically defective children, be rescinded.

"That the resolution of July 5, 1904, sanctioning the taking over of certain temporary premises, be no further acted upon.

"That the estimate of expenditure on capital account of 38,000*l.*, submitted by the Finance Committee in respect of the accommodation referred to together with other similar accommodation and accommodation for children attending ordinary public elementary schools on one site (in lieu of several small sites as previously proposed, be approved."

It was also agreed that the Board of Education be informed that the Council will raise no objection to the proposal of the managers of the St. Charles-square R.C. Training College (Kensington, N.), to provide a new public elementary school for about 200 girls and infants to be used as a practising school in connection with the college.

Tramways.—The Highways and Improvements Committee recommended, and it was agreed:—

"(a) That expenditure, on capital account, not exceeding 23,167*l.* 15*s.* 8*d.*, be sanctioned for the

execution of the roadwork and platelaying for the reconstruction and doubling of the existing single line of tramways in Goswell-road, between Clerkenwell-road and Upper Ashby-street, for the underground conduit system of electric traction, and for the widening of the paving works in connection with the widening of Goswell-road, between the points named, being 22,200*l.* for the tramway works, and 10,968*l.* 15*s.* 8*d.* for the street improvement works.

"(b) That the offer of Dick, Kerr, & Co., Ltd., to execute (i) the roadwork and platelaying in connection with the reconstruction and doubling of the existing single line of tramways in Goswell-road, between Clerkenwell-road and Upper Ashby-street, for the underground conduit system of electric traction, upon the same schedule of prices and upon the same general conditions as those contained in the contract entered into with the company in pursuance of the resolution of March 6, 1906, for the reconstruction of the tramways from Bloomsbury to Poplar, and (ii) the paving works in connection with the widening of Goswell-road, between aforesaid points, upon a schedule of prices involving a total cost estimated at 10,968*l.* 15*s.* 8*d.*, be accepted."

The Highways Committee also recommended, and it was agreed:—

"That expenditure, on capital account, not exceeding 35,000*l.*, be sanctioned for the laying of the first section of the Council's electric works."

"(b) That the contract entered into with Messrs. Reed Brothers, as reported on October 10, 1905, for the laying of cable-ducts in certain portions of the Council's tramways, be extended so as to include the laying, at a cost not exceeding 33,000*l.*, of the cable-ducts required for the electric working of the first section of the Council's northern tramways."

Bexley Asylum—Repair of Fireproof Ceilings.—The Asylums Committee reported as follows:—

"We have to report that certain fireproof ceilings on the female side at this asylum have been pronounced by the architect of the Council to be dangerous, and that the necessary repairs, estimated to cost 2,750*l.*, have been put in hand. Bexley Asylum was designed and its erection supervised by Mr. G. T. Hine, architect, 35, Parliament-street, S.W. The contractor for the erection of the super-ceiling work on the female side was, by permission, sublet to Messrs. Wilkinson & Co. The certificate of completion of the whole building was issued in July, 1902. The ceiling concerned are those of blocks A, B, and C, which were the first blocks occupied. In February, 1900, a deflection of about 2 in. in the fireproof ceiling of 42 dormitory was first reported. This deflection has gradually increased, and we have had reports from time to time from the architect, and sub-contractor. Eventually we thought it advisable to obtain the opinion of the architect of the Council, with the result we have reported. There is considerable divergence of opinion between the architect and the contractor and sub-contractor as to the cause of the deflection, and as to the remedy to be applied."

Aldwych Site.—Mr. Austruther asked the Chairman of the Improvements Committee whether any action had yet been taken on the minute of the Council passed that day week as to the letting of the central portion of the site at Aldwych which would preclude the further deliberate consideration of the prior offer of M. Gérard to rent the site? Lord Monkswell asked whether it was a fact that on December 12 last M. Gérard's syndicate requested an option to take over the site at 55,000*l.* a year; that on February 13 the same syndicate made a formal offer; that on February 16 the Council's valuer wrote that the Committee was prepared to entertain the proposal; whether, on March 14, Mr. Young, the valuer, wrote to the syndicate to the effect that the Committee had decided to accept an offer from a rival syndicate, and whether the syndicate did not then offer a further 1,500*l.* a year, and if so, why the rival offer was accepted and the amended offer not considered?

Mr. Hubbard, the Chairman of the Committee, in reply, said he was prepared with a complete answer to the several questions, but, in view of the fact that the letters had been addressed to the Chairman and members of the Council respecting the matter, he would consider it in the interest of the Council that a full report should be brought up next week. Nothing had been done in the matter since last week, further than to instruct the solicitor to prepare an agreement signed until the Committee had had an opportunity of further considering the subject. The matter accordingly stood adjourned. The Council adjourned soon after seven o'clock.

PROPOSED NEW THEATRE, SUNDERLAND.—It is proposed to erect a new theatre on a site in Crowtree-road, Sunderland. The plans for the new building have been prepared by Mr. William Hope, architect, Newcastle, and they have been approved by the Sunderland Corporation.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Conversion of Buildings.

St. George, Hanover-square.—The conversion of Nos. 6 and 7, George-street, Hanover-square, into a domestic building (Mr. C. H. Worley for Mr. T. Stevens).—Refusal.

Lines of Frontage and Projections.

Lewisham.—Buildings on the northern side of Stanstead-road and western side of Ravensbourne-road, Lewisham (Messrs. Norfolk & Prior for Mr. J. Watt).—Consent.

Finchley, Central.—That the application of Mr. T. H. Watson for an extension of the periods within which the erection of buildings at Nos. 2 to 5, White Lion-street, Pentonville, was required to be commenced be granted.—Consent.

Kennington.—That the application of Mr. F. A. Powell for an extension of the periods within which the erection of an institute building for the Beaufoy Charity, on the site of Nos. 65 to 71 (inclusive), and of eight houses on the site of Nos. 56 to 64 (inclusive), Princes-road, Kennington, was required to be commenced and completed, be granted.—Consent.

Lewisham.—That the application of Mr. W. Stephens for an extension of the periods within which the erection of a building on a site abutting upon the east side of High-street and north side of Limes-grove, Lewisham was required to be commenced, and completed, be granted.—Consent.

Marylebone, West.—A projecting oriel window in front of No. 16, James-street, St. Marylebone (Messrs. Forsyth & Maule for Mr. H. Friedberg).—Consent.

Whitechapel.—Additions in front of Nos. 49, 51, 53, and 55, Mansell-street, Whitechapel (Messrs. Selby & Kilsingbury for Mr. S. Harris).—Consent.

Clapham.—That the Council do consent to the application of Mr. E. S. Barr on behalf of Messrs. Hillier & Parker, for an extension of the periods within which the erection of a two-story building on land at the rear of Nos. 20, 22, 24, and 26, St. John's road, Battersea, was required to be commenced, and for a deviation from the plan approved, so far as relates to the erection of an addition on the eastern side of the building.—Consent.

Brixton.—An iron structure upon the forecourt of No. 205, Clapham-road, Brixton (Mr. J. H. Doughty).—Consent.

St. Pancras, South.—Construction of underground cellarage in the forecourt of No. 13, Euston-road, St. Pancras, and to a deviation from the plan approved for the construction of underground cellarage in the forecourts of Nos. 15, 17, 19, and 21, Euston-road, St. Pancras, so far as relates to the omission of the steps in front of No. 15, Euston-road (Mr. W. Floekhart for Dr. Pavy).—Consent.

St. Pancras, West.—A conservatory over the porch in front of No. 3, Albert-road, Regent's-park (Mr. E. C. Macpherson for Mrs. Desmond).—Consent.

Wandsworth.—A horticultural show-house on the western side of Trinity-road, Wandsworth, to abut upon Magdalen-road (Mr. A. Southam for Mr. R. Neal).—Consent.

Wandsworth.—(a) That the resolution of January 23, consenting to the erection and retention of houses on the east side of Garratt-lane and west side of Trannere-road, Wandsworth, be rescinded. (b) Erection of three houses, and the retention of nine houses, on the east side of Garratt-lane, Wandsworth, between Quinton-street and Littleton-street, and the retention of a house on the west side of Trannere-road, abutting upon Quinton-street (Messrs. Holloway Brothers).—Consent.

Isleworth.—Bay windows in front of Nos. 9 and 11, Clough-street, Egham (Mr. J. J. Bassett for Mr. A. Cameron Corbett).—Consent.

Chelsea.—An addition at the western end of Christ Church, Christ Church-street, Chelsea (for the Rev. J. P. Thompson).—Consent.

Clapham.—Projecting balconies at the southern end of the ward block of the Bellingbrooke Hospital, Wandsworth Common, to abut upon Bellevalle-road (Messrs. Young & Hall for the Council of the Bellingbrooke Hospital).—Refusal.

Width of Way.

Southwark, West.—A building on the southern side of Webber-street, Southwark, to abut upon Barron's-place, and to exceed in height the width of that street (Mr. A. E. Chasemore for Mr. Sumption).—Consent.

Whitechapel.—An addition to the London Hospital, Whitechapel-road, Whitechapel, at less than the prescribed distance from the centre of the roadway of East Mount-street (Mr. R. Plunbe for the Committee of the London Hospital).—Consent.

Projections and Construction.

Southwark, West.—Two external iron gangways

over the roadway of Pump-court to connect Nos. 114 to 118, with Nos. 120 to 128, Union-street, Southwark, at the second floor and roof levels, and two iron balconies and two iron ladders at the rear of Nos. 114 to 118, Union-street (Mr. R. J. Lovell for the General Electric Company, Ltd.)—Consent.

Line of Frontage and Space at Rear.

Chelsea.—An addition at the rear of No. 57, Cadogan-gardens, Chelsea, to abut on Droycott place (Mr. G. L. Wilson for Mr. P. Holland).—Consent.

Hammersmith.—Retention of a greenhouse in front of No. 329, Kings-street, Hammersmith (Mr. L. G. Brinby for Mr. T. Grant).—Consent.

Deviation From Approved Plan.

Strand.—Deviation from the plans approved in connexion with the rebuilding of No. 32, Rupert-street, and No. 6, Upper Rupert-street, St. James, so far as relates to an alteration in the position of an air duct (Mr. R. H. Kerr).—Consent.

Buildings for the Supply of Electricity.

Hammersmith.—That the Council do approve the drawings submitted by the Kensington and Notting Hill Electric Lighting Companies, showing the details of the construction of the bunkers and other steelwork in connexion with the proposed erection of a generating-station on a site eastward of the generating station of the Central London Railway Company, and approached from Wood-lane, Hammersmith.—Consent.

Southwark, West.—Additions to the western power house of the Summer-street and Bankside generating station, Southwark (City of London Electric Lighting Co., Ltd.)—Consent.

Formation of Streets.

Lewisham.—That an order be issued to Mr. A. W. Osborn, sanctioning the formation or laying out of a new street for carriage traffic on the Summerfield estate, Catford, to lead from Ravensbourne-park-road to Ravensbourne-park, and in connexion therewith the widening of portions of Ravensbourne-park-road and Ravensbourne-park (for Mr. J. Watt).—Consent.

Hampstead.—A deviation from the plans approved for the formation of Glenilla-street and Howitt-road (late Howitt-street), Hampstead, so far as relates to an alteration in portions of the boundaries of the said streets (Mr. C. J. Bentley for Mr. J. C. Hill).—Consent.

Space at Rear and Alteration of Building.

Paddington, South.—An addition on the half landing between the first and second floors at the rear of No. 43, Cambridge-street, Hyde-park-square (Messrs. Thurgate & Cope for Mr. J. Asher).—Refused.

Alteration of Building.

Paddington, North.—The uniting of No. 31, Westbourne-terrace with No. 19, Craven-road, Paddington, by an opening at the first floor level (Messrs. Macey & Sons, Ltd.).—Consent.

The recommendation marked † is contrary to the views of the local authorities.

Architectural Societies.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At a meeting of this Society on Thursday, the 22nd inst., Mr. W. H. White read a paper on "Modern Town-house Architecture." Mr. G. B. Balmer in the chair. The lecturer said:—"I had occasion some time ago to look up a great many illustrations of old and modern town-houses, and I found it very interesting to trace the development of the town-house, both externally and internally; but what particularly struck me in studying the exterior designs of most modern town-houses was the utter absence of 'consistency' as to style. As compared with old work, I could not help noticing the 'restlessness' of our modern work; indeed, it seems to me to be the keynote of modern architecture, as it is of our everyday life. I shall show you a series of views which I hope you will find interesting, and which will serve to give point to my remarks—at the same time please remember that most of the slides represent 'picked' work of its kind. The town-house may not, I fear, prove a very interesting subject to your members, as I do not suppose you have to meet quite the same conditions here in Leeds that we have in London, but I thought that it might be of some interest to you to know how such problems are dealt with by your brother professionals in London. With regard to the planning, there are a few characteristics I should like to mention, the chief of which is the relation of the hall and staircase to the rest of the plan; this point settles to a great extent the whole scheme

of the house. Assuming, for example, the case of an ordinary good-class town-house, with a frontage of from 22 ft. to 30 ft., and (according to position) of a rental value from 300l. to 500l. per annum, the accommodation required would be dining room, library, and morning-room upon the ground floor, drawing-rooms and boudoir upon the first floor, and some eight or ten bed and dressing rooms, two or three bath-rooms, a well arranged basement with all the necessary offices, service lifts, a good hall and staircase, and, if possible, a back staircase, and to be quite up to date, an electric passenger lift. The first point to be considered is the position of the hall and staircase. If 'double' drawing-rooms are required on the first floor the staircase must be at the side of the middle room. There is no doubt that what has been termed the half-sitting-room adds greatly to the attractions of a house if sufficient space can be afforded. Wherever possible, a second or back staircase is very desirable, and in houses of more than three square stories a passenger lift adds greatly to the attractiveness of the house; it should, however, be arranged so that it can be used without a special attendant. The position of the kitchen must be carefully considered in relation to the staircases and service lifts. As to the upper floors, in addition to good bedrooms, dressing-rooms will be required on the second and third floors; these should be so planned that they can be used as additional bedrooms, and there should be a bath-room and water-closet upon each bedroom floor. It should not be forgotten that the basement is not the least important part of the house, for upon its satisfactory arrangement depends, to a great extent, its economical working and the comfort of its inmates. No part of a house will pay better for able planning, as if badly arranged the comfort of the occupiers must certainly be lessened, and an abnormal staff of servants required. It is obvious that the planning and fitting up of a good class town-house is a more complex problem than formerly, and requires expert knowledge on the part of the architect." The lecture was illustrated by lantern slides.

The following officers were elected for the ensuing session:—President—Mr. H. S. Chorley, M.A. (A.); Vice-Presidents—Messrs. P. Robinson (F.) and S. D. Kitson, M.A.; Hon. Treasurer—Mr. G. F. Bowman; Hon. Librarian—Mr. F. Musto (A.); Hon. Secretary—Mr. A. E. Kirk (A.); Members of Council—Messrs. W. G. Smithson (A.), F. E. P. Edwards (F.), C. B. Howdill (A.), H. A. Chapman (A.), A. R. Hill (A.), and G. E. Reason (Assoc. Member).

SHEFFIELD SOCIETY OF ARCHITECTS.—A meeting of the Sheffield Society of Architects and Surveyors was held on the 22nd inst., when Mr. H. L. Paterson delivered a lecture on "English Renaissance, 1750 to 1800." The lecturer said that this period was considered by some to be the closing one of the Renaissance, and by others the commencement of strictly modern architecture. It has been vigorously denounced by the leaders of the Gothic revival last century, and it was almost universally held to be the period of the Renaissance least worthy of study. There was, however, no doubt about the high estimation in which it was held at the time; architects and public were agreed in regarding it as the greatest architectural age since the days of Imperial Rome. The principles of that architecture as interpreted by Palladio and others were considered binding for all time, and no further development was desirable. Mediæval architecture was almost ignored, although Chambers expressed great admiration for it, without, however, taking any steps to revive it. Chambers was the most cultured exponent of the style and the most worthy of study, but his violent prejudice against Greek detracted somewhat from the value of his counsels. The latter half of the XVIIIth century was a period of great national prosperity, in spite of the wars and revolutions that involved nearly the whole of Europe. Many of our finest mansions were erected or remodelled, and much of the work was in the hands of a small number of architects. The order was essentially the basis of design in this period, and dominated not only the elevations but the plans. To obtain a dignified external order people were willing to sacrifice internal convenience. The type of house which had already been developed, and

of which Castle Howard, Fonthill, and others were examples, gave place towards the end of the century to the self-contained plan of the brothers Adam and others. Slides were shown illustrative of the different types. The treatment of interiors was next touched upon, and the introduction of the Adam style of decoration illustrated. One of the main features of this period was the great attention paid to street design, notably in the West-end of London, in Edinburgh, and in Bath. In Bath the development of the city, which had been largely in the hands of Wood, senr., was continued by his son. The works of Wood, junr., were then illustrated, and the architecture of the new town of Edinburgh, and it was stated that both in the planning of the city as well as in the style of architecture, Edinburgh and Bath had much in common. The treatment of gardens was referred to, and it was stated that the landscape garden had almost entirely taken the place of the old formal garden, and that a great feature was made of the casinos, temples, and ornamental bridges. At the close of the century the Greek influence ousted in popularity the XVIIIth century style. The style of Chambers, however, continued to be used throughout the whole of the Greek revival, and even through the Gothic revival down to the present time. The lecturer concluded by claiming for the latter Renaissance style generally an adaptability to almost all classes of buildings, and pointed out that whatever was the fashion in architecture this style never lost its charm, if reasonably handled, and that it was the architecture of the greater part of the civilised world. Slides were lent by Mr. Mowbray A. Green, by the London Architectural Association, and Mr. J. R. Wigfull. At the conclusion of the lecture a vote of thanks was accorded to Mr. Paterson on the proposition of Mr. A. E. Turnell, seconded by Mr. C. Ridley, and supported by Messrs. F. M. Gibbs, T. W. Green, J. R. Wigfull, and Mr. J. B. Mitchell-Withers (the Chairman).

Archæological Societies.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held on Wednesday, March 21, the Hon. Treasurer, Mr. R. H. Forster, in the chair, when the Rev. Henry Cart, who was appointed by the Council to represent the Association at the recent International Archæological Congress at Athens, gave a very interesting account of the Congress. The success of the Congress was attributable in a large degree to the great interest taken in its proceedings by the King, Queen, and Royal Family of Greece, most of whom attended the daily meetings and readings of papers, while the Crown Prince made an ideal chairman. A large number of photographic views of events and scenes of the meetings were exhibited by lantern light, and many charmingly artistic ones, taken by Mr. Cart himself, of places in the interior and other parts of Greece which he visited after the Congress, particularly the celebrated Vale of Tempe, Corinth, Salonica, etc., were greatly admired. The Rev. W. S. Lach-Szirma, Mr. Emanuel Green, Mr. Gould, the Chairman, and others took part in the discussion which followed. In answer to an inquiry, Mr. Cart said he was glad to be able to assure the meeting that at the Congress it was decided that the talked-of restoration of the Parthenon should not be attempted.

Competitions.

BUILDINGS FOR THE INSTITUTION OF ENGINEERS AND SHIPBUILDERS, GLASGOW.—Forty-three competitive designs have been received by the Institution of Engineers and Shipbuilders in Scotland in connexion with the erection of their new buildings at the corner of Elmbank-street and Elmbank-crescent, Glasgow. The successful design is by Mr. J. B. Wilson, architect, 92, Bath-street, Glasgow.

ST. PANCRAS CENTRAL LIBRARY.—The Libraries Committee of St. Pancras Borough Council reported on Tuesday having considered and approved of the conditions

prepared by the assessor for the guidance of the competing architects for the Central Public Library.

Books.

The Encyclopedia of Practical Engineering and Allied Trades. Edited by JOSEPH G. HORNER, A.M.I.Mech.E. London: Virtue & Co.; Vols. 1 and 2.

There is certainly an opening for a work of the kind foreshadowed by the first two volumes of this encyclopedia, which is announced as intended to cover "the entire practice of civil and mechanical engineering." No mention is made of electrical engineering in the title-page or preface, but examination of the text shows that this important branch of engineering has received a fair share of attention. Bearing in mind the numerous subdivisions of modern engineering practice and the different educational requirements of those connected with the same subdivisions of the subject, it is scarcely to be anticipated that anything like exhaustive treatment will be found in the present publication. Judging by the two volumes we have received, the editor has decided to give prominence to the needs of those who follow engineering as a trade, in contradistinction to others who make it a profession. Mechanical engineering in its practical aspect is undoubtedly the most prominent feature of the new encyclopedia, although, so far as the letters A and B have been treated, civil and electrical engineering, metallurgy, physical science, engineering chemistry, and mathematics are by no means neglected. Still, the true value of the work is to be found in the articles dealing with the strictly practical side of mechanical engineering. These contributions have evidently been written by men thoroughly familiar with the department of work discussed, and one excellent characteristic is that mechanics and others will be able to glean useful information relative to operations in which they are not actually engaged and of which, owing to modern methods of specialisation, they have few opportunities of gaining knowledge and familiarity. Thus the pattern-maker and the iron-moulder, the smith and the turner, will each be enabled to learn something of the work conducted in departments other than their own, and draughtsmen will be able to obtain some hints respecting workshop practice. In those subjects which are beyond the boundaries of mechanical engineering the treatment is less detailed, and in one or two articles may be described as popular rather than technical. So far as publication has proceeded, a few of the subjects appear to be inadequately discussed, but we understand that the articles will be supplemented by others in the remaining volumes, so that by the aid of cross references the reader may be able to fill up the gaps now apparent. Taken as a whole, the two volumes contain much useful and well-selected information, carefully arranged and concisely expressed. The illustrations are exceptionally good, most of them having been reproduced from drawings specially prepared for the purpose of the work.

Modern Milling Machines, their Design, Construction, and Working. By JOSEPH G. HORNER, A.M.I.Mech.E. With 269 illustrations. London: Crosby Lockwood & Son, 1906.

Mr. HORNER gives in this book detailed consideration to a single department of workshop practice, but one which has developed in a remarkable manner during the past twenty years. At one time looked upon with disfavour by some engineers, the milling machine is now extensively employed for work of almost every kind. Its general use practically dates from the introduction of emery wheels, without which it would be impossible to grind the milling cutters. Although milling machines are particularly suitable for specialised methods of manufacture, it would be a mistake to suppose that they are not equally useful in shops where work of general character is undertaken. Consequently the subject-matter of this book has more extended application than might be assumed after mere inspection of the title. Mr. Horner has treated the subject in an exhaustive manner, and the illustrations are admirable, consisting largely of reproductions from actual drawings.

His treatise is not one for people who merely desire general knowledge, but forms a special study, appealing to practical men and engineering students. The brevity of this notice must not be attributed to lack of appreciation for a most excellent book, but to the demands on our space by matters more directly associated with architectural and constructional practice.

Martin's Up-to-date Tables of Imperial, Metric, Indian, and Colonial Weights and Measures. By ALFRED J. MARTIN, F.S.I. London: T. Fisher Unwin; 1904.

In view of the controversy which has arisen with regard to the proposed adoption of the metric system in the United Kingdom, this book will be of service to those who are interested in the subject, as well as to others having occasion to employ tables of various kinds that are not published in all works of reference. Mr. Martin's work is only incidentally a table-book, for in Part I. the author has concerned himself chiefly with the task of showing the inconsistencies of the British system, and of formulating proposals for the decimalisation of British units. Briefly stated, his views are that by bringing our system of weights and measures into line with those of other countries we shall derive direct benefit, besides contributing in a most material manner to the consummation of that desideratum—a universal medium of arithmetical expression in commerce. Part II. contains a collection of miscellaneous tables and data, and the volume is provided with a very complete index, which enables the user to pick out any required particulars from the argumentative portion of the manual.

BOOKS RECEIVED.

SHIPPING MARKS ON TIMBER. 1906 Edition. (W. Rider & Son. 7s. 6d.)
LAND AND HOUSE PROPERTY YEAR BOOK FOR 1905. (*Estates Gazette Office.* 7s. 6d.)
THE MODERN HOME. By W. Bidlake, Halsey Ricardo, and John Cash. Edited by W. Shaw Sparrow. (Hodder & Stoughton. Editions at 5s., 7s. 6d., and 21s.)

Trade Catalogues.

We have received from the General Electric Company, of Queen Victoria-street, a leaflet announcing that the price of their well-known "Geeko" ignition accumulators has been considerably reduced. These accumulators can be used in motor-cars and launches, and for stationary engines. They have also sent us a leaflet describing a novel direct working telephone, an insulated hand-lamp, which is stated to be thoroughly trustworthy, a novel form of cover for a Nernst lamp, etc. The bracket-holder for an electric lamp, or the "bracket fitter," as it is called in this leaflet, is distinctly novel. Any bracket to which it may be attached can be easily taken down at once for cleaning or other purposes.

Messrs. Waygood & Co. send us two new catalogues—one an eight-page list relating to their specialities in general, but giving prominence to electric lifts for motor-car factories and garages, while the other is a circular containing particulars of the latest novelty represented by the introduction of lifts into ocean steamships. Considering that vessels such as the great liners virtually reproduce the essential features of a large hotel, it is only natural that they should be furnished with similar conveniences. The popularity of the lift installed by Messrs. Waygood & Co. on the *America* may be gauged by the fact that during the first voyage of this vessel the lift made 2,154 journeys and carried 4,469 passengers.

Messrs. A. Ransome & Co., of Newark, send us their catalogue of sawmill accessories, such as tend to increase the efficiency and profit-earning capacity of the machinery to which they are applied. Many of the auxiliaries described and illustrated in this book are not infrequently omitted from specifications of sawmill plant, and are generally ordered from time to time as suggested by the practical experience of the manager. This is evidently not the best way of furnishing a mill, and the publication of the present catalogue should assist prospective sawmill proprietors to obtain

thoroughly efficient plant at the outset, and be of use to those who desire to complete their equipment by the addition of the most modern appliances. The catalogue also includes particulars of wood-trimming machines, glue-heaters, saw guides, anti-guards, and various apparatus useful in the wood-working industry.

Fifty Years Ago.

FROM THE *Builder* OF MARCH 29, 1856.

ALUMINIUM AND THE ELECTRIC LIGHT.

The new metal which excited so much attention lately as a hopeful cheap substitute for silver, has by no means fulfilled the public expectation as yet, mainly from the cost of its production. Still, however, the endeavour to economise the means of its evolution from clay-prone or alumina is being persisted in, and the desire to produce it at a moderate cost has already contributed much towards the cheapening of the previous processes, whereby other metalloidal substances, particularly sodium, required to be evolved from their alkaline or earthy oxides. A new step has just been made at Lyons, by Messrs. Lacassagne & Sheers, who have invented a galvanic battery, in which the usual fluids are replaced by anhydrous salts in a state of igneous fusion, and by means of which alumina is reduced into aluminium, while the electric light is evolved in the course of the process. The inventors are also trying their hand at the regulation or steadying of the electric light. M. St. Clair Deville, we observe, has been assisting at a lecture on the subject of aluminium at the London Royal Institution.

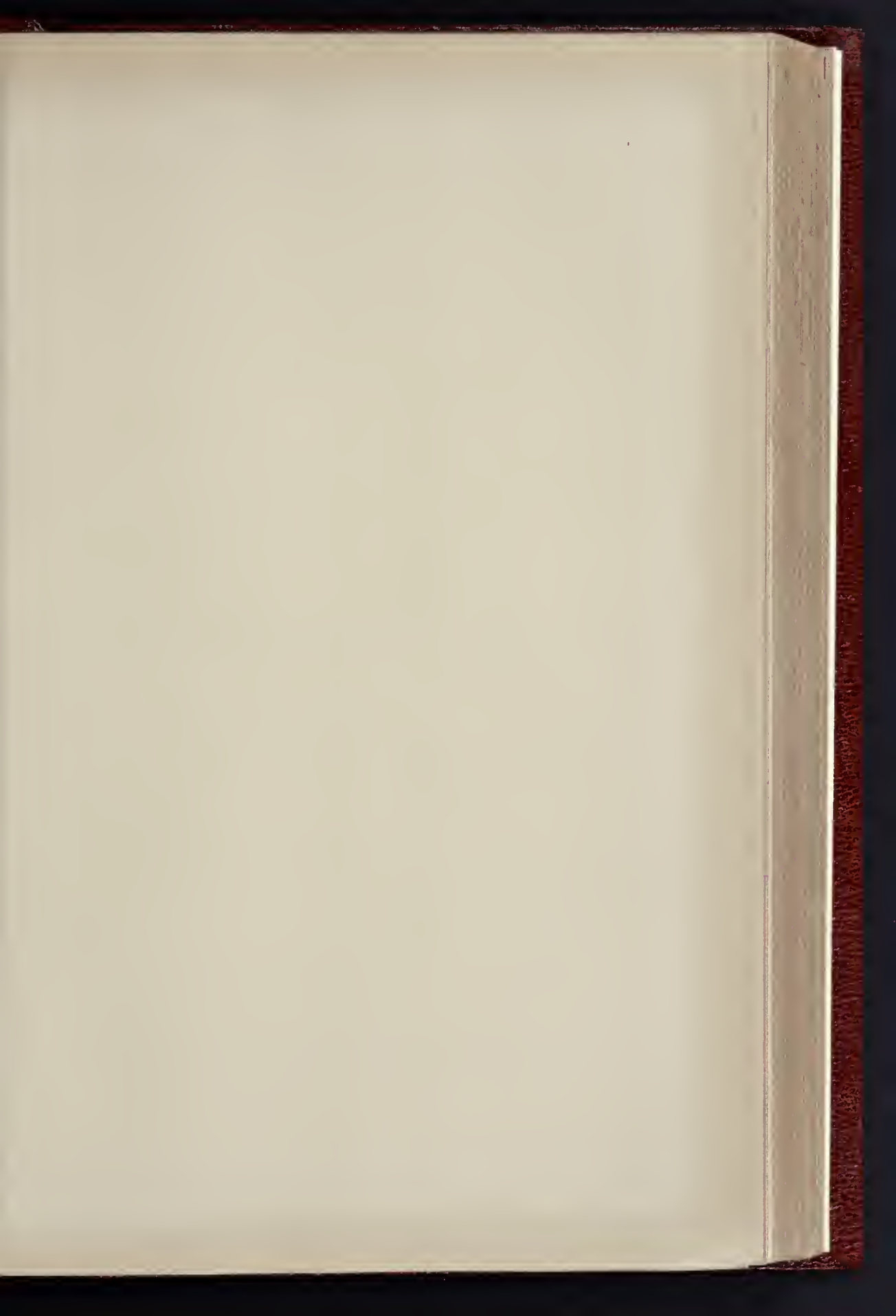
Illustrations.

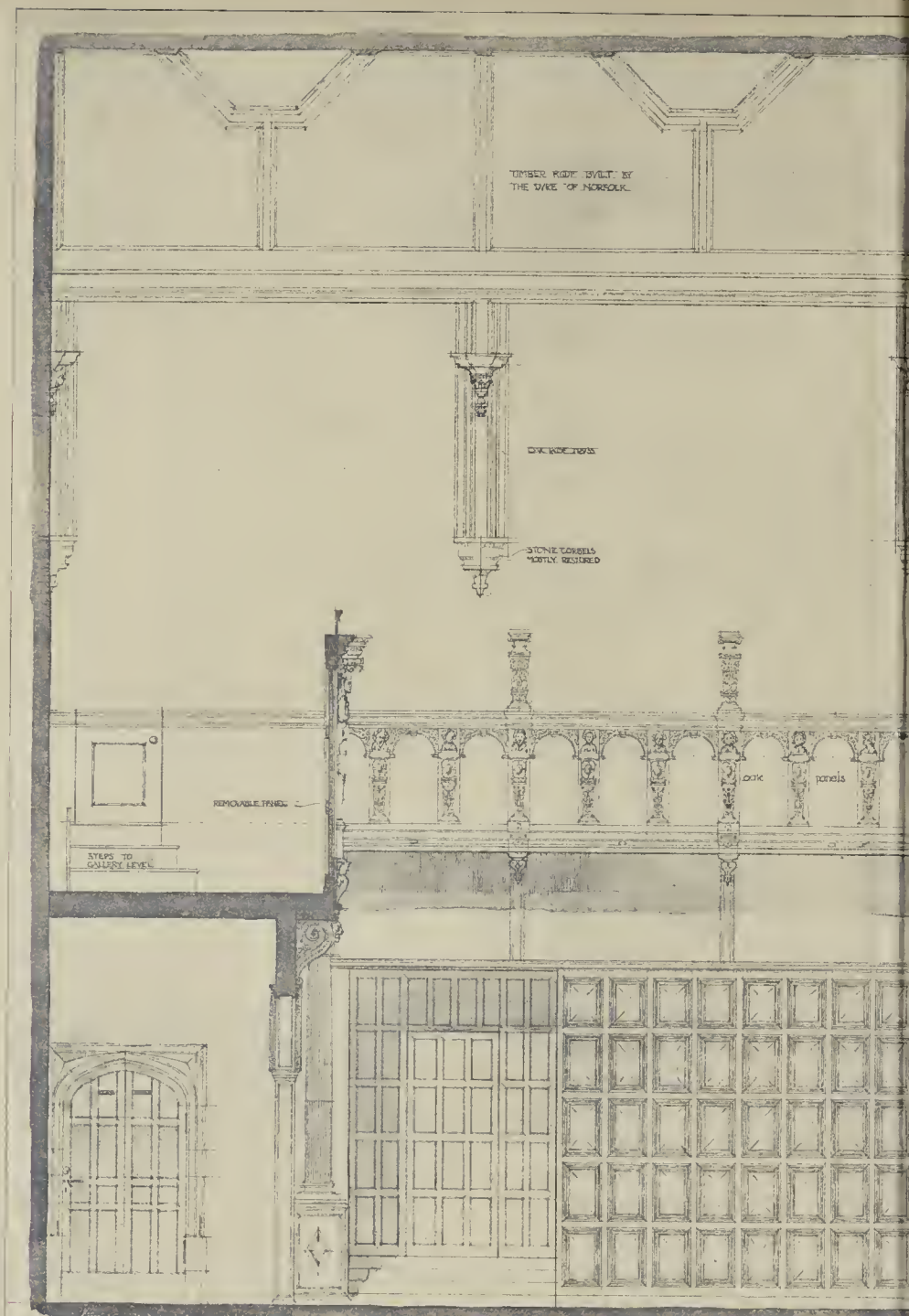
THE CHARTERHOUSE HALL.

THIS old "Guesten" Hall of the Charterhouse seems to have been built about the year 1500, and, although of so late a period of Gothic, the mouldings to the window-jamb are of considerable beauty, the oak-work, however, excepting a few remaining portions of the old monastic panelling, was added by the Duke of Norfolk, who, long after its disuse as a monastic building, made the Charterhouse his London residence between 1555 and 1571; he entirely transformed the hall, raising the walls and adding the top tier of lights and the rather interesting roof, which is of hammer-beam construction, with a plaster core down the centre, divided into panels with oak ribs. Very beautifully-carved pendants hang from the trusses, which spring from moulded stone corbels projecting from the walls.

The screen, which is dated 1571, was also built by the Duke of Norfolk, and is of Italian character, although probably of English workmanship; it originally extended the entire width of the hall, the narrow side gallery being constructed at a somewhat later date for the purpose of connecting up the great staircase with the westernmost chambers of the building. This addition involved the removal of the end Caryatid panel, and shifting the console above one of the capitals, so that the next Caryatid which it carries should stand clear of the gallery, an alteration which sadly affects the appearance of the whole; the upper panels of the screen are removable, so that the space behind could be used as a minstrel's gallery as well as a passage. The carving on the whole, is of good design and workmanship, notably the fine lion-headed consoles over the archways, the frieze above with its interlacing strapwork and delicately-designed cartouches; the interesting capitals are also well done, and worth notice. The Caryatides are of unusual character, and each is represented carrying a huge bunch of fruit upon its head.

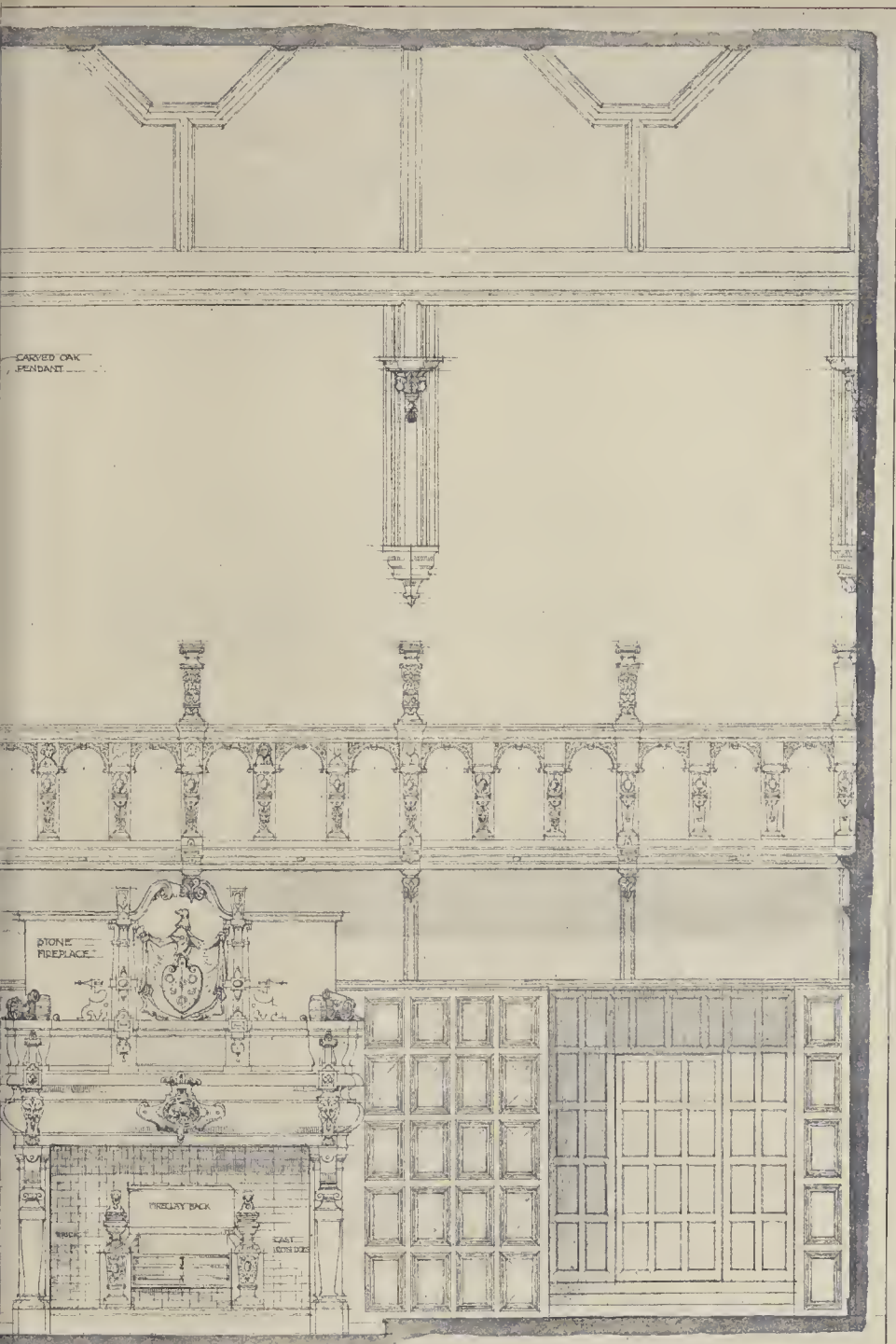
The screen, being placed at the western end of the hall, forms the approach to the monastic buteries and kitchens, while at the opposite end is the very fine door which originally led to the prior's lodgings. The floor is modern, but still retains the raised dais at the eastern end; there is also the usual bay window found in halls of this period. The panelling, which is delicately moulded, is of the same date as the screen,





CHARTERH

Scale

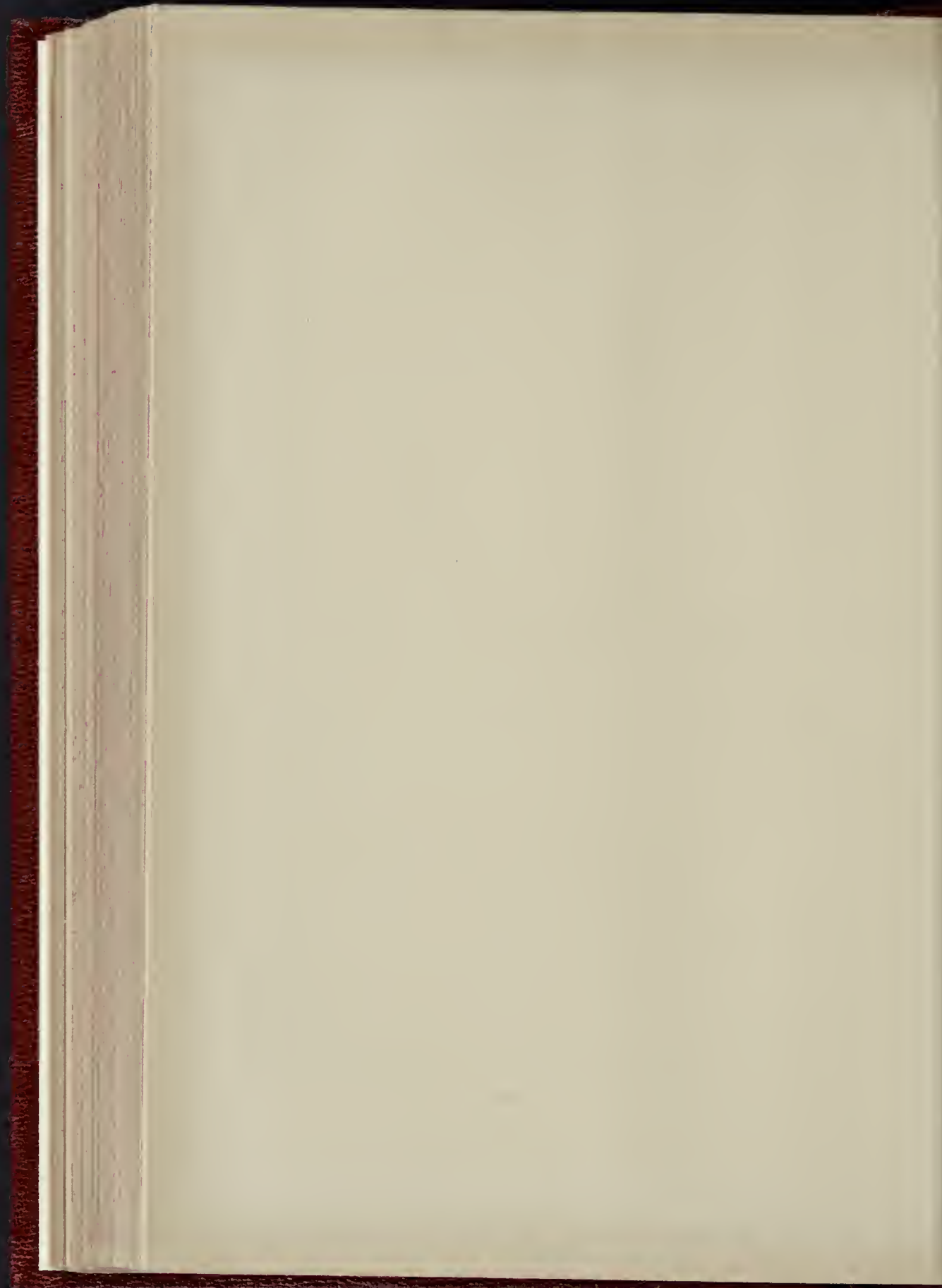


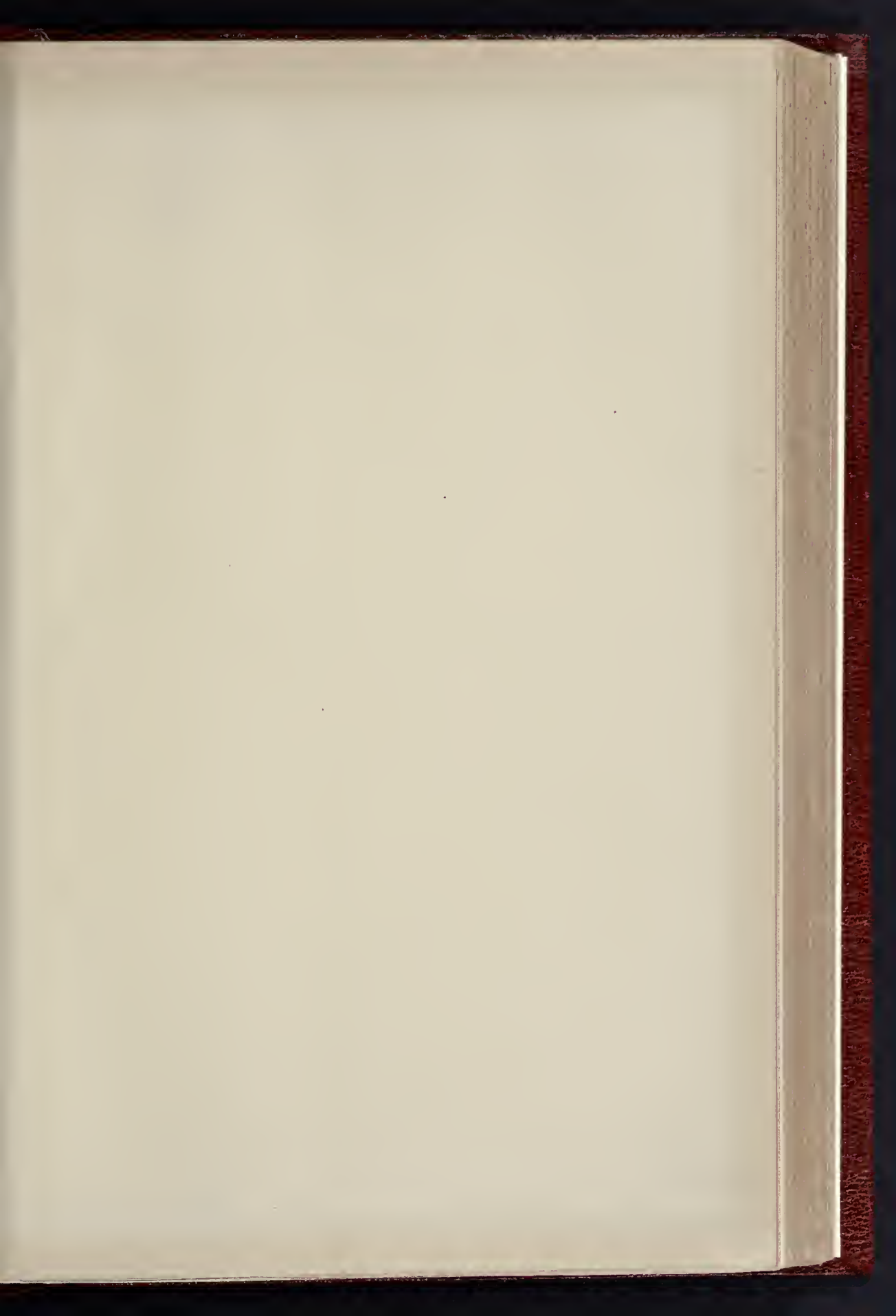
W. & A. LONDON.

Section at B.B.

Scale of feet.

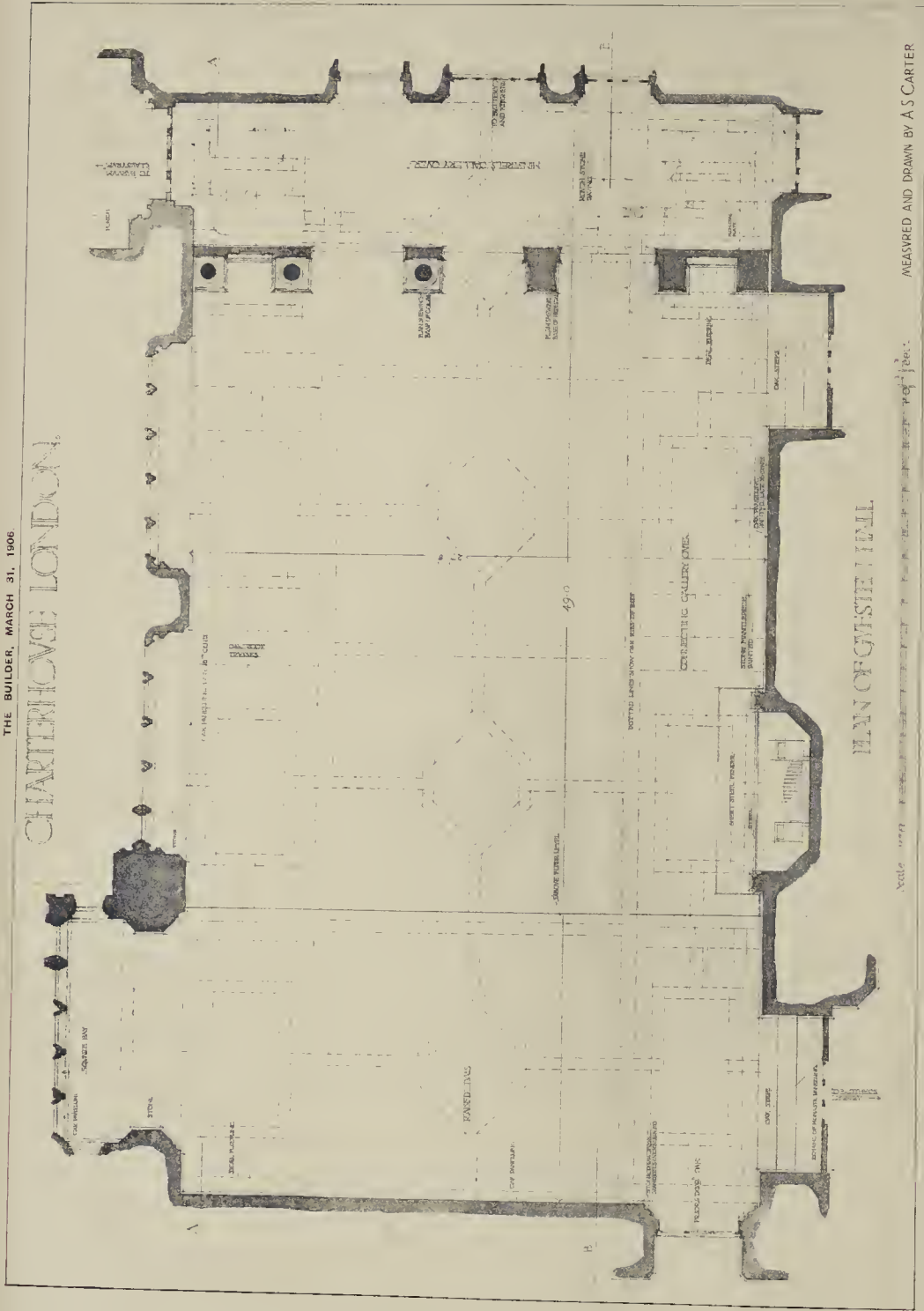
MEASURED AND DRAWN BY A. S. CARTER





THE BUILDER, MARCH 31, 1906

CHARTERHOUSE LONDON



PLAN OF CHARTERHOUSE

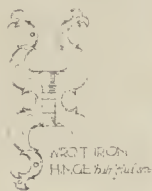
CHARTERHOUSE LONDON, E.C.

details

Scale 1/4" = 1'-0"

SECTION OF MOWINGS
TO MINSTREL GALLERY

SECTION THRO
STONE CORBEL



SECTION THRO
FIREPLACE

SECTION THRO
ROOF TRUSS

SECTION THRO
JAMB OF WINDOW
TO MINSTREL GALLERY

SECTION OF MOWING
TO MOVABLE PANELS ON
MINSTREL GALLERY

SECTION THRO
STONE JAMB TO
PRIORS DOOR

SECTION THRO FRONT
OF CONNECTING GALLERY

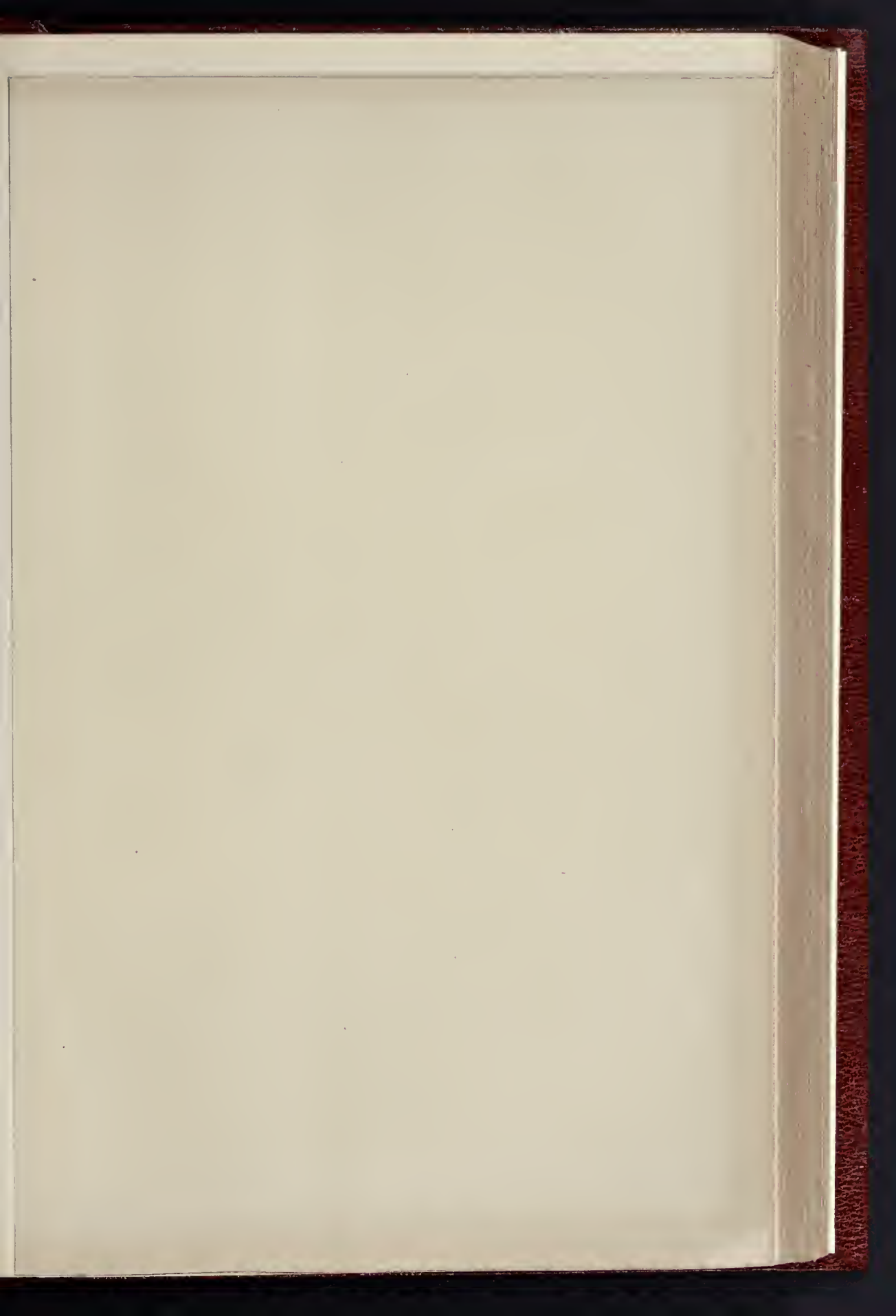
SKETCH OF CASIMENT
FASTENERS

INSIDE

SECTION THRO JAMB
OF LARGE WINDOWS

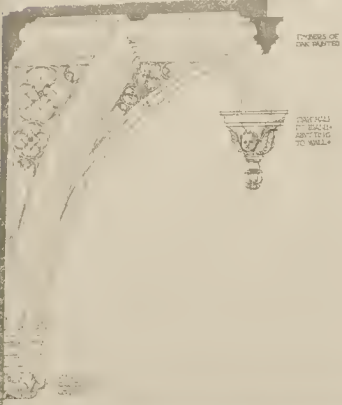
CORNICE TO
PANELLING

MEASURED AND DRAWN
BY A. S. CARTER



OAK SCREEN WALL OF

The screen wall is a wall of oak, with a decorative archway at the top. The wall is composed of oak panels, with a decorative archway at the top. The wall is composed of oak panels, with a decorative archway at the top. The wall is composed of oak panels, with a decorative archway at the top.





WALL PATTERN
AND PAINT

DOOR CASE
AND PANEL

WALL
PATTERN
AND PAINT

1/4\"



and extends all round the walls to a height of 13 ft. The connecting gallery before mentioned is elaborately carved with quaint figures and has a row of standards rising above the rail, probably used for fixing rushlights and torches upon to give light to the hall below. The stone fireplace under was also added by the Duke. It is of fine proportions, with many subtle and vigorous mouldings, and forms a very pleasing example of the open-fire hearth of the period.

On entering the hall one is struck with its size and lofty proportions, it being 49 ft. by 27 ft. 8 in. by no less than 55 ft. to its highest point; a goodly height, indeed, and one notices the effect of the general classic influence of the time upon the dying traditions of the medieval builders. The Charterhouse has played no mean part in the history of our country, and it is interesting to note that it was here that Thackeray laid the last scene in Colonel Newcome's life.

ALEX. S. CARTER.

Correspondence.

SEA SAND FOR MORTAR.

Sir,—Through the medium of your paper could any authority enlighten me as to why there is a great tendency of late to utilise sea sand in preference to good pit sand, in connexion with building and sewer works.

In the past the outcry has been concentrated against the presence of salt in sea sand.

Has this difficulty been overcome by process, otherwise one fails to understand such a course, unless with a view to economy. ENQUIRER.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XII. LABOUR-SAVING CONSTANTS.

ALCULATIONS of various kinds frequently occurring in practice can be wonderfully simplified in many cases by the employment of constants, especially if these are prepared in such a manner that one multiplication or division of a given quantity will furnish the required result.

To show the desirability of constants which represent in concentrated form the result of several preliminary arithmetical processes, let us suppose that it is required to find the weight of a hollow cast-iron cylindrical column 20 ft. long by 12 in. external diameter, the metal being $\frac{3}{4}$ in. thick.

Clearly the first thing is to find the volume of metal in cubic inches or cubic feet, and the second to multiply the value into the weight of metal per cubic inch or cubic foot.

(1.) The volume may be found by calculating the areas of two circles, one corresponding with the outside diameter and another with the inside diameter of the column, multiplying the difference of these values—which represents the net area of metal—into the length of the column in inches.

Thus the area of a circle 12 in. diameter
 $= 12^2 \frac{\pi}{4}$
 $= 144 \times 0.7854$
 $= 113.1$ sq. in.

Similarly, the area of a circle 12—(2 × 0.75)
 $= 10.5$ in. diameter
 $= 10.5^2 \frac{\pi}{4}$
 $= 110.25 \times 0.7854$
 $= 86.6$ sq. in.

Th refore the area of metal in the cross section of the column is

$113.1 - 86.6 = 26.5$

and the volume is

$26.5 \times 240 = 6360$ cub. in.

Then, taking the weight of cast-iron at 0.26 lb. per cubic inch, the required weight is

$6360 \times 0.26 = 1653.6$ lb.

(2.) The volume can also be found by calculating the circumference corresponding with the mean diameter of the annular ring (that is the external diameter less the thickness of metal), then multiplying the mean circumference by the thickness of metal, and the product by the length of the column in inches, and by 0.26, the weight of cast-iron per cubic inch.

Thus the mean diameter of the annular ring
 $= 12 - 0.75$
 $= 11.25$ in.

and the corresponding mean circumference is

$11.25 \pi = 11.25 \times 3.1416$
 $= 35.34$ in.

Therefore the area of metal in the cross section of the column is

$35.34 \times 0.75 = 26.5$ sq. in.

and the volume is

$26.5 \times 240 = 6360$ cub. in.

Then the required weight is

$6360 \times 0.26 = 1653.6$ lb., as before.

Although we have not needlessly occupied space by detailed workings, the general character of the foregoing calculations is sufficient to indicate the comparatively large amount of work they involve, and to suggest the desirability of shorter methods.

The following is a demonstration of the way in which method (1) can be simplified for general use:—

As employed above, the operation is represented by the equation

$W = \left(D^2 \frac{\pi}{4} - d^2 \frac{\pi}{4} \right) l w$

Where W = weight of the column, D = external diameter, d = internal diameter, l = length in inches, and w = weight of cast iron per cubic inch.

This may be written

$W = (D^2 - d^2) \frac{\pi}{4} l w$

Whence, employing $\left(\frac{\pi}{4} l w \right)$ as a constant, denoted by the symbol c , and assigning a constant value to l , we get

$W = (D^2 - d^2) c$

Taking l at 12 in., the value of c becomes

$0.7854 \times 12 \times 0.260 = 2.45$.

Then to calculate the weight of the given column is a very simple matter.

First we get the weight per foot length,

$w = (12^2 - 10.5^2) \times 2.45$
 $= 33.75 \times 2.45 = 82.68$ lb.

and next,

$W = 82.68 \times 20 = 1653.6$ lb., as before.

But method (2) points to a still more simple process, as shown below.

The operation previously performed is represented by the equation

$W = d_m \pi l w$

where d_m = mean diameter of the annular ring, and the other symbols have the same significations as before.

Separating variable from constant values we get

$W = (d_m l w) (\pi w)$.

Assigning the constant value of 12 in. to l , and treating $(\pi l w)$ as a constant with the value $(3.1416 \times 12 \times 0.26) = 9.8$, we have for the weight per foot length

$w = (d_m l) 9.8$.

Then to calculate the weight of the specified

column, we first find the weight per foot length,

$w = (11.25 \times 0.75) \times 9.8$
 $= 84.437 \times 9.8 = 82.68$

and next

$W = 82.68 \times 20 = 1653.6$ lb., as before.

To facilitate calculations relating to the weight of hollow cylinders, such as are represented by columns, flues, drains, and pipes, we give in Table IV. constants for different materials, by the aid of which the weight can be readily computed per unit length of one foot or one yard, from the diameter and thickness in inches, or in feet. This table has been calculated for use with the equation

$W = (d_m \times l) c$

where $c = (\pi l w)$.

By preparing in a similar manner constants for unit lengths of hollow columns and conduits of other sections, the corresponding weights can be readily computed.

Ellipse.—The constant for a hollow elliptical body may be determined by one of the two following methods:—

(1.) The circumference of an ellipse is given approximately by the rule

$\left(\frac{D + D'}{2} \right) \pi = (D + D') 1.5708$

where D = major axis and D' = minor axis.

Consequently the area of material in the cross section in a hollow ellipse may be found by employing mean values for the major and minor axes.

Thus

$A = (D_m + D_m) \times t \times 1.5708$

and the weight per unit length is

$w = [(D_m + D_m) \times t] (1.5708 l w)$

which may be stated

$w = [(D_m + D_m) \times t] c$.

(2.) An alternative method of finding the area of material in the cross section is to take the difference between the areas of two ellipses, one calculated from the outside axes, and the other from the inside axes.

The area of an ellipse being equal to the product of its semi-axes into π , the process of finding the net area of a hollow elliptical body is

$A = \left(\frac{1}{2} D \times \frac{1}{2} D' \right) \pi - \left(\frac{1}{2} d \times \frac{1}{2} d' \right) \pi$
 $= \left(\frac{DD' - dd'}{4} \right) \pi = (DD' - dd') \frac{\pi}{4}$

Therefore the weight per unit length is

$w = (DD' - dd') \left(\frac{\pi}{4} l w \right)$

which may be expressed

$w = (DD' - dd') c$,

where D = external major axis, D' = external minor axis, d = internal major axis, d' = internal minor axis, l = unit of length adopted, and w = unit weight of material.

If method (1) be adopted the values of c for a unit length of 1 ft. are

$c = (1.5708 \times 12 \times w)$ for dimensions in in.
 $c = (1.5708 \times 1 \times w)$ " " ft.

If method (2) be adopted the values become

$c = (0.7854 \times 12 \times w)$ for dimensions in in.
 $c = (0.7854 \times 1 \times w)$ " " ft.

TABLE IV.—CONSTANTS FOR CALCULATING THE WEIGHT OF HOLLOW CYLINDRICAL COLUMNS, CONDUITS, AND PIPES OF VARIOUS MATERIALS FOR A LENGTH OF 1 FOOT AND OF 1 YARD.

Material.	Values of Constant. (c)					
	Per Foot Length.		Per Yard Length.			
	Diameter,		Diameter.			
Description.	Weight per cubic foot in lb.	In in.	In ft.	In in.	In ft.	
Brickwork.....	112	$c = \pi l w$	352	7.2	$c = 3 \pi l w$	1,056
Cement.....	86		272	5.7		816
Cement mortar.....	130		408	8.4		1,224
Concrete.....	115		408	8.4		1,224
Earthenware.....	450		361	7.5		1,083
Cast-iron.....	480		1,413	29.4		4,239
Wrought-iron.....	480		1,538	31.8		4,524
Mild steel.....	480		1,538	31.8		4,524
Brass.....	549		1,725	35.0		5,175
Copper.....	712		2,237	46.5		6,711
Lead.....	450		1,413	29.4		4,239
Zinc.....	450		1,413	29.4		4,239

The constants in this table are calculated upon weights per cubic inch where diameter and thickness are intended to be taken in inches, and upon weights per cubic foot where diameter and thickness are intended to be taken in feet.

As addition involves less trouble than multiplication, it will save time to employ constants calculated in accordance with the former method.

Square.—(1) The area of material in a hollow square is

$$A = D^2 - d^2,$$

and the weight per unit length is

$$w = (D^2 - d^2) (lw),$$

where D = length of external side, and d = length of internal side. The constant is $c = lw$.

(2) Another method is to use as factors the mean length of side s_m , the thickness of side t, and the number of sides n.

Thus the mean length of side s_m is obviously $S - (2 \times \frac{t}{n})$, and the number of sides, $n = 4$.

Then the area of material in the cross section of a hollow square is

$$A = [S - (2 \times \frac{t}{n})] \times 4 = (s_m \times t) \times 4$$

and the weight per unit length is

$$w = (s_m \times t) (4lw)$$

the constant being $c = (4lw)$.

Hexagon.—(1) The area of material in the cross section of a hollow hexagonal body can be ascertained by taking the difference between the areas of two hexagons, one calculated from the outside dimensions, and the other from the inside dimensions.

The rule for calculating the area of a regular polygon is

$$A = S \times n \times (r \div 2)$$

where S = length of external side, n = number of sides, and r = radius of inscribed circle.

To find the area of a hexagon is perfectly easy, as the length of outer side is constant for any given hexagon. But the length of inner side for a hollow hexagon varies with the thickness of metal or other material, and must be determined for any given thickness either by measurement from a specially prepared drawing or by calculation.

To ascertain the length of the inner side by calculation we must first determine the length of the perpendicular of a right-angled triangle, of which the hypotenuse is a line joining the points where the inner and outer surfaces of two sides meet, the base of which equals the thickness of the sides of the hexagon, and the angle opposite the perpendicular = 30 deg. As the internal angle of a hexagon = 120 deg., the angle opposite the base = 63 deg., and—since the three angles of a triangle are together equal to 180 deg.—the angle opposite the perpendicular = 30 deg.

By trigonometry the perpendicular of a triangle = base $\times \tan \theta$.

Whence in this case the length of the perpendicular

$$= (t \times \tan 30 \text{ deg.}),$$

and as one such triangle has to be considered at each end of each side the length of side for the inner hexagon is

$$s = S - (2t \times \tan 30 \text{ deg.}).$$

Table V. gives the value of r for a hexagon = 0.866, when the length of side = 1. So it is necessary to multiply this factor by the length of side.

TABLE V.—DATA RELATIVE TO POLYGONS.

Description.	No. of Sides.	Internal Angle.	Length of Side of Polygon = 1.	
			Radius of Inscribed Circle (r).	Area.
Triangle	3	deg. min.		
Square	4	90 0	0.7071	1.0000
Pentagon	5	108 0	0.6882	1.7208
Hexagon	6	120 0	0.8660	2.5980
Heptagon	7	128 34	1.0383	3.6398
Octagon	8	135 0	1.2071	4.8284
Nonaagon	9	144 0	1.3747	6.1818
Decagon	10	144 0	1.5388	7.6942
Undecagon	11	147 16	1.7028	9.3656
Dodecagon	12	150 0	1.8660	11.1961

The general rule for the area of material in the cross section of a hollow hexagonal body is

$$A = (S_n \times \frac{r}{2}) - (s_n \times \frac{r}{2}).$$

Inserting the factors in full the equation becomes

$$A = [S_n \times (\frac{0.866}{2} S) - [S - (2t \times \tan \theta)]_n \times (\frac{0.866}{2} (S - 2t \times \tan \theta))]$$

which reduces to

$$[S^2 - (S - t \cdot 1.1548)^2] 2.598.$$

When the area has been found, it only requires multiplication by the length in inches or feet and the weight per cubic inch or cubic foot to give the required weight.

Therefore the weight of a hollow hexagon per foot length is

$$w = [S^2 - (S - t \cdot 1.1548)^2] \times (2.598 lw)$$

The constants are

$$c = (2.598 \times 12 \times w) \text{ for dimensions in in.}$$

$$c = (2.598 \times 1 \times w) \text{ " " " ft.}$$

$$\text{Apply the equation to the case of a hollow hexagonal cast-iron column 12 ft. long with the length of side = 6 in. and } \frac{1}{4} \text{ in. thickness of metal, and taking the value of } c \text{ at}$$

$$(2.598 \times 12 \times 0.26) = 8.1$$

we have

$$W = [S^2 - (S - t \cdot 1.1548)^2] c \times 12$$

$$= [36 - (6 - 0.5 \cdot 1.1548)^2] \times 8.1 \cdot 12$$

$$= [36 - 29.4] \times 97.2$$

$$= 641.5 \text{ lb.}$$

(2) Instead of applying the foregoing method, which is based upon the rules given generally in text-books and works of reference, we may arrive at the area and weight of a hollow hexagon far more expeditiously by the following alternative method:—

Multiply the mean length of side by the thickness and number of the sides.

$$\text{The mean length of side, } s_m \text{ is}$$

$$s_m = S - (2 \cdot \frac{t}{n} \times \tan \theta)$$

$$= S - (t \cdot 0.5774)$$

Therefore the weights per foot length are

$$w = [(S - t \cdot 0.5774) t] n \cdot 12 \text{ w for dimensions in in.}$$

$$w = [(S - t \cdot 0.5774) t] n w \text{ " " " ft.}$$

Applying this method to the case of the hollow hexagonal cast-iron column in the example above, and taking the value of c at $(6 \times 12 \times 0.26) = 18.72$, we have

$$W = [(6 - t \cdot 0.5774) t] \times c \times 12$$

$$= [(6 - 0.5 \times 0.5774) 0.5] \cdot 18.72 \cdot 12$$

$$= (5.7113 \times 0.5) \cdot 224.64$$

$$= 641.5 \text{ lb., as before.}$$

Hollow octagons and other hollow polygonal bodies can be treated in similar manner, taking due account of the internal angle in each case.

Next week we shall give a table of constants for hollow columns of different sections in various materials, and a selection of useful constants for general use.

NORTHCOTE-ROAD, BATTERSEA, FIRE-STATION.

On February 8, 1898, the London County Council approved a scheme for further increasing the means of protection from fire in London. This scheme included the provision of a permanent fire-station in the neighbourhood of South Battersea, a district which is intersected by several lines of railway, which interfere greatly with direct means of communication. For the site of the station, the Council required Nos. 61 to 71 (odd) Chatham-road, and the rear portions of the gardens of Nos. 41-59 (odd), Chatham-road, at a cost of 2,386l. 19s. 2d., including all costs. The Council decided on November 22, 1894, that the station should be erected by the Works Department, and work was commenced in December, 1904. The architect's estimate was 12,500l. The staff of the station consists of an officer, ten firemen and a coachman, and there will be kept at the station a motor fire-engine, a horsed escape, a long ladder (drawn by hand), and a hose cart. It is proposed that the fire-engine at this station shall be a motor engine, but stalls for four horses have been provided, as until motor traction has been adopted more extensively for the brigade appliances, it is necessary that stations should be adapted for both types of appliances. The following is a detailed description of the station taken from particulars furnished by Mr. W. E. Riley, F.R.I.B.A., the superintending Architect to the Council:—

Ground Floor.—The appliance room (with run-out to Chatham-road) is 39 ft. 7 in. by 38 ft. 3 in., with accommodation for a steam fire-engine and a horsed escape, and stalls for four horses arranged as at the Kensington fire-station. A covered shed is provided for the long ladder in the north-west corner of the yard. The walls of the appliance-room are lined with white glazed bricks, the floors paved with ironstone in same to assist the horses in starting. The stalls are drained into covered enamelled iron gutting, flushed automatically, a sinking has also been formed in the floor under the appliance to take the drippings from the boiler, and this is connected with the gutting referred to. The waiting-room, 9 ft. 9 in. by 12 ft. 4 in., is entered from the appliance-room, and has an inspection window overlooking the passage which commands both the separate entrance and the entrance to the waiting-room. The waiting-room is a small

room opening from the corridor which leads from the separate entrance to the staircase and appliance-room. The recreation-room is also entered from this corridor, is 24 ft. by 19 ft. (with panelled dado), and is capable of containing four full size billiard tables. There is a lavatory and water-closet adjoining. The laundry, 19 ft. by 13 ft., with hot closet and stoker's, is lined with white glazed bricks, and paved with granolithic paving, and is entered from the yard, in the north-east corner of which are situated the workshop, fodder store, stores for coal in bulk, coal in sacks, coke, oil and wood, general store, and twelve coal stokers to quarters, and also the urinal and water-closet. The yard, which is entered from the run-in from Chatham-road and the back of the appliance-room, is about 10.584 sq. ft. in area, and is paved with granite sets. The surface has been made level throughout for purposes of drilling. At the western end of the yard near the ladder-shed, is the drill tower and hose hoist combined. This is an iron-framed structure covered with oak weather-boarding; the ground story contains a smoke chamber enclosed with concrete, having a trap-door in the ceiling for the liberation of the smoke, the upper stages have open wood batten flooring, ordinary sash windows (but without glazing) are fitted in the vertical face of tower, and access is obtained to the "look out" on top by means of an iron ladder in the hose hoist portion.

First, Second, Third, and Fourth Floors.—On the first-floor are provided one set of three-room quarters, and one set of two-room quarters, also single men's quarters, consisting of two dormitories, mess room, bath-room and lavatory, water-closet, and scullery. On the second floor there are one three-room set, one two-room set, and the station-officer's quarters, consisting of four rooms. On the third and fourth floors there are three three-room sets of quarters. A bath-room is provided on each floor. A sliding pole leads from the single men's dormitories into the appliance-room in front of the pier between the first and second floors. The station is lighted by electricity. The east and west elevations of the building are faced with red brick, the front elevation to Chatham-road is faced with red bricks and has Portland stone dressings. The appliance-room is heated by hot water, a subsidiary boiler being provided for this purpose in the stoker's.

STANFORD'S MAP OF METROPOLITAN RAILWAYS, TRAMWAYS, AND MISCELLANEOUS IMPROVEMENTS.

Owing to the general lull in Metropolitan railway projects the new issue of Mr. Stanford's useful map does not present quite so many suggested lines of communication as in the last two or three years. Nevertheless, the record of railways under construction, sanctioned, and proposed is satisfactory so far as it extends. Of lines in progress and practically completed the Great Central new route and the Baker-street to Waterloo Railway are the most important, the former being intended to open up a great suburban district in the north-west and the latter to link North and South London.

In the north-east district an extremely valuable route sanctioned is the North-East London Railway from the City to Walthamston via Bethnal-green, Hackney, and Leyton, and the proposed Hammersmith, City, and North-East London line, passing through Shoreditch, Haggerston, Dalston, and Stoke Newington to Tottenham and beyond, is equally desirable. Both of these are termed "underground railways," but we assume they will emerge into daylight when open country is reached.

In South-East London no railway projects are in hand. Existing companies do not appear anxious to compete with tramways, and the district is scarcely suitable for underground electric railways. In North-West London the Great Northern Railway appear to be widening their Edgware branch, although Mr. Stanford does not make quite clear the precise work in contemplation. The Baker-street and Waterloo line we have already mentioned as nearly ready for operation. Two other sanctioned lines shown on the map are the Great Northern, Piccadilly, and Brompton, the Charing-cross, Euston, and Hampstead, but, curiously enough, neither of these is marked with any distinguishing sign or number, rather an omission. The District Railway is accompanied by a dotted line indicating the sanction of some additional work, the nature of which ought to be explained in the key to the map. A new loop on the Great Western system from Acton to the West London Railway practically completes the category of railway projects sanctioned in this quarter of London. Two useful underground lines proposed are the North-West London Railway from Victoria along Edgware-road, to Cricklewood, and the Hammersmith, City, and North-East London Railway, with a feeder branch from the Marble Arch.

In the south-west district no new railways are in contemplation, this part of Metropolitan being left to tramways, so far as fresh traffic is concerned.

Turning now to tramway projects we find abundant evidences of progress. A number of useful little lines have been sanctioned and proposed in North-East London, such as those from Aldgate to the Mint, Stoke Newington, Cross St. Forest-hill, Camberwell—Peckham, East Dulwich—Forest-hill, and lines in the Croydon and Beckenham districts joining up Croydon, Beckenham, Anerley, Penge, Lower Sydenham, and Norwood.

The list of sanctioned lines in the south-east is more extensive, and includes routes such as the following:—Blackwall Tunnel—Greenwich, Woolwich—Plumstead, Woolwich—Eltham, New Cross—Forest-hill, Camberwell—Peckham, East Dulwich—Forest-hill, and lines in the Croydon and Beckenham districts joining up Croydon, Beckenham, Anerley, Penge, Lower Sydenham, and Norwood.

In the north-west quarter tramways are sanctioned between Child's-hill and Willesden, Harlesden and Sudbury, Harlesden and Acton, Harlesden and Putney, and in some portion of the map occurs the Kingsway route now in full operation.

In the south-west there are evidences of much activity on the part of the London County Council, and the London United Tramways Company Lines already sanctioned include those between Tooting and Mitcham, Tooting and Wandsworth, Sumner, Barnes and Richmond, and various lines in the Kingston district. The Surrey extensions of the London United Tramways are of the utmost importance, and constitute a remarkable testimony to the energy and perseverance of Sir Clifton Robinson, who has worked so hard to bring pleasant places within reach of those who require fresh air and recreation in the true sense of the word.

Mr. Stanford's map is issued, as last year, on two sheets, to the scale of 3 in. to a mile, and in addition to means of Metropolitan communication it includes other proposed undertakings, such as additional arrangements for the distribution of electric power, new buildings for public purposes, and some street and bridge improvements. We think the general utility of the map would be increased by a more detailed explanatory table for the benefit of the uninitiated. In fact, a good many people who are interested in the question of London traffic, but have not at hand full records of the undertakings indicated on the map, would be glad to purchase at a small additional charge a supplementary sheet or pamphlet containing brief particulars as to the origin and scope of the various projects.

Obituary.

M. CARRIÈRE.—The eminent painter, Eugene Carrière, has died after a long and painful illness of three years. He had suffered several operations for cancer in the throat, which had only the effect of delaying the final result. At the last he passed away, without suffering, in his sleep. Carrière was born at Gourmay-sur-Marne in 1849; he lived for a long time at Strasbourg, and after his captivity during the German war he returned to Paris and to the atelier of Cabanel. In 1876 he contracted successfully for the Prix de Rome. In 1879 he exhibited a picture entitled "Jeune Mère," in which he showed already the peculiar style which was to distinguish his work. It was the first of a series of pictures all dealing with the idea of motherhood. Married early, and always poor, he found most of the models for his pictures in his wife and children. His works were too numerous to mention here, but among them may be named the frescoes which he painted in the Salon des Sciences at the Paris Hôtel de Ville; "L'Enfant Malade"; "Premier Voile," suggested by the first communion of his oldest daughter; "Maternité," which is in the Luxembourg; a decorative panel for the Sorbonne; a "Crucifixion" exhibited at the Salon of 1897; portraits (among them the curiously original one of Daudet), lithographic drawings, etc. He had latterly been occupied mainly in the decoration of the Mairie of XII^e Arrondissement, which he executed unskilfully. Carrière was "Officier" of the Legion of Honour.

General Building News.

CHURCH RENOVATION, KINGSTONE.—The Church of St. John and All Saints, Kingstone, was reopened on the 15th inst., after having been renovated. The work comprised, in the interior, the entire removal of a coating of thick mortar, discoloured, as was the stone work, by damp. This, in the chancel, has been replaced with thin cement, whilst in the nave the walls have been pointed. The decayed plank floor has been replaced by wood block flooring; a dwarf-wall, with steps, all of Han-stone, has been erected as a boundary to the chancel. The old seating has been refitted and revarnished. The Ecclesiastical Commissioners have related the chancel floor with dark tiling, and beneath the choir-stalls with wood block flooring.

The sanctuary floor, which is paved with ancient memorial stones of the Tripp family, has been polished. The outside work consists chiefly of pointing the walls and draining. The work was done under the supervision of Mr. L. Hepworth, whilst Mr. William Hutchings and Mr. Hazlewood have been the contractors. Messrs. Hann & Son, of Beaminster, have done the chancel work for the Commissioners.

CHRIST CHURCH, TOTLAND BAY.—Improvements have recently been made to this church at a cost of over 1,500*l*. The old transept on the south side of the church, which had been closed for a number of years owing to its insecurity, has been taken down, and in its place there has been constructed a new south aisle of late XIIIth century English Gothic style, in keeping with the remaining portion of the church. A feature of the work is the polished Hoptonwood stone columns supporting the arcades, the shafts being monoliths. Additional seating accommodation is provided for 120. A vestry is also provided. Another alteration is the erection of a western porch, with a gallery over, giving thirty additional sittings. This porch is closed with iron gates, and the architect's designs by Mr. Bundy, of Carisbrooke. The church has also been re-heated on a new system by Messrs. Parker, of Birmingham, under the architect's superintendence. This work marks the completion of the first portion of an extensive scheme for enlarging Christ Church from the designs of Mr. Percy Stone, architect, which embraces an additional aisle on the north side of the church, a lengthening eastward of the chancel, and the erection of a tower at the north-west. In addition to the improvements already mentioned, a lych-gate of XVth century design has been placed at the north-west angle of the churchyard. The stonework and carving has been executed by Messrs. Garrett and Haysom, Southampton, and the general work has been carried out by Mr. R. D. Medway, Frelswater, Mr. C. Noble, of Bournemouth, was the clerk of the works.

CHURCH EXTENSION, BRIDGFORD.—The parish church of St. Giles, West Bridgford, is to be enlarged. The proposed work includes the completion of the body of the church, giving it a length of 67 ft. by 28 ft. wide, with two classrooms or vestries at the west end which can, if necessary, be thrown into the main building, giving it a total length of 90 ft. It has been designed by Mr. W. R. Gleave, of Nottingham, who has been architect for the whole scheme.

BAPTIST CHURCH, SOUTHELD.—A new Baptist church is in course of erection on a site at the corner of Wimbledon Park-road and Bright-road, Southfields. The work is being carried out by Mr. William Hammond, of Battersea, to the plans of Mr. Weymouth, of Westminster. The portion of the church now being constructed will cost nearly 2,800*l*., and the whole church, when completed, with galleries, tower, vestries, etc., will cost some 4,500*l*. to 5,000*l*. WESLEYAN REFORM CHAPEL AND SCHOOLS, HUCKNALL TORKARD.—On the 10th inst. the memorial stones were laid of the new chapel and schools of the Wesleyan Reform community at Hucknall Torkard. The chapel is designed in the Gothic style with frontage to Amnesley-road, and will be 32 ft. by 45 ft., with a roof of the open hammer-beam principle, and will provide seating accommodation for 555 persons. The front will be executed in red Istock bricks, the vestibules will be laid in mosaic, and the aisles in wood block. Entrance to the schools will be gained from Ogde-street. The scheme includes a central hall, and various classrooms with folding partitions. A gallery will run on either side of the central hall, and as the Ogde-street end of the site is lower than that of Amnesley-road, this gallery is on a level with the chapel floor. The building is from the designs of Mr. Harry Spencer, architect, of Hucknall, and the contract has been let to Mr. J. A. Munks, builder, Hucknall, for 2,560*l*.

SUNDAY-SCHOOL, IPSWICH.—Memorial stones have just been laid of a new Sunday-school for Bethesda Chapel, Ipswich. The architect of the building is Mr. Frederick C. Fauchel, and the builder Mr. C. A. Kenney. The schoolroom will have lavatories and a kitchen attached. In external design the building is Gothic, and is being constructed with red brick facings, with ornamental red brick dressings. The schoolroom will accommodate about 300 children, and will be so arranged that it can be divided by curtains into separate classrooms.

ADDITIONS TO EXETER DIOCESAN COLLEGE.—The Bishop of Exeter opened on the 16th inst. a new dormitory and laboratory which have been erected at the Exeter Diocesan Training College on a portion of the grounds of St. Luke's, Baring-crecent. The walls are of brick, the floors and staircase are constructed with concrete, with steel reinforcement, the partitions and divisions of cubicles are constructed in steel framing and uraltite asbestos panels. The ground floor contains a master's room, a physics laboratory, a manual workshop, and an heating chamber, with entrance doorway and hall from Heavitree-road, an exit door on the garden front, and an entrance to the master's room from Baring-

crecent. The upper floor, approached by a fireproof concrete staircase, has a dormitory, divided into fifteen cubicles, with a corridor running the whole length, and a panic egress door and stairs on the outside of the building on the garden front, for use in case of emergency, and a master's bedroom, bath-room, etc. The dormitory is ventilated with inlet ventilators and extraction air pumps. The building is warmed with hot water circulating pipes. The plans were prepared and carried out by Messrs. Lusscombe, Exeter, the surveyors and builders of the college.

PUBLIC LIBRARY, FENTON.—A public library was opened at Fenton on the 7th inst. The building is situate at the corner of Station-road and Baker-street. The style of architecture is in keeping with that of the Town Hall, which adjoins. The exterior is of red Acerington brick and white Hollington stone—the roofs being covered with brindled tiles. A flight of steps lead to the main entrance, and through doors of solid oak a small vestibule is reached. Van Kannel patent revolving doors separate this from the hall. The hall floor is laid with ceramic mosaic with the Fenton arms as a centrepiece. The walls have been painted green, having a tiled dado, continued up a staircase immediately opposite the entrance, and round the landing. The lending library is on the left of the entrance. The librarian's office is at one end of the counter and communicates with the hall, and a private staircase runs from the lending department to the filing room above. The reference library is entered from the public space of the lending department, with which it communicates. The general reading-room is on the right of the main entrance. The walls have a tile dado shoulder-high, and the roof is north-open with pitch-pine principals and plaster panels, divided by pitch-pine ribs. This room will accommodate seventy-eight readers. On the ground floor a caretaker's store-room is also provided, and in the basement there is a heating chamber, with coke and coal grate. The staircase from the entrance-hall is constructed of Stuart's granolithic, and has a wrought-iron balustrade supporting the handrail. The principal room of the first floor is a lecture hall, to seat over 100 persons. It has a rich ornamental plaster ceiling, with moulded ribs; and a faience mantel with a wrought-iron grate. There is lavatory accommodation in connexion. Also on the first floor there are a ladies' reading-room, and a committee-room. Most of the walls in the building are painted with Harland's flat enamel. The woodwork is of selected varnished pitch-pine. The ranges of balustrades, grates, and gas fittings are executed in wrought-iron from designs by the architect. The floors are fireproof and of steel and concrete. All the rooms are laid with wood blocks. The entire building is heated by means of low-pressure hot water apparatus on the one-pipe system, with radiators. The furniture and internal fittings have been designed by the architect and have been executed by Messrs. G. Fleet & Co., of Stoke. Messrs. Minton, Holius, & Co., of Stoke, supplied all the mosaic, faience, and wall tiling; Messrs. Thos. Brawn & Co., of Birmingham, the wrought-iron grates and gas fittings, the remaining fittings being supplied by Mr. W. Durose, of Tunstall; Messrs. Burgess & Co., of Liverpool, the wood block floors; the Crittall Manufacturing Company, of Braintree, Essex, the wrought-iron casements; Messrs. E. Peake & Sons, of Fenton, the heating apparatus; and Mr. C. T. Lysons, of Burslem, the blinds, and the sanitary ware by Messrs. F. White & Co., of Stoke. The architect of the work was Mr. F. R. Lawson, whose designs were accepted in a competition confined to local architects.

HOTEL IMPROVEMENTS, PORTFUSH.—Improvements, including the erection of a new wing, are being made to the Northern Counties Hotel at Portfush. The work has been designed and planned by the chief engineer to the Midland Railway Company, Mr. Berkeley D. Wise, C.E., and Mr. McNeill had personal supervision. The contractors for the building were Messrs. McLaughlin & Harvey, Belfast, and Messrs. Wilkinson, Newcastle-on-Tyne, supplied the marble for staircase; Messrs. Wm. Coates & Son, Ltd., Belfast, electrical fittings and installation; Messrs. Riddels, Ltd., fire escape, steam heating apparatus and radiators, and plumbing work.

THE NEW MUNICIPAL BUILDINGS, COWDENHEATH.—New Municipal Buildings are being erected in High-street, Cowdenheath. Red Dumfriesshire stone has been used in their erection. The town clerk's room, general offices, burgh court room, magistrates' room, and police accommodation are all on the ground floor, while above is situated the council chamber. The architect is Mr. T. Hyslop Ure, Dumfries.

PADDINGTON WORKHOUSE EXTENSIONS.—The Paddington Guardians are considering questions connected with (1) providing additional infirmary accommodation, and (2) the provision of work shops. In regard to the latter scheme revised plans for a single block of two stories have been prepared. The estimated cost of the workshops, according to these plans, is 2,350*l*.

NEW OFFICES, FALL MALL.—The London and Lancashire Fire Insurance Company are about

to erect new offices in Pall Mall, opposite Marlborough House, from the design of Mr. Guy Dawber. The constructional steelwork and fire-resisting floors are to be done by Messrs. Mark Fawcett & Co.

WESLEYAN HALL AT WHITLEY, READING.—The new Wesleyan Hall, at Whitley, Reading, was formally opened on the 14th inst. The hall forms a part of the Reading Wesleyan Methodist Extension scheme, and is the fifth building which has been erected under the scheme. The foundation-stones were laid on July 12, 1905. The cost of the building, including the purchase of three old houses and the land connected with them, was 6,314*l.* The large hall measures 51 ft. by 68 ft. on the ground floor, but on the gallery level the length is increased to 78 ft. It has an open pitch-pine roof. The hall is approached from the front through a vestibule with two stone staircases leading to the gallery; a third staircase (also of stone) gives access to the other end of the gallery. Behind the hall is a schoolroom measuring 33 ft. 6 in. by 53 ft. It is faced internally with sand-lime bricks supplied by Messrs. S. & E. Collier. The other accommodation comprises an infants' room, minister's vestry, various classrooms, kitchens, and the usual sanitary accommodation. The main hall and approaches are lighted by electricity, and the schoolroom block by incandescent gas. The building contract has been carried out by Mr. Robert Curtis. The stained-glass was from the studio of Messrs. Swaine, Bourne, & Sons, of Birmingham; the electric lighting and heating works have been carried out by Messrs. Callos, Sons, & May, and the wrought-iron work is by Mr. Girdler. The design and superintendence of the whole work was in the hands of Mr. W. Roland Howell, architect, of Reading.

ALMSHOUSES, PAIGNTON.—Two memorial stones were laid at Paignton on the 21st inst. on the site of two blocks of almshouses and flats. These will consist of forty distinct tenements, in two separate blocks, in Merritt-road, off the Totnes-road, in contiguity to an existing range of flats. The ground-floor tenements, sixteen in number, are to be used as almshouses, and the flats above let at moderate rents for small families. The architect is Mr. W. G. Coudrey. The total cost will be about 6,000*l.*, irrespective of the land.

NEW BUILDINGS, NATIONAL PHYSICAL LABORATORY.—The new electrical buildings are nearly finished. They are being erected by Messrs. Mowlan & Co., at an outlay of about 8,000*l.*, after the designs of Messrs. Mott & Hay, who act as honorary architects; the contractors' tender was based upon the cost price of the works. In their report for 1905, recently approved by the general board, the executive committee state that the Government have agreed to make a building grant during the current year of 16,000*l.*, instead of 6,000*l.*, as promised a few months ago, and to increase their annual grant by 500*l.* The laboratory work for the present year embraces the continuation of the wind pressure and steam researches, enquiry into the resistance of materials of construction to impact, experiments upon the effect of the continued application of high pressure to insulators, research into the properties of aluminum bronze, and completion of the work with the Ampere balance.

Stained Glass & Decoration.

ST. MARK'S, KENNINGTON.—A memorial window illustrative of the Sermon on the Mount was unveiled on March 25 in memory of a former vicar, the late Rev. Arthur G. Bowman. The window and tablet were executed by Messrs. Heaton, Butler & Bayne.

INSTITUTE OF BRITISH DECORATORS.—The Council of this Institute has decided to offer for the encouragement of colour decoration, a gold medal, to be awarded yearly, or at intervals of not more than three years, for either one of the following forms of distinction:—(1.) Executed decorative work of notable excellence. (2.) Effect of conspicuous value to decorators. (3.) Scientific invention or improvement in the manufacture of pigments or other materials used in decoration. The competition is to be open to Great Britain, Ireland, Canada and British Colonies. We are glad to notice the proviso that as each medal will be awarded to one person only, any firm whose work may be considered will be required to declare the name of the individual to whom the merit of the work, as a whole, is chiefly due. The Institute also announces that silver medals will be awarded annually to students in the training classes of the London Technical Schools, or in such technical classes for students) as may from time to time be nominated by the National Association of Master-Painters of England and Wales, the National Association of Master Painters in Scotland, or the National Association of Master Painters in Ireland. One such medal is to be awarded in each of the four above-mentioned District Divisions for each of the following subjects:—(a) To the student who shows the best general knowledge of the principles of

architecture in relation to design. (b) To the student submitting the best scheme of colour decoration as applicable to the interior of some existing building. All inquiries must be addressed to the Secretary of the Institute of British Decorators, Painters' Hall, Little Trinity-lane, E.C.

Sanitary and Engineering News.

THE ROYAL SANITARY INSTITUTE.—The following is the list of members and associates elected during March:—*Members:* Dr. J. A. Beaudry (Montreal); T. K. Dealy (Magazine Gap, Hong Kong); N. F. Dennis (Borough Engineer, West Hartlepool); E. C. Douglas (Montreal); H. R. Gray (Montreal); R. T. Hewlett (Director of Public Health Laboratories, King's College, W.C.); W. J. James (Streatham, S.W.); A. Johnson (Glasgow); E. P. Lachapelle (Montreal); J. J. Leckland (Water Engineer, St. Helens); E. S. Lea (Montreal); J. A. Luudie (Montreal); T. Moulding (City Engineer and Surveyor, Exeter); E. Pelletier (Montreal); H. J. B. Rowall (Provincial de Lima, Peru); J. F. Revill (Leytonstone); J. W. Seane (Montreal); H. J. C. Turner (Bombay); D. Millar (Glasgow). *Associates:* A. Ainley (Huddersfield); W. G. Bell (Plymouth); Miss M. B. Box (South Benfleet, Essex); J. A. K. Cooper (Gatford, S.E.); H. R. Crisp (W. Ealing); H. Crossley (Oldham); Miss I. Curwan (W. Hampstead); J. Duncan (Ayr, N.B.); H. J. W. Gidley (Victoria, Hong Kong); T. Gray (Mid-Caldor, Midlothian); Miss K. E. Griess (Westminster, S.W.); W. J. Hutchings (Beckham, S.E.); E. J. Johns (Alabar, S. Nigeria); S. Matthews (Middleton Junction, Lancs.); W. H. McDowell (Ballsbridge, Dublin); H. McKinnon (Rothsay, N.B.); Miss E. G. Moyrhan (Regent's Park, N.W.); H. F. Naughton (Rochampton); J. Smith (Glasgow); J. Thorley (Chorlton-cum-Hardy).

SEWERAGE SCHEME, GLENFIELD.—At the Co-operative Hall on the 22nd inst. Mr. W. O. E. Meade-King, Local Government Board Inspector, had an inquiry into the application of Blaby Rural District Council for sanction to borrow 4,250*l.* for purposes of sewerage and sewage disposal for the township of Glenfield. In the course of the inquiry Mr. Turner (Surveyor) said the population his scheme provided for was 900. The treatment of the sewage would be by open septic tanks, filters, and automatic revolving sprinklers; and the effluent would be discharged into the brook.

PROPOSED ADDITIONS TO THE SEWAGE FARM, SALTLEY.—The Birmingham, Tame, and Ryland District Drainage Board having applied to the Local Government Board for sanction to borrow 73,000*l.*, an inquiry into the subject matter of the application was held on the 22nd inst. at the Council House by Mr. R. H. Bicknell, Inspector to the Local Government Board. Mr. H. A. Pritchard (Deputy Town Clerk) informed the inspector that a few years ago the Board put down at Saltley certain storm-water filters, but these had not proved quite so useful as was anticipated at the time, and Mr. G. D. Watson, engineer, had recommended to the Board a scheme for dealing with the difficulty. It was proposed to remove the percolation media from certain of the beds on to other beds, so as to make the depth of the media 5 ft. instead of 3 ft., as previously, and new media would be placed in the remaining beds to a similar depth. Close by the existing storm-water filters there were thirty acres of land, and Mr. Watson proposed to use that area for storm-water filtration. In connexion with the storm water proposal, it was necessary to deal with the three main outfall sewers bringing the sewage to the farm. Mr. Watson proposed to carry these outfalls to the back of the present beds at a higher level, to pump the sewage up to that height, and then to take it over the river, through two conduits instead of one as at present. The carrier would be provided with means for cutting off the sewage in times of normal flow, and the sewage would then be conveyed to the various beds for treatment. For the purpose of lifting the sewage to the higher level electric power, which had already been installed, would be used. The beds were to be divided into three separate sections of ten acres each. In answer proposed to deal with twice the present dry weather flow by means of gravitation, and four times by pumping, and this method would release a large acreage of land. Mr. Watson also gave evidence as to technical details.

SEWERAGE SCHEME, KESWICK.—The Local Government Board having approved of a scheme of sewage disposal for the town of Keswick, the contract for the work has been let to Mr. J. W. Broadhead, of Furston, Pontefract. The work consists in the construction of an open storage tank at the end of the existing main outfall sewer. Adjacent to this tank a pumping station is to be erected. The sewage will be lifted by centrifugal pumps, driven by gas engines, and delivered at the high end of the works into

a receiving reservoir, from which it will gravitate at a slow rate to bacterial tanks and filters, the effluent being finally treated on land. The storm water is to be dealt with separately in specially constructed storm water filters. The works have been designed by Messrs. D. Balfour & Son, consulting engineers, of London and Newcastle.

WATER SCHEMES, PENARTH.—At a recent meeting of the Penarth Urban Council a report was read from the Special Water Committee, which recommends the adoption and carrying out of the Glenderamakin scheme as prepared by Mr. Baldwin Latham, the engineer, and that a Bill should be promoted in Parliament for the necessary powers with clauses giving the Rural Council the privilege of taking a supply for their area from the Urban Council up to 100,000 gallons a day.

Foreign.

ST. PETERSBURG BUILDING AND ARCHITECTURAL EXHIBITION.—Mr. H. Cooke, British Commercial Agent in Russia, writes to the Board of Trade that he has now been officially informed by the Exhibition Committee that the opening of this Exhibition, which was originally fixed for Tuesday next, has been deferred until April, 1907.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The partnership which has existed for some five years between Mr. R. S. Balfour and Mr. W. A. Pitt, architects, has been dissolved as from February 24 last.—Mr. Philip Sturdy, architect and surveyor, has removed his offices from 4, Clarendon-buildings, Bournemouth, to 84, Poole-road, Bournemouth (near County Gates).—Messrs. Carter & Banks have purchased the business of Alfred T. S. Carter, Ltd., tile and mosaic manufacturers and builders' merchants, which will in future be carried on at 283, Brockley-road (not 288, as hitherto), and St. Margaret's Works, Brockley.

UNBREAKABLE TIE-BARS AND AXLES.—An invention by Carl Fox, of the London Salvage Corps, is intended to obviate the risk of fracture in the tie-bars of steel structures and the axles of railway rolling-stock. The idea is based on a method of manufacture in which a steel bar constituting the core is surrounded by a series of other bars and the whole welded and forged so as to form a solid mass. As it is highly improbable that a flaw would exist in every bar at the same place it is contended that perfect safety would be assured. To a certain extent bars so made would be produced in a manner similar to that necessarily adopted in the early days of wrought iron, and it may be doubted whether they are wanted in structural engineering, as no evidence exists to show that ordinary steel bars are lacking in reliability.

ESTIMATES (PUBLIC BUILDINGS), 1906-7.—The estimates which have just been issued for the ensuing financial year show a decrease of 8,050*l.* on a vote of 51,800*l.* for the Houses of Parliament. There are votes of 13,340*l.* for official residences of the First Lord of the Admiralty, the Second Lord of the Admiralty; 24,000*l.* for new works, Royal College of Science; 23,200*l.* for the vaccine station at Hendon; and 12,000*l.* for Eskdale Muir magnetical observatory. Other votes relate to the royal palaces—66,000*l.* (an increase of 3,000*l.*); Osborne House, 16,400*l.* (1,500*l.*); art and science buildings, 70,800*l.* (23,828*l.*); and public buildings in Great Britain, 517,000*l.* (53,000*l.*). The aggregate estimates for public works and buildings amount to 2,790,280*l.*, being an excess of 86,247*l.* over the sum for the last year.

HOLBORN TOWN HALL.—The property which the Holborn Borough Council will offer for sale at the Mart on April 9 extends over 12,000 ft. superficial, with frontages to Gray's Inn and Clerkenwell roads. The Town Hall, of which we published illustrations on December 13, 1879, was built after Mr. L. H. Isaac's designs, and some improvements were carried out since by Messrs. Isaacs & Florence. The building comprises a large concert-hall with galleries, two smaller halls, and a range of offices. At a recent meeting of the Council it was stated that the Hall was valued at 57,160*l.* when the Council took it over from the former Vestry, and that the loans on the building which will mature in March, 1908, amount to 11,574*l.* For the twelve months 1903-4 the income derived from the premises, which are assessed at 1,914*l.*, was 4,556*l.*, the cost of maintenance being 2,277*l.*

FOAMING GLUE.—It is well known that glue varies very much in the amount of foam they produce when treated with water, and technical chemists have for some time past been endeavouring to discover the causes which induce this objectionable foaming. Two papers have recently been communicated to the Society of Chemical Industry on the subject, and although a method of producing glue which will not foam has not yet

a claim for trespass in connexion with the party-wall.

By their defence the defendants denied that their new buildings had, or would, cause any nuisance to the plaintiff as alleged, and that they would to any appreciable extent affect the plaintiff's light, or interfere with the comfortable enjoyment by the plaintiff or his tenants of the premises. (The case was reported in the *Builder* of March 3 last.)

Mr. Hughes, K.C., and Mr. Crossfield appeared for the plaintiff, and Mr. Younger, K.C., and Mr. Edward Ford for the defendants.

In giving judgment his lordship said that by the action the complaint was of a two-fold nature. The first was as to the erection by the defendants of the party-wall above the height which the plaintiff authorised them to raise it, and which it was alleged on behalf of the defendants was done in error. However that might be, it was clearly unwarrantable, but as during the trial the defendants had offered to take it down, it was not material for him (his lordship) to say anything more about it except perhaps on the question of costs. The other complaint was as to the obstruction of light to certain windows in the plaintiff's building. On the hearing of the motion for an interlocutory injunction it was agreed as regarded the plaintiff's claim for a mandatory injunction the rights of the parties were to be the same as if the trial had taken place at the date of the motion, and that his lordship should assume that the defendants' new buildings were then in the condition shown on the ground plans and elevation. The plaintiff was an under-lessee for the residue of a not long term of years—seven years from December, 1904. His immediate reversioner was not a party to the action, and the ultimate reversioner was the ground landlord of the defendants as well as of the plaintiff. That gentleman did not desire to have any part of the defendants' building removed, and his lordship thought that under the circumstances the plaintiff could be properly compensated by damages being awarded to him if he was entitled to any relief. His lordship having specifically described the windows in the plaintiff's building alleged to have been affected by the defendants' buildings, said he came to the conclusion that none of the plaintiff's windows, or the rooms lighted by them on the ground and first floors, were ever specially well lighted in any sense, or more than sufficiently lighted for the ordinary use and occupation of rooms in a dwelling-house or flats. He thought that really the light was deficient according to the notions of ordinary people. He was of opinion that the light to the studio through its only light—the skylight—had been greatly diminished by the defendants' new buildings. The defendants by their new buildings had not only obstructed a considerable amount of light coming to the room, but they had rendered it less comfortable, and had made it unfit for the immediate purposes for which it was formerly used. With regard to the window "K" that was the only window lighting a bed-room on the ground-floor in the plaintiff's building, it would be idle to say that that room had ever been well or sufficiently lighted. The light to it had always been obstructed. Some of the witnesses alleged that the room, although badly lighted, was sufficiently lighted for a bed-room. His lordship said that the room had always been a dark room, and by reason of the defendants' buildings the light coming to the upper portion of the window had been further diminished, and actual damage thus occasioned to the plaintiff. The window "C" on the first-floor lighted the staircase, and "D" was a window lighting a water-closet and bathroom. These windows had been rendered darker by reason of the defendants' new building. The rear room on the first-floor was lighted by the windows "A" and "B," the room being at present unoccupied. He found that this room was never well lighted. It was dark before and uncomfortably dark now by reason of the defendants' buildings, and the room thus rendered less comfortable. His lordship, having referred to the other windows in the plaintiff's building said to have been affected by the defendants' new buildings, said he was of opinion that what the defendants had done could fairly be held to be a nuisance, and he so decided. He must award the plaintiff some damage, and he fixed the amount at 120*l.*, and the defendants must pay the costs of the action.

Mr. Younger, on behalf of the defendants, agreed to pull down the portion of the party-wall which was too high within three weeks.

BUILDING DISPUTE IN ST. MARTIN'S-LANE.

THE case of *Borwick v. the London Coliseum, Ltd.*, came before Mr. Justice Grantham, sitting by consent without a jury in the King's Bench Division this week, an action by the plaintiff for damages for alleged breach of an agreement. In this case the plaintiff is an engraver, and carrying on business at No. 42, St. Martin's-lane, W.C., the defendants being the owners of the adjoining premises, No. 41, St. Martin's-lane. In June, 1904, it was alleged defendants began to

pull down the premises on the site of No. 41, and thereby deprived plaintiff's premises of the support of No. 41, and caused the party wall to crack and become unsafe. In consequence of these matters a dispute arose between the parties, which was compromised by letters of July 14 and August 6, 1904, which it was agreed between the plaintiff and the defendants that the defendants should rebuild the wall on the following terms, viz.:—(a) That the work should not be begun until the specification and plans had been approved by the plaintiff; (b) that all damage done in making the proposed alterations should be made good at the defendants' expense, even to rebuilding if necessary, and including repapering and painting the parts affected by the alterations; (c) that the defendants should erect a partition to enable the plaintiff to carry on his business during the alterations; and (d) defendants to pay the plaintiff's surveyors' and solicitors' charges. Plaintiff said it was an implied term of the agreement that the work should be completed within a reasonable time. In breach of this agreement plaintiff alleged that the defendants had pulled down the said wall and started the work before the plans and specification had been approved by him, and so indignantly erected the partition to be erected that the plaintiff was unable to carry on his business or reside at the premises, owing to the dust, draught, and damp, and plaintiff had to remove his business, and therefore, as he said, had suffered considerable loss. In further breach of the agreement plaintiff said the defendants had not made good all damages done by the alterations, and put the shop or fittings or fixtures into the proper condition for carrying on the business. Plaintiff claimed 700*l.* special damages, including 300*l.* for loss of trade and loss of profits.

Defendants, by their defence, denied that they were guilty of any wrongful acts. They said that any work done by them in or about the premises in question was executed by them in accordance with a notice duly served by them upon the plaintiff in December, 1903, and also under the powers conferred upon them as building owners by the London Building Act, 1894. Defendants denied that they had deprived the plaintiff's house of support, or caused the party wall to crack or become unsafe as alleged. Defendants admitted that after the dispute arose a compromise or agreement was made, but they denied that those terms were according to those set out by the plaintiff. Defendants admitted the terms numbered b, c, and d, and said they were part of the terms arrived at, but they denied that there had been any breach of b or c, and further said with regard to d that they had always been ready and willing, and still were ready and willing, to pay all the proper charges of plaintiff's solicitors and surveyors, but no accounts had yet been rendered. In the alternative defendants said that if no compromise was arrived at plaintiff's remedy was by arbitration in accordance with the provisions of the London Building Act, 1894. Defendants contended that the items of 300*l.* odd claimed by plaintiff for loss of trade and business, and expenses of having to remove elsewhere, were not recoverable in law. Defendants brought the sum of 150*l.* into court, and said that the same was sufficient to satisfy the plaintiff's claim.

Mr. English Harrison, K.C., and Mr. Colam appeared for the plaintiff, and Mr. Foote, K.C., and Mr. T. Hunnifreys for the defendants.

After hearing a great deal of detailed evidence, and the addresses of counsel, his lordship, in giving judgment, said the case ought never to have been brought into that court for trial. The defendants had endeavoured to persuade the plaintiff to have the case referred, but, as the plaintiff refused, it thus came on for trial before him. There was very little law in the case, practically the whole "hug" being a question of account. With regard to the case itself it was not free from difficulty. He thought he ought to say that so far as the defendants were concerned they had behaved in a very liberal manner, and they had done everything which honourable people should do in the peculiar circumstances in which they were placed. The result of what had been done was that the freeholder of No. 42 had been very much benefited. He also thought that the plaintiff (the leaseholder) had also been benefited by having a better house, now that it was finished, than it was before. He (his lordship) agreed that the plaintiff had been benefited by having now a good corner house and a good shop and a wall very well built. But that had nothing to do with the case. Defendants could not rely on the fact that they had been that the plaintiff, who had been there for a good many years, should be disturbed in his occupation of the house. One could quite understand that the party wall was a perfectly good party wall, while it was up. The moment the defendants pulled down the house, the plaintiff's position was quite right in trying to protect their client as much as possible. He had no doubt that the plaintiff was damaged more than expected, and

that by what was done he did suffer in his casual trade. Plaintiff made no claim with regard to his general trade. He did not think that the work was carried out in its entirety, as it was intended to be. He came to the conclusion that the partition was not done as it might have been done to protect the plaintiff from injury.

He thought that it was badly done, and did not keep out the dust and damp. He was of opinion that the defendants were liable for some of the loss which the plaintiff had sustained. He considered, however, that the plaintiff's claim was an extravagant one. He could not hold that the plaintiff was entitled to the large sum he claimed for loss of trade, but he believed there was a loss of trade. On the whole he thought the plaintiff was entitled to judgment for 280*l.*, which included the 150*l.* paid into court. That would mean that there would be judgment for the plaintiff for 130*l.* above the 150*l.* paid into court, which amount the plaintiff would take out of court.

Order accordingly.

NUISANCE TO PROPERTY BY NOISE AND VIBRATION.

THE case of *Hawkins v. Nichols* came before Mr. Justice Buckley in the Chancery Division on the 28th and 29th insts., an action by Mr. H. J. Hawkins and his wife against the defendant, Mr. Jas. Nichols, for an injunction restraining the defendant from carrying on the business of a saw-mills in such a way as by reason of the noise and vibration and the violent and disgusting language of the men employed by the defendant or otherwise as to cause a nuisance or injury to the plaintiffs and their property. There was an alternative claim for damages. The defence was a general denial of the allegations of the plaintiffs. Mr. Duke, K.C., Mr. Hamilton, K.C., and Mr. Wainson appeared for the plaintiffs, and Mr. Ruckmaster, K.C., and Mr. Sargent for the defendant.

Mr. Duke, in opening the case, said the plaintiffs resided at Brookside, near Barnes Common, and their premises adjoined the defendant's saw-mills and timber-yard. The action was brought in respect of a nuisance and noise. Plaintiffs were the owners of house-property in Barnes, and they themselves occupied one of these houses. Defendant was a neighbouring owner. At the end of 1900 the defendant set up immediately at the back of the plaintiffs' premises a saw-mills and joinery-yard on a large scale, and had converted residences and houses which were quiet residences into places where now it was impossible to enjoy quiet and comfort. Defendant was the owner of a house called the "Grove," plaintiffs' house was of a rental value of about 100*l.* a year. Plaintiffs were also the owners of the surrounding houses, let at about 40*l.* a year. The neighbourhood was essentially a residential one, and he contended that to establish this factory as the defendant had done would entirely upset the whole character of the district. Mr. Mills occupied an acreage of 24 acres, and was equipped with modern and up-to-date appliances for the business. Defendant had several machines running, and this caused a substantial nuisance as the mills seemed to be constantly in operation. Besides that there was vibration caused by the running of the machinery and the constant hammering of men in the joinery works. Plaintiff also complained of the bad language used by the men. Defendant had offered to erect a wall 14 ft. high to mitigate the nuisance complained of, but it had been found ineffective. Defendant had offered to erect a wall 22 ft. high on plaintiffs' own property, but this offer had been declined.

His lordship said he thought the offer reasonable. Defendants were entitled to have saw-mills and joinery works, but not to cause a nuisance to the neighbourhood. Plaintiffs' only proposition appeared to be to close the works.

Mr. Duke said he was not instructed to ask for anything less than the closing of the mills. His lordship said that that appeared to be too large a proposition.

Evidence was then called in support of plaintiffs' case. After hearing evidence on behalf of the defendant, his lordship, in giving judgment, said the question he had to determine was whether the defendant's acts on his land had been such as to create a legal nuisance. He was not satisfied at all with the evidence given by the plaintiff's witnesses, the evidence being greatly exaggerated. He thought the defendant had acted in a perfectly straightforward and honest way, and that the question for him was to a great extent imagined. The conclusion at which he arrived was that it was not a *bona-fide* action. He thought it was brought for the purpose of compelling the defendant to pay the plaintiff a sum of money. He came to the conclusion that it was a dishonest action, and dismissed it with costs.

THE COMPOSITION OF MORTAR.

MR. BAGGALLAY gave his decision at Greenwich Police Court on Wednesday in the matter of the summonses, issued at the instance of the London County Council, against Messrs. H. & G. Taylor, builders, of Boyne-road, Lewisham, alleging

that they had used in the construction of certain houses mortar not in accordance with the Council's by-laws. The point in which the mortar was said to fail was that it was not composed in the proportions of one part of lime to three parts of other materials.

Mr. Bagallay said he found as fact that the mortar used was in the proportion of one of lime to three of sand or grit if the proportions were measured with slaked lime—that if unslaked lime had been used for the purpose of measurement the proportions would have been about one to five. He also found evidence that many leading builders used slaked lime as the basis of measurement in the composition of mortar, and—a third fact—that this particular mortar was good enough for the purpose for which it was employed. There was a further question however, in regard to the by-law, it having been argued that it was bad, as nobody could understand what it meant. Mr. Macmorran had contended that it must be so clear that anyone looking at it would know what it meant. He said that even if it were good, it did not seem to him an unreasonable construction to put upon it, that the lime should be slaked before measurement. He dismissed the summons with 50s. costs. The case had been taken upon one summons of several, and he deferred his decision upon the others until Mr. Boulton, who appeared for the London County Council, had decided whether he would ask for a case to be stated.

Mr. W. P. Neal, solicitor, was for the defendants.

Patents of the Week.

APPLICATIONS PUBLISHED.*

5,272 of 1905.—W. H. BODIN: *Baths, Lavatory Basins, and Sinks.*

This relates to baths, lavatory basins, and sinks, and consists of runners, forming gutters, at the sides of the bath, and emptying into an outlet pipe at the end of the same, and a cover made in two or more parts shaped so as to drain into the gutter, and adapted to slide under the lavatory basin when the latter has been slid along the bath to the foot end of the same.

5,514 of 1905.—R. ZELLENKA: *A process for Making of Foundations and Bond in Laying Stone Blocks, Bricks, and Masonry.*

This invention relates to a process for making a binding material for foundations, in which broken up stones, clean and sharp sand, pebbles, slag, and the like are mixed with a binding material made from finely ground sulphur or pyrites and ferrous sand, and the mixture heated in a suitable vessel to a temperature of about 150° C.—180° C., whereby the binding material melts to a thin liquid, thus completely filling up interstices between the stones, and the like, covering the same perfectly, and forming of the whole a plastic mass of similar properties to concrete, which mass can be rammed or stamped in moulds or between boards to any shape or form and for any kind of foundation work. After a few minutes the mass sets to a hard structure, which is at once able to stand against heavy pressure.

9,180 of 1905.—W. S. THOMPSON: *Cranes.*

This relates to cranes, and consists in the combination of a slidable clutch on the crank shaft, which has mounted on it a spur pinion of a diameter greater than that of the main spur pinion, with a spur wheel on the barrel shaft of a diameter less than that of the main spur wheel, and a hand lever for actuating said clutch.

9,615 of 1905.—R. DUNCAN: *Coin Freed Locks for Lavatories, Water-closets, and the like.*

This relates to coin freed locks for lavatories, water-closets, and the like, which may be operated by one key when the indicator reads "vacant," and consists in the combination therewith of means whereby the entrance can also be effected by a different or master key when the door is bolted and the indicator reads "engaged."

10,005 of 1905.—J. CALLEE: *Windows.*

This relates to a collapsible ventilating hopper for windows, consisting of a main pivoted part and pivoted side parts articulated to the said main part so that they open and close therewith in a direction about the vertical, so that the edges of the side parts coincide, when the hopper is open.

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

with the edges of the main part, and so that when the hopper is closed the necessary leverage to open the side parts is provided; the construction being such that the main part may be disconnected from the side parts for the purpose of cleaning or removal.

10,367A of 1905.—S. BEAL: *Mixing and Timing Bakes, or apparatus for Water and other Liquids for use in Showers or other Baths, and such like applications.*

This relates to a mixing valve or apparatus provided with a timing cylinder, for the purpose of cutting off the supply after any given interval, following the opening of the valves, even against the will of the bather. A further supply of water can only be passed or obtained after a second or longer period has elapsed following the automatic closing of the valves.

16,388 of 1905.—A. T. LINDENMAN: *Lumber Joining Machines.*

This relates to a machine for joining lumber, and consists of oppositely moving carriers, the section or carriages whereof are provided with normally depressed dogs for pushing the stock, in combination with automatic selecting mechanism for positioning the proper dogs for action, and means for tripping the dogs automatically. The invention further consists of a rotably rotating cutter mounted upon an inclined arbour, said arbour having its bearings located eccentrically in a cylindrical casing capable of a turning adjustment and a spring actuated ejecting device consisting of an arm lying normally in the path of, and positioned for action by the lumber.

11,822 of 1905.—W. E. HIFKINS: *Weightbridges.*

This relates to weightbridges, and consists of a rocker bearing consisting of two U-shaped end pieces connected by a bridge piece, preferably formed in one with the said end pieces, said bridge piece containing or forming the bearing steel of the knife edges of the main levers, the said bridge piece being recessed back to allow the legs or verges of the weightbridge to be supported by the upward projections in the hollows of the U-pieces.

15,014 of 1905.—S. H. ADAMS: *Flushing Arrangements for Water Closet Basins.*

In this invention a ridge or projection is formed at the entry to the trap, which causes the water to leap into the trap, and having passed this ridge or projection, which may go around the closet-pan if desired, the matter will very readily pass through the trap, because there will be an immediate widening of the trap after the ridge has been passed.

25,963 of 1905.—E. BRADBURY: *Spigot and Socket Earthenware Pipe Joints.*

This invention relates to a spigot and socket earthenware pipe joint, and consists in the combination of a notched or recessed annulus in the socket having its back face formed with inclines, a spigot with exterior lugs set back from the end of the spigot, a ring on the end of the spigot, and a ring in the interior of the socket with which it is adapted to engage. The invention further comprises a facing ring on the shoulder of the socket, and a ring on the end of the spigot wide enough to fill up the space between the spigot and the annulus when the joint is made.

8,392 of 1905.—W. P. INGHAM: *Bricks or Blocks for Building, Paving, the Construction of Floors, or other purposes.*

This relates to a brick or block for paving, the construction of floors, or other purposes, having longitudinally inclined planes upon only two opposite sides or ends, or faces thereof, arranged diagonally or in opposite directions so as to cross one another, thus constituting tapered flanges or shoulders adapted when the bricks are placed side by side, end to end, or face to face, to interlock with the next adjacent bricks in the same course or row.

18,242 of 1905.—T. W. ADSHEAD: *Fenders and Curbs for Fireplaces.*

This relates to a dog-ended fender or curb in which the dogs are tied to the base of the article and thereby braced or stiffened by means of a curved or dropper rail, whose extremities are connected to the front of the dog ends, whilst the middle part of the same is attached to the front of the base, and consists in securing the middle of the dropped bracing rail to the front of the curb or fender base by an ornamental connexion.

24,750 of 1905.—A. C. BREWERTON: *Roofing Tiles.*

This invention relates to roofing tiles, and consists in a process of "aging" tiles, so that a new tile shall have the appearance of an old tile. According to the invention the upper surface of the tile whilst still in the state of clay and before baking is sprinkled and scrubbed with sand either by hand and a brush or by machine. In one way of carrying out this invention, the upper surface of the clay as it leaves the mill in the process of the making in the form of a flat band is sprinkled and scrubbed with sand either by hand and a brush or by a machine. The sheet is afterwards cut into tiles and baked in the usual manner. The sand may be contained

in a hopper attached to the mill and be supplied continuously on to the band, and a brush may be continuously reciprocated across the band.

24,969 of 1905.—F. M. H. JONES: *Building Block.*

This relates to a building block having a groove upon the sides and bottom chamfer or recesses within the sides, a projection upon the top of an outline corresponding to the channel upon the bottom, but of such dimension as to leave a space between it and the said projection, which is filled with cement or the like, and channels upon the edges of the block.

17,922 of 1905.—A. H. CORN: *Domestic Fireplaces.*

This relates to an open domestic fireplace, and consists in the combination of a removable heat-resisting frame having a hole or orifices through its sides supporting a back and a removable metallic grid with heat-resisting blocks having a channel or passages through same with a rotatable or slidable metallic shutter fitted to their inlet end, and built or erected upon a heat-resisting base, the upper surface of which is level or nearly level with the flooring of the room.

4,758 of 1905.—D. M. NESBIT: *Steam Heating Systems and Apparatus employed therewith.*

This relates to a heating system including a combined heater and condenser, and consists in the combination of an auxiliary coil in the jacket of the condenser or in a water chamber in connexion therewith, and a thermostatic device, influenced by the heat of the water in the jacket, for automatically controlling the supply of live steam to said coil.

5,765 of 1905.—THE ASSOCIATED PORTLAND CEMENT MANUFACTURERS, LTD., H. K. G. BAMBER and G. R. M. LAYTON: *Manufacture of Portland Cement.*

This relates to the manufacture of Portland cement, and consists in the combination of two rotary kilns, the space intervening between the two being so cased in that the hot gases from the lower pass into the upper, and a mixing or grinding machine for acting on the raw material, between its delivery from the upper and its entry into the lower.

12,133 of 1905.—D. MCINTYRE: *Floors of Buildings.*

This relates to the construction of floors for buildings in which the flooring boards are carried by auxiliary or floating joists placed in between the main joists and supported by metal straps extending over said main joists, the latter being kept under the level of the flooring boards, and cushioned pads being interposed between the straps and the joists.

4,191 of 1905.—A. J. BOULT (M. REICHER): *Process for Manufacturing Hydraulic Binding Substances or Cements.*

This relates to a method of manufacturing binding substances containing water, and is characterised by causing hydrate of lime, in proportions suitable for forming cements, to act on cement-forming oxides or hydroxides or salts in a finely-ground flaky condition in the presence of water in an atmosphere of high pressure, or, if desired, super-heated steam, until the complete or nearly complete opening up of the fine meal takes place.

7,043 of 1905.—K. H. WOLMAN: *Composition Matter for Impregnating Wood.*

This relates to a composition matter for impregnating wood, consisting of such mixed solutions of salts of strong mineral acids and of weak organic acids as are capable of existing together in a solution, the mixture being so composed that when the basic salts are formed no strong mineral acid is liberated. In a modification of the invention ammonium acetate is used instead of the weak organic acid.

20,085A of 1905.—A. G. BAGOT: *Apparatus for Extending or Exhibiting Maps, Charts, Rolled Drawings, or the like.*

This invention comprises a cylindrical casing containing a number of spring rollers constructed preferably of a corresponding number of longitudinal strips pivotally mounted in end plates and normally urged by suitable springs to close on each other and form a continuous envelope or casing. By raising one or other of the strips, the roller of the corresponding map may be withdrawn from or admitted to the casing. The cylinder itself is journaled in the end plates of a protective casing, and this is conveniently done by entering the ends of the cylinder spindles in slots in the end plates and securing them by spring catch hooks. The casing is supported automatically by a rod attached thereto, and stepped in a socket tube which may be fixed to the floor, front, or side of the vehicle by suitable means. The rod is urged upwardly by means of a spring, and the elevation of the casing is controlled and its upward movement checked by a spring trigger or other suitable device. To prevent rotation of the casing about the axis of its support the rod and socket tube may be of a section other than circular, or a transverse pin in the rod may be arranged to move in a longitudinal slot or guide way in the tube.

List of Contracts, etc.

(For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xix.; Auction Sales, xxxii. Certain conditions, beyond those given in the following information, are imposed in some cases, such as; that the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.)

BUILDING AND ENGINEERING.

APRIL 2.—BRADFORD.—ALTERATIONS.—For various works required in sundry alterations to the Bradford Church Institute. Plans may be seen and quantities obtained at 42, Tyne-street, Bradford, until Monday, April 2, when tenders are to be delivered to T. H. & F. Healey, architects.

APRIL 2.—LEEDS.—SHOP PREMISES.—For the whole or any of the several trades, viz., excavator's, bricklayer and mason's, carpenter and joiner's, shopfitter's, plumber and glazier's, painter's, slater's, ironfounder's, and concretor's work required in the erection of block of shop premises at Hyde Park Corner, Leeds, for Mr. Joseph Pickerskill, Names to Messrs. Thomas Winn & Sons, architects, 84, Albion-street, Leeds, on or before April 2, when bills of quantities will be duly forwarded.

APRIL 2.—BELFAST.—WATER TANK.—The enlargement of a cast-iron water tank at Ormeau, near the Gattorna, alternative tenders for the erection of a new tank, for Belfast Baths and Lodging-House Committee. Form of tender, etc., on application at the City Surveyor's Office, Sealed tenders, endorsed "Tender for Storage Tank," to Mr. R. Meyer, chief clerk, by April 3.

APRIL 3.—EDINBURGH.—WALL.—A retaining wall at the Queensberry road, on the estate of Binkbonny, Schedules of quantities and bills of materials, by James City Architect, Public Works Office, City-chambers, Edinburgh. The estimates must be sent by 10 a.m. prompt on Tuesday, April 3, sealed and marked "Tender for Retaining Wall at Queensberry-road."

APRIL 4.—BADMINTON.—RECREATION HALL, SCHOOLS, ETC.—A recreation hall, schools, cottages, etc., at Badminton, Gloucestershire, for the Badminton Estate. Names by April 4, to Mr. Frank W. Will, F.R.I.B.A., 8, St. George-street, Bristol. Bills of quantities supplied upon payment of the sum of 1l.

APRIL 4.—BARNSELY.—HOUSE.—House to receive the chalk-mixing apparatus, etc., for Midhope filter-beds, for the Corp. Form of tender, etc., may be obtained (on payment of two guineas) on application at the office of Mr. J. Henry Taylor, Manor House, 10 Barnsley, and at the offices of Messrs. T. & C. Hawley, Civil Engineers, 30, Great George-street, Westminster, S.W. Tenders must be delivered at the office of the Town Clerk by April 4.

APRIL 4.—CARLETON.—SHELTERS.—Materials and erection upon the Newport Borough Asylum, Carleton, Mon. Estate of four airing court shelters. Plans and specifications may be seen at the Asylum. Tenders, endorsed "Airing Court Shelters," must be delivered, addressed to the Visiting Committee, Newport Borough Asylum, Carleton, Mon., by April 4.

APRIL 4.—INVERARY.—SCHOOL.—Mason, joiner, slater, plumber, plaster, and painter work (either for the whole or separate) of proposed new school in the burg of Inverary, for School Board. Plans and specifications may be seen at the Office of the Clerk, National Bank, Inverary, and copies of the scheduled quantities may be obtained from him on payment of a few shillings. Sealed offers, marked "Tender for New School," to be lodged with Alister Macnabth, Clerk to the Board, Inverary, on or before April 4.

APRIL 4.—PORTLAND.—JUSTICE ROOM.—A justice-room, adjoining the Police-station, at Portland, for the Dorset Standing Joint Committee. Forms of tender, etc., obtained from the County Surveyor, at his office, Wimborne, or at the Bhirre Hall, Dorchester. The sum of two guineas will be charged for the bills of quantities. Tenders, marked "Justice Room, Portland," must be sent to E. Archibald Crooks, Clerk to the Standing Joint Committee, County Council Offices, Sherborne, on or before April 4.

APRIL 4.—STORE.—REPAIRS TO WORKHOUSE.—Repairs to the workhouse buildings, for Stoke-upon-Trent Guardians. Specifications, etc., from Mr. C. Daniel, Clerk to the Guardians, Union Offices, Stoke-upon-Trent. Tenders, marked "Repairs," to be delivered by 9 a.m., on April 4.

APRIL 4.—TATWORTH.—CHURCH.—SCHOOL.—New infants' school at Tatworth, for Somerset County Education Committee. Drawings, specifications, and conditions of contract may be seen at the Chard Tatworth Council School, and bills of quantities and forms of tender obtained from Messrs. Sanson & Cottam, 43, High-street, Bridgwater, on depositing one guinea. Tenders, endorsed "Tatworth Infants' school," must be delivered at the County Education Office, Weston-super-Mare, not later than April 4.

APRIL 4.—WIMBORNE.—ALTERATIONS, ETC., TO WORKHOUSE.—Additions and alterations to the juvenile wards at the Wimborne Workhouse, for the Guardians of the Poor of the Choriton Union. Plans, etc., may be seen, and bills of quantities obtained, at the offices of Messrs. Charles Knapp & Sons, architects, 21, Spring-garden, Manchester, upon payment of 1l. 1s. Sealed tenders to be delivered to David S. Bloomfield, Clerk to the Guardians, at the Union Office, All Saints, Manchester, not later than 12 p.m. on Wednesday, April 4.

APRIL 5.—BATH.—CHURCH.—New U.M.F. church, etc., Shakerspare-avenue, Bath. Plans, etc., on application to Rev. H. Walker Elliott, 28, Devonshire-buildings, Bath, to whom tenders may be obtained, not later than 1 p.m. Thursday, April 5. Quantities obtained from Mr. W. Hughlin Dinsley, architect, Chorley, Lancashire, on deposit of 10s.

APRIL 5.—EDINBURGH.—WALL.—Retaining wall at Western-terrace, Murrayfield, required in the widening of the public road, for the magistrates and council of the City of Edinburgh. Specifications and schedule of the measurement may be obtained from Mr. James Massie, Burgh Engineer, 1, Parliament-square, who will exhibit the plans and give all information. Sealed tenders, endorsed "Tender for Retaining Wall, West-

terrace, Murrayfield," must be lodged with Mr. Thomas Hunter, W.S., Town Clerk, City-chambers, by April 5.

APRIL 5.—POWERTOWN.—CONVERTING.—Converting present premises into three shops at Pontottoy for Mr. M. Morgan, Railway Inn, Pontottoy. Plans and specification can be seen at the office of Mr. T. Boderick, architect, Ashbrook House, Aberdare. Endorsed tenders to be sent in to Mr. Morgan not later than April 5.

APRIL 5.—WOODBRIDGE.—VENTILATION AND ALTERATIONS.—Ventilating and making small alterations to Board Room at Woodbridge, for the Woodbridge Guardians. Plans and specifications of the proposed work may be seen at the office of Messrs. Brown & Burgess, Architects, Arcalet-erect, Ipswich. Tenders, sealed and endorsed "Alterations to Board Room," to be delivered at the Board Room on April 5.

APRIL 6.—CROSTWATE AND TREKLENO.—BRIDGE.—A stone skew bridge, of 30 ft. square span, at an angle of 40°, across the giechlermuckin, in the parishes of Crostwate and Threkelno, within a quarter of a mile of Threkelno Railway Station, C.K. and P. Railway, for the Highways and Bridges Committee of the Cumberland County Council. Sealed tenders may be seen and particulars obtained at the office of Geo. Jos. Bell, M.Inst.C.E., County Surveyor and Bridge Master for Cumberland, The Courts, Carlisle. Sealed tenders, endorsed "Towald Bridge," addressed to the Chairman of the Highways and Bridges Committee, must be delivered by April 6.

APRIL 6.—EAST GRINSTEAD.—REPAIRS, ETC.—New works and repairs, decontaminating in connection with Wesleyan Church, East Grinstead, for the Trustees. Specification and further particulars may be obtained on application to Mr. H. Criswell, 57, Queens-road, East Grinstead. Tenders, endorsed "Tender for Painting," to be sent to Rev. J. G. Gill, "York House," East Grinstead, not later than 10 o'clock, April 6.

APRIL 6.—NARBOROUGH, ETC.—BRIDGES.—A brick and concrete bridge, 20 ft. span, over the River Soar, near Narborough ugh, and a similar bridge, 20 ft. span, over stream at Little Bowden, near Market Harborough, for the Highway Committee of the Leicestershire County Council. Forms, etc., from the County Engineer, Mr. S. Perkins Pick, 6, Millstone-lane, Leicester, on payment of the sum of one guinea (1l. 1s.) for the quantities of each bridge. Tenders, marked "Mr. George Rowlat, Clerk to the Highway Committee, 10, George-street, Leicester, not later than 10 o'clock in the forenoon of Friday, April 6, endorsed (a) Tender for Enderby Mill Bridge," (b) "Tender for Little Bowden Bridge."

APRIL 7.—BRADFORD.—ALTERATIONS.—Alterations and renovations to the Old Dolphin Wesleyan Chapel, Clayton Heights, near Bradford. Plans, etc., may be seen and quantities obtained at the office of Mr. Sam Spencer, architect, Old Bank-chambers, Gt. Horton, Bradford, from Monday, April 2, to Saturday, April 7.

APRIL 7.—RUSWARY.—HOUSES.—For erection of a pair of semi-detached houses to be built at Ruswary, Whitby, for Mr. H. B. Bell. Plans, etc., at the office of Mr. Edward H. Smiles, A.R.I.B.A., architect, 5, Flower-gate, Whitby. Tenders to be sent in by noon on April 7.

APRIL 9.—DARTFORD.—POLICE STATION.—The enlargement of the existing police station at Dartford, ordered by the Standing Joint Committee, form, etc., on deposit of 2l. at the office of the County Architect, 18, West-street, Maidstone. Tenders, endorsed "Dartford Police Station," are to be delivered to Mr. Charles Turner, Clerk, Sessions House, Maidstone, not later than April 9.

APRIL 9.—KINGSTON.—PREMISES AND WORKSHOP.—For pulling down old premises and erection of new premises and workshops for Messrs. Knapp, Drevett, & Sons, Ltd., of Kingston-on-Thames: (a) New premises for the Surrey Comet offices, at No. 20, Clarence-street, Kingston-on-Thames; (b) new workshops on land at rear of No. 18, Church-street, Kingston-on-Thames (adjoining above-named premises). Information by Mr. William H. Hope, C.E., architect and surveyor, of Hampton Wick, Middlesex. The plans may be seen and copies of specification and quantities obtained on application to the Secretary, Messrs. Knapp, Drevett, & Sons, Ltd., 20, Clarence-street, Kingston-on-Thames. A deposit of two guineas for these particulars is required by the company. Sealed tenders to be delivered to the Secretary not later than April 9.

APRIL 9.—LEEDS.—URINALS.—The erection of a range of urinals in Burmaholts-street; additional entrance to urinals at Victoria Cattle Market. Particulars may be obtained at the City Engineer's office, Municipal-buildings, Leeds. Tenders delivered at Mr. Clark's office, not later than 10 a.m. on Monday, April 9.

APRIL 9.—LOCKERHEE.—ROOF.—The steel and iron work required in the renewal of roof over Dummies Dock Lines at Lockerbie Station, for the Caledonian Railway Company. Drawings, etc., at the office of the Company's District Engineer, Princes-street Station, Edinburgh, on payment of two guineas. Tenders, endorsed "Tender for steel and iron work required in the renewal of the Roof over Dummies Dock Lines, Lockerbie Station," to be lodged with Mr. J. Blackburn, Secretary, Caledonian Railway Company's Office, 302, Buchanan-street, Glasgow, on or before April 9.

APRIL 9.—PENDLETON.—STORE-ROOMS AND PUMP-HOUSE.—Store-rooms and pump-house at the electricity station, Frederick-road, Pendleton. Forms, etc., at the Borough Engineer's Office, Town Hall, Salford. Tenders, endorsed "Store-rooms, Electricity Station," addressed to the Chairman of the Electricity Committee, must be delivered to Mr. C. Evans, Town Clerk, Town Hall, Salford, by 5 p.m., Monday, April 9.

APRIL 9.—STONE.—FENCING, SHEDS, ETC.—Wood or canvas and wood-fencing; also shedding, with loose-boxes or partitions for stock and implement; also a grand stand, etc., in the showyard at Stone, on July 18

and 19 next, for the Staffordshire Agricultural Society's General Committee. Forms, etc., from the Secretary, J. F. Jones, and all tenders must be sent to the Secretary, Newcastle, Staffordshire, not later than April 9.

APRIL 10.—ISLEWORTH.—IRON STAIRCASE.—Supply and erection of an iron escape staircase to be fixed at Percy House, Mill Hill, Islington, for the Bradford Guardians. Plans, etc., may be seen at Union Offices, Isleworth, W.

APRIL 10.—KENSINGTON.—DEMOLITION OF EXISTING HOUSES AND ERECTION OF WORKING MEN'S FLATS AT NOTTINGDALE.—For the Council of Royal Borough of Kensington. Specification and drawings of Town Clerk, Town Hall, Kensington High-street, W. Deposit of 3l. 3s. will be required (payable to Borough Treasurer at Town Hall), to be returned conditionally. Tenders, sealed and endorsed "Tenders for Working Men's Flats," to be sent in to the Council, not later than April 10.

APRIL 10.—SOUTH SHIELDS.—SCHOOL.—A public elementary school, situated in Dean-road, South Shields, for the Education Authority. Forward names to Mr. J. W. Allen, R.F.S., 10, South Shields, on or before April 10. Sealed tenders, together with a deposit of 3l. 3s. Forms of tender and bills of quantities prepared by Messrs. J. P. Allen & Partners, of Newcastle-upon-Tyne. Plans can be seen at the offices of the architect, Sealed tenders, endorsed "Tender for Dean-road School," must be addressed to the Secretary, Education Office, Gean-road, South Shields, and delivered not later than 4 p.m. on Tuesday, April 10.

APRIL 11.—EXETER.—ELECTRIC TRAMWAYS.—Contract No. 6A, for the construction of two additional bays at the end of Festivity-road; contract No. 7, for the construction of permanent way and paving (including bonding) of about five-eighths of a mile of route length line (with line), with passing places, for the Corp. Forms, etc., at the office of Mr. Thomas Moulden, City Engineer and Surveyor, Municipal Offices, Southwestern Street, Exeter, on payment of a deposit of one guinea for each set. Sealed tenders, endorsed "Contract No. 6A and No. 7," must be received at the office of Mr. H. Lloyd Parry, Town Clerk, No. 4 Southwestern Street, Exeter, by April 11.

APRIL 11.—FELHAM.—New wing to Almshouses, Fulham Palace-road, S.W., for the trustees of the Fulham Waste Lands and Lygon Almshouses Charity. Bills of quantities, prepared by Mr. T. Woodbridge Biggs, 10, Clifford's Lane, E.C. may be obtained on or after April 3 from Mr. Cole, Town Hall, Fulham, S.W., on payment of deposit of 5l. Bills of quantities to be returned, with the tender, to the last-mentioned before 6 p.m., April 11.

APRIL 12.—ANTRIM.—COTTAGES.—Labourers' cottages in the Rural District, for Antrim, R.D.C., in accordance with plans and specifications, which can be seen at the office of the Clerk of the Council, or at the Office of the Architect, Mr. W. D. B. Taggart, Scottish Provident Buildings, 10, South Street, Antrim. Two cottages at Toward, Antrim, on the lands of Dr. Gawn. Two cottages at Toward, Antrim, on the lands of Mrs. Young. One cottage at Islandhawn, Muckamore, on the lands of John Curran. One cottage at Ballinacorney, on the lands of Mr. Wm. Houston. One cottage at Ballymore, Muckamore, on the lands of Scott Gilliland. One cottage at Lillyfield, Handstown, on the lands of John Fultou. One cottage at Antrim, on the lands of B. G'Boyle. One cottage at Portlee, Toomebridge, on the lands of Mrs. McCann. One cottage at Antrim, Toomebridge, on the lands of John O'Boyle. Two cottages at Ballymullan, Toomebridge, on the lands of Felix Lavery. One cottage at Tannaderry, Randalstown, on the lands of James Gilber. Four cottages at Cranfield, Randalstown, on the lands of James Charlton. Two cottages at Cranfield, Randalstown, on the lands of Bernard O'Keane. One cottage at Cranfield, Randalstown, on the lands of Mrs. Hume. Two cottages at Ballydoonagh, Crumlin, on the lands of John Nelson. Two cottages at Feebooge, Randalstown, on the lands of Lord O'Neill. Four cottages at Ballydoonagh, Crumlin, on the lands of Lord O'Neill. One cottage at Ballybooye, Randalstown, on the lands of G. L. Young. Two cottages at Craignure, Randalstown, on the lands of J. H. Mulligan. Two cottages at Ballymacshoye, Crumlin, on the lands of W. S. Thompson. Persons tendering may do so for any or all of the different blocks, but they must name the particular site or sites on their tender. Tenders to be lodged with Mr. J. Clerk, Clerk of Council, Union Office, Antrim, by the 12th April.

APRIL 14.—LANARK.—RAINFORTH AND CASTLEFORD.—SCHOOLS.—For all or any of the trades in connexion with the following schools should send in names to J. Flockers-Edwards, County Architect, County Hall, Wakefield, before April 14:—New school at Sandal, Wakefield—builder, joiner, slater, plasterer, plumber, ironfounder, and smith, painter; Stanforth (Thorpe) Primary School, new cloak-room, etc.—builder, joiner, plumber, painter, cast-iron, and wood-lane; Provided School, alterations, repairs, etc.—builder, joiner, plumber, plasterer, slater. A deposit of 1l. is required for each school.

APRIL 18.—SANDY.—NEW COUNCIL SCHOOL AT SANDY FOR THE BEDFORDSHIRE C.C.—Drawings, specifications, and form of contract may be seen at the offices of the architect, Messrs. G. B. Saunders, Bank-chambers, Kettering, and names should be sent to them by April 7, with a deposit of one guinea. Sealed tenders, endorsed "Tender for Sandy Primary School," to be sent by April 18 to Mr. W. W. Mark, Town Clerk, 10, Wilton-lane.

APRIL 10.—MERTON, SURREY.—FOUR SHOPS.—Plans and specifications of H. R. G. S. Smallman, 8, Queen-street, E.C. 4. Tenders opened at 12 noon, April 19.

APRIL 20.—NEAR FOLKSTONE.—ENLARGEMENT TO THE HAWKING COUNCIL SCHOOL, NEAR FOLKSTONE, FOR THE KENT EDUCATION COMMITTEE.—Drawings and

specifications may be seen at the office of the Architect, Mr. Andrew Bromley, Radnor-chambers, Folkestone, to whom the names of those wishing to be tenderers to be with Mr. Logan, Town Clerk, Wishaw, not later than April 7.

APRIL 20.—SOUTHWAM, HALIFAX.—LIGHT RAILWAY.—For a single line railway, about four miles and a quarter in length, from Holmfield Station to Southwam, in the borough of Halifax, in the West Riding of the County of York, together with certain station works connected therewith, for Holmfield and Southwam Light Railway. Specification, etc., from Messrs. Land & Foster, Solicitors, 13, Ward's End, Halifax, and tenders must be sent into the office of the architect, Mr. W. T. G. Atkinson, Town Clerk, Southwam, on or before April 20, at 3 o'clock p.m.

APRIL 20.—TONBRIDGE.—NEW COUNCIL SCHOOL AT TONBRIDGE, KENT, FOR THE KENT EDUCATION COMMITTEE.—Drawings and specifications may be seen at the office of the architect, Mr. C. H. Strangé, 20, Dudley-road, Tonbridge Wells. Names to be sent to above, with 12 deposit, by noon, April 5. Tenders, on form supplied, to be delivered to Mr. N. R. Stone, 23, Church-road, Tonbridge Wells, by noon, April 20.

APRIL 21.—MOLD.—ALTERATIONS TO SCHOOLS.—Alterations and extensions to the County School, Mold, Flintshire, North Wales, for the Governors. Plans and specifications may be seen at the office of the architect, Messrs. C. G. & T. Evans, 13, The Quadrant, Mold, and from whom bills of quantities may be obtained on payment of a sum of 2s. Tenders to be sent in to Mr. R. Howarth Evans, Solicitor, Mold, Clerk to the Governors, not later than April 21.

APRIL 23.—COVENTRY.—NURSE'S HOME.—For the Coventry and Warwickshire Hospital. Plans, specifications, etc., of Herbert W. Chattaway, Trinity-churchyard, Coventry, may be seen at the office of the architect, Mr. J. C. W. P. & T. Evans, 13, The Quadrant, Coventry, on or before April 23. Tenders, sealed and endorsed "Nurse's Home," to be sent to Mr. E. A. Crisp, Coventry and Warwickshire Hospital, Stoney Stanton-road, Coventry, not later than April 23, at 3 o'clock p.m.

APRIL 23.—LITTLEHAMPTON.—BRIDGE, ETC.—A steel bridge over the River Arun, to consist of a swing span and a fixed span, also for approaches and abutments. Tenders may be sent to the Engineer, Mr. T. G. G. & T. Evans, 13, The Quadrant, Coventry, on or before April 23. Tenders, sealed and endorsed "Bridge," or "Tender for Approaches," and must be delivered to Mr. Arthur Shelley, Clerk, Town Offices, Littlehampton, not later than 9 a.m. on Monday, April 23. For a scale of tenders, see form from firms who have erected similar bridges will be considered, on a deposit of 6s. Forms of tender, etc., may be obtained on application to the Engineer, Mr. T. G. G. & T. Evans, 13, The Quadrant, Coventry, on or before April 23, at 3 o'clock p.m.

APRIL 24.—BOSTON.—NEW POST OFFICE AT BOSTON. For the Commissioners of H.M. Works and Public Buildings. Drawings, specifications, and forms of contract may be seen on application to the Postmaster between 11 and 4. Bills of quantities and forms of tender in unalterable address on payment of one guinea, which will be returned conditionally. Tenders, before noon April 24, addressed Secretary, H.M. Office of Works, Storey's Gate, S.W.

APRIL 24.—WALTHAMSTOW.—Tenders desired for proposed Epping-road Council School. Names to be sent to Mr. H. Prosser, Education Committee Offices, High-street, Walthamstow. A 5s. note must be sent with application as deposit for bills of quantities to be obtained on payment of one guinea. Tenders, sealed and endorsed "Epping-road School," not later than 4 p.m. April 24, addressed to Mr. T. W. Liddiard, Secretary to Committee, High-street, Walthamstow.

MAY 5.—ST. PETER-PORF, GUERNSEY.—NEW QUAY.—A new quay wall, with low-level landing on the southern side of St. Julians' Emplacement, Harbour of St. Peter-Porf, Guernsey, for Harbour Commission. Forms of tender, etc., from J. H. Duquenne, States Engineer, States Office, St. Peter-Porf, Guernsey, may be seen at the office of the architect, Messrs. G. & T. Evans, 13, The Quadrant, Coventry, on or before Saturday, May 5, at 3 o'clock p.m.

ARNOLD, BARNARD CASTLE.—SHOPS AND BUSINESS PREMISES.—Shops and business premises at Barnard Castle, the Co-operative Society. Send names to T. Farrow, Architect, 7, Market-place, Barnard Castle.

—BARNFORD.—Enlargement of Mawneys-road Schools, for the Essex O.C. Education Committee. Names to the architects, Messrs. Harrington & Levy, 65, Bishopsgate-street Without, E.C.4, with depositors' receipts, on or before April 3.

POOL (Dorset).—COBN STORE (Principally Steel Construction and Galvanized Iron).—Drawings, specification, and conditions of contract may be seen, and bills of quantities obtained, on payment of one guinea, to be returned conditionally. Tenders to Fred Bath, architect, Crown-chambers, Salisbury.

IRON AND STEEL.

APRIL 4.—GREAT YARMOUTH.—WATER SOFTENING PLANT, ETC.—Contract No. 1, a water softening plant; Contract No. 2, a water softening pump. Specification and all particulars may be obtained on application to Mr. W. J. Carpenter, A.M.I.C.E., South Dons-road, Great Yarmouth, on deposit of 10s. Tenders, sealed and endorsed "Water Softening Plant," to be sent to the Clerk, Great Yarmouth Board of Guardians, Queen-street, Great Yarmouth, and must be received by April 4, at 3 o'clock p.m.

APRIL 4.—SUNDERLAND.—PIPES.—Steam Exhaust and other pipes in connexion with the extension of Hyton-road Electricity Station. Specification and form of contract may be seen at the office of the architect, Messrs. J. P. & T. Evans, 13, The Quadrant, Sunderland, and on payment of a deposit of 1s. which will be returned on receipt of a bona-fide tender. Sealed tenders, addressed to the Chairman of the Electricity and Lighting Committee, Town Hall, Sunderland, by 12 o'clock noon, on the 4th day of April, endorsed "Steam Exhaust and other Pipes," to Frax, M. Bowey, Town Clerk, Town Hall, Sunderland, on or before April 4, at 3 o'clock p.m.

APRIL 7.—WISHAW.—GAS PIPES, ETC.—For 870 tons, or thereby, of 12-in. cast-iron gas pipes, with the necessary special drip boxes and valves. The Town Council are also prepared to receive tenders for the cutting and fitting of the track for the laying of the above pipes.

Plans of the proposed pipe track can be seen, and forms of tender can be obtained, on application to Mr. P. B. Wilson, Town Clerk, Wishaw, on or before April 7.

APRIL 16.—BELFAST.—PLANT, ETC.—Coal and ash-conveying plant, bunkers and chain grate mechanical stokers, for the Tramways and Electricity Committee of the Belfast Corp. Specification, with form of contract, may be obtained from Mr. Victor A. H. McGowan City Electrical Engineer, Belfast, on payment of two guineas, which will be returned provided a bona-fide tender has been sent and not withdrawn. Sealed tenders, endorsed "Conveying Plant," shall be lodged with Sir Samuel Black, Town Hall, Belfast, not later than eleven a.m. on Monday, April 16.

LIGHTING, HEATING, ETC.

APRIL 6.—GREENOCK.—ELECTRIC LIGHTING, ETC.—The Hospital Board invite tenders for (1) electric lighting, (2) electric lift, (3) telephones and electric bells for new Continuation Hospital, presently in course of erection at Gateside, Inverclyde, Greenock, according to plans and specifications by John Dixon, A.M.I.M.E.E., Consulting Engineer. Schedule of quantities and form of tender from Colin MacCallum, Clerk to the Board, Municipal-buildings, Greenock, on payment of a deposit of one guinea for each schedule, which amount will be returned on receipt of a bona-fide tender. Sealed tenders to be at Town Clerk's office, Greenock, by 11 a.m., April 6.

MISCELLANEOUS.

APRIL 3.—BANDRY.—REPAIRS TO CEMETERY.—The Town Council invite tenders for sundry repairs at the cemetery. Specifications of work can be seen at the office of Mr. H. Dawson, C.E., Borough Surveyor, on and after Saturday, March 24. Sealed tenders, endorsed "Cemetery Repairs," to be delivered not later than noon, April 3.

APRIL 4.—EDINBURGH.—PANEL.—Tenders, from bronze founders only, for producing and fixing a memorial panel on the north frontage of the City Chambers Building. Specifications on receipt of crossed cheque for 11.1s., which will be returned on receipt of a bona-fide tender. Tenders to R. Morham, City Architect, Public Works Office, Edinburgh, by April 4, sealed and marked "Tender for Bronze Panel, City Chambers."

APRIL 5.—EDINBURGH.—FENCING, ETC.—Estimates are wanted for (1) wrought-iron fencing, (2) rustic staircase, (3) public gymnasium at Redbraes and Roseburg Public Parks. Estimates must be sent to Mr. R. Morham, City Architect, Public Works Office, Edinburgh, on April 5, sealed and marked "Tender for 1, 2, or 3," as above, as the case may be.

APRIL 7.—DEWSBURY.—DISINFECTANTS.—The supply, in such quantities as may be required during the ensuing twelve months, of ten tons of disinfecting powder, and a quantity of disinfecting fluid, for the Corp. Tenders must specify the base and nature of the disinfectant, the price per ton of the powder, and the price per gallon for 40-gallon casks, and price per gallon of 8-oz. bottles for fluid. Tenders, under sealed cover, endorsed "Disinfectants," to be to April 7, Mr. H. Ellis, Town Clerk, Town Hall, Dewsbury.

APRIL 10.—WIMBORDON.—FIRE HYDRANTS.—Fire hydrants for a period of two years, the minimum quantity required being fifty, for the Corporation. Conditions, etc., from C. H. Cooper, Borough Engineer, Town Hall, The Broadway, Wimborne, Dorset. Tenders, sealed and endorsed "Fire Hydrants," addressed to Chairman of Watch Committee, not later than April 10.

APRIL 11.—WIMBORDON.—WATER VAUS.—Two water vases for the Corporation, to be supplied by C. H. Cooper, Borough Engineer, Town Hall, Wimborne. Tenders, endorsed "Tender for Water Vaus," addressed to Chairman of Highways Committee, by April 11.

APRIL 21.—BARMING HEARTH (EXCISE) FURNITURE AND EQUIPMENT FOR THE NEW PATIENTS' BLOCKS AT THE KENT COUNTY LUNATIC ASYLUM, BARMING HEATH, NEAR MAIDSTONE.—Drawings, specifications, and schedule may be seen at the office of the architect, Messrs. G. & T. Evans, 13, The Quadrant, Coventry, on or before Saturday, April 21, at 3 o'clock p.m. Tenders, sealed and endorsed "Furniture and Equipment for the Kent County Lunatic Asylum Committee, 9, King-street, Maidstone."

MORRISTON.—PIT SINKING.—Sinking the Copper Pit, Morrision, near Swansea, from the 6 ft. vein down to the 2 ft. vein, a depth of about 60 yds, 12 ft. diameter in the clear. Forms, etc., from Mr. D. W. A. Saunders, Civil and Mining Engineer, Worcester-chambers, Swansea.

PAINTING.

APRIL 9.—HALIFAX.—PAINTING.—Outside painting of Council schools, for Halifax Education Committee. Specifications and forms of tender may be obtained on application to Mr. James Lord, C.E., Borough Engineer, Town Hall, Halifax. Tenders, endorsed "Painting Council Schools," must be sent to Mr. W. H. Ostler, Secretary, on or before April 9.

APRIL 12.—LONDON, S.E.—Cleaning and painting work at Newton Warehouse, Westmoreland-road, Walworth, for Guardians of Southwark Union. Specification can be seen at the office of Master of Workhouse, as above. Tenders, endorsed "Cleaning and Painting Work," to Clerk, Union Offices, John-street West, Blackfriars-road, S.E., by 4 p.m., April 12.

APRIL 15.—DUBLIN.—PAINTING.—Painting, decorating and repairs to Gurten Church and Presbytery, for the Rev. J. O'Connor, Bric, City. Specification at office of Messrs. William H. Byrne & Son, Architects, 20, Suffolk-street, Dublin. Tenders by April 15.

ROADS, SANITARY, AND WATER WORKS.

APRIL 2.—BEARFORD.—TAR PAVING.—Tar paving a number of school playgrounds for Bedford Education Committee. Forms of tender, etc., from the Architect's Department, Manor-row, Tenders, endorsed "Tenders for Tar Paving," to The Garbutt, Secretary, Education Office, Manor-row, Bedford, by April 2.

APRIL 3.—BROSELEY.—SEWER.—A new 9-in. and 6-in. sewer at Broseley, Salop. Plans, etc., may be seen by appointment at the office of the Borough Surveyor, Municipal Office, Iron Bridge, Salop. Sealed tenders, endorsed "Broseley Sewer," must reach F. H. Potts, Town Clerk's Office, Much Wenlock, Salop, by April 3.

APRIL 4.—LEIGH.—PAVING.—Paving, with cement concrete, of part of Jameson-place, for Leigh Town Council. Plans and specifications of works may be seen, and information obtained, at the Borough Surveyor's office, Charlotte-street. Tenders, marked "Paving," to be lodged with Mr. T. B. Lising, Town Clerk, Town Clerk's Office, Leigh, by April 4.

APRIL 5.—LEEDS.—PAVING, ETC.—Paving and flagging of the following streets:—Hamilton-terrace, Back Hillcrest-avenue, Hillcrest-avenue, Tempest-road, Mand-pole, Back Burlington-road, Colenso-mount, Back Colenso-mount, Cleveleys-mount, Cleveleys-terrace, Cleveleys-terrace, and Cleveleys-avenue, for Leeds Highways Department. Plans and specifications may be seen at the City Engineer's office, Municipal-buildings. Tenders, on forms supplied, must be sent to the Town Clerk's office, Town Hall, on or before April 5, addressed to the Highways Committee, and endorsed "Tender for Private Street Works."

APRIL 6.—HITCHAM.—WATER SUPPLY.—Digging the trench and laying about 1,950 yds. of cast-iron water main, 3 in. diameter, with valves and hydrants; also for the construction of a small concrete reservoir at Hitcham, the construction of a small concrete reservoir at Hitcham, the provision will be included in the contract. Plans can be seen and copies of specification obtained on deposit of 10s. at the office of Mr. Alfred Newman, Clerk, Hadleigh, Suffolk, to whom tenders are to be sent by 10 a.m. on April 6, or on application to Mr. Henry Miller, Engineer, 16, Museum-street, Ipswich.

APRIL 6.—LYNNE, STANFORD, ETC.—WATER MAINS.—Laying an footage of water mains in the parishes of Lynning, Stanford, and Saitwood, for the Elham Valley Water Company, Ltd. Forms of tender, etc., may be obtained on application to the Manager to the Director of the Company at Lynning, Kent. Tenders, endorsed "Tender for Laying Mains," to be sent to Mr. H. H. Elliott, Secretary, 7, Victoria-street, Westminster, S.W., on or before Friday, April 6.

APRIL 7.—CONGLTON.—SEWER.—Main sewer, 2 1/2 in. diam., 390 yds. in length. Labour, etc., in laying 2,400 yds. of water-main. Forms, etc., from Mr. Rankie Burslan, Borough Surveyor. Tenders to be sent to the office of the Town Clerk, endorsed "Tender for Sewer or Water-main," addressed to Edw. A. Plant, Esq., Town Clerk, by April 7.

APRIL 9.—BABDY AND FLORRY.—WATER SUPPLY AND SEWERAGE.—The R.D.C. of Deventry invite tenders for Babdy water supply. To lay cast-iron mains, construct reservoir and collecting well, and to erect a wind motor, and flow sewerage, to construct small outfall. Forms of tenders, etc., from the Engineer to the Council, Mr. J. B. Williams, Moot Hall, Deventry, upon the payment of 2s. for each. Sealed tenders, endorsed "Babdy Water Supply" or "Flow Sewerage," may be sent to J. D. Sparling, Clerk of the Council, The Moot Hall, Deventry, not later than April 9.

APRIL 9.—SANDAL MAGNA.—STREET WORKS.—Works in Grosvenor-street, Lord-street, Back Montague-street, Montague-street, Back Bowman-street, Bowman-street, Back Gordon-street, and Gordon-street, being streets of the Abingdon-road within the Sandal Magna U.D.C.'s area. Forms, etc., at the office of Mr. Frank Messie, M.Inst.C.E., Terley House, Kirkgate, Wakefield. Tenders, endorsed "Tender for Street Works," to be delivered to A. E. Greaves, Clerk to the said Council, Wood-street, Wakefield, not later than April 9.

APRIL 9.—SEVENOAKS.—ROAD WORKS.—Leveling, metalling, kerbing, tar-paving, footpaths, channeling, and making good of The Drive, Sevenoaks, for the U.D.C. Forms of tender, etc., obtained at the office of Mr. S. Towison, A.M.I.C.E., Surveyor for the Council. Prices payment of a cash deposit of 5s. Tenders, endorsed "Tender for Street Works," to Herbert J. Thompson, Clerk to the Council, Urban Council Offices, Argyle-road, Sevenoaks, by April 9.

APRIL 10.—BADMEN.—UPKEEP OF ROADS AND BRIDGES.—For a period of three years from Whitsunday (1) Abernethy No. 1, extent 261 miles (or thereby); (2) Abernethy No. 2, extent 211 miles (or thereby); (3) Dalwhinnie, extent 29 miles (or thereby); (4) Laggan, extent 33 miles (or thereby). For Badmoch District Council. Specification and schedule of quantities required annually may be had from Mr. John Macmillan, District Council Surveyor, County-buildings, Kinross. Offers to be lodged with John Grant, Esq., District Clerk, Grantown-on-Spey, on or before Tuesday, April 10. The lowest or any other may not be accepted.

APRIL 10.—LOUGHBOROUGH.—SHEPHERD WATER SUPPLY.—About 1,200 yds. of 6-in., 2,300 yds. of 4-in., and 3,500 yds. of 3-in. cast-iron mains, valves, and other fittings; together with building valve and other chambers, for supply of water to Shepherds, for the Water Committee of the Loughborough Corp. Forms, etc., from the Engineer, Mr. A. H. Walker, Assoc.M.Inst.C.E., Town Hall, Loughborough. Sealed tenders, addressed to the Chairman of the Water Committee, Town Hall, Loughborough, are to be delivered not later than 5 p.m. on Tuesday, April 10, endorsed "Tender for Shepherd Mains."

APRIL 10.—WALTON-ON-THAMES.—SEWERAGE WORKS.—Construction of 270 yds. of 8-in. cast iron pipe sewer, together with manholes and house connections, in Russell-road, Walton-on-Thames, for the U.D.C. Specifications, etc., at the Council offices, Walton-on-Thames, on or before Saturday, April 10. Sealed tenders, endorsed "Russell-road Sewerage," to be delivered to Mr. R. Wilds, Engineer and Surveyor, Council offices, Walton-on-Thames, by April 10.

APRIL 11.—PORTBALINTRADE AND BUSHFORD.—WATERWORKS.—For Portbalintrade and Bushford waterworks, for Hallymown R.D.C. Plans, quantities, etc., may be seen at the office of Mr. McCormick, Esq., District Engineer, Culmoran, from whom form of tender may be obtained on payment of 2s. 2s. Proposals, endorsed "Tender for Portbalintrade Waterworks," to be in the hands of the Clerk of the R.D.C. by April 11.

APRIL 14.—DONAGHADEE.—WATER AND SEWERAGE SCHEME.—The U.D.C. invite tenders to take levels, prepare plans, specifications, and estimates for a proper water and sewerage scheme for the town of Donaghadee. Applicants to state whether they have ever carried out similar work. If so, to give particulars, and enclose copy of any testimonials they may have. Tenders, sealed and endorsed "Engineer," will be received by D. Walker, Clerk to the Council, till April 14.

APRIL 14.—LEITH.—CAUSEWAYING.—Laying causeway required on the Quays of the Harbour and Docks, for the Commissioners for the Harbour and Docks of Leith. Particulars on application at the office of the Superintendent, Tower-Place, Leith. Tenders to be lodged with Victor A. Noel Paton, W.S., Clerk to the Commissioners, by April 14.

APRIL 14.—PORTSMOUTH.—SEWERS.—For the construction of sewers, manholes, etc., and all accessories in Tangier-road and through Bull's Estate into Milbrook-road, and thence to Bran-bury-road, at Eastney, in the said Borough. On payment of the sum of 5*l.*, a lithographed copy of the specification, general conditions, and bill of quantities, with form of tender, can be obtained on application to Alexander Hellard, Town Clerk, Town Hall, Portsmouth. Tenders, marked "Tender for Tangier-road Sewer," must be sent to the Town Clerk not later than 10 a.m. on Saturday, April 14.

APRIL 18.—BOURNEVILLE.—ROADS.—For making-up Firs Glen-road, Winton, A.A. (about 460 ft. long); Firs Glen-road, Winton, B.B. (about 370 ft. long); road near Parade, Boscombe (about 250 ft. long). For the Corporation. Forms, etc., from Borough Engineer, F. W. Lacey, Municipal Offices, Bournemouth. Deposit of 1*l.* is required. Tenders to Town Clerk, G. W. Bailey, by April 18.

APRIL 18.—ST. BREWARD.—LAYING, ETC., PIPES.—Tranching and laying of 9-in. diameter cast-iron and stoneware pipes from Stannon to near Wenford Bridge, in the parish of St. Brevard, a distance of over five miles, and other works, at the direction of the North Cornwall China Clay Co., Ltd. Plans and specification may be seen at the office of Mr. T. H. Andrew, engineer, Market Hill, St. Austell, and at the office of the Borough Engineer, who will be received by him not later than April 18.

APRIL 19.—CHARLESTOWN.—SEWERAGE.—St. Austell R.D.C. invite tenders for the following works in connexion with the sewerage and sewage disposal of the districts of Charlestown, and the parishes of the North districts of 2,317 yds. run of 6-in. stoneware pipe sewer, 4,522 yds. run of 9-in. stoneware pipe sewers, 120 yds. run of 12-in. stoneware pipe sewer, 140 yds. run of 8-in. cast-iron pipe sewer, together with manholes and other works, the construction of storage culvert, with cast-iron pipe outlet to low water. The whole to be let in one contract. Drawings and specification may be seen at the offices of the Engineers, Messrs. Beesley, Son, & Nichols, M.M.C.E., of 11, Victoria-street, Westminster, S.W., where forms, to be obtained on deposit of 5*s.* Tenders, addressed to Mr. John Stephens, Clerk to the St. Austell R.D.C., St. Austell, and endorsed "Sewerage and Sewage Disposal," are to be delivered at his offices, at St. Austell, before 10 a.m., April 19.

APRIL 19.—YSTRADYFODWG.—TUNNEL.—Driving a tunnel (mining only) 2,100 yds., or thereabouts in length, through the Blaenrhonda Mountain, sinking shafts, and constructing works in connexion therewith, in the parish of Ystradyfodwg, in the county of Glamorgan, for the Rhonda U.D.C. Forms of tender, etc., upon application to Mr. J. E. Hughes, M.Inst.C.E., Engineer, at his office, Fynevied, Trehafod, near Llan-zan, upon depositing the sum of 5*l.* An assistant-engineer will accompany intending contractors along the site of the works on Wednesday, April 19, at 11, starting from the Engineer's office at Fynevied at 11 o'clock a.m. Sealed tenders, addressed to the Chairman of the Gas and Water Committee, endorsed "Tender for Tunnel," must be delivered to the Council Office, Centre, Glam., not later than 10 a.m. on Thursday, April 19.

STONE, MATERIALS, AND STORES.

APRIL 3.—CAERPHILLY.—LIMESTONE.—Limestone for the various portions of district of the U.D.C. for the year ending March 31, 1907. Specification can be seen and forms of tender obtained at the Council Offices, Caerphilly. Sealed tenders, endorsed "Tender for Limestone," to be addressed to the Chairman of the Council, and delivered not later than Tuesday morning, April 3.

APRIL 3.—HAMMERSMITH.—PAVING.—Certain paving work to be carried out at the workhouse and infirmary at Ducane-road, Wormwood Scrubs, W., for the Guardians. Specification from Mr. J. Lamb, Clerk to the Guardians, Guardians' Offices, 206, Goldhawk-road, Shepherd's Bush, W., and tenders, endorsed "Tender for Paving," not later than 4 o'clock in the afternoon of April 3.

APRIL 3.—HENLEY.—GRANITE.—Hartsbill, Cleehill, Rowley Regis, or Leicestershire granite, broken to a 2-in. gauge, for Henley R.D.C. The quantities required, and which must be completely delivered at the various railway stations by September 30, 1906, are as follows:—Henley-on-Thames, 500 tons; Reading, 520 tons; Ship-lake, 100 tons; Watlington, 300 tons. Tenders and samples should reach J. MacPherson, Surveyor, 38, Mark-road, Henley-on-Thames, not later than April 3.

APRIL 3.—LINTON.—TOOLS.—The Council are prepared to receive tenders for undermentioned tools for the year ending March 31, 1907:—(1) Road base brooms, (2) road picks, (3) road rakes, (4) road shovels, (5) road spades, (6) road lines, (7) road scrapers, (8) road hooks, (9) road gullies and gratings, (10) road barrows, for Linton R.D.C. Samples to be sent in 47 require for Nos. 1, 2, 3, 4, 5, 6, 7, 8, and 10. Tenders to be delivered not later than noon, April 3, addressed to A. M. Cook, Engineer and Surveyor, Offices, Linton, Cambridgeshire.

APRIL 3.—LONDON.—SPRINGS, WHEELS, ETC.—For (1) springs, spiral, (2) springs, laminated, (3) wheels and axles for railway wagons, (4) w.l. buffers for wagons, or the Secretary of State for India in Council. Conditions

of contract from the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office by 2 o'clock p.m. on Tuesday, April 3.

APRIL 3.—PORTSEA.—FLINTS.—Portland-by-Sea U.D.C. invite tenders for 350 yds. of clean hill flints and 500 yds. of screened sand flints. Forms of tenders from the Surveyor, St. Andrew's-road, Portland-by-Sea. Tenders, endorsed "Tender for Flints," to be addressed to T. Austen, Clerk, Council Office, Portland-by-Sea, not later than 12 o'clock noon on Tuesday, April 3.

APRIL 3.—SHEPPY.—STONE.—Blue rag stone and pit flints (quantities likely to be required being 1,070 yds. of blue rag stone and 210 yds. of pit flints), for the R.D.C. The materials to be free from haddock and dirt and samples to be delivered with tenders. The materials to be delivered free alongside in barges at the following wharves and delivery places, viz.:—Harty Ferry and the several sidings on the Sheppy Light Railway in proportions as specified in forms of tender. Forms of tender can be obtained from John Copland, Clerk Sheerness; and sealed tenders, marked "Tender for Road Materials," must be sent by April 3.

APRIL 3.—SUTTON.—MATERIALS.—Supply of the following materials during the year ending March 31, 1907:—(1) Broken granite and basalt; (2) gravel flints and ballast; (3) hand-picked surface flints; (4) granite setts and cubes; (5) hardwood paving blocks; (6) granite kerbing and channelling; (7) Honevare and sanitary pipes; (8) Portland cement; (9) manganese of soda; (10) sulphuric acid; (11) disinfectants; (12) tar-paving materials; (13) lantern-glass, tools, oils, paints, soaps, etc.; (14) manhole covers, gully grates, etc.; (15) street lamp columns; (16) horse hire; (17) horse forage; (18) coal and coke; (19) smith's work; (20) purchase of street furniture, including benches, etc., for the town, for Sutton (Surrey) U.D.C. Conditions and forms may be obtained on payment of 2*s.* 6*d.* (which will not be returned on application) to Chamberlain, Smith, Engineer and Surveyor to the Council, Municipal Offices, Sutton, Surrey. Sealed tenders, endorsed "Tender for Materials," will be received up to 3 o'clock p.m. on April 3.

APRIL 4.—BROMSGROVE.—GRANITE.—600 tons of 24-in. broken granite, delivered free at Bromsgrove Station. Tenders and small samples to be sent to Francis J. Luxon, Clerk, New-road, Bromsgrove, not later than April 4 next.

APRIL 6.—SMETHWICK.—STORES.—Materials and articles for the year ending March 31, 1907:—Broken Cleo Hill granite, broken and unbroken Rowley ragstone, kerbs, circles, elbows and setts; steel chisels and steel picks, scrapers, mud scoops, digging forks, and galvanised sanitary ashbins—1 all Smethwick pattern; bricks (Staffordshire bricked and common); scavenging and dandy brushes and pickhelves, gully grates, frames and manhole and lamp-hole covers and cast-iron trunks—all Smethwick pattern; glazed earthenware pipes; cement (best heavy) Portland; lime (best); instant powder. All the above to be delivered at the contractor's cost to the Highway Stores, Stony-lane, except the following: ragstone—separate prices to be given for delivering to Spire-lane Wharf and Bovey-street Dandy Wharf. Forms from Mr. C. J. Fox Allen, Borough Surveyor, Town Hall, Smethwick, Tenders, addressed to the Chairman of the Streets and Buildings Committee, not later than 10 a.m. on April 6, endorsed "Tender for Stores."

APRIL 6.—STAFFORDSHIRE.—ROAD MATERIALS, ETC.—Supply and cartage of road materials, tools, and road implements for Leek, Newcastle, Uttoxeter, Stafford, Lichfield, Sedgley, to March 31, 1907, for the Staffordshire County Council. Specifications and forms from Mr. James Moncur, Chief Surveyor of Main Roads, County-buildings, Stafford, on or after Saturday, March 24, and the applicants are requested to state which form of tender they require, and also the name of the district. Sealed tenders, endorsed "Tender for Road Materials," to be delivered at the offices of the Clerk of the Council, County-buildings, Stafford, on or before April 6.

APRIL 7.—BEDFORD.—TIP WAGGONS, ETC.—Supplying and delivering iron on rail at Bedford station two tip wagons for the removal of horse refuse, two street watering vans, and three general purpose carts, for Streets and Buildings Committee of the Corp. Full particulars can be obtained from the Borough Surveyor, Town Hall, Bedford. Sealed tenders, endorsed "Tender for New Vans, etc.," and addressed to the Chairman of the Streets and Buildings Committee, to be delivered not later than 12 noon on April 7.

APRIL 7.—BLYTHING.—GRANITE.—2,900 tons of granite, consisting of 800 tons of 24-in. granite, 1,900 tons of 14-in. granite, and 500 tons of granite chips, to be delivered on or before July 31, at the following places, viz.:—Saxmudham, Darsham, Halesworth, Beccles, Leiston, Brampton, Westhamton, Blythburgh, Walberswick, Southwold, and Laxfield Stations, Beccles Quay, and Lowestoft South Quay, for the R.D.C. Tenders to Mr. Harold A. Mullens, Clerk, Union Offices, Bulcamp, Halesworth, not later than April 7. No printed form of tender is issued.

APRIL 7.—BRUMBY.—WHINSTONE.—400 tons of Whinstone, delivered free at Frodingham and Guinness Stations Great Central Railway, for Drummy and Frodingham U.D.C. Specifications and forms of tender may be had on application to Joe Geener, Surveyor, Council Offices, New Frodingham, Doncaster, to whom tenders must be sent not later than Saturday, April 7.

APRIL 7.—WROTHAM.—ROAD MATERIALS.—For flints, ragstone, ironstone, and gravel, also for cartage for Wrotham U.D.C. Conditions of contract may be

inspected and forms of tender obtained upon application to Mr. A. J. Powell, the Surveyor of the Council, at his office, 10, St. Andrew's, Leith, on Tuesday, April 3, to be sent to the Clerk of the Council, sealed, and endorsed outside "Tender for Road Material" or "Cartage," not later than Saturday, April 7. Samples of the different stone must be sent to the Surveyor's Office.

APRIL 9.—EDINBURGH.—STORES.—The Edinburgh and Leith Corporations' Gas Commissioners invite tenders for the supplying of oils and paints, timber, meters, gas fitters' stores, wrought-iron tubes and fittings, cast-iron pipes and connections, yarn, etc., iron, steel, and implements, iron castings, etc., caseway repairs, cast cooking stoves, for their various undertakings during the year from Whitlunday first. Tender forms can be had on application to the Chief Engineer and Manager at the Gas-works, New-street. Offers must be lodged on April 9 to Mr. James McG. Jack, Clerk, 25, Waterloo-place, Edinburgh, marked "Tender for Oils and Paint," or as the case may be.

APRIL 9.—MANCHESTER.—MATERIALS.—The Tramways Committee of the Manchester Corporation are prepared to receive tenders for the supply of the following:—(a) Steel girder tram rails, (b) steel tie bars, (c) granite setts, (d) pitch for paving purposes. Specifications and forms may be obtained on application to Mr. J. M. McElduff, General Manager, Tramways Department, 55, Piccadilly, Manchester, on deposit of 2*s.*, which will be returned on receipt of bona-fide tender. Tenders are to be addressed to the Chairman of the Tramways Committee, 55, Piccadilly, Manchester, and must be received not later than 5 p.m. on Monday, April 9.

APRIL 10.—WEST ASHFORD.—ROAD MATERIALS.—Granite, sand, broken stone, and other materials for the Parishes of Bethersden, Great Chart, Little Chart, Charing, Epserton, Hothfield, Kingsnorth, Pluckley, Inceaden, Shadoxford, and Westwell, and for the purchase of granite, broken stone, and other materials for Charing and Ashford Railway Stations; also from Great Chart Siding, for West Ashford R.D.C. Forms, etc., from Mr. Alfred Sims, Surveyor, Surveyor's Office, Charing, Sealed tenders, endorsed "Tender for Materials and Haulage," addressed to the Chairman of the R.D.C., are to be delivered at the Union House, Westwell, Ashford, by April 10.

APRIL 11.—HORSHAM.—GRANITE, ETC.—Granite or other approved stone and flints (total, about 7,000 cubic yds.), delivered to the various railway stations in district of the Horsham R.D.C. Also for cartage of materials from railway stations to the roadsides. Forms of tender and further information to be obtained of the Surveyor, Mr. Wm. Dengeate, 58, Park-street, Horsham, to whom prepaid samples must be sent. Tenders, marked "Highways Tender," to reach A. C. Cook, Clerk to the Council, 9, Carfax, Horsham, on or before April 11.

APRIL 11.—YEARSELEY-CUM-WHALEY.—GRANITE.—500 tons of 2-in. and 20 tons of 1 1/2-in. granite delivered free at Whaley Bridge Station (L. & N.W. Railway) at such times and in such quantities as the Council may require during the ensuing year, for the U.D.C. Tenders, marked "Tender for Granite," to Mr. S. Taylor, solicitor, Buxton, and samples to be forwarded to the Council Room, Whaley Bridge. Tenders by April 11.

APRIL 12.—DEVONPORT.—STORES.—Devonport Corporation Electricity Department invite tenders for the supply of general stores for a period of twelve months. Items, etc., may be obtained of the Borough Engineer, Electrical Engineer, Newport-street, East Stonehouse. Tenders to be sent in, sealed, and endorsed "Tender for Electricity Stores," to H. J. Fitzall, Esq., Town Clerk, Devonport, on or before noon, April 12.

APRIL 14.—LEITH.—TIMBER, ETC.—Timber, iron, and stores required by the Commissioners for the harbour and docks, Leith, from May 1, 1906, to May 1, 1907. Particulars on application at the office of the Superintendent, Tower-Place, Leith. Tenders to be lodged with Mr. Victor A. Noel Paton, W.S., Clerk to the Commission, 31, Melville-street, Edinburgh, by April 14.

APRIL 14.—SOUTHBOROUGH.—STONE.—600 yds. of hard Sevenoaks or other stone, broken to pass 1 1/2-in. ring, to be delivered into the various districts of Southborough U.D.C., at Southborough, in accordance with the Surveyor's instructions. Also for about 450 tons, more or less, of Chertsey, Glastonbury, Rhinish Basalt, or Norway Granite, machine broken to 1 1/2 to 2-in. gauge, to be delivered to Toulridge Station of the South-Eastern and Chatham Railway. Tenders, with samples, by 14th day of April, endorsed "Tender for Stone," and addressed to Philip Hamner, Clerk to the Council, Council Offices, Southborough.

APRIL 17.—SEVENOAKS.—MATERIALS.—Quartzite, basalt or pebble, rag stone, chert, flints, etc., at the various stations or on to the various roads within the district, cartage iron stations and depots, and steam rolling for the whole of the district, for the year ending March 31, 1907, for Sevenoaks R.D.C. Forms, etc., from Mr. R. Bailey, Sundridge, Sevenoaks, and Mr. W. H. Bolt, Leigh, Kent, Surveyors to the Council, or Mr. George F. Carmel, Clerk of the Council. Samples of material to be delivered, cartage paid, at the Union Workhouse, Sundridge, Sevenoaks, and sealed tenders, marked "Tenders" on outside of envelope, to be returned with the conditions of contract, to Clerk, by April 17.

APRIL 18.—BRADFORD.—ROAD METAL.—For 20,000 tons of road metal. Form of application, etc., to be sent to Mr. J. H. Cox, City Surveyor, at the Town Hall, Sealed tenders, endorsed "Tender for Road Metal," to be sent to Ernest Sturt, Town Clerk, Town Hall, Bradford, on or before Wednesday, April 18.

Public Appointments.

Table with 3 columns: Nature of Appointment, By whom Advertised, Salary. Includes entries for Clerk of Works at South Shields Corporation and Applications to be in.

Auction Sales.

Nature and Place of Sale.

By whom Offered.

Date of Sale.

'DEALS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.
'BUILDING MATERIALS, DUSSELDORF HALL, GODALMING—On the Premises
'FRESHOLD BUILDING LAND, WITTON, BIRMINGHAM—Grand Hotel, Birmingham
'MANUFACTURER'S STOCK OF ELECTRICAL FITTINGS—62A, Aldersgate-street
'FREEHOLD PROPERTY, ENFIELD—At the Mart
'BUILDING MATERIALS—At 22 and 23, Grosvenor-square, W.
'BRICKWORKS and BUILDINGS AS GOING CONCERN—Bordon Camp, Hants
'FREEHOLD BUILDING SITE, MILE END-ROAD—At the Mart
'FREEHOLD BUILDING ESTATE, STRATFORD—At the Mart
'CORNER FREEHOLD BUILDING SITE, WANDSWORTH-ROAD, S.W.—At the Mart
'FREEHOLD BUILDING SITE, TOTENHAM COURT-ROAD—At the Mart
'RESIDENTIAL ESTATES, RUISLIP PARK, NE. HARBOR—At the Mart
'REGISTER OF PROPERTIES

Churchill & Sim
N. & W. Debenham
Mabbett & Edge
Frank O. Bowen
Keynolds & Eason
White, Berry, & Taylor
R. C. S. Evennett
S. Walker & Son
Fuller, Horsey, Sons, & Cassell
Fuller, Horsey, Sons, & Cassell
Ventom, Bull, & Cooper
Fuller, Horsey, Sons, & Cassell

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

March 14.—By H. J. WAY & SON (at Newport).
Newport, Isle of Wight, 6 and 7, Cross-st., f. y. 281
7 Elm-gate, 107 88.
March 15.—By THURGOOD & MARTIN (at Eastbourne).
Easthorne, Sussex.—8, Marine-parade, f. y. 384 10.
8 and 9, Marine-parade, f. y. 507.
Marine-parade, f. g. r. 86, 18, reversion in 23 yrs.
Marine-parade, f. g. r. 86, reversion in 77 1/2 yrs.
Marine-rd., f. g. r. 86, reversion in 86 yrs.
St. Aubyns-rd., f. g. r. 104, 109, reversion in 86 yrs.
St. Aubyns-rd., f. g. r. 277, reversion in 93 yrs.
By COBBS' (at Maidstone).
West Farleigh, Kent.—"Elmscroft" and 70 acres, f. p.
East Farleigh, Kent.—"East Kent Plantation," 4 a. 3 r. 25 p. f. p.
Hop and pasture land, 17 a. 1 r. 21 p. f. p.
Yalding, Kent.—"Freehold hop gdn., 10 a. 1 r. 10 p. d.
March 19.—By CARTWRIGHT & ECHES.
Wimbleton.—187 and 188, Meriton-rd. (s.), f. y. 82
Pimlico.—114, Denbig-st., and 3, Morcoteon-rd., news, ut. 23 yrs. f. g. r. 107, 108. y. r. 1147 48.
8 to 12, Gray's Inn-pl., ut. 16 1/2 yrs. g. r. 122, 108, w. r. 1044.
By EASTMAN BROS.
Altaram, Cornwall.—"Reburland Tin Mine," 91 a. 3 r. 5 p. f. y. 504.
By J. HIBBERD & SONS.
Clerkenwell.—5, Percival, ut. 12 1/2 yrs. g. r. 33.
By F. HOLLAND (at Masons' Hall Tavern).
March 20.—By REYNOLDS & EASON.
Hammersmith.—47, Hallford-st., ut. 39 1/2 yrs. g. r. 74, c. r. 454.
Battersea.—11, Newman-st., ut. 40 1/2 yrs. g. r. 52, w. r. 324, 108.
By F. E. WINDOUSH.
Hammersmith.—Great Church-ls, The "Lord Napier" p.h., ut. 31 yrs. y. r. 1007, with goodwill
17, By-Brook, f. y. 234.
Beckenham.—1, Hayne-rd., ut. 60 yrs. g. r. 24, p. d.
By BISLEY & SONS (at 113 (odd), Rotherhithe).
Rotherhithe.—113 (odd), Rotherhithe New-rd., ut. 46 1/2 yrs. g. r. 466, w. r. 4732, 128.
27 and 29, Hawkstone-rd., ut. 44 1/2 yrs. g. r. 67, f. r. 674, 128.
63 and 65, Hawkstone-st., ut. 44 1/2 yrs. g. r. 67, w. r. 672, 128.
78 and 77, Hawkstone-rd., w. r. 672, 128; also 79, ut. 44 1/2 yrs. g. r. 67, w. r. 672.
77 and 76, Abbeyfield-rd., ut. 48 1/2 yrs. g. r. 104, w. r. 787.
62, 54, 56, 64, 66, and 68, Rotherhithe New-rd., ut. 1 and 2a, Linton-st., ut. 46 yrs. g. r. 24, 74, 6d., w. r. 2154, 168.
22 to 36 (even), Old-rd., ut. 42 1/2 yrs. g. r. 232, 68, w. r. 2534, 68.
24, 23, and 25, Manorbala, ut. 42 1/2 yrs. g. r. 64, 158, w. r. 722, 168.
9 to 17, Reed-st., ut. 44 1/2 yrs. g. r. 204, 58, w. r. 2106, 128.
289 to 295 (odd), Lower-rd., ut. 16 1/2 yrs. g. r. 184, w. r. 1762, 168.
10 and 12, St. Helena-rd., ut. 51 yrs. g. r. 64, w. r. 632, 148.
8 and 10, Union-rd. (s.), ut. 36 1/2 yrs. g. r. 91, f. y. 907.
30 to 36 (even), Union-rd. (s.), y. r. 41, also g. r. 12, 108, ut. 91 yrs. g. r. 374, 108.
2 and 4, Prospect-st., ut. 56 yrs. g. r. 41, y. r. 300.
126, 128, 144, and 146, Rotherhithe New-rd., g. r. 107, w. r. 1404, 88.
Bernonsey.—39, 41, and 43, Anchor-st., ut. 31 1/2 yrs. g. r. 122, 156, w. r. 1054, 68.
319 to 324 (odd), Lynton-rd., ut. 44 1/2 yrs. g. r. 184, w. r. 1794, 88.
By DAVID BURNETT & CO.
Bernonsey.—62 to 68, Grange-walk, area g. r. 107, w. r. 1564.
Pimlico.—24, Denbig-st., ut. 31 1/2 yrs. g. r. 81, y. r. 607.
Chelsea.—30, Sydney-st., ut. 9 1/2 yrs. g. r. 64, p. d.
Hammersmith.—10, Southernd-rd., and plot of land near, ut. 83 yrs. g. r. 174, 108, p. d.
By NORRIS, FRIST, & GILBERT.
Stoke Newington.—12, Grazebrook-rd., ut. 56 1/2 yrs. g. r. 41, c. r. 403 (including mortgage).
Rainham Creek, Essex.—Freehold waterside land, with buildings thereon, area 1 a. 3 r. 36 p. d.

By ALFRED RICHARDS.
Ponders End.—7 to 15, Boundary-cottages, c. r. 911.
By E. & S. SMITH.
Islington.—53, Colerobrook-row, f. c. r. 654.
By DOUGLAS YOUNG & CO.
Battersea.—214, Battersea Park-rd. (s.), ut. 64 yrs. g. r. 104, y. r. 466.
March 22.—By H. J. BRISS & SONS.
Mile End.—50 to 60 (even), Bridge-st., f. w. r. 1297, 78.
Stepney.—105 to 111 (odd), Duckett-st., f. w. r. 752, 88.
Bethnal Green.—112 and 114, Cambridge-rd., f. w. r. 1117, 168.
Dalston.—37, Shrubland-rd., ut. 36 1/2 yrs. g. r. 81, y. r. 381, 88.
86 and 88, Shrubland-rd., ut. 41 yrs. g. r. 92, y. r. 76.
Crouch End.—17, Middle-rd., ut. 49 yrs. g. r. 31, 108, c. r. 322.
By JESSE W. JONES.
Chingford.—11, Buxton-rd., f. y. 322.
Wembley, Middx.—32, Chaplin-rd., ut. 90 yrs. g. r. 34, 108, c. r. 501.
By C. C. & T. MOORE.
Bow.—35, Eglinton-rd., f. w. r. 907.
51, 53, and 59, Southend-rd., ut. 64 1/2 yrs. g. r. 147, 58, w. r. 1044.
40, Malmsbury-rd., ut. 60 1/2 yrs. g. r. 46, w. r. 894.
171, Mannersbury-rd., ut. 45 1/2 yrs. g. r. 46, y. r. 300.
Mile End.—56, Lichen-rd., ut. 36 1/2 yrs. g. r. 32, 108, c. r. 282.
4, Chainsborough-rd., ut. 34 1/2 yrs. g. r. 54, 58, c. r. 301.
18, Bancroft-rd., ut. 51 1/2 yrs. g. r. 54, 58, p. 340.
Stepney.—39 and 41, Duckett-st., f. w. r. 494, 88.
6, 7, 8, 9, 11, and 13, Elms-st., f. w. r. 1444, 68.
15, 24, 26, and 28, Elms-st., f. w. r. 1064, 128.
37 and 39, Eastfield-st., w. r. 584, 108.
48, Eastfield-st., and 70 and 72, Aston-st., f. w. r. 1117, 168.
63 to 69 (odd), Duckett-st., f. w. r. 894, 148.
Bethnal Green.—Ryeston-st., f. g. r. 304, ut. 67 1/2 yrs. g. r. 154.
Ilford.—King Edward-parade, etc., a block of freehold building land, p. d.
By NEWBON, EDWARDS, & SHEPARD.
King's Cross.—19 and 20, Carlisle-st., ut. 36 yrs. g. r. 122, w. r. 834, 48.
Kilburn.—238, Belisle-rd. (s.), ut. 43 1/2 yrs. g. r. 1, y. r. 564.
Lee.—11, 17, 18, 20, and 21, Manor-pk., ut. 8 1/2 yrs. g. r. 274, c. r. 274.
Old Ford.—39 and 41, Norman-rd., ut. 53 1/2 yrs. g. r. 71, c. r. 704, 48.
Upton Park.—45, 67, 69, and 71, Elizabeth-st., ut. 8 1/2 yrs. g. r. 144, w. r. 984, 168.
Forest Gate.—323, 323A to 341, and 341A (odd), Sherrard-rd., f. g. r. 3904.
Hornsey.—16, Ghebr-st., ut. 56 1/2 yrs. g. r. 1, y. 451.
Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w. r. for weekly rental; q. r. for quarterly rental; y. r. for yearly rental; a. n. for unexpired term; p. a. for per annum; y. s. for years; h. a. for half; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cred. for crescent; av. for avenue; gdns. for gardens; yd. for yard; g. for grove; h. for house; p. h. for public-house; o. for offices; a. for shops; ct. for court.

TUESDAY, APRIL 3.
Royal Institute of British Architects.—Special general meeting to receive formally the Draught Registration Bill and the report and recommendations of the Registration Committee adopted at a meeting on March 20, when it was resolved to adopt the scheme outlined in the report instead of the Draught Registration Bill already published. The following resolutions to be proposed from the chair:—(1) That the report and recommendations of the Registration Committee, dated March 29, 1906, be adopted; (2) that the Council be requested to take the necessary steps to apply to His Majesty the King for a Revised or Supplemental Charter embodying the said report and recommendations, and also as soon as possible to prepare and present a Bill to Parliament to give effect to the same. 8 p.m.
Royal Institution.—Mr. J. E. Mear, M.A., F.R.S., on "The Influence of Geology on Cartography," III. 5 p.m.
Institution of Civil Engineers.—Mr. Cathart W. Methven on "The Harbours of South Africa." 8 p.m.

WEDNESDAY, APRIL 4.
Institution of Sanitary Engineers, Ltd.—Mr. H. K. G. Bamber on "Manufacture of Portland Cement." 8 p.m.
Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.
Royal Archaeological Institute.—Mr. Montague Sharpe, D.L. Middx., on: (a) The extensive line of British Stakes protecting the ford across the Thames at Brentford; (b) did Caesar cross here? and (c) were the Coway Stakes in existence B.C.? With lantern illustrations. 4 p.m.
Institution of Civil Engineers.—(1) Students' Visit, at 2.30 p.m., to inspect the Works in Progress at the Rotherhithe Tunnel; (2) Students' Meeting, at 8 p.m., paper to be read: "Variations in Direction of the Wind, and an Instrument for Determining them Graphically," by Mr. B. F. Beverley.

THURSDAY, APRIL 5.
Civil and Mechanical Engineers' Society (Caxton Hall, late Westminster Town Hall).—Mr. G. D'A. Moynell on "Steam Turbines." 8 p.m.
Royal Institution.—Professor B. Hopkinson, M.A., on "Internal Combustion Engines," with experimental illustrations, III. 5 p.m.

FRIDAY, APRIL 6.
Architectural Association.—Mr. E. Greenop on "Valuations, Compensations, and Light and Air." 7.30 p.m.
Royal Institution.—Mr. W. Bates Thury, M.A., F.R.S., on "Physical Basis of Life." 9 p.m.

SATURDAY, APRIL 7.
Royal Institution.—Professor J. J. Thomson, M.A., on "The Corpuscular Theory of Matter." 7.30 p.m.
Edinburgh Architectural Association.—Associates' visit to Coulsland Cement Works.

PRICES CURRENT OF MATERIALS.

* * * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.
BRICKS, &c.
£ s. d.
Hard Stocks..... 1 7 0 plus for 1000 alongside, in river.
Rough Stocks and Grizzles..... 1 4 0 " "
Picked Stocks for Facings..... 2 15 0 " delivered.
Pistons..... 1 5 0 " at railway depot.
Bed Wire Cuts..... 1 11 0 " "
Best Fareham Bed Best Bed Pressed Rimbon Facing..... 5 0 0 " "
Best Blue Pressed Staffordshire..... 3 15 0 " "
Do. Bullnose..... 4 0 0 " "
Best Stourbridge Fire Bricks..... 3 14 0 " "
GLAZED BRICKS.
Best White and Iron Glazed Stretchers..... 12 0 0 " "
Headers..... 11 0 0 " "
Quoins, Bullnose, and Flats..... 16 0 0 " "
Double Stretchers..... 19 0 0 " "
Double Headers..... 15 0 0 " "
One Side and two Ends..... 19 0 0 " "
Two Sides and one End..... 20 0 0 " "
Spits, Chains, ferred, Squaints, and Flats..... 20 0 0 " "
Best Dipped Salt Glazed Stretchers, and Header, 12 0 0 " "
Quoins, Bullnose, and Flats..... 14 0 0 " "

MEETINGS.

FRIDAY, MARCH 30.
International Congress on School Hygiene.—Preliminary meeting of Second Congress, to be held in the Jubilee Hall of the University of London, South Kensington. 6 p.m.
SATURDAY, MARCH 31.
Royal Institution.—Professor J. J. Thomson, M.A., on "The Corpuscular Theory of Matter." 8 p.m.
Institution of Sanitary Engineers.—Visit to Edmonton Sewage Farm, Mr. G. E. Eachus, Engineer to the Edmonton Urban District Council, to conduct the party. 7.30 p.m.
MONDAY, APRIL 2.
Royal Institute of British Architects.—Messrs. W. Anonliver and A. W. Martyon on "Wood-Carving." 8 p.m.
Society of Engineers.—Mr. Frank Latham, Borough Engineer of Penzance, on "Harbour Emergency Works." 8 p.m.
Society of Arts (Cantor Lectures).—Professor Vivian B. Lewes on "Fire, Fire Risks, and Fire Extinction," I. 8 p.m.
Liverpool Architectural Society, Incorporated.—Annual general meeting.

BRICKS, &c. (continued).

GLAZED BRICKS (continued)—	
Double Stretchers 15 0 0	per 1,000, at railway depôt.
Double Headers 14 0 0	" " " "
One Side and two Ends 15 0 0	" " " "
Two Sides and one End 15 0 0	" " " "
Spalls, Chamfered, Squints 14 0 0	" " " "
Second Quality White and Dipped Salt Glazed 2 0 0	" less than best.
Thames and Pit Sand 6 9	per yard, delivered.
Thames Ballast 5 3	" " " "
Best Portland Cement 24 0	per ton, " "
Best Ground Blue Lias Lime 19 0	" " " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime 11s. 0d. per yard, delivered.

Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

BATH STONE—delivered on road waggons, Paddington Depot 1 6 3/4	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depot 1 8 1/2	" " "
PORTLAND STONE (20 ft. average)—Brown Whitbed delivered on road waggons, Paddington Depot, Nine Elms Depot, or Pimlico Wharf 2 1	" " "
White Bashed delivered on road waggons, Paddington Depot, Nine Elms Depot, or Pimlico Wharf 2 2 1/2	" " "
ANCASTER in blocks 1 10	per ft. cube, del. rly. depôt.
Beer Greenhill 1 10	" " "
Darley Dale in blocks 2 4	" " "
Red Crosshill 2 2	" " "
Closeburn Red Freestone 2 0	" " "
Red Mansfield 2 4	" " "
YORK STONE—Robin Hood Quality.	
Scrapped random blocks 2 10	" " "
6 in. sawn two sides landings to sizes (under 40 ft. super.) 2 3	per ft. super. "
6 in. rubbed two sides ditto ditto 2 6	" " "
3 in. sawn two sides slabs (random sizes) 0 11 1/2	" " "
2 in. to 2 1/2 in. sawn one side slabs (random sizes) 0 7 1/2	" " "
1 1/2 in. to 2 in. ditto ditto 0 6	" " "

HARD YORK.

Scrapped random blocks 3 0	per ft. cube, " "
6 in. sawn two sides landings to sizes (under 40 ft. super.) 2 8	per ft. super. "
6 in. rubbed two sides ditto ditto 3 0	" " "
3 in. sawn two sides slabs (random sizes) 1 2	" " "
1 in. self-faced random slabs 0 5	" " "
Hopton Wood (Hard Bed) in blocks 2 0	per ft. cube, del. rly. depôt.
" " " 6 in. sawn both sides landings 2 7	per ft. super. del. rly. depôt.
" " " 3 in. sawn both sides landings 1 0	" " "
" " " 2 in. do. 0 8 1/2	" " "

SLATES.

In. In. 20x10 best blue Bangor 13 2 6	per 1000 of 1200 at r. d.
20x12 " " " 13 17 6	" " "
20x10 first quality " 13 0 0	" " "
20x12 " " " 13 15 0	" " "
16x8 " " " 7 5 0	" " "
20x10 best blue Portmadoc 12 12 6	" " "
16x8 " " " 6 12 6	" " "
20x10 best Bureks fading green 15 17 6	" " "
20x12 " " " 18 7 6	" " "
18x10 " " " 13 5 0	" " "
16x8 " " " 10 5 0	" " "
20x10 permanent green 11 12 6	" " "
18x10 " " " 9 12 6	" " "
16x8 " " " 6 12 6	" " "

TILES.

Best plain red roofing tiles 42 0	per 1000 at rly. depôt.
Hip and Valley tiles 3 7	per doz. "
Best Brossley tiles 50 0	per 1000 "
Do. Ornamental tiles 52 6	" " "
Hip and Valley tiles 4 0	per doz. "
Best Eubon red, brown, or brinded do. (Edwards) 57 6	per 1000 "
Do. Ornamental do. 59 0	" " "
Hip tiles 4 0	per doz. "
Valley tiles 3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes) 51 9	per 1000 "
Do. Ornamental do. 54 6	" " "
Hip tiles 4 1	per doz. "
Valley tiles 3 8	" " "
Best " Rosemary " brand plain tiles 48 0	per 1000 "
Best Ornamental tiles 59 0	" " "
Hip tiles 4 0	per doz. "
Valley tiles 3 8	" " "
Best " Hartshill " brand plain tiles, semi-faced 50 0	per 1000 "
Do. pressed 47 6	" " "
Do. Ornamental do. 50 0	" " "
Hip tiles 4 0	per doz. "
Valley tiles 3 6	" " "

WOOD.

BUILDING WOOD.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in. 13 10 0	At per standard. £ s. d. 15 0 0
Deals: best 3 in. by 7 in. and 3 in. by 7 in. and 8 in. 11 0 0	12 0 0
Battens: best 2 1/2 by 6 and 3 by 6 10 0	10 0 0
Deals: seconds 10 0	10 0 0
Battens: seconds 9 0	10 0 0
2 in. by 4 in. and 2 in. by 6 in. 9 0	10 0 0
2 in. by 4 in. and 2 in. by 6 in. 8 10 0	10 0 0
Foreign Sawm Boards—1 in. and 1 1/2 in. by 7 in. 10 0	more than battens.
3 in. 1 0	0
Fir timber: best middling Danzig or Memel (average specification) 4 10 0	5 0 0
Seconds 4 0	4 10 0
Small timber (8 in. to 10 in.) 3 12 6	3 15 0
Small timber (6 in. to 8 in.) 3 0	3 10 0
Swedish balks 2 10 0	3 0 0
Pitch-pine timber (30 ft. average) 3 15 0	4 5 0

JOINERS' WOOD.

White Sea: first yellow deals, 3 in. by 11 in. 24 0 0	25 0 0
3 in. by 9 in. 22 0 0	23 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in. 18 10 0	20 0 0
3 in. by 9 in. 17 10 0	19 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in. 13 10 0	15 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 11 0 0	12 0 0
Petersburg: first yellow deals, 3 in. by 11 in. 21 0 0	22 10 0
Do. 3 in. by 9 in. 18 0 0	19 10 0
Battens, 2 1/2 in. and 3 in. by 7 in. 13 10 0	14 10 0
Second yellow deals, 3 in. by 11 in. 16 0 0	17 0 0
Do. 3 in. by 9 in. 14 10 0	15 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in. 13 0 0	14 0 0
Do. 3 in. by 9 in. 12 10 0	13 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 10 0 0	11 0 0

White Sea and Petersburg.

First white deals, 3 in. by 11 in. 14 10 0	15 10 0
3 in. by 9 in. 13 10 0	14 10 0
Battens, 2 1/2 in. and 3 in. by 7 in. 11 0 0	12 0 0
Second white deals, 3 in. by 11 in. 13 10 0	14 10 0
3 in. by 9 in. 12 10 0	13 10 0
Battens, 2 1/2 in. and 3 in. by 7 in. 10 0 0	11 0 0
Third yellow deals, 3 in. by 11 in. 13 0 0	14 0 0
Do. 3 in. by 9 in. 12 10 0	13 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 10 0 0	11 0 0
Yellow Pine—First, regular sizes 44 0 0	upwards.
Oldtimers 32 0 0	" "
Seconds, regular sizes 28 0 0	" "
Yellow Pine oldtimers 28 0 0	" "
Kauri Pine—Planks, per ft. cube. 0 3 6	0 5 0
Danzig and Stettin Oak Logs—Large, per ft. cube. 0 3 0	0 3 6
Small 0 2 6	0 2 9
Wainscot Oak Logs, per ft. cube. 0 5 6	0 6 0
Dry Wainscot Oak, per ft. sup. as inch 0 0 8 1/2	0 0 9 1/2
1 in. do. do 0 0 7	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch 0 0 9	0 1 0
Selected, Figury, per ft. super. as inch 0 1 6	0 2 6
Dry Walnut, American, per ft. super. inch 0 0 10	0 1 0
Teak, per load 17 0 0	22 0 0
American Whitewood Planks, per ft. cube 0 4 0	0 5 0
Prepared Flooring, etc. Per square. 1 in. by 7 in. yellow, planed and shot 0 13 6	0 17 6
1 in. by 7 in. white, planed and matched 0 14 0	0 18 0
1 1/2 in. by 7 in. yellow, planed and matched 0 16 0	1 0 0
1 in. by 7 in. white, planed and shot 0 12 0	0 14 6
1 in. by 7 in. white, planed and matched 0 12 6	0 15 0
1 1/2 in. by 7 in. white, planed and matched 0 15 0	0 16 6
2 in. by 7 in. yellow, jointed and beaded or V-jointed brds. 0 11 0	0 13 6
1 in. by 7 in. 0 14 0	0 18 0
3 in. by 7 in. white 0 10 0	0 11 6
1 in. by 7 in. 0 12 9	0 15 0
6 in. at 6d. to 8d. per square less than 7 in.	

JOISTS, GIRDERS, &c.

Bolled Steel Joists, ordinary sections 7 0 0	per ton. 7 10 0
Compound Girders, ordinary sections 9 0 0	10 0 0
Steel Compound Stanchions 12 0 0	13 0 0
Angles, Tees, and Channels, ordinary sections 9 0 0	10 0 0
Flitch Plates 9 0 0	10 0 0
Cast Iron Columns and Stanchions including ordinary patterns. 7 10 0	8 10 0

METALS.

Iron—Common Bars 8 0 0	8 10 0
Staffordshire Crow Bars, good merchant quality 8 10 0	9 0 0
Staffordshire " Marked Bars " 10 10 0	—
Mild Steel Bars 8 15 0	9 0 0
Hoop Iron, best price 9 5 0	9 10 0
" Galvanised 17 0 0	—
" (And upwards, according to size and gauge.)	
Sheet Iron Black—Ordinary sizes to 20 g. 9 10 0	—
" " 24 g. 10 10 0	—
" " 26 g. 12 0 0	—
Sheet Iron, Galvanised, flat, ordinary quality—Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g. 14 0 0	—
Ordinary sizes to 22 g. and 24 g. 14 10 0	—
" " 26 g. 15 0 0	—

METALS (continued).

Iron (continued)—Sheet Iron, Galvanised, flat, best quality—Ordinary sizes to 20 g. 17 0 0	17 0 0
" " 22 g. and 24 g. 17 10 0	—
" " 26 g. 19 0 0	—
Galvanised Corrugated Sheets—Ordinary sizes 6 ft. to 8 ft. 30 g. 14 0 0	—
" " 22 g. and 24 g. 14 10 0	—
" " 26 g. 15 10 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. Ordinary sizes 6 ft. to 8 ft. 20 g. 11 0 0	—
" " 22 g. and 24 g. 12 10 0	—
Best Soft Steel Sheets, 22 g. & 24 g. 12 10 0	—
Cut Nails, 1 in. (Under 3 in., usual trade extras.) 9 10 0	9 15 0

LEAD, &c.

LEAD—Sheet, English, 3 lb. and up. 18 10 0	per ton. £ s. d. 18 10 0
Pipe in coils 19 0 0	" " "
Soil pipe 21 10 0	" " "
Compo pipe 21 10 0	" " "
Zinc—Sheet—Vielje Montagne 32 0 0	per ton. £ s. d. 31 10 0
Silesian 31 10 0	" " "
COPPER—Strong Sheet 1 0 1 0	per lb. £ s. d. 1 0 1 0
Thin 1 0 0	" " "
Copper nails 0 0 11	" " "
BRASS—Strong Sheet 0 0 11	" " "
Thin 0 0 0	" " "
Trs.—English Ingots 0 1 8	" " "
Solder—Plumbers 0 0 8	" " "
Blowpipe 0 0 11	" " "

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds 24d.	per ft. delivered.
" fourths 14d.	" " "
24 oz. thirds 34d.	" " "
" fourths 24d.	" " "
26 oz. thirds 44d.	" " "
" fourths 34d.	" " "
32 oz. thirds 54d.	" " "
" fourths 44d.	" " "
Fluted Sheet, 15 oz. 34d.	" " "
" 21 oz. 44d.	" " "

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

1/4 Hartley's 2d.	per ft. delivered.
1/2 " 24d.	" " "
3/4 " 34d.	" " "
Figural and Oxford Rolled " Oceanic " Oless, white 4d.	" " "
Do. " tinted 4 1/2	" " "

OILS, &c.

Raw Linseed Oil in pipes 0 1 10	per gallon. £ s. d. 0 1 10
" " " in drums 0 2 1	" " "
Bolled " " in pipes 0 2 0	" " "
" " " in barrels 0 2 1	" " "
Turpentine in barrels 0 9 11	" " "
" " in drums 0 4 6	" " "
Geneva Ground English White Lead per ton 22 10 0	" " "
Red Lead, Dry 21 0 0	" " "
Best Linseed Oil Putty per cwt. 0 7 0	" " "
Stockholm Tar per barrel 1 12 0	" " "

VARNISHES, &c.

Fine Pale Oak Varnish 0 8 0	per gallon. £ s. d. 0 8 0
Pale Copal Oak 0 10 6	" " "
Superfine Pale Elastic Oak 0 12 6	" " "
Best Extra Hard-drying Oak, for seats 0 10 0	" " "
Superfine Hard-drying Oak, for Churches 0 14 0	" " "
Fine Elastic Carriage 0 12 6	" " "
Fine Elastic Carriage 0 16 0	" " "
Fine Pale Maple 0 18 0	" " "
Fine Pale Durable Copal 0 18 0	" " "
Extra Pale French Oil 1 1 0	" " "
Best Japan Old Size 0 16 0	" " "
White Copal Enamel 1 4 0	" " "
Extra Pale Paper 0 12 0	" " "
Best Black Japan 0 10 6	" " "
Oak and Mahogany Stain 0 9 0	" " "
Brunswick Black 0 8 6	" " "
Berlin Black 0 16 0	" " "
Knottling 0 10 0	" " "
French and Brush Polish 0 10 0	" " "

TO CORRESPONDENTS.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted, unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 1000, unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

BILSTON.—For the installation of a heating apparatus on the low-pressure hot-water system, Stonefield Council School, for the Education Committee. Messrs. Bailey & McConnell, architects, Bridge-street, Walsall. — Harlow & Mason, Lichfield. £1,938

BOURNEMOUTH.—For the erection of a house in Flag Head-road, Canford Cliffs, for Mr. W. Hamilton Thompson, Mr. P. Sturdy, architect, 4, Clarendon-buildings, Bournemouth. — W. E. Jones & Son. £1,938

BRESSINGHAM (Norfolk).—For erecting classroom and cloakroom, etc., at school, for Norfolk Education Committee. Quantities by the Building Inspector to the Committee. — J. B. Mirkelburgh, Eagle-street, Newmarket-road, Norwich. £315

CARDIFF.—For cooling towers, electrically-driven pumps, pipe work, etc., for Roath Power Station, for the Corporation. Mr. A. Ellis, City Electrical Engineer, The Hayes, Cardiff. — Bate & Co., London. £2,440 5 0

CENARTH.—For taking down and rebuilding a house, for Mrs. Williams, Messrs. A. O. Evans, Williams, & Evans, architects, Pontypridd. — Thomas & Lewis, Newcastle, Emlyr. £583

COLES.—For erecting a public elementary school in Lewis-street, Farnborough, for the Corporation. Mr. J. H. Woodhouse, architect, 100, King-street, Manchester. Quantities by architect. — R. Cardie, Seymour-grove, Old Trafford. — Macleod & Co., London. £7,308 10

GRAVESEND.—For enlargement of the Grassland and Dartford Reporter printing premises, Harner-street, Messrs. Bayner & Bridgland, architect, 16, New-road, Gravesend. — W. Holland, Parrock-street, Gravesend. £298 10

GRIMSBY.—For erecting a sports pavilion in the playing-field, Old Cole, for the Education Committee, Mr. H. C. Scapling, architect, Court-chambers, Grimsby. — H. Marrows, Garden-street, Grimsby. £347

HARLEY.—For works of sewers and sewage disposal for Harley, Wentworth, for Rochester Rural District Council. Mr. J. Platts, Engineer, High-street, Rochester. — W. B. Unwin, Renfrew-street. £680 16

HARROW.—For making-up about 2,100 ft. of road, 765 ft. of sewer, and 2,006 ft. of storm-water drain, Messrs. Allen & Heath, surveyors, 285, West End-lane, West Hampstead, N.W. — T. Tree & Sons. £2,503 15

HOCKLEY (Essex).—For erecting a Wesleyan chapel, for the Trustees, Messrs. Greenhalgh & Brookbank, architects, Bank Chambers, Southend. — Leamy & Co. £915 0 0

HORSFORTH.—For erecting a pumping-station at waterworks, Borehole, Scotland-lane, for the Urban District Council, Mr. E. J. Silcock, engineer, 10, Park-road, Leeds. — J. Pickard. £866 10 0

HULL.—For concrete footpaths in Queen-street, Withernsea, and paving of handstand, shelters, etc., for Withernsea Urban District Council. Mr. J. B. Kirton, Surveyor, Exchange-buildings, Lowgate, Hull. — P. J. Barnard, Hull. 2s. 1d. per yard.

IVYBRIDGE.—For erecting a house in Plymouth-road, Mr. W. F. Trott, architect, Totnes. — G. B. Andrews, Ivybridge. £622

LEVERINGTON (Isle of Ely).—For erecting new offices, alterations to playgrounds, etc., at Endowed Provided School, for the Education Committee, Mr. H. Farr Simpson, County Surveyor, Club Chambers, Wisbech. — H. Rands & Son. £215 0 0

LINCOLN.—For alterations, etc., to buildings at the rear of the Corporation offices, Silver-street, for the Corporation. Mr. B. A. MacRae, M.I.C.E., City Surveyor, Lincoln. — C. Taylor. £561 18 0

LOANHEAD.—For Loanhead Fever Hospital extension, for the Loanhead District Committee of Midlothian County Council. Mr. C. S. Johnston, architect, 65, Hanover-street, Edinburgh. — Mason and Brick Works.

Mason and Brick Works. With Portland Cement Mortar. — G. Beattie & Co. £602 10 0

Carpenter, Joiner, Glazier, and Ironmonger. With White Pine Flooring. — S. Craig. £472 16 6

Roofing and Sanitary Work. — Burns Bros. £24 3 7

Plaster and Cement Work. — R. Pattison. £141 8 3

Slater Work. — J. Bain. £152 2 3

Painter Work. — T. Hall. £85 0 0

Heating Pipes. — J. McKenzie & Moncur. £40 0 0

Low Pressure, Extra if New. Hot Water. Boiler Required, Including Lagging. — J. McKenzie & Moncur. £40 0 0

LONDON.—For roadmaking, kerbing, paving, etc., Baker's Hill, Clapton, for the Hackney Borough Council, Mr. N. Scordia, Borough Engineer and Surveyor, Town Hall, Hackney. — Grounds & Newton. £1,000 7 3

LONDON.—For the supply and erection of oak fencing, for the new park at Denmark-hill, for the London County Council. — J. East. £850 0

LONDON.—For plates for sidewalk rails for reconstruction of portion of first section of northern tram lines, for the London County Council. — Fruehauf Iron and Steel Company, Ltd. £715 0

LONDON.—For enlarging the boys' playground of the Waple-way school, Wandsworth, for the London County Council. — Lyle & Co. £740

LONDON.—For the British Museum Extension. First contract. — J. Appleby & Sons. £58,290

MOBLEY.—For erecting a rag warehouse, rag grading plant, offices, stables, etc., at Tingby Common, for Mr. D. Banks, Messrs. T. A. Buttery and S. B. Birds, architects, 1, Basinghall-square, Leeds. — Mason: W. & H. Sykes, Morley. £738 8 7

MORLEY.—For erecting a rag warehouse at Parkfield Mills, Fountain-street, for Messrs. J. Brunitt & Son, Messrs. T. A. Buttery and S. B. Birds, architects, Queen-street, Morley. — Mason: P. Rhodes, Leeds. £547 0

NANTWICH.—For alterations and additions to school buildings, Broomhall, for County of Chester Administrative Sub-Committee for the Nantwich Union area. Mr. H. Bewick, County Architect, Newgate-street, Chester. Quantities by Architect. — H. Fairbrough. £1,302 10 0

NEW WORTLEY.—For erecting a Sunday school, for the trustees of the Primitive Methodist Chapel, Holdforth-street, Messrs. T. A. Buttery & S. B. Birds, architects, Queen-street, Morley. — Mason: Pullan, Beeston. £1,088 0

NEW WORTLEY.—For alterations and additions to school buildings, Broomhall, for County of Chester Administrative Sub-Committee for the Nantwich Union area. Mr. H. Bewick, County Architect, Newgate-street, Chester. Quantities by Architect. — H. Fairbrough. £1,302 10 0

STAMFORD.—For erecting buildings at the Town Hall, St. Mary's Hill, for the Town Council. Mr. F. R. Ryman, Borough Engineer, Stamford. Quantities by Engineer:—

	Bricklayer, Waller, etc.	Carpenter and Joiner.	Slater.	Plumber and Glazier.	Plasterer.	Painter.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Bacon & Son	—	—	—	103 5 3	—	—
Braithwaite & Co.	—	—	—	93 12 8	—	—
G. Brown	559 11 8	185 8 6	22 18 6	97 15 0	63 14 5	32 6 5
Froadmont & Co.	—	—	23 7 9	—	—	—
H. Corby	—	209 10 0	—	—	—	—
J. Cooper & Son	540 0 0	210 0 0	—	—	—	—
Dawber, Townsley, & Co. .	—	—	—	20 11 6	—	—
W. Emcton	541 5 5½	229 8 11½	22 9 3	—	—	—
F. Fathor & Sons	—	—	—	—	62 14 5	—
J. Foster	—	—	—	—	—	26 18 0
Halkes Bros.	580 9 4	230 6 0	24 19 9	104 12 4	67 0 9	26 4 9
Hare & Son	—	—	—	—	—	19 17 3
Hart & Son	—	—	—	—	—	14 18 9
W. Harrison	—	—	—	94 10 2	—	—
Hinson & Co.	592 14 6	295 11 10½	26 1 3	98 14 2	45 15 0	25 5 2
E. E. Hoves	—	181 13 4	—	—	—	—
Hull & Son	—	—	—	93 0 0	—	—
J. Lucas	472 11 7	187 5 3	25 19 0	105 16 9	47 18 1	35 1 5
J. S. Marsden	535 0 0	195 15 0	—	—	—	—
H. W. Munton	—	—	—	102 11 6	—	13 4 5
J. Peasgood	—	200 0 0	—	—	—	180 0 0
Roberts Bros.	—	—	—	—	—	—
J. Rouse	676 19 5	—	—	—	—	—
R. Scholes	417 0 0	223 0 0	19 6 0	88 19 4	41 0 0	21 2 0
P. Sibson	—	—	—	—	—	17 15 0
W. Wilson	—	—	—	88 19 4	—	—

[The tender of Messrs. Roberts Bros. for bricklaying, carpentering, joinery, and slating has been accepted.]

RIDLEY.—For alterations and additions to School Buildings, Ridley, near Tarporey, for the Sub-Committee for the Nantwich Union area. Mr. H. Bewick, County Architect, Newgate-street, Chester. Quantities by Architect:—

J. Mayer & Son .. £580 0	Stretton & Gibson, Audlem	£391 10
T. G. Huxley	520 0	—
Reece Bros.	440 0	—

ST. COLUMB MAJOR (Cornwall).—For constructing a new cattle market, for the St. Columb Cattle Market Company, Ltd. Mr. Lewis Stevens, surveyor, Newton Abbot, South Devon:—

No. 1 section.—All work except No. 2 section for Ironwork.	
H. Bennalark	£1,700 0
W. E. Bennett	1,417 0
J. Parker Bros.	£1,326 0
No. 2 Section.—Ironwork.	
D. Bowell & Co.	£600 0
J. Collier	560 4 0
Bowilton & Pene	540 4 7
W. E. Bennett	531 0 0

No. 1 section.—All work except No. 2 section for Ironwork.

T. L. Harding & Sons	£489 2 7
J. Lyascht, Ltd.	476 7 8
W. J. Powell	402 10 5
Hill & Smith	422 18 10
W. Gratric & Sons	398 19 10
No. 1 and 2 Sections.—Undivided tender.	
W. Wilson, Holdworthy ..	£1,632

SALISBURY.—For the addition of a new coffee-room and other alterations to the "White Hart" Hotel, Salisbury. Mr. A. C. Bothams, architect, 32, Chipperlane, Salisbury:—

Mitchell	£986	Day Bros.	£870
Dawkins	957	Wort & Way	829
Kite	956	Musselwhite	809
Vincent & Folland	916	Harris Bros., Fiskerton, Salisbury ..	795
Grage & Sons	880		

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J. Mumford	1,234 8 0	R. W. Wyatt	1,089 0 0
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E. P. Bovey	1,198 0 0	R. F. Yeo & Son, Torouay ..	974 0 0
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VOL. XC.—No. 3206

APRIL 7, 1906

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Church of St. Bartholomew, Stamford Hill.....	Mr. W. D. Caroe, F.R.I.B.A., Architect.
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2. Interior View.	
Wayside Notes in East Anglia.....Drawn by Mr. J. S. Corder.
Examples of Wrought Iron Work.....Drawn by Mr. Leonard Dakin.
Old Cottage, Potter Heigham.....Drawn by Mr. J. S. Corder.

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The Trade Unions Bills.



It is doubtful if the public at large as distinguished from capitalists and workmen take much interest in the two important Bills which are now before the House of Commons in regard to the law as to Trade Unions, one brought in by the Government, the other by Mr. Hudson, a private member. It is only, as a rule, indirectly that strikes affect the general public, and so it is inclined not to trouble itself about these measures. It is nearly as certain, therefore, as anything can be that, having regard to the electoral power of the organised working men, these Bills will pass into law in the form of a single Act—that is, that the clause in the private Bill as to the immunity of Trade Union funds from liability for acts committed by members of Trade Unions will be incorporated in the Government Bill before it leaves the House of Commons. But we doubt if it would become law were the matter more one of general public interest, for it is intended to make a Trade Union, which is a registered and definite body, with members, officers, and funds, not liable for the acts of its agents. In other words, the Bill would authorise a departure in the case of these bodies of men from a clearly recognised principle of law applicable to every other like body in Great Britain. The proposition really

needs to be stated to stand condemned as unjust. One of the newly-elected lawyers—the victorious opponent of Mr. Balfour at Manchester—in the debate last week pointed out that whilst the particular clause would give immunity to Trade Unions it would confer the same benefit on capitalist corporations. The words of the Bill are, “a trade union or other association aforesaid.” Whether the supporters of the Bill will be altogether grateful to their advocate may perhaps be doubted, for if his views are right an action cannot be brought against a railway company for damage. Moreover, there is a popular saying that two blacks do not make one white, and if capitalist associations or companies were exempted from liability by this Act we should regard this also as unjust; for as long as the law of agency—that is, the liability of a master for the act of his servant, of the employer, in the broadest sense, for the act of the person he employs—remains part of the law of the land, so long should there be no departure from the general principle.

Ordinary people may reasonably ask for good cause to be shown for this demand of the Trade Unionists, but in the recent Parliamentary debates we look in vain for any reply to this question. One labour member expatiated on the benefits conferred on the community by Trade Unions; but even if this be admitted, it is no answer to the question—Why should Trade Unions be placed outside the ordinary law? Mr. Keir Hardie seemed to find an analogy in the Factory Acts and the Workmen's

Compensation Acts, and said that as these Acts took workmen outside the operation of the common law, therefore they were justified in their present demand. But factory legislation does not deal, any more than does the Compensation Act, with exemption from general legal principles. The truth is that, as one sentence of Mr. Keir Hardie's speech shows, the Trade Union leaders desire the exemption, not in justice, but because it will enlarge their power during strikes. “All they asked,” he said, “was that their organisations should be maintained in efficiency so as to be able to carry on a strike successfully.” That is the long and short of the whole matter, and there is no more to be said about it.

On the other points of the two Bills less need be said. “Peaceful picketing” is to be legalised, and any number of men may surround a factory or a house. Everyone knows that crowds do not congregate at a factory-gate merely for the nominal purpose of peacefully persuading non-strikers. They do so for the purpose of intimidation, none the less improper because it is done without actual physical violence. There, again, the Trade Unions are seeking to enlarge their offensive powers, as is plain to the mere ordinary understanding. Peaceful picketing should, therefore, only be allowed by a limited number of men. The amendment of the law of conspiracy, which is common to each Bill, is reasonable. The law has on this point become at once confused and technical, creating artificial offences, and neither strengthening the law nor adding to its value. In regard to this subject,

Trade Unions have a good case, but we regret that they should be desirous of seeking also to obtain an extraordinary position, one of immunity from the general law, which in time to come may cause a strong popular reaction against what tends to produce a tyranny of labour. For it should be remembered that in the past Trade Unions have received support because in their inception they were regarded by the country generally as organisations intended to place workmen, men without capital, on an equality with powerful employers. This public approval will cease when Trade Unions seek to obtain exceptional power and to limit individual freedom.

THE BRITISH SCHOOL AT ROME.

THAT the British Archaeological School at Rome is doing good and useful work is evident from the quality of the papers collected in this publication,* the third volume of the series. The papers deal chiefly with subjects hitherto scarcely touched upon by writers on archaeology, and consequently furnish much valuable new material for a study as wide as it is absorbing.

The volume, plentifully illustrated, includes a paper on Pythagoras, dealing with a problem in the difficult field of iconography, another on some drawings attributed to Pisanello, two papers on Roman historical sculpture, and the second instalment of Mr. Ashby's valuable work on the lost history of the Roman Campagna.

The scrupulously accurate observations collected in this latter paper, and the untiring energy it displays, testify to the well-deserved reputation the author has won for himself. The two excellent maps which illustrate the article are of great help in travelling with Mr. Ashby step by step, but unless one is acquainted with the environs of Rome it would be difficult to follow the author, so full is the detail he offers us. To rightly appreciate this paper it should be read on the spot. It teems with information gathered from previous writers as well as from personal research. Its completeness should recommend it to students, for it will be the means of saving them many a weary hunt in literary paths. Not its least merit is a full index, which is invaluable in a paper of such length relating to so much detail.

The three roads dealt with are the Via Salara, the Via Nomentana, and the Via Tiburtina, all leaving the city on the north-east, within a short distance of each other. The first two are among the oldest of Roman roads, and from that fact alone their history is of the deepest interest; while the Via Tiburtina, which came into existence during the establishment of the Latin League, led to a very populous and important district, and hence supplies considerable archaeological material. Besides two maps, the paper is illustrated with photographs of the author's own taking, and with copies of inscriptions and sketch plans, which are of great assistance in supplementing the text.

Mr. Stuart-Jones's "Notes on Roman

* "Papers of the British School at Rome," Vol. III, Macmillan & Co. 1906. Price 30s. net.

"Historical Sculptures" throw much light on a study which only recently has received its due share of attention—*i.e.*, the growth and development of Roman historical sculpture. Mr. Stuart-Jones has selected for examination three sets of reliefs which up to the present have on insufficient grounds been assigned to periods to which they in no way belong. The reliefs dealt with are the "Aurelian" panels of the Arch of Constantine, which were attributed to Trajan's time till Professor Petersen demonstrated in 1890 that they belonged to a different period; the medallions of the same arch, which were also assigned to the period of Trajan, but which Mr. Stuart-Jones considers to be late Flavian work; and the reliefs in the portico of Villa Borghese, which were held to be Claudian, but which the author recognises as Trajanic in style and execution. The arguments he employs in proving this latter point are of peculiar value.

Not only was a wrong date assigned to these Borghese reliefs, for by no process of orderly development could they belong to such an early period, but a wrong origin was given them. Mr. Stuart-Jones does not content himself with pointing out that Nibby's mere conjecture was the only foundation for the theory that these reliefs once belonged to an arch erected by Claudius: he gives satisfactory reasons for denying that they were discovered in the excavations which from time to time have taken place in the Piazza Sciarra, and offers in place of these assertions a practically certain pedigree of the reliefs in question. He bases his opinion on writings of the XVIIth century which give descriptions of certain reliefs in the Church of S. Martina, tallying with the Borghese reliefs. As this church stood on the site of the Secretarium Senatus, it is reasonable to suppose the reliefs were found near the spot, and that they might have adorned the Forum of Trajan. Mr. Stuart-Jones's opinion is further corroborated by the stylistic affinities between these reliefs and those on the Arch of Constantine which are known to have been removed from Trajan's Forum. The most noteworthy feature, says the author, of the Trajanic style is its attempt to substitute height for depth in perspective. This practice is characteristic not merely of the Borghese reliefs, but also of the great frieze of the Arch of Constantine and of the column of Trajan. Thus there can be no doubt as to the period to which our reliefs belong, a period to which they were rightly assigned by Wincklemann, the founder of archaeological science.

The relief medallions on the Arch of Constantine were more troublesome to identify on account of the large amount of touching up to which they have been subjected. Authorities assigned them variously to Trajan and to Hadrian, but Mr. Stuart-Jones was the first to give them that minute scrutiny which alone could render possible a final decision as to their date. As a result of his examination, the author suggests that the reliefs originally came from the gens Flavia or some monument of the Flavian dynasty, and he assigns them to the closing years of Domitian's reign. The subjects represented, *viz.*, hunting scenes, are

characteristic of the time and personality of Domitian, and although the technical detail might as well belong to a later period, still style is more than mere technical conventions, and the balance, spaciousness, and freedom of these reliefs are in sharp contrast to the style of Trajan's later years.

Mr. Wace's paper on "Fragments of Roman Historical Reliefs in the Lateran and Vatican Museums" deals with the same period discussed by the previous author, and is especially valuable as it treats of Roman sculpture during a time to which as yet no historical reliefs have been assigned, *i.e.*, the time of Domitian. It certainly appears strange that, in spite of Domitian's activity in building, no historical reliefs should exist which would illustrate the progress of that art from the death of Titus to the last years of Trajan, a period of some forty years.

If, as Mr. Wace claims, he has discovered fragments of reliefs belonging to this period, he has won the merit of filling a gap in our knowledge of the development of Roman historical reliefs. His researches were conducted along lines so simple that the result of his discoveries appears the more convincing. Having noticed the gap in the history of reliefs, he expected very reasonably to find in Roman museums fragments of such, belonging to the period in question. He consequently examined closely the stylistic and technical details of the sculpture on two characteristic monuments of the Flavian and Trajanic periods—*i.e.*, the Arch of Titus and the Arch of Trajan at Beneventum. These differences he analyses in the most instructive manner, and sums up his analysis in the form of two tables, the characteristics in the Flavian table having their relative counterpart in the Trajanic table. With such data before him Mr. Wace has been able to identify hitherto unrecognised fragments, and to classify them chronologically, according as they retain more or less of Flavian naturalism and evince more or less definitely Trajanic hardness.

The paper is of exceptional interest, both from its material and from the way in which this is handled, and it leaves one with the satisfactory feeling that the author has accomplished what he set out to do—*i.e.*, he has clearly traced a well-defined and progressive series of Flavian historical reliefs.

THE COLUMN OF TRAJAN.

ACCORDING to the account given by Dio Cassius (LXIX. 2) and other writers, the ashes of the Emperor Trajan, after his death in Cilicia, in 117 A.D., were conveyed to Rome for burial, and, enclosed in a golden urn, were deposited within the column which still stands in his Forum, and with its series of bas-reliefs illustrates his campaigns in Dacia. Some recent writers have stated that no trace of any sepulchral chamber was to be seen in the square base of the column; but some uncommon engravings of the middle of the XVIIth century bear clear testimony to its existence. The plates in question form part of the series known as the *Speculum Romanæ Magnificentiæ*,

published in Rome by one Antoine Lafreÿ and his successors (Nos. 94 and 95* of the copy which was formerly in the hands of Mr. Quaritch, and, though not complete, is the finest hitherto known—see *Bernard Quaritch's Rough List*, No. 135, p. 122). On each of them is given an elevation and vertical section of the column, with detailed horizontal sections also. The plan of the base shows that, opposite to the entrance to the staircase leading to the summit of the column (which is immediately on the right as one enters the base by the door under the inscription recording the erection of the column in Trajan's honour, and bearing the date 113 A.D.), there was a doorway about 3½ ft. in width leading into a corridor, which turned to the right, and by a second doorway, 3½ ft. wide, led into a chamber measuring 11 ft. long by 4½ ft. wide, which was lighted by a small slit window on the south-west side, near the door. This chamber left a rectangular mass of solid material, about 5 ft. by 7 ft., in the centre of the base, the rest being hollow.

The chamber and corridor had, however, been filled in (not very long ago, it is true, for on the lintel of the doorway leading to the chamber is the inscription "Radel, 1764") with brickwork, and the outer door had been plastered over. Nibby (*Roma nell' anno 1838, Parte Antica, II.* 188) was still able to point to what he rightly considered distinct traces of the existence of a chamber in the base at the column, and it is worth notice that Piranesi, in his *Colonna Traiana*, dedicated to Pope Clement XIII. (1758-1769), gives a plan and sections of the chamber, which must therefore have been still accessible in his day, though more recent writers, as we have seen, have denied its existence. Commendatore Boni has, however, rediscovered the blocked entrance independently, and has already reached the doorway leading to the chamber. He has also noticed that the torus immediately under the column itself, with laurel leaves sculptured upon it, had on the north-west side been broken by a violent blow—perhaps, as he conjectures, by the fall of the bronze statue of Trajan from the top of the column. The missing pieces have been found below the ground level, and it can be seen that the shock was so violent as to damage the travertine foundations of the base itself. The progress of the examination of the column will produce interesting results.

NOTES.

The Institute Registration Report. We give on another page the wording of the resolutions consequent on the Registration Committee's Report, which were passed at the Institute of Architects' meeting on Tuesday last; and which, as will be seen, differ somewhat from those originally proposed; the first one committing the Institute to the principles of the Report while leaving it open to consider and (if necessary) to modify

* In No. 95 the plan of the base is shown reversed, but the measurements are more correctly given than in No. 94. Labacco (*Libro appartenente a l'Architettura* (1832) pl. 12) gives a reduced copy of No. 95, with slight alterations in the arrangement, and the plan of the base correctly placed, but without measurements.

details before presenting a final Report. As we have felt obliged to strongly oppose the general policy of those whom we may call the "Registrationists," we have pleasure in adding that in this case we almost entirely agreed with the speech made by a prominent member of that party, arguing that some of the points in the Report were far too much open to difference of opinion to admit of being adopted there and then without further discussion, and which led to the modification of the Resolution. The two points which we wish to see reconsidered are (1) the phrase referring "to a definite course of architectural education in a recognised school," the meaning of which certainly ought to be explained, as it looks like a definite blow at the articulated-pupil system, which at all events deserves better than to be knocked on the head without benefit of clergy; and (2) the proposal to alter the name from "Institute" to "College," to which we are absolutely opposed, and to which there was evidently an almost universal feeling of opposition among those present. In general it was gratifying to see that a meeting on a subject which has been discussed with a good deal of acrimony passed off in such an entirely friendly spirit on all sides.

The Port of London.

By the motion which was carried in the House of Commons last week it is made clear that all parties are in substantial agreement as to the extreme desirability of placing the management of the greatest port in the world in the hands of a public authority. Notwithstanding the great increase of business which has taken place there have been practically no dock extensions during the last twenty years, and in point of fact the dock companies are unable to raise the capital necessary for the new works that are required, and the resources of other authorities are equally limited. Moreover, owing to the state of uncertainty created by the Report of the Royal Commission, and by the various Bills brought before Parliament, none of these bodies are inclined to make any serious movement with the object of improving the present conditions. Something more than a purely theoretical service has been rendered by the motion to which we refer; for, although no action can be taken this year, we gather from the remarks of Mr. Lloyd-George that a conference will probably be summoned by the Board of Trade to discuss the whole subject, and so to prepare the way for a satisfactory scheme for approval by Parliament.

Cement for Concrete Blocks.

NOW THAT concrete is beginning to be employed in the form of building blocks, it ought to be pointed out that considerable discretion must be exercised in the choice of cement used in block-making. Too many architects seem to act as if Portland cement were produced only in one standard quality, and too many builders as if price were the only criterion by which its quality ought to be judged. The indifferent material that can be employed without much risk for ordinary foundations must not be used under the more exacting conditions obtaining when

concrete building blocks are applied to finer classes of work. For such blocks the three essential qualities are durability, strength, and colour. To make enduring blocks it is absolutely necessary to obtain cement capable of passing the test for soundness in a satisfactory manner. If the cement is not absolutely sound the blocks may appear good when made, but after a year or two will begin to crack, the faces will crumble, and, in the case of very inferior cement, they will slowly but surely disintegrate. Strength is a property more easy to gauge, but as a building may have to support its full load within three months after the blocks have been made, fairly quick-setting cements are most suitable. While the foregoing considerations apply to the architect in his capacity as a constructor, the question of colour appeals to him with equal force as an artist. Uniformity in this respect can only be secured by adopting uniform materials, proportions, and methods of manufacture. Calcium sulphate, always added to regulate the set of cement, is one fruitful cause of efflorescence on the surface of concrete. Hence the proportion should be strictly limited, and the same applies to all other soluble alkaline salts. Sulphide of iron and excess of clay are apt to produce brown blotches of unsightly appearance. Even when uniformity of colour has been secured, the tone of concrete is decidedly cold, and the problem of imparting to it a pleasing tint is one still awaiting a satisfactory solution.

ON Monday last Professor Fire Risks.

Lewes delivered the last of his four Cantor Lectures on "Fire, Fire Risks, and Fire Extinction" before the Society of Arts. The first three lectures were of a popular character, and discussed mainly the theory of combustion and the fire risks attendant upon the use of various materials. The fourth lecture calls for special mention in these columns because it dealt with the precautions which it is possible to take to prevent the spread of fire in buildings. We agree with Professor Lewes in his contention that properly fire-proofed timber is a better material for staircases and upper floors than iron, stone, or concrete. Iron being a ready conductor of heat, a partition of this material does not prevent heat from one room being speedily conveyed to the room adjoining; while stone supported by iron, when subjected to intense heat, becomes a source of great danger to the firemen. The extra cost of using fire-proofed timber in place of untreated timber is admitted to be heavy, but there are many cases in which this additional cost ought to be incurred and regarded as an insurance premium. In proposing a vote of thanks to the lecturer, Captain Hamilton, Chief of the London County Council Fire Brigade, explained that one of the reasons why the cause of a fire is so often entered in the records as "unknown" is that litigation between private individuals sometimes follows the fire, and his official reports are liable to be taken as evidence. He also referred to the danger of a number of different trading firms jointly occupying a large block of buildings, for in such cases much time is sometimes lost before the

seat of the fire can be discovered. Colonel Fox, Chief of the Salvage Corps, spoke very strongly against the use of concrete ceilings in warehouses, owing to their great liability to collapse and fall upon his men.

New Water Supply: Lincoln. THE latest reports from Lincoln indicate that the yield from the deep well at Boultham ought to be ample for the total water supply of the city. This well has been sunk to the depth of 1,502 ft., and is the largest and deepest work of the kind in the world. From its bottom an artesian well of 30 in. diameter will be bored for an additional depth of some 2,200 ft., making the total about 3,702 ft. Although the depth of the bore itself has been exceeded, the two portions of this well taken together certainly surpass the limits hitherto reached in connexion with any waterworks undertaking. As originally intended the diameter of the bore was to have been 13 in., but after the loss of the boring tool in November, 1903, it was decided to increase the size to 30 in., with the object of securing increased supplies. The wisdom of this decision is fully justified by the copious flow from the 3-in. pilot boring recently completed, the delivery having far exceeded the expectations of the engineers. We understand that operations on the larger boring will be recommenced without loss of time. There seems good reason for believing that the final result will be such as to give Lincoln one of the best and purest supplies of water in the kingdom, and to remove all future anxiety in respect of this important question.

St. John the Baptist Church, Coventry. MESSRS. BUCKNALL & COMPEN in their report upon the fabric state that a thorough reparation of the exterior should be carried out forthwith, at a computed cost of 4,500*l.*, and a building fund has been opened. The church of St. John the Baptist, or Bablake, is cruciform on plan, with small transepts and an embattled tower, and was erected in 1345-75 for the Guild of St. John, to which Edward II.'s Queen, Isabella, gave a parcel of land called Babbelak, close to the Spougate and south-west of the Bablake Hospital, for a chapel, which was afterwards enlarged by two of the citizens and made collegiate. On the suppression of the college under an Act of 1 Edward VI., the fabric was alienated to the Corporation; a statute of June 23, 1734, converted it into a parish church. The piers and arches of the crossing are remarkably beautiful, and the interior is characterised by a simple yet dignified style. The choir bends somewhat to the north, as does that of St. Michael's. The west wall does not make right angles with those that adjoin it, nor are all the piers vertical. The floor, which had been raised in 1735 and then lowered, was relaid to its proper level thirty years ago. The long range of clearstory windows on the north side, with some of those on the south side, form an early instance of the adoption of square-headed windows. The font in use is a copy of the Early Perpendicular font in St. Edward's, Cambridge, and has a cover of tabernacle work finely carved.

Sir G. G. Scott restored the church in 1875-8 at a cost of some 7,000*l.*; the outer stonework has become much weathered since, and as a precautionary measure some of the pinnacles have been taken down.

Church of St. Edmund the King, Lombard-street. At a sitting of the Court of Arches on March 26 Sir Lewis Dibdin, K.C., Dean of the Arches, heard an appeal by the London County Council from a judgment of Dr. Tristram, K.C., Chancellor of the diocese, delivered in the Consistory Court on July 18, whereby he agreed that a faculty should issue for the building by the Commercial Banking Company of Sydney of a wide bay window upon steel girders over the churchyard. The rector and churchwardens contended that the land is part of the site of the earlier church. The London County Council objected that it is a portion of the old graveyard and therefore comes within the purview of the Disused Burial Grounds Act, 1884. The learned Chancellor held that the Council had not sustained their objection. Of the situation and history of the ground in question we gave an account in our number of August 12, 1905. At the hearing of the appeal Mr. C. E. Allan, counsel for the rector and wardens, stated that they had decided not to proceed with the faculty, and, having come to terms with the appellants, would, moreover, pay them 50*l.* towards their out-of-pocket expenses. The Dean of Arches adjudged that by consent and without prejudice to any question that might arise between the parties the order in respect of the faculty would be discharged; he gave no decision as to the important point of law involved, namely, whether the land is part of the site of the former church or part of the graveyard on the west side of the present church.

Church of SS. Anselm & Cecilia, "The Sardinian Chapel," Lincoln's Inn-fields. THE old church in Sardinia (until 1878 Duke street) will, it is stated, be soon pulled down. Some writers aver that it is co-eval with the archway on that side, formerly Arch-row, of Lincoln's Inn-fields; over the middle arch on each face is a tablet inscribed "Dyke Streets, 1648"; but our columns of October 22, 1898, contain a summary of some inquiries we made in the matter, showing that in November, 1687, the Franciscan Fathers of the Second English Province of Friars Minor resolved to acquire "the spot near the arches in Lincoln's Inn-fields, lately in the possession of the Countess of Bath."* A novice, by name of Our Holy Father St. Francis, was opened in the new chapel in October, 1688. The two houses, Nos. 53-4, Lincoln's Inn-fields, were at one time a single house occupied by the Portuguese, and afterwards by the Sardinian Ambassadors; the house was entered through a door, since blocked up, in Sardinia-street. No. 54, latterly the Presbytery, extends over one-half of the archway and communicates through the old hall and a door with the chapel in the rear. Having been during more than one hundred and

fifty years the chief centre of Roman Catholic worship and charity in London, the church has recently played a prominent part through the revival of an ancient ceremony—that of "La Messe Rouge," attended by members of the Bench and Bar at the close of the Long Vacation. In our article cited above we gave two illustrations of the silver medal executed by George Bower and presented to William and Mary in commemoration of the attacks made by the mob in the night of Tuesday, December 11, the day of King James's flight from Whitehall, upon the ambassadors' houses, and upon the other embassies in London. The reverse of the medal bears in beautifully-wrought relief a view of the chapel and house in ruins, and of the old elevations in Arch-row. The chapel was rebuilt and enlarged upon the site of the Embassy stables westwards, after the assault and pillage by the "No Popery" rioters in the night of Friday, June 4, 1780. The eastern portion of the fabric has an octagonal dome and a lantern, carried by four arches, with a gallery and a rounded apse; the western and later portion is much plainer and has an upper gallery. Fanny Burney was married in the church on August 1, 1793, and there on August 11, 1787, Nollekens, the sculptor, was baptised.

Mr. Byam Shaw's New Pictures. MR. BYAM SHAW is a painter of exceptional talent who is trying experiments; but his experiments are always interesting. The latest, illustrated in the three works entitled "Purity," "The Neglected Invitation," and "Hope," at Messrs. Dowdeswell's Gallery, may be described as a kind of revival of the art of Crivelli and his school, in the production of decorative paintings embellished with gold and other ornamental adjuncts in actual relief. The most important of the three, "The Neglected Invitation," enshrined in a sumptuous columned frame, represents the Saviour seated in the centre of the sacred table, facing the spectator; along the table are chalices spaced at equal distances, ready for the guests who do not appear. The whole of this is treated in a strictly conventional and decorative manner. Through semi-circular lunettes, one on each side of the Christ figure, are seen realistic pictures of the world outside—medieval crowds occupied in fighting and parade and business—hence "The Neglected Invitation." This cannot be called exactly a picture; it is an artificially made-up mingling of painting with decoration; but it is very impressive. "Purity" is a beautiful nude figure enshrined in like manner in decorative material, standing on a floor in which the perspective effect of the light and dark squares is realised by an actual inlay of mother-of-pearl and gilt plaques cut to the shape as seen in perspective. "Hope," a draped figure, is treated on the same principle. Though, as observed, this recalls Crivelli, there is a new feeling about it, and it represents practically a new form of art. There are some fine and original pictures of the usual type of painting; "Pegasus in the Plough," a fine poetic fancy; "The Pilgrim Year," much developed and improved since it was seen at the Academy; and an allegorical figure of "Autumn" which is

* *Conjer*, "The Franciscans in England A.D. 1600-1850, etc." By the Rev. Father Thaddeus, O.S.F., 1897; and "Collectanea Anglo-Minoritica: Or a Collection of the Antiquities of the English Franciscans, etc., by [Anthony] [Parkinson]": 1726.

exceedingly fine in colour. It is an exhibition entirely outside of the common-places of painting.

The Leicester Gallery.

AT the Leicester Gallery is a collection of some of the French pictures which formed part of the Staats Forbes collection. A good many of these are by Corot, but include none of his great works; and in "The Carp Pond, Fontainebleau" (3), the holdings are very bad; "The Water Meadow" (4), just below it, is a beautiful little composition. But the best things in the room are two beautiful woodland scenes by Diaz (37 and 50) in his finest style in this class of subject; and another by him called "The Salad Gatherer" (27), remarkable as a very fine little landscape quite out of this artist's usual style. It is interesting, too, to find a fine work by Rousseau (16) which is not a forest scene; and, on the other hand, a forest scene by Troyon in which he seems to have been imitating Diaz. Among other good pictures is a coast scene by Daubigny (15), "The New Moon," by the same artist (17), and "The Storm" (22), by Dupré.

The Fine Art Society.

THE announcement of an exhibition of eighty water-colour pictures illustrating the life of Christ carries the memory back to Tissot's remarkable exhibition years ago at the Doré Gallery; but the result is hardly satisfying. The subject is too great a one to hear anything but a high order of treatment, which we hardly find in Mr. Hole's drawings. We should gather that the artist's main object has been to realise the scenery of the life of Christ; in this respect he may have succeeded; but the realisation of the personages leaves much to be desired, and hardly seems to have been seriously attempted.

Mr. Maclean's Gallery.

THE exhibition at Mr. Maclean's Gallery is noteworthy for including three beautiful landscapes by M. Harpignies, and also a fine one by M. Weiss, "Autumn" (38), which however we think we have seen in another gallery in London before, or one exceedingly like it. Millais' "Jessica" is to be seen here; a fine painting, though we have never thought it answered to the character of Shylock's daughter; the figure is too dignified and lady-like in style for Jessica. Mr. Godward's cold classicities and Mr. Hurt's imitations of Mr. Peter Graham do not interest us much.

The Modern Gallery.

AT the Modern Gallery, under the title "Three Generations" is a collection of the water-colours of the late L. J. Wood, R.I., and his son and grandson, Mr. Pinhorn and Mr. Lawson Wood. The grandfather makes the best figure in the show. He was a painter of architectural subjects, somewhat in the school and manner of David Roberts; and, old-fashioned as their style of execution appears now, his drawings are excellent work of their kind, and illustrate some very picturesque architectural groupings. A curious example is that of the old bridge at Dietz on the Lahn, where

the heavy up-stream huttresses have evidently had their lower portion undermined and carried away by the water when the river was in flood, leaving the upper portions as masses of masonry hanging on to the piers of the bridge, which is probably not standing now. Mr. Pinhorn Wood's works are landscapes, and those of Mr. Lawson Wood caricature sketches in colour, very clever and humorous in many cases, though hardly meriting the name of art.

The Institute Prize subjects.

THE list of subjects for Prizes and Studentships to be awarded by the Institute of Architects in 1907 has been issued. That for the Essay Medal is an admirable subject—"The Influence of the use of Iron and Steel on Modern Architectural Design"; which should perhaps rather have been worded "The Influence which the use of Iron and Steel should have on Modern Architectural Design"; for as yet it has had little or no influence, in this country at least, except in the had sense of inducing concealed construction and displays of impossible pretences in masonry. But there is much to be said on the subject, and we hope there may be a better competition for this prize than has usually been the case. The subject for the Soane Medallion is "A Large City Hotel facing a Public Square"; a good subject, giving opportunity both for practical planning and for suggesting a better architectural treatment than we generally see in hotels. We hope the competitors will bear in mind that a hotel need not necessarily be florid and exuberant in architectural style, but is quite capable of treatment in a refined and sober manner. The subject for the Tite Prize is "A Loggia for Sculpture to screen the blank end, 150 ft. long, of a Building," but the height of the building should surely also have been given, or the height to which the loggia was to be carried. We observe that it is again stipulated that the design should be "according to the principles of Palladio, Vignola, Wren, or Chambers," which, as we have before indicated, is a misuse of the word "principles"; it should be according to the "practice" or the "examples" of those architects: "principles" is a word too large for its position as here employed.

LETTER FROM PARIS.

AT each Presidential election the Ministry of Fine Arts has a portrait engraved of the new President, prints of which are sent to all the Prefectures, sub-Prefectures, and Mairies of France. The portrait of M. Loubet was engraved by Patricot. On this occasion the etcher, M. William Barbotin, has been selected to execute the portrait of M. Fallières.

A grand Franco-American function will take place on the 20th at the Trocadéro, under the patronage of the United States Ambassador, on the occasion of the presentation to the city of Paris of the statue of Benjamin Franklin. The statue is to be erected on the Place du Trocadéro, at the entrance to Rue Franklin. It is the work of Mr. John Beyle, and is an exact reproduction of that which was erected in front of the Post Office buildings at Philadelphia. The pedestal is adorned with bas-reliefs by M. F. Bron; and on the plinth are engraved the words of Mirabeau—"Le Génie qui affranchit l'Amérique et versa sur l'Europe des Torrents de lumière, le Sage que Deux Mondes réclament."

Owing to the construction of line No. 4 of the Paris Metropolitan Railway to cross the

city from north to south, it will be necessary to make a tunnel beneath both branches of the Seine between the Place du Châtelet and the Place St. Michel. It was at first proposed to run the lines in separate tunnels, but as the result of a competition the Prefecture decided to accept the scheme proposed by M. Chagnaud, a well-known Parisian contractor, for a single tunnel of dimensions similar to those on other sections of the Metropolitan system. Except in the portions beneath the bed of the river, the subway will be excavated by means of a shield, and beneath the river it will be formed by the aid of caissons sunk from the surface of the water. The walls of the tunnel are to be built of cast-iron segments, bolted together in the usual way, to form an oval cross section, and cement grout will be injected outside the tube to fill any space between its exterior surface and the surrounding earth. The interior lining of the tube will consist of concrete-steel finished with a coat of Portland cement. Beneath the river the tube will be built in lengths, inside caissons formed of a steel framework of rolled sections and plates. One of these caissons has already been sunk. The lining tube was built inside the caisson as soon as the latter had been floated into position, and the space between the tube and the outer walls of the caisson was then filled with concrete, thus sinking the caisson upon a specially prepared bed at the bottom of the river. Sinking to the final level will be performed by means of compressed air, and when the adjoining lengths have been sunk the steel plates closing the ends will be removed to form a continuous tunnel. Beneath the Orleans railway the excavation will be conducted by the freezing process, a wise precaution intended to avoid the risk of settlement during construction.

The Municipality of Paris are at present considering the question of the future of the electric supply of the city. The concessions granted to the six private companies who supply the city with the electric light will all expire shortly, and it has been agreed to convert all the present systems, so that by 1912 they should be all practically uniform. In a report presented to the Council by the Prefect of the Seine, M. de Selves, the offer made by a syndicate of manufacturers for taking over the companies' undertakings directly their concessions expire and converting them to a uniform system is recommended for acceptance. The company would be given practically a monopoly of the electric supply for nearly thirty years. In return it would have to pay to the Municipality 3 per cent. of the gross receipts for the sale of the current, and, in addition, 45 per cent. of the net profits. The sum of these payments, however, must never be less than four million francs (60,000*l.*) per annum. The concessions granted would expire in 1938, when the whole system would belong to the Municipality. It is not surprising, therefore, that under these heavy burdens the price of electric light in Paris is dearer than in almost any other city in Europe. Under the new scheme consumers have the option of paying on the basis of a two-tariff rate or on the maximum demand system, which is extensively used in this country. When the double tariff is accepted, the consumer's meter automatically registers much faster at certain times of the day than at others. For instance, in January every unit consumed between the hours of 4.15 p.m. and midnight will be charged at the rate of 7*d.*, whilst at other times of the day the charge will only be 2*d.* In June and July only the lower tariff rate will be charged. It has been decided to have one or two large generating stations outside the city. The electric power will be transmitted by three-phase currents at 10,000 volts to substations for distribution on the three-wire system at 110 volts. Incidentally the question of the best frequency to adopt for the supply has led to the reading of several papers before the electrical societies and an animated discussion in the technical press. Many engineers are in favour of the low frequency of 25, but others say that the flickering of the light of low candle-power lamps and of arc lamps at this low frequency is very objectionable. Parliament has just voted a law in regard to the protection of sites and natural monuments of artistic beauty. By the terms of this law, a "Commission de Protection des

Paysages" is to be formed in each department in France and Algeria. This committee will draw up a list of landed properties the preservation of which would be, in regard to their artistic or picturesque interest, of public importance; and the proprietors are to enter into an undertaking not to destroy or to alter the aspect of the site without a definite permission from the Department of Fine Art, which will keep a classification of them in the same way as in the case of Monuments Historiques. In case of refusal to obey this injunction the Government will take proceedings against the proprietor "pour cause d'utilité publique" for the payment of an indemnity fixed by a jury of expropriation, and he will be also subject to a fine, under a penal clause, ranging from 100 to 3,000 francs. The measure is regarded in France as somewhat too sweeping, and an interference with the rights of individuals in private property.

Parliament has also been occupied with a Bill relative to the erection of a Chemical Institute which would occupy a site of about 9,000 square metres between Rue Ulm, Rue St. Jacques, and Rue Gay-Lussac, in the Vth arrondissement. The scheme will require an expenditure of close on five million francs.

The Société Nationale des Beaux-Arts (New Salon) has obtained the use of the two pavilions at Bagatelle for its exhibition, from April 15 to June 30, of works by its deceased members, among whom are the great names of Meissonier, Dalon, Pavis de Chavannes, Cazin, etc. The exhibition is being arranged by M. Dubufe, and is likely to be a great success. The receipts from it are to go to swell the art budget of the Municipality. It is hoped that, with these extra gains from the Bagatelle exhibitions, the Municipal Council will see its way to make purchases from the various Salons of the works of foreign artists, which hitherto it has reluctantly been compelled to pass over in its annual acquisitions. In that case certain rooms at the Petit Palais will be reserved for the works of foreign artists, as is at present done in the State gallery of the Luxembourg.

The gallery at the Petit Palais containing the collection of Henner's works, which his nephew has presented to the Municipality, has just been opened. It is a fine collection, showing Henner's best qualities, and the fine colour and calm and restrained style of these is in striking contrast with the very different character of the works of Ziem in the adjoining room. It is proposed to organise in another room a collection of the works of Carrière, some of whose best works, especially those which he painted for the mairie of the XIIIth arrondissement, are in the possession of the Municipality. There is also to be shortly opened to the public, at the Petit Palais, an interesting collection of sketches by Daniel Vierge, Diaz, and M. Harpignies.

The work of enlarging the Musée Carnavalet has been actively carried on under the direction of the architect to the museum.

Following the example of South Kensington, the Union Centrale des Arts Decoratifs has decided to open its doors to temporary exhibitions of loan collections. By way of a beginning, M. Bernard Franck has lent his fine collection of caskets, bottles, and toilet objects of the XVIIIth century.

For the first time, this year, the manufactories of Sevres and Gobelins have been invited to contribute to the exhibition of the Old Salon. They will send some of the most remarkable works executed during the last few years, and also a collection of Sevres designs of the XVIIIth century, executed from moulds still existing at the factory.

The death is announced, at the age of seventy-five, of the painter Jean Baptiste Millet, brother of the more celebrated author of the "Angelus." He was the pupil of his brother, and exhibited landscapes in the neighbourhood of Fontainebleau and of Paris. He had, however, devoted himself more especially to sculpture, and, along with Geoffroy Dechaume, he executed, under the direction of Viollet-le-Duc, important work at Notre-Dame, Paris, and at the church of Vezelay. He has left also some remarkable water-colours.

THE "WOODMAN" TAVERN, HOLLOWAY.—This tavern has recently been rebuilt from plans drawn by Mr. M. T. Saunders, architect.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

WOOD-CARVING.

AN ordinary general meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, Regent-street, W., Mr. Leonard Stokes, Vice-President, presiding in the absence of Mr. John Belcher, A.R.A., the President, when papers on "Wood-Carving" were read by Mr. W. Aumonier and Mr. A. W. Martyn.

Mr. Aumonier, dealing principally with the treatment proper to wood-carving, referred to the various ways of applying carving in architectural decorations. If the wood-carver, he said, can succeed in making these points of real interest in the scheme, and by a right understanding of the power of light and shade help the architect to bring his whole design into harmony; and if he impart into the work some subtle touches that will help to bring mystery and life into it, in however small a degree, he has done something to relieve the appalling monotony of machine-worked moulding and correctly-planned boards—he has done something to justify the hope that he may be regarded as a brother artist working in sympathy with the architect towards a common end. Going into details of the carver's art in relation to architecture, and treating of panel-work, the lecturer said that very fine effects can be obtained by the actual treatment of the work as light and shade, by putting some parts very low on to the ground and keeping others high. Even a bad design may be made to look tolerable by the way the work is in the language of the craft, "thrown about," and a really fine design may have no interest if carved with no sense of relief or proper variety of surface. A design should never be too elaborate or intricate in character. The lecturer expressed his strong personal sympathy in favour of solid panels carved with a considerable amount of relief, some parts being high and others very low and dying delicately into the ground and combining with it. He felt, however, that in these days of distinct, and to some architects disquieting, revival of the Grinling Gibbons sort of work, one could not ignore altogether the sumptuous effects arrived at by swags, etc., boldly applied on to the surface of plain panels. By this process rich and strongly-decorative effects may be obtained which, perhaps, could not be conveniently accomplished by any other means. Styles or rails forming part of the frames of carved panels should be treated very delicately, and carved into the solid wood itself, so as not to lose the feeling of strength properly belonging to framing of any sort. Columns, if carved, should be treated in the same flat, solid manner as recommended for styles. Perforated work should be kept very flat on the surface. As regards mouldings, architectural decoration might be often improved by giving more thought to the suitable treatment of carved mouldings—for instance, keeping some of them very delicate in effect, and some much stronger as a whole; while some may be delicate in parts and much stronger in others, always dividing the strength and delicacy to run in line with the edge of the moulding. The lecturer showed by means of diagrams various ways of treating enriched mouldings. Caps to columns or pilasters should never be overcrowded, but should show the bell plainly, thus revealing the strength of the column going right up to the abacus. They should be very lightly carved, and the volutes may be freely cut through in all directions, plainly disclosing the bell underneath them. As to carving generally, the lecturer deprecated all mechanical means of getting effect. He pleaded for its own treatment, that of real carved or cut wood, cut with sharp tools, and alive with living, nervous cuts all over, both subject and ground, making one harmonious whole. No part of the ground should ever be absolutely smooth like a planed board—no part of the surface of the carving itself ever robbed of all expression by the brutal use of glass-paper or fish-skin—all parts of the work should team with the joy of life and effort which the carver felt in doing it.

Mr. A. W. Martyn briefly sketched the history of wood-carving from early times

down to the present day, deducing the fact that the best work in all periods has been inspired by religious enthusiasm. How are we, he asked, to inspire enthusiasm, and will the expression of such enthusiasm elevate the public taste so that we shall not have such a character for the next fifty years as we have had in the past? To inspire enthusiasm one must have contagious enthusiasm oneself; had we a wood-carver—or, say, an architect, with the enthusiasm for his work that a man like General Booth has, we should find a marked improvement in all branches of architectural art. The lecturer emphasised the point that it is the architect who makes the carver. The architect must know what he wants, and must be able to inspire his carver with his requirements; he must work with him as a fellow-artist, leading him on to produce that which is in his (the architect's) mind. The lecturer cited Grinling Gibbons as an example of an artist in wood who, when left to himself, simply became a clever expert with his tools; his work lacked architectural harmony, it was wood-carving pure and simple, without direction—witness the altar-piece at St. James's Church, Piccadilly. On the other hand, much of the same artist's work in St. Paul's Cathedral, though not nearly so well carved or so dexterous, has control; it has architectural harmony, and is part of the architecture, and, what is more, part of the architect. As regards the architect's knowledge of carving, intimacy with good work is essential; and a carver to give the best results must have a fair knowledge of architecture, i.e., the carver should know as much of architecture as the architect should of carving. Contagious enthusiasm cannot be within the power of all; but intimacy with one's subject and sympathy between the artists can be secured by every architect, and will to some extent remedy the deficiency in the lack of enthusiasm. Necessarily enthusiasm must be properly directed; must be placed at the back of knowledge to encourage and direct. But how is this knowledge to be secured in the fullest degree? Though real, useful, living knowledge is being given to students at some of the schools of art, we have no central leading authority to found or carry on any given school of carving. The school of Gibbons was created by his personal force in his work, which was lifted right away from its immediate surroundings to a height carving had not reached for 200 years. Since his time carving has steadily depreciated. We must now look for some artist to lead us along the line of progress; if it cannot be done alone, it may be by united efforts. Unless we can hand down to the younger generation some of the knowledge we have gained through the years of experience, so that the threads of our knowledge may be carried on indefinitely, we cannot make such progress as history has painted for us in the past. The old schools of painting were more or less continuous, the pupil often rising above the standard of his master, and so by continued growth the fullest development took place. The lecturer expressed a wish that it were possible to found such a school for carving. A London master, he said, had given twenty years' hard service, and had probably done more good in this direction than almost all the others combined. This work ought to be carried forward, and should receive the assistance and sympathy of architects. The lecturer suggested that, as religious fervour was lacking, another spur should be found to help us along. Perhaps the best was ambition; at present ambition in a carver was almost dead. A gold medal might be founded, on the lines of the Royal Gold Medal for Architecture, and presented annually, or even triennially, as an award of merit to the individual who had done something to raise the standard of his art, be it in mural decoration, stained-glass, plaster-work, wood-carving, or any other branch of architectural work; the recognition should be public, so that the award should carry with it the good opinion of the art-loving public. But the opportunity must be created for continued study; there should be a central school directed by men of knowledge. By looking at the past one was able to judge of the future, so that in all probability the architectural profession must be looked to to raise the standard of work. The architect is the master, the carver the servant; but a direct

and living sympathy must at all times exist between them if the best results are to be obtained. The lecturer referred to a little difficulty carvers continually meet with in connexion with architects' sketches of carving. An architect will mark on his drawing the word "carving," and his assistant, often a junior, will roughly sketch what he thinks is required; and the carver is invariably affected by whatever is shown, no matter how rough. This is an important point; whatever is shown on the drawing should be strictly indicative of what the architect desires. A carver often produces a clever piece of carving by the inspiration of a clever sketch supplied by the architect.

Mr. Hubbard, in proposing a vote of thanks to the readers of the papers, said the subject they had dealt with was essentially one of the high arts, and it became exceedingly difficult to criticise this art, as the leading architects of the day had just been telling them they could not examine or criticise art. He did not know exactly what that meant, but they would appreciate the difficulty in which he was placed on that occasion. He began at last slightly to realise what was meant by that when he saw one of the photographs which had been exhibited. This photograph showed a good deal of the carving executed by Grinling Gibbons which was originally in the chapel of Winchester College. Some forty-five years ago one of the leading architects of that time—Mr. Butterfield—had instructions to carry out certain works at this chapel, and when he saw this carving—and it was some of the finest carving in the country—he did not consider it quite appropriate. At all events, he must have considered his own Gothic architecture more important, for he turned this carving out of Winchester College and superseded it with his own. That carving, whether it was appropriate or not, had apparently been placed in the rooms of the Institute, and it was difficult to say whether Mr. Butterfield was right or not, inasmuch as he was a leading architect of his times; but, if he (the speaker) as a humble architect representing no influence at all might say so, he was inclined to think that, handsome as the carving was in that room, it might still have been more handsome in the position in which Grinling Gibbons wished it erected. They saw another example of Grinling Gibbons's work on the opposite side of the room, and one of the characteristics of his work was this—that he invariably neither enlarged or diminished the size of the foliage, or flowers, or fruit he was depicting in his work, and he so arranged his carving that any flower or fruit could easily be picked out from the wall on which it was hanging. The realistic effect thus gained was perhaps the chief characteristic of his work. The lecturers had pointed out how the best effects might be obtained, but there was a great deal more in wood-carving than just the effect which was attempted to be obtained from the artistic point of view. At the back of all artistic work they would find there was a certain sentiment, and it was the duty of the architect or the carver to represent that sentiment in his work. Even in the architecture more than the carving they could embody the sentiment. Architecture and carving was but the representation of a sentiment quite apart from the artistic effect. He noticed amongst the examples given a long panel, and one was confused in one's mind to know in what position it could be properly placed. It was a handsome piece of work from the carving point of view, but whether it was intended for a church or a ballroom it was impossible to say. The cherub with wings growing out from the shoulder-blades seemed to imply that it was meant to give an ecclesiastical effect, whereas other features of the carving seemed to suggest a ballroom effect. Mr. Martyn had pointed out that it was for the architect to instruct the carver in the work he was to carry out; that it was really for the architect to explain to the carver the sentiment he wished carried out, and the architect ought to be in a position, however roughly, to indicate that sentiment. He was sure that if they as architects really did try to represent the sentiment intended to be carried out the better would be the result, and it was, thanks to lecturers like those who had been there that night, and who had explained their difficulties, that architects would be able to appreciate how best to assist them.

Miss Eleanor Rowe, in seconding the motion, said that as a sister carver she appreciated many of the difficulties which had been referred to. If carvers only bore in mind what Mr. Aumonier had said about the treatment of the ground, they would find it very helpful. What was said about mouldings also was very helpful. She would like to see more pierce carving. Such carving applied to the hollow moulding had been done with wonderful effect in some of the churches in Devonshire. One instance was the church at Coleridge, where some panels were brought forward which gave an exquisite effect. With regard to Gibbons, she would be very sorry if there was any attempt to revive his carving, although the carver could learn an immense amount from his work. The way Gibbons treated his foliage and flowers was admirable; he knew exactly what to take and what to omit, but she did not like the effect of the cutting and applied ornament, for there was a lack of harmony in the whole arrangement. They would see this in St. Lawrence, Jewry, although the carving was very fine. She felt that the giving of a gold medal would be a very great encouragement, and hoped the Institute would see its way to offer one.

Mr. Alkin Perry said he felt there was scarcely a word in Mr. Martyn's paper which would not appeal to the sympathies of all present. Mr. Martyn, amongst other things, spoke of the indefinable thing called "spirit" in the work, and he contrasted the commercial spirit with the true artistic spirit. They knew that the commercial spirit was the bane of all they as architects were trying to achieve, and it was unfortunately very prevalent in these days. Mr. Martyn seemed to imply, and, in fact, said, that architects made the carver. That might be so, but he thought the architect was very much in the hands of the carver, and very much dependant on the carver. The carver might either make or mar the work of the architect. Mr. Martyn also spoke of the enthusiasm that was necessary. They knew that enthusiasm was a potent force if it met with due encouragement, but that it was in art a delicate and sensitive plant, and was chilled and withered by the want of encouragement. How often they as architects had to deplore that want of encouragement from those who employed them? They were not absolutely masters of the situation, but they were in the hands of those who had to pay for the work which was executed, for often when they would like to employ the very best talent they were prevented by the want of encouragement and want of enthusiasm on the part of their clients. Therefore he did not think that architects must be held entirely responsible for making the carver. He wished it were so. Mr. Martyn referred to the practice of the architect in writing the word "carving" on the drawing and some other hand attempting to interpret the word and very often spoiling the whole thing. He thought it would be much better if the architect left the word "carving" to be interpreted by the carver, because, given a carver of the right sort, he was quite certain they would get carving of the right sort.

Mr. H. Inigo Triggs remarked that, so far as English work was concerned, he had chiefly studied those of Inigo Jones, and had always felt that he did an enormous amount towards the development of English wood-carving. In All Souls' College, Oxford, he had gone through a lot of Inigo Jones's original sketches which he made for wood-carvers, and was very much struck at that time to see how very minutely he sketched out all the work which was executed for him. He certainly did not write the word "carving" on his drawings. He understood that up to that time carving was very much left in the hands of the carver himself. There was a wonderful collection of Inigo Jones's drawings at Worcester College, Oxford, which he was afraid that architects did not value as they should, and it was wonderful to see what an amount was shown in them. It was some time said that Wren rather started English craftsmanship, but it seemed to him that Inigo Jones was a little bit before him in that respect. He had seen a good deal of Mr. Aumonier's work at Oxford, and it had always given him the very greatest pleasure.

Mr. J. D. Crace said that, taking a great interest as he did in wood-carving, he had followed the speakers with close attention, and there were some points which were

perhaps worth laying a little stress upon. He entirely agreed with Mr. Martyn's view that Grinling Gibbons became valuable as a carver, apart from the *tour de force* of his power, from the time that he came under the direction of Wren. Gibbons's work when subjected to architectural direction became at once valuable to the building, and so long as the carving, however beautiful, does not contribute to the beauty of that which it is supposed to adorn it had no value from the architect's point of view. In examining the work of Grinling Gibbons, or the work, at any rate, done under him or in connexion with him, too much stress could not be laid upon the extremely able treatment of the mouldings. Whenever the mouldings were not near the eye or when they were running in long lengths and in great continuity, their contours were never disturbed. They found in Wren's work almost throughout St. Paul's and in other places that the wood sections of the mouldings could always be read right through. There was an undisturbed surface, and that was one of the great charms of the work done under Wren's direction by Grinling Gibbons. This was observable in the strap mouldings and in the most beautiful ogee carving. One of the most beautiful examples of Grinling Gibbons's architectural carving had not been mentioned. He alluded to the chapel of Trinity College, Oxford. Of course, the library of Trinity College, Cambridge, was better known, but for the most beautiful woodwork of Wren's time he thought that of the chapel of Trinity College, Oxford, was quite amongst the very best. There had been allusion to French work, and the work of the XVIIth and XVIIIth centuries was mentioned, but there had been no allusion to the stalls at Amiens and Auch, which were both superb and far beyond anything executed in England in the same period. Another point which it appeared to him that wood-carvers of the present day were apt to overlook was the great importance in architectural work, and especially in panel work, of maintaining the line of interest in ornament. Of course, in the panels illustrative of Grinling Gibbons's *tour de force* style practically the direction of the ornament was lost unless one was actually opposite them. The Italian carvers worked with an extraordinary knowledge of effect. In such work as the doors of the Vatican and the panels in the stalls at St. Pietra, Perugia, or, again, in the beautiful work at Bergamo, there was always direction of the main line of scroll, however elaborate the ornament. It might be a piece of foliage or a mere string of light or shade, and the first feature in the carving was that they always maintained the motif. That was a thing very often lost sight of now. In reference to French and Italian work, in both of course, there was a life and delicacy quite unknown in the English work of the same periods. Speaking of the later carving, Bergamo afforded a most beautiful example, which no wood carver should fail to see in the stalls of the cathedral. At least, he believed it was the cathedral, but there were two churches near together, and it was many years since he was there. In those stalls there were a number of children carved in wood surmounting the arms and canopies. He believed there were over 200 of them, and they were the most natural and beautiful representations of children ever produced. It should certainly be well studied by wood-carvers as an admirable example of the form in which the more independent kind of wood-carving could be carried out.

The Chairman said they would all agree that they had had two most valuable papers. Mr. Aumonier dealt, if he might say so, more with the practical side, and Mr. Martyn seemed to be filled with enthusiasm and vigour of the theoretical side, although to him were largely due the examples of practical work which they had before them, and which showed clearly that, however much he was imbued with theoretical ardour, yet he was also endowed with practical knowledge. They would all admit that, while there were carvers and carvers, there were also architects and architects. While it may be very wise for some architects who write "carving" on the drawing and leave it to the carver, it might be well for other architects to do a little more. Some architects might have some knowledge of carving, and might suggest to the carver pretty straightly the sort of thing they wished to see carved on their buildings. But, as he had said, some of them were architects and

some were carvers, and some were carvers of one kind and some architects of another kind, and so they could not lay down a hard-and-fast rule. He felt that it was most desirable that carvers should know something about architecture. Mr. Martyn quite admitted that, and he (the speaker) thought many of their buildings suffered, if he might say so, from the want of knowledge of the carvers. They got unnatural foliage trickling about their buildings, which they had hoped when they saw the sketches and models were not going to be so unmarred and trickling. Of course, Grinling Gibbons was a master, and, although they might not hold exactly all his views, they could not help admitting that his work was full of genius. Mr. Hubbard seemed to be disturbed with regard to a piece of carving as to whether it was meant for a church or ballroom, and had pointed out that the figure of the cherub was suitable for a church. He, however, sometimes thought that a cherub was more suitable for a ballroom, but they would not quarrel over that. He himself did think that Grinling Gibbons was a great master. Of course, there was the good old Gothic principle that they should carve everything out of a chunk of wood. He himself was brought up in those principles, and he supposed he would die in them. At the same time, he could not help thinking that this applied work had a charm of its own. They would probably each go their own way, and some would carve out of the chunk and some would apply their carving in the way that Grinling Gibbons did.

The vote of thanks was then carried. Mr. Ammonier said that, with regard to Mr. Crace's point that no mention was made of the Amiens work, he might say that, personally, he did not care to speak about the historical part of the subject, but when he read a paper before he did mention it. He came there to talk about what he himself knew, and to show how men of the greatest culture appreciated good work. He would tell a little tale of the very work of Grinling Gibbons to which Mr. Crace referred at Trinity College, Oxford. He knew that work years ago, when it was beautifully dirty and toned. Some time ago he went to Oxford again, and, as usual, visited Trinity College, and directly he entered the door he found the carving looked quite white and new. He thought it had been cleaned, but when he went to examine it he found that every inch of that work had been painted with white oil-paint. That was the way that some of the cultured people of England took care of priceless examples of old work. He expected something better from Oxford, but he did not get it.

Mr. Martyn said the only thing he would point out was that in all Gothic carving the value of the carving was taken from the front of the work. Whatever piece of Gothic carving they took, the outline—the front line—was its value. On the other hand, the classical carving, they would find that the value was created through the background.

The Chairman announced that the next meeting would be held on April 23, when papers on "Plaster Work" would be read by Messrs. G. P. Bankart and L. A. Turner.

Registration.

A special general meeting was held on Tuesday, Mr. Edwin T. Hall, Vice-President, in the chair, to receive formally the draft Registration Bill and the report and recommendations (see our last issue) of the Registration Committee adopted at a meeting on March 20, 1906, when it was resolved to recommend the Royal Institute to adopt the scheme outlined in the report instead of the Draft Registration Bill already published.

The following resolutions were proposed from the chair:—

"1. That the report and recommendations of the Registration Committee dated March 20, 1906, be adopted.

"2. That the Council be requested to take the necessary steps forthwith to apply to His Majesty the King for a revised or supplemental charter embodying the said report and recommendations, and also as soon as possible to prepare and present a Bill to Parliament to give effect to the same."

After discussion, the resolutions were varied, and unanimously adopted as follows:—

"Resolved, that the general principles of the report and recommendations of the Regis-

tration Committee dated March 20, 1906, be adopted, and the details referred to the Council for further consideration and report to the general body.

Resolved, that the Council be requested to take the necessary steps, when the scheme is perfected and approved by the general body, to apply to His Majesty the King for a revised or supplemental charter and to prepare and present a Bill to Parliament."

THE LEGAL OWNERSHIP OF ARCHITECTURAL DRAWINGS.

A JOINT meeting of the Architectural Association Discussion Section and the Law Students' Debating Society was held on Wednesday evening last week in the Law Society's Hall, Chancery-lane, W.C., when an interesting discussion took place on the subject of "The Legal Ownership of Architectural Drawings." Mr. E. B. Ames, of the Law Students' Society, presiding.

The discussion was opened by Mr. William Woodward, on behalf of the Discussion Section of the Association, who said that he might subdivide the subject as follows, viz., (1) The Sentimental, (2) The Practical, (3) The Legal, (4) The Remedy. As to the sentimental view, we must differentiate between the architect of fifty years ago and the architect of to-day.

Fifty years ago the architect was permitted by his employer to occupy a far longer time in the preparation of his designs than he is now, and this resulted in a careful inking-in and finish of the drawings which would astonish some of the younger architects of to-day—not only inking-in and colouring, but perspective views and elaborate shading of full-sized carved work and ornament—so that really and truly, apart from design, these drawings might be appropriately termed works of art. Therefore, to deprive the architect of these particular sheets of paper was an injury to his sense of right, and his sentimental views were considerably upset. He took the pride of an artist in the result of so many weeks and months of study, of the work of pencil and of brush. As an evidence of this just pride he even went so far as to put into frames what were really pictures possessing considerable artistic merit, apart altogether from design. As to the average architect of to-day, days were allotted to him in place of weeks and months to his *confirms* of half a century back; he had frequently to be content with hastily-produced one-eighth-of-an-inch scale pencil drawings, which he thrust into the quantity surveyor's hands as soon as he possibly could; he scarcely ever inked-in these small-scale drawings; tracings were made from them to supply to the builder; the half-inch scale and full-size details followed on as soon as possible, all in pencil, and the photographer's art was called in to reproduce as many copies of these tracings, within an hour or so, as might be desired. So that, regarded as works of art, these drawings were as different as possible from those of fifty years ago, and probably the last wish of the up-to-date architect would be to produce them in court, and, except for other reasons, the sooner these drawings were put out of sight the better the architect would like it. They would, therefore, probably agree that, apart from other questions which naturally arose, the sentimental idea of retaining the drawings depended a good deal upon the amount of work and of finish which had been bestowed by the architect upon the particular sheets of drawing-paper under consideration at the time. The late Professor Kerr had dealt with this question of ownership of drawings in a broad, business-like way, and, no doubt, what it must all come to was that if we could not establish custom we must get what we want by contract. He assumed that when architects' drawings were referred to as regards "ownership," the contract drawings were meant, and he thought the late Alfred Waterhouse, appreciating this, made the tracings the contract drawings, and thus defeated the client as regards the retention of the original drawings in the event of dispute as to ownership.

As to the practical point of view, and the injury which might arise to architects unless the present state of the law was altered, he would quote a case which had recently come to his knowledge illustrating the desirability

of some change in the law. About fifteen years ago a Roman Catholic church was built in Warwickshire, under the superintendence of an architect, who handed over the drawings to his employers at the finish of the work, but whether compulsorily or voluntarily he (the speaker) did not know. Quite recently another church had been erected in another part of England from the very drawings left with the original employer, who handed them over to the new employer, who placed them in the hands of a builder to proceed with the work without the aid of an architect, only making such modifications as became desirable in the second church.

He (the speaker) built a house at Hampstead, and, most curious to relate, a gentleman, who wished to build a house and stables on the adjoining piece of land, took a fancy to his design; but, instead of coming to him, he found out the builder, went to him, and, saying that he supposed he had the drawings from which he built the house, asked him whether he would build him a similar house, thus, no doubt, thinking he would save the architect's charges. The builder had the drawings, but was honest enough to decline to have anything to do with the matter unless the gentleman employed an architect. He (the speaker) then received a visit from the employer, and ultimately built him a house and stables at a cost of over 12,000.

Another reason—it might be a selfish one for the non-parting with the drawings was that it occasionally happened that additions and alterations had to be made to premises, and there were many employers who thought, very wrongly no doubt, that they could save money if they got rid of the architect and went direct to a builder with the drawings, who would thus see the nature of the construction, and be enabled to make the proposed alterations or additions without the aid of the architect. Another important point was that frequently questions arose years after the completion of the building, when it was absolutely essential, for his own defence, that the architect should be in possession of the original drawings, and, finally, it was perfectly clear to him that architects' drawings could be of very little value to an employer, unless he intended to use them in some way or other to the ultimate injury of the architect. All this might arise in the case of executed works, but the door was opened for greater mischief in the case of abandoned works. In these cases his employer could get the drawings, and, having paid only half of the charges which he would have paid if the contemplated building had been completed, he could hand the drawings over to a builder, and so save 25 per cent., or, at all events, he thought he would. But whether he did or not, the architect lost a job.

As to the law on the subject, the first case fought was the well-known one of *Ebdy v. McCowan*, and in this it was decided that, upon payment of the balance of his charges, an architect must deliver up the plans unless it had been stipulated that they were not to become the property of the employer, and, in his book on Building Contracts, Mr. Hudson gave a note on a case at Quebec, in which it was held that plans formed an essential part of the contract, and, in the absence of proof that they were the property of the architect, were deemed to be the property of the employer, and they could not be reclaimed by the architect. The court denied the existence of any general binding usage to the effect that the plans belonged to the architect and not to the employer. This case was apparently decided upon that of *Ebdy v. McCowan*, and apparently no case had been subsequently tried in this country except the important recent one of *Gibson v. Pease*, which resulted in the defeat of the architect's contention, and, upon appeal, the same unfortunate decision was arrived at. A case somewhat bearing upon the subject was fought some years ago by a firm of quantity surveyors. It was the School Board for London v. Northcroft, in which the Board had demanded from the surveyors the delivering up of their dimensions, abstracts, and bills of quantities for some work they had done for the Board. The surveyors declined to give these documents up, and they were supported in their contention by Mr. Justice A. L. Smith, who held that the dimensions, etc., asked for

were the private property of the defendants. The ink, paper, and brains, he said, used in making the documents were all the defendants', and "they are right in law in refusing to give them up." He should have thought that a similar train of argument to that used by Mr. Justice A. L. Smith would have been appropriate in the case of an architect's drawings as against the surveyor's dimensions. Perhaps lawyers had somewhat confused the issue by an interpretation placed upon the document issued by the Royal Institute of British Architects, and entitled "The Professional Practice as to the Charges of Architects." In clause 1, detailing the services covered by the commission of 5 per cent., it stated, *inter alia*, "the necessary general and detailed drawings and specifications" had to be provided by the architect, but that, of course, only meant that in the 5 per cent. was this provision for the drawings, etc.; it certainly was never intended to mean that the drawings became the property of the employer.

As to the remedy it seemed to him that the whole case lay in the fact that the employer did not really pay for the drawings at all when he had secured his building. He employed the architect, not to make drawings, but to erect a structure, and when that had been done the material which had produced the architect's work, composed of brain, paper, pencil, brush, etc., was no concern of his, and he should have no power to demand their delivery over to him. Many of the details of a building were made verbally and by rough sketches on the job itself, and these also it would be difficult to hand over to the employer. In France and in Germany it was the acknowledged custom that the architect retained the drawings, and, if the employer wished for copies, he might have them by paying for them as a distinct extra fee. He knew one architect who inserted a clause in the specification that all drawings and documents, together with all copies of same by whomsoever received, were to be returned to the architect within fourteen days of the issue of the final certificate. If the law was not to be altered they must make the matter the subject of a special contract with the employers. They must make it clear that the original drawings are the property of the architect, and that copies would be supplied on the client paying the cost thereof on condition that these copies were not used for any purpose other than that in connexion with information which might be legitimately required after the work was finished, and that such drawings were not to be used for reproducing any structure from them or in any other way to the detriment of the architect who supplied the drawings. Architects might also provide for drawings and specifications and all other documents supplied by them for the purposes of the building being delivered up to them at the end of the job, and this would include the builder, the clerk of works, sub-contractors, etc. If the law could not at present be altered they might ask the Council of the Institute to consider a revision of the scale of charges, and to insert in that scale, as the acknowledged custom of the profession, a paragraph to the effect which he had set forth. He was glad to see that one of the subjects for discussion at the forthcoming Congress of Architects in London was "The Architectural Copyright and the Ownership of Drawings," and no doubt the result of that discussion would be some improvement on the present condition of matters.

Mr. C. M. Knowles, of the Law Students' Debating Society, quoted from the Master of the Rolls in *Gibbon v. Pease*, that he found some difficulty in distinguishing the case from a contract to paint a picture or design a coat of arms, and he (the speaker) felt it was unreasonable to suppose that the ownership of the drawings should be in the hands of the architect and not the client. Mr. Woodward said that the drawings were of no value to the employer unless he intended to make use of them in some way injurious to the architect. That he emphatically traversed. It frequently happened that some sort of repair to a building was necessary—the drains, or the flues, for instance—and how was the owner to discover where the defects were without the drawings? That was sufficient

to rebut the suggestion that the building owner had no use for the drawings. The client, on the other hand, might think that, if the drawings remained in the hands of the architect, someone might take a great fancy to the bonus and might ask the architect to build him one just like it, and the building owner might very well object to that—the drawings, remaining in the hands of the architect, might, in such a case, be used injuriously against the building owner. There was considerable point in what was said as to an architect's drawings being used again by the building owner or someone else after they passed out of the hands of the architect. It was a complicated question; but there was a distinct grievance from the architect's point of view, and it would be interesting for the architectural societies to bring up some test case, as it was possible that, by a process of injunction, an architect might find some remedy. There was no reason why a *prima facie* case might not be made against a building owner for using the drawings in the illegitimate manner suggested. As to the custom in the architectural profession, no judge could recognise it. To make a custom legal it was necessary, not only that it should be general, but also that it should be reasonable. In the matter under discussion were two decisions alleging that the custom was not reasonable, and therefore there was not much prospect of success for the contention of architects. The judges had considered the cases on their merits, and had decided that the custom was not reasonable from the clients' point of view. And there was a simple remedy for all this, *i.e.*, by contract. He did not know why architects were not satisfied with the opportunity of embodying in their contract a distinct clause stating that the ownership of drawings was in the hands of the architect.

Mr. E. W. M. Wonnacott, Chairman of the Discussion Section of the Association, expressed, on behalf of the Section, the appreciation of the members to the Society for the invitation to join in that debate. He hoped that it was the initiation of a new policy, which, in the future, would be extended to the benefit of both societies. The question of the ownership of drawings was intimately connected with the question of copyright, but the number of legal cases bearing on the former was small. In addition to the cases of *Ebdy v. McGowan* (1870) and *Gibbon v. Pease* (1904), there was the Westminster County Court case of *De Castro*, which, however, did not establish a precedent, and, in that case, the architect was called upon, six years after their preparation, to produce the drawings. The trouble which had arisen over the claim to the ownership of drawings was due to the fact that there was a misunderstanding of the architect's function. Architects contended that they were employed to erect a building, and when that was done the client had all bargained for: the use of the plans was only incidental to work, and were the architect's instructions to workmen and explanations of his ideas. The fixed idea in the legal mind, however, was that the architect was a man who sold plans, and would not part with them when paid for them. The architect was employed to impress upon his work his own individuality—those little touches, which might be called his handwriting, by which he appealed to the emotions, and which, primarily, indicated that the architect was an artist, though that was the view that architects could not get lawyers to see. How his ideas were expressed to the workmen was no concern of the client, and really plans were not essential to the erection of a building, nor was there any obligation to prepare them. Why should the architect deliver up his drawings? The sculptor did not deliver up his sketches, models, or even his full-size studies. In the case of *London School Board v. Northcroft*—in which the defendant won—the ultimate object of the quantity surveyor, Mr. Northcroft, was to make a bill of quantities, and he was held to be right in refusing to give up the means by which he prepared his quantities. The ultimate object of the architect was to deliver to the building owner a completed building, and the materials with which he was enabled to do that should by analogy be his. The case of *Gibbon v. Pease* was not put fairly and clearly before the court, but the defendant gained his case on the question of

quantities and other documents, and was actually awarded costs on this part of the case. It had been suggested that the remedy was by simple contract, but why should the architect be called upon to enter into a contract in regard to a matter which, by custom, he claimed as a right? If the drawings were given up, the architect's position was a hopeless one, for his designs might be carried out by someone else. He became a planning machine, deprived of those credentials of his professional ability. Drawings were often wanted for the purpose of sending to would-be clients so that evidence might be afforded of ability, and especially in important competitions. If evidence of custom had been called in the case of *Gibbon v. Pease* they would have been more satisfied even if the case had gone against them, but the learned judge simply ruled that there was no custom. As to the remedies, why should architects give up the whole principle they were contending for by making a contract in regard to the drawings—a contract which was unnecessary abroad? If the contract were entered into it would pave the way to discord, and by making the ownership of the drawings a special right the onus would be put on the architect to prove the right which was his by reason. As to special legislation, on the Continent architects had the law almost in a nutshell, and a decision like *Gibbon v. Pease* was regarded as absurd. In France, Belgium, Italy, Roumania, Austria, Spain, Switzerland, Hungary, Russia, Denmark, and Norway architects were protected. In France, the architect kept and had an absolute right to his drawings, but, by an act of courtesy and the payment of extra fees, the client could have copies. He had not the slightest right to them except by special agreement. In Germany the client had the right to a copy of the drawings, but could not use them for future building operations. The only countries in which there was no legislation governing the subject were Great Britain and the United States, but there was a movement in the States in favour of legislation on Continental lines. As to the view that if the client was not allowed to have the drawings he could not know about the drains of his own house, there was a statutory deposit of plans as to drainage, as the judges in *Gibbon v. Pease* might have been told, and drawings for nearly all other purposes were useless to the building owner. In conclusion, Mr. Wonnacott gave, as an instance of the law in France, a decision as to the reproduction of the Palais de l'Industrie of the 1855 Exhibition. It was held that the exclusive right to reproduce this monument and to publish the plans lay with the architect.

Mr. A. E. Riddett, a member of the Society, in supporting the views of architects, asked what was the contract which the building owner made with an architect. Did he contract for the plans or for the building which was to be erected, and of which the plans were but means? If there was nothing specially stated in the contract about the drawings, which he understood was generally the case, then he thought that the contract was for the building and not for the drawings. There were many analogous cases to that under consideration. In the erection of a derrick the scaffolding was not given up, nor did the tailor hand over his patterns. As to the case of *Ebdy*, where tenders had not been invited at all he thought it was reasonable to hand over the plans to the building owner, as otherwise he got nothing at all for his money, but in the case of the completed building he thought that the plans ought not to be handed over, as the building was all the client contracted for. Even for purposes of reference it was more convenient for the plans to be kept by the architect.

Mr. Frank Daphne, who acted for Mr. Pease in the case of *Gibbon v. Pease*, said the point was not whether it was more convenient for the architect or the building owner to have the plans, but it was a question of contract. He did not think the case of *Ebdy* had any bearing on the case of *Pease*; it was a question of contract between the parties. He used to think that the architect was a man who prepared plans, but he knew now that he was more than that—*i.e.*, that he was an artist; but in the case of *Ebdy*, the client bought and paid for

plans, just as he might have paid for boots; the contract was to prepare plans, and the ordinary 5 per cent. rule of the Institute of Architects seemed to imply the preparation of plans, and but for that he should say that the ordinary contract between architect and client was to build a building and not to prepare plans. There was no doubt that the Institute rule mentioned the preparation of plans. If the contract contemplated the preparation of plans, those plans would be the property of the building owner; if it did not, the drawings should remain the property of the architect just as much as scaffold-poles remained the property of the builder of a house. He could not see how the means by which the ultimate end of the quantity surveyor was achieved differed substantially from the means employed by the architect, and he ventured respectfully to differ from the decision of the Court of Appeal.

Mr. Hart, for the Society, said that the sentimental arguments of Mr. Woodward might more emphatically be described as selfish arguments. Architects seemed to fear that the unfortunate client had some sinister motive in asking for the plans, but surely it was hardly politic to impute such motives. There was no important principle involved; it was all a matter of contract. Why did not architects stipulate in their contracts that the plans should be their property? Had they the courage? Did they fear that to do so would mean some reduction of the 5 per cent.? That 5 per cent. had been fixed for something, and surely for something more than artistic touches. He suggested that there was something else, and that it was the plans. The short principle was what was meant by the contract which was entered into between the building owner and the architect. Mr. Riddett had suggested that it was analogous to a number of examples he gave. As to the tailor's pattern, no one went to a tailor for anything but the clothes, and the pattern was of no use except for the purpose of making clothes for a particular person. As to a photograph, the person whose photograph was taken had an unanswerable right to the negative. The negative belonged to the person who ordered the photograph, and that was obviously fair, because it would prevent the duplication of the picture. When one ordered and paid for a picture one had a perfect right to it. The architect's plans fell within the Copyright Acts, but not, he thought, within the Artistic Copyright Acts. They came within the Literary Copyright Act, just as maps, etc., did, and there was a right to prevent the multiplication of them. If anyone, it was the building owner who had the right to object to his building being duplicated, and surely the architect need not complain if the earth was studded with his master pieces. The whole difficulty seemed to be as to who should bear the expense of making the tracing of the plans. In his opinion there was no valid ground for altering the law.

Mr. C. H. Brodie, for the Association, said that two of the ablest lawyer-speakers had taken the architect's point of view, and the last speaker would do the same when he had studied the question. Mr. Hart said that when he employed a man to paint a picture he had a right to the picture. Who said he had not? But he had no right to the 100 sketches which were made in the production of the picture. There were great artist's sketches of priceless value throughout the galleries of Europe and America, and they were not the property of the owner of the picture which had been the outcome of those sketches. That case was analogous to the case of architects. There was only an implied contract, and what they arranged to do was to give a man a building. As to the photo negative, the fact that the photographer had been compelled to hand over the negative did not affect the case, as there was no art in a negative. It was purely a mechanical piece of work. That was not the case with architects' designs. As to Mr. Riddett's contention that in the case of a building which was not carried out by the building owner was entitled to the drawings, as otherwise he would get nothing for his 2½ per cent., what about the time and skill and experience of the architect? That was what he paid for. If a man went for a physician in Harley-street he paid for advice,

not medicine; the architect was paid in the same way, and paid badly. Unfortunately, there were dishonest men, and therefore dishonest builders, and it might be law, but it could not be sense, that a man could engage an architect for the erection of a house and then use the plans for erecting fifty more houses without further payment. The case was mentioned of the lawyer's draft being handed over, but the draft could not be of use in another case. ("Oh, yes, it is!") Then he was sorry they had to hand over the draft. ("We keep copies.")

Mr. Pleadwell, for the Society, said that there was no doubt that under statute the man who commissioned the architect was entitled to the production of the drawings. The fact that there might be duplication was certainly a grievance, but there was the suggested remedy of entering into a contract. As the law at present stood, he thought that the legal ownership of the architect's drawings belonged to the building owner.

Mr. Hamp, for the Association, said it would be quite unfair if they had to hand over to clients all the drawings they produced. A great deal of work was done in the preparation of drawings, and if the architect felt that the client could demand them, and later on get someone else to carry out the work, the architect would not devote the time, etc., to their preparation that he did now.

Mr. Rendell, for the Society, and Mr. Waldram, for the Association, having spoken in favour of the drawings being handed over to the building owner.

Mr. Woodward, in replying to the discussion, said he thought that the point as to the tailor's pattern was a good one. If a high-class tailor had to give up his patterns, what was to prevent a man getting his clothes made from them in the Bethnal Green-road at very much less cost? As to the charge of selfishness, he was selfish; if a man tried to take advantage of him he did what he could to protect himself. He had never been asked by the client for a copy of his drawings. Architects were not in favour of the repetition of similar designs; they desired to get originality in all the work they did. The rough sketches an architect did not much care about, but he felt that the finished drawings, if handed over to the building owner, might be misused.

The Chairman said it had given the members of the Society great pleasure to have the members of the Association with them, and he hoped it was not the last debate they would have together. He then asked them to vote on the following motion—i.e., "That the legal ownership of architects' drawings should be in the architects." There voted in favour of the proposition 27, and 19 against.

The proceedings then terminated.

SCOTTISH BUILDING TRADE NOTES. (FROM A CORRESPONDENT.)

THERE are many signs that a revival of the building trade will follow the great improvement which has taken place in the shipbuilding, jute, and iron industries in Scotland. Last year there was a drop of over 800,000L. in the value of buildings erected in Glasgow as compared with the value of those erected in each of the three previous years. In Edinburgh and Paisley the fall last year amounted to 25 per cent., while in Aberdeen the number of plans passed by the Dean of Guild was the smallest on record for fifteen years.

The depression is, however, not the only thing requiring improvement in the Scottish building trade. Recent law cases show that there is much need of reform in some of its antiquated customs. In one most notable law action it was clearly shown that, though it is the custom to make contracts which are as verbally binding as need be, some contractors do not consider it necessary that they should act up to them if the work they have taken shows but a narrow profit. The effect of this outrageous custom is all against both the public who build and the straightforward contractor who has given a fair estimate and desires to do conscientious work. It has also, needless to say, the bad effect of reducing prices to a point at which good work is impossible, and only the contractor who has fallen into the habit of estimating for first-

rate work at the price at which only third-rate work is possible benefits, because he gets the job, and, relying upon the custom brought to light in this law case, actually puts in only third-rate work.

These abuses have been sufficiently made known, and there is some hope that the exposure may result in something like reform. They are, however, not the only points at which reform is needed, the system of including in general schedules the work of specialists is the cause of serious loss, not only to the sub-contracting specialist, but also to those who pay for the erection of buildings and to the general public in the case of buildings erected with public money. To give an example from actual fact; in a general schedule there was not long since included a sum of 2,000L. for work done by specialists whose trade was in no way connected with that of the contractor who quoted for the chief work contained in the schedule in question. What happens in cases of this kind? The contractor goes round to the specialist with the object of squeezing as high a commission as possible from him. He approaches large firms and little, and is naturally able to squeeze the little firms most; but he must be able to say if questioned that he has approached the large firms and that they are too dear. The price allowed by the architect was in the instance before us one at which the very best work could be done. In England 10 per cent. is regarded as a fair builder's profit, but some Scottish contractors, in dealing with a sub-contractor, think this humble 10 per cent. very poor business indeed, and the small contractor in this case actually took the work at a price which was more than 40 per cent. below the price allowed by the architect.

What was the result of this? What must inevitably be the result of the abstraction of 40 per cent. from a job without value given? The work must be starved, and so it was in this instance. Instead of the best work which the architect had a right to expect for the price he had allowed, a perfectly plain and second or third-rate job was given, and the most important material entering into the composition of the work was of the cheapest description. The fault cannot be placed at the door of the sub-contractor; it was impossible that better value could have been given at the price.

Attention has been called to the application of the North British Railway Company for power to enable them to stop the public right-of-way along the so-called "Cromwell's Dyke" at Burntisland. It is hoped that efforts will be made locally to oppose the application. At the south end of the dyke is what is known as "The Island," which also has historical associations. Cromwell captured the interesting and picturesque little town after several unsuccessful assaults in 1651, and from his quarters there on July 29 he wrote: "It has pleased God to give us Burnt Island, which is, indeed, very conducive to the carrying on of our affairs. The town is well seated pretty strong. . . . We took three or four small men-of-war in it, and I believe thirty or forty guns. . . . The enemies' affairs are in some discomposure, as we hear, surely the Lord will blow upon them." The beauty of Burntisland was destroyed by the railway company, which, after cutting through the woods and cliffs of lovely Aberdour and paving with cement the primrose-strewn walk by famous Starley burn, out the seafont of Burntisland in two by running its line along the whole of its length. This, however, will be no excuse for allowing the company to wipe out a landmark of its historic past.

The movement of a large Glasgow firm in passing plans for the building of a garden city near Greenock will increase the number of houses to let in Glasgow, and cause a general improvement in the accommodation offered to the householder. Greenock has also a similar scheme, Dundee is following, and the plans of its garden city prepared by Messrs. C. Ower & Co., of Dundee, have just received the sanction of the Dean of Guild.

SOCIAL INSTITUTE, WAKEFIELD.—The foundation-stone of the Wakefield Social Institute was laid a short time ago in Brook-street. The plans for the work have been prepared by Mr. Abraham Hart, architect.

ARSENIC IN FABRICS AND PAPERS.

Many years ago a great outcry was, very properly, raised against the use of arsenical colours in wall-papers. More recently an extensive examination of the beers sold throughout the country revealed the fact that arsenic was quite a common constituent of this beverage. Professor Thorpe, Chief of the Government Laboratory in London, has just communicated to the Chemical Society a paper in which he shows that arsenic is present in commercial wool, flannel, blotting paper, writing paper, white wall-paper, and undyed silk. Apparently Japanese paper, filter paper, and white linen are the only forms of commercial cellulose which were found to be free from arsenic. The presence of arsenic in natural undyed lambs' wool is shown to be due to the practice of dipping the mother in arsenical dip some time before the birth of the lamb.

The results obtained in the Government Laboratory are shown in the following table. Instead of raising alarm, they will probably convince most persons that arsenic may be present in the articles enumerated in such small quantities as were found and yet be quite harmless:—

Material.	Mgm. of arsenious oxide in one gram of material.
1. Flannel No. 2 (natural wool)	005
2. Flannel No. 3 (natural wool)	009
3. Flannel No. 3 (after two washings) ..	010
4. Flannel No. 3 (after four washings) ..	009
5. Flannel No. 3 (after six washings) ..	009
6. Old worn flannel (undyed)	004
7. White Berlin wool	007
8. Green flannel	004
9. Welsh flannel	015
10. Vest wool	011
11. Blotting paper (white)	001
12. Writing paper (azure-blue)	024
13. Foolscap (white, blue-lined)	028
14. Wrapping paper (white)	024
15. Paper (for sugar)	003
16. Paper (for butter, grease proof)	001
17. Japanese paper	Free
18. Wall-paper (white, for lining)	018
19. Linen (white)	Free
20. Silk (undyed)	001

INTERNATIONAL CONGRESS ON SCHOOL HYGIENE.

On Friday evening in last week, at the University of London, a meeting, convened by the Royal Sanitary Institute, was held under the presidency of the Duke of Northumberland to make preliminary arrangements for the second International Congress on School Hygiene which it is proposed to hold in London during August, 1907.

Sir Lauder Brunton (President of Congress) said that the first Congress was held in Nuremberg about three years ago, and at it were representatives of all civilised countries. It was then resolved that the next Congress should be held in 1907. The French were anxious that the next Congress should be held in Paris, but as the invitation to hold it in London had been previously sent by the Royal Sanitary Institute the French gave way. He was glad to say that the French Minister of Education had become a Vice-President, and had appointed committees in every town, Austria, Finland, Germany, Japan, Denmark, and Sweden had all formed national committees, and many had got local committees. Two years ago he went to the United States and Canada and obtained promises to co-operate from every large town in those two countries. Last year he went to South Africa and obtained promises in the same way. Therefore they could very fairly hope that at the Congress to be held next year not only would Great Britain and the Colonies be thoroughly represented, but also every civilised country in the world. At that Congress they hoped to get the digested opinion of all countries on questions affecting the health of school children, and also plans for carrying the views into effect. The Congress promised to be not only one of the largest, but one of the most important congresses ever held in London, and therefore he trusted they would have a unanimous body of support throughout the country.

Lord Reay moved—"That, in view of the importance of school hygiene in developing a strong and vigorous race, the necessity for scientific methods being followed in the training of the young, and for hygienic surroundings being supplied in order to promote the health of the children during school life, this meeting, consisting of representatives of educational authorities, medical men, teachers,

and others, is unanimously of opinion that it is desirable to hold the second International Congress in London in August, 1907, to which representatives from India and the Colonies should be invited, in addition to representatives from other countries."

The resolution was seconded by Dr. Lyttleton, and carried.

On the motion of the Chairman, it was resolved to present a petition to His Majesty the King praying that he would be pleased to extend his Royal patronage to the Congress.

Mr. A. J. Shephard (Chairman of the Education Committee of the London County Council) moved—"That this meeting heartily approves of the steps already undertaken by the Organising Committee to initiate the arrangements for the Congress, and earnestly invites the co-operation of the educational and municipal authorities, societies, and other representative bodies interested in education and the health and development of children during school life, in promoting the Congress and carrying out the necessary organisation." He remarked that they all knew that their schools should be well built and well ventilated, and he was glad to think that they would have the opportunity of enforcing these facts upon the people of England.

Sir John Cockburn seconded the motion, and it was carried.

Further resolutions were carried authorising the issue of an appeal for subscriptions, and appointing an Organising Committee, of which Sir Edward Brabrook will be chairman, Sir Richard Martin, Bart., treasurer, and Dr. Kerr and Mr. E. White Wallis secretaries.

THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Alderman Evan Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Hackney Borough Council 4,000*l.* for electric lighting purposes; Finsbury Borough Council 540*l.* for street improvement; Hammersmith Guardians 8,000*l.* for poor law purposes; Kensington Royal Borough Council 5,620*l.* for street improvement; Poplar Borough Council 3,02*l.* for works at Bow depot and for paving; St. Pancras Borough Council 13,500*l.* for site for public library; and Shoreditch Guardians 27,000*l.* for poor law purposes.

Storm Floodings.—The Main Drainage Committee recommended, and it was agreed:—

"That the estimate of expenditure on capital account of 9,500*l.*, submitted by the Finance Committee in respect of the construction of section No. 2 of the Falconbrook pumping-station, be approved.

"That expenditure not exceeding 9,500*l.* be sanctioned in connexion with the construction of section No. 2 of the Falconbrook pumping-station, cost of supervision, general incidentals, etc.; that the work be done without the intervention of a contractor; and that the drawings, specification, and estimate of 9,500*l.* be referred to the Works Committee for that purpose."

School.—The Education Committee recommended, and it was agreed:—

"That the Board of Education be informed that the Council will raise no objection to the proposal of the managers of the St. Charles-square R.C. Training College (Kensington, N.), to provide a new public elementary school for about 200 girls and infants to be used as a practising school in connexion with the college."

Appointment of Electrical and Mechanical Engineers.—On the recommendation of the Fire Brigade Committee, it was agreed that Mr. Leicester Richards Lee be appointed in the fire brigade as electrical and mechanical engineer at a salary of 400*l.* a year, and that Mr. Victor Ambrose Cornelius be appointed in the fire brigade as assistant electrical engineer at a salary of 200*l.* a year.

Totterdown-fields Estate, Tooting—Completion of Cottages.—The Housing of the Working Classes Committee reported as follows:—

"One hundred and twenty-six cottages on section B of the Totterdown-fields Estate have recently been completed, and twenty more are almost finished. The cottages contain accommodation for 1,278 persons. . . . Upon the completion of the twenty cottages accommodation for 3,462 persons in 464 tenements will have been provided on the estate."

The Council adjourned soon after seven o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Conversion of Buildings.

St. George, Hanover-square.—The conversion of Nos. 6 and 7, George-street, Hanover-square into a domestic building (Mr. C. H. Worley for Mr. T. Stevens).—Refused.

Lines of Frontage and Projections.

Levisham.—That the application of Mr. E. C. Christmas for an extension of the period within which the erection of three houses with one-story shops in front, on the site of No. 63, Dartmouth-road, Forest-hill, and the erection of additional stories over the existing shops at Nos. 55 and 55A, Dartmouth-road were required to be completed, be granted.—Consent.

Hammersmith.—A greenhouse at the rear of No. 24, Shepherd's Bush-green, Hammersmith, to abut upon Camden-gardens (Mr. G. Stone).—Consent.

Clapham.—That the application of Messrs Homer & Lucas for an extension of the periods within which the erection of buildings between Nos. 65 and 69, South-side, Clapham-common, Clapham, was required to be commenced and completed, be granted.—Consent.

Finsbury, East.—An oriel window in front of No. 88, Goswell-road, Finsbury (Mr. P. B. Tubbs for Mr. F. Gough).—Consent.

Greenwich.—The retention of a greenhouse at the rear of Siebert House, Gleniuch-road, Greenwich, abutting upon Westcombe-hill (Mr. E. Mills).—Consent.

Hammersmith.—Buildings with projecting one-story shops, on the eastern side of The Grove, Hammersmith, on the site of Nos. 2 and 2A (Mr. L. V. Hunt for Mr. F. Britton).—Consent.

Strand.—A projecting sign in front of No. 11, Long-acre (Messrs. Windover, Turrill & Sons).—Consent.

Marglebone, East.—An addition to No. 1, Cochran-street, St. John's-wood, to abut upon Wellington-place (Messrs. Woodrow & Helston for Messrs. J. K. Tinson & Son).—Consent.

Wandsworth.—A house with large boxes on the eastern side of Mount Ephraim-lane, Streatham, to abut upon Norfolk House-road (Messrs. Chapple & Utting).—Consent.

Levisham.—That the Council do extend the periods within which the erection of buildings on the east side of Bromley-road and south side of Sandley-lane, Catford, was required to be commenced and completed.—Consent.

Width of Way.

Hampstead.—A deviation from the plan approved for the erection of buildings upon the site of No. 106, Heath-street, Hampstead, so far as relates to an alteration in the height and length of the bank wall abutting upon New-end (Mr. J. D. Hunter for Miss G. Elston).—Consent.

City of London.—A wooden screen at the rear of Nos. 6 to 10, Barden-place, Aldgate, City, at less than the prescribed distance from the centre of the roadway of Aldgate-avenue (Messrs. J. Hood & Sons for Mr. G. Horwitz).—Refused.

Lines of Frontage and Construction.

Bow and Bromley.—The retention of an iron and concrete timber drying stage at Tredgar Works, on the south-west side of Ordell-road, Bow (Messrs. Perry & Co.).—Consent.

Hammersmith.—The retention of two wood and iron buildings on a site on the western side of Latimer-road, Hammersmith (Mr. A. Dawkins for Mr. W. J. Moore).—Consent.

Levisham.—The retention of two wooden sheds on a site abutting upon the northern side of Elmer-road and upon the western side of St. Fillens-road, Catford (Mr. E. Wright for M. H. Amey).—Refused.

Width of Way, Lines of Frontage, Space at Rear and Projections.

Westminster.—Buildings to abut upon Regency-street, Chapter-street, Frederick-street and Hide-place, Westminster (Messrs. Clutton for the Ecclesiastical Commissioners).—Consent.

Space at Rear.

Levisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to Nos. 3 and 5, Rusby-green, Catford, with irregular spaces at the rear (Mr. A. L. Guy).—Consent.

Whitechapel.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a block of dwellings on the western side of Rupert-street, Whitechapel (Mr. R. W. Hobden for Messrs. Hickman, Limited).—Refused.

Deviation from Certified Plans.

Strand.—Deviations from the plans certified by the district surveyor under section 43 of the Act, so far as relates to the proposed erection of buildings upon the site of Nos. 28 and 29, Lisle-street and Nos. 28 and 29, Little Newport-street, Strand (Mr. P. E. Pilditch).—Consent.

Formation of Streets.

St. Pancras, East.—That an order be issued to Mr. S. G. Castleman, sanctioning the erection of two-story workshop buildings upon land at the rear of houses in St. Paul's-road, and Elm-road, Camden-town, St. Pancras, and in connexion therewith the formation or laying out of a street (for Mr. H. G. Rognart).—Consent.

Wandsworth.—A deviation from the plans approved for the formation or laying out of new streets for carriage traffic on the Furzedown-park estate, Back (or Rectory) lane, Streatham, so far as relates to an alteration in the gradients of two of the proposed streets (Messrs. Milner, Son, & White).—Consent.

The recommendation marked † is contrary to the views of the local authorities.

Architectural Societies.

CARDIFF, ETC., ARCHITECTS' SOCIETY.—A lecture was delivered at the meeting of the Cardiff, South Wales, and Monmouthshire Architects' Society in the architects' room at 5, High-street, Cardiff, on Thursday evening last week by Mr. Ernest Runtz, of London. Mr. J. H. Phillips, of Cardiff, presided. Mr. Runtz had chosen as his subject "The Planning of Modern Hotels and Restaurants." and the lecture was illustrated with lantern slides of plans and buildings. He traced the development of hotels from the times of the old coaching days and inns, made famous during the last century by Charles Dickens, and said that the improved means of locomotion, with the introduction of steam in the early part of the XIXth century, and the laying of railway tracks, had given a great impetus to hotel construction, resulting in the bulk of the railway companies erecting large hotels at their termini. Facilities for ocean traffic being also greater, the interchange of ideas between England and foreign countries had caused many palatial hotels to be built in the heart of the entertainment centres, and in these the great feature was the restaurant and lounge, the latter practically taking the position of the old-time coachyard, roofed in. From six to eight millions sterling had been spent on the principal hotels in London during the last ten years, and it was estimated that over 1,000 miles of electric wiring had been installed in them. The Gaiety Hotel alone had thirty miles of electric wire. A vote of thanks, proposed and seconded by Mr. Brunton and Mr. Seward respectively, terminated the meeting.

MANCHESTER SOCIETY OF ARCHITECTS.—At the meeting of the Manchester Society of Architects, on the 27th ult., the chair was taken by Mr. Alfred Darbyshire, and a paper was read by Mr. John Swarbrick upon "The Works of Sir Christopher Wren." At the outset, Mr. Swarbrick called attention to the fact that, so numerous were the works of Wren, that it would not be possible for him to do more than review the principal phases. He then outlined the architect's early career; and pointed out that the discouragement that the arts suffered during the Commonwealth was probably the cause of Wren's early adoption of scientific, rather than artistic, study. During this period, Inigo Jones died a disappointed man. One who could have risen to the heights of architectural achievement passed away with his strivings defeated. How long this condition of things would last, no one knew. When Wren's opportunities came later, the fabric of architectural development had been seriously injured, and it became his task to begin at the foundation once again. Passing reference was made to the lamentable manner in which John Webb, Inigo Jones' assistant, was overlooked. All the speaker said, high and low alike, delighted to extol the merits of the man, who, by his gifts and perseverance, raised himself from the abyss of obscurity. But, Wren was not long unknown and overlooked like many of the most distinguished artists. Evelyn, the diarist, did not discover Wren as he discovered Grinling Gibbons, in an obscure street of Deptford. He did not begin his career in poverty and unaided like that great painter, J. W. M. Turner. Though Wren did not gain force of character by combating almost overwhelming odds, he seemed to have possessed that initial ardour that alone led to success. He ought, therefore, not to be disparaged because he would not shroud himself with that glamour

of achievement by which the less fortunate rightly commanded admiration. Mention was made of the architect's brilliant career at Oxford, terminating in his election to a Fellowship at All Souls', and his appointment to the Professorship of Astronomy at Gresham College, London, and to the Savilian chair of Astronomy at Oxford. Wren's active interest in the formation of the Royal Society was also referred to. At the meetings of the Society and elsewhere, he frequently met his Sovereign, King Charles II., and possibly this was, to some extent, the reason why the King offered him the commission to survey the fortifications at Tangiers, which was not accepted. The reason for Wren's selection may, however, have been due, in a larger degree, to the great influence of Evelyn, and his uncle, Matthew Wren, the Bishop of Ely. To this source, at all events, must be attributed his appointment as assistant to Sir John Denham, the Surveyor-General. Wren was very promising, but he was protected and assisted by fortune, while those around him, who were at first better qualified, were overlooked and ultimately forgotten. Soon carried aloft by fortune and great ability, he rose to an eminence above and beyond them all. His work at the Chapel of Pembroke College, Cambridge; and at the Sheldonian Theatre at Oxford, was then described, and also the details of his six months' architectural study in Paris, his letter to Dr. Bate-man being read, and the opportunities afforded by Paris during the "Siècle de Louis XIV." outlined. Soon after his return from this, his only period of architectural studentship, the Great Fire broke out. The Great Fire brought about his magnificent opportunity. Those qualities and knowledge that he at first lacked were cultivated and acquired by observation, as the almost innumerable commissions he received were executed. In 1662, two years after the fire, Sir John Denham, the Surveyor-General, died, and Wren was appointed to the position. Yet the King had already officially granted this office to John Webb, in reversion upon the death of Denham. Thus, Wren secured a signal opportunity, supreme pre-eminence, and was, without any influential rival. The plan for rebuilding London and the designs of the City churches were next discussed, the letter that Wren wrote long afterwards, as one of the Commissioners of Queen Anne's Act for building fifty new churches, being read to explain some of the guiding principles that had governed his work. Mr. Swarbrick especially mentioned the campanile of St. Bride, Fleet-street, and St. Mary-le-Bow, Cheapside; while many others were incidentally referred to. Among the churches with the most interesting interiors were St. Stephen, Walbrook; St. James, Piccadilly; and St. Mildred, Bread-street. Subsequently, many very important works were considered, foremost among these being St. Paul's Cathedral, Hampton Court Palace, and Greenwich Hospital. In conclusion, the speaker said, in speaking of Greenwich Hospital, their chief regret must be that Sir Christopher Wren, although he lived beyond the usual span of life, did not live long enough to complete his work entirely himself. Wren's life, in spite of all its early artistic failings, was considered, as a whole, one of the most glorious records in the history of English architecture. Few others had such opportunities, but they must be thankful that, in that instance, fortune had favoured one so worthy and so able. The Chairman, Mr. Alfred Darbyshire, subsequently referred to Wren's use at St. Paul's of concealed flying buttresses, and also to the intermediate brick cone in the dome. Mr. Charles H. Potter, in proposing a vote of thanks to the speaker, remarked upon the beauty of the design of the interior of St. James', Piccadilly, and St. Stephen's, Walbrook. Mr. R. W. Orme, in seconding, made special reference to the treatment of the campaniles of the City churches. An opportunity was ultimately afforded for a more careful examination of the numerous drawings and other illustrations provided.

EXETER DIOCESAN ARCHITECTURAL SOCIETY.—This Society held its annual meeting a few days since at the College Hall, Exeter. The Rev. O. Reichal, in the chair. The Report stated that an excursion to St. Germans was fixed for May 29, and it was probable that a visit to Ford Abbey would be arranged in

the autumn. The Committee regretted that the old church of Allhallows, Goldsmith-street, Exeter, was to be demolished. That would be the fourth church destroyed within about fifty years, the others being St. George, St. Kerrian, and St. Mary Major. The old history of the city in its architecture was fast being obliterated. The removal of Mount Radford House, the old manor-house of the Barings at Exeter, disclosed, in the pulling down, many traces of XVIIth century work, and also work of an older structure, which had been at a late period clothed in a pretentious exterior of stucco-work. Some rich examples of old work remained in the partially-dismantled Lark-bear House, in the valley below Mount Radford House. At Henock Vicarage two XVIIth century wood windows of three lights had been revealed, and were being reopened. One had a most unusual feature, viz., oak stanchion bars. The attention of one of the secretaries had been again called to the fact that one of the original "misereres" in the choir of the Cathedral, removed during the restoration of 1870-7, was now in the Cathedral library. The Committee suggested that the odd one of perpendicular work, now among the XIIIth century ones, should be removed, and the original one of Bishop Bruere's work (1224-44) put in its place, so as to complete the fit of that bishop's time. The Committee were glad to see the decided improvement of the street architecture of the city, and hoped that when anything more was done the houses might be designed in keeping with the remaining houses of the XVIth or XVIIth century, so as to retain the picturesqueness of the old streets. The Report was adopted, and the Committee and the officers re-elected.—The Rev. Cecil Square read a paper on "Parish Registers," in which he reviewed their whole history. For the first use of registers they must look to Spain. It was a matter of a little uncertainty as to when registers, as they now thought of them, were really instituted in England. They found at least two registers dating as far back as 1536, and six others had been found of earlier date than 1538, when the duty of keeping them was imposed upon the parochial clergy by Royal injunction by Thomas Cromwell, Vicar-General. In 1653 a new system of registration was enforced, and the clergy were ordered to give up their registers to laymen, who were appointed under the names of parish registrars. In many parish registers they saw the appointment of these men set forth.—Mr. James Jerman contributed some notes on "Ancient Ecclesiastical Needlework," claiming that the study of art, as expressed in needlework, might fairly receive a share of attention, along with the cognate subjects of metal-work and carving, especially having regard to the great antiquity of the decorative treatment of the woven and needlework fabrics and embroidery associated generally with the ritual of religious service and the adornment of palaces.

Correspondence.**THE OFFICE OF WORKS, AND DESIGNS FOR PUBLIC BUILDINGS.**

SIR,—I believe most architects will be in sympathy with the Note in your last issue about the alteration or omission of any feature of importance, such as towers or pavilions in the late architect's design, and see at once that, so far as two main frontages are concerned, no great interference with the light of adjacent offices would occur by towers. I hope that a further appeal will be made for reconsideration, so that the features may be retained with due importance, as it is said not to be for economy they are to be omitted.

I believe the same curtailing, or, rather, cutting off entirely the corner towers in Sir G. G. Scott's design for the Foreign, etc., Office block occurred, so that there we have another incomplete building. Perhaps you may know if any reason was given.

While glad that these works are put out to competition, it does not seem fair that the architect who wins should never be sure that the accepted design will be adhered to.

E. W. H.

ARCHITECTS AND TIMBER SPECIFICATIONS.

SIR,—I, a clerk of works, was glad to read the comments you made on this subject, page 341. There is nothing which causes more friction than timber and its quality in the carrying out of building contracts, owing to the loosely-worded and often quite inaccurate clauses in the specification.

Now, in front of me, I read that the timber in the building I am superintending is to be "good Baltic." The general clauses say that all materials are to be "best." Is "good Baltic" timber best Baltic? Can I demand Russian, or must I accept Swedish, and if so, must I put up with middling quality Swedish, or can I insist upon best Swedish?

Nothing in the building trade varies so much in price as timber; it can be bought at prices ranging from 10*l.* to 20*l.* per standard, and, naturally enough, a contractor is more inclined to think 10*l.* is a better price than 20*l.*, and is anxious to pass in timber at the lowest figure specified, and the loosely-worded description almost justifies him in doing so. In some specifications I have had it stated that the timber is to be best Christiania or St. Petersburg, but not the slightest attention has been paid to it, either by the builder or the architect, the words used being looked on as an euphemism, a figure of speech, something handed down to us by our grandfathers. If the stuff is not altogether sappy, not very much crowded with knots, is moderately free from shakes, and is evidently the produce of a tree or its branches rather larger than an ordinary scaffold-pole, it is accepted as "best" nine times out of ten. At the tenth time the builder learns to his cost that it is intended to have what is known as "best" in the general clauses, and does not stultify itself by saying "good" in other clauses, then the bother begins.

All this might be avoided if more attention was paid to trying to make clear what kind of timber was required. Nothing would help the writer of a specification more than the study of the book referred to (page 352), "Shipping Marks on Timber": W. Rider & Son. A few high-class brands might be specified from which the timber was to be selected, and the architect would then know whether he was getting his wood goods from Sweden, Norway, Russia, or Denmark (all Baltic ports). He would also know by reference whether the exporter considered his goods were firsts, seconds, or thirds, and that would be of great assistance.

To a painstaking clerk of works wood and its quality is the bane of his life, indeed doubly so by the wording of its specification, and the apparently general indifference, or ignorance, of those in authority over him.

CLERK OF WORKS.

REPORT OF THE REGISTRATION COMMITTEE.

SIR,—The last paragraph in your "Note" of this week will, I feel sure, meet with the hearty approval of a large number of the Royal Institute of British Architects. You say:—
"We strongly object to the proposal to change the title of 'Institute' to 'College,' for which we can see no possible reason, and which is simply throwing away attention. A matter of detail, no doubt, but still it is better not to clash with the letters used by any other body, which would be the case if these were adopted. It would appear that the Registration Committee did not know of the Royal Cambrian Academy of Art (the Welsh Academy), founded over twenty years ago, with such names as Sir E. J. Poynter, P.R.A., Sir L. Alma Tadema, R.A., Professor Henker, R.A., and W. Goscombe John, A.R.A., on their roll of honorary members; their academicians using R.C.A., and their associates A.R.C.A."

There appears to me to be one very definite reason why the title should not be altered as recommended in the Report, as will be seen by the following letter addressed to the Secretary of the Royal Institute of British Architects immediately after the issue of the Report:—
"Mostyn Estate Office, Llandudno.
March 26, 1906.

W. J. Locke, Esq.,
Secretary, I.L.B.A.,
9, Conduit-street, London.

Dear Sir,
Report of the Registration Committee.
The Report of the Registration Committee is one of momentous interest to architects (for and against), and will be subjected to much careful analysis by both sides. The principles involved are too important for it to be otherwise.

A first perusal of the report suggests some difficulty in respect to the proposed new titles. Regrettably I note the omission of the word 'British,' but it is the initials A.R.C.A. and R.C.A. to which I wish to draw attention. A matter of detail, no doubt, but still it is better not to clash with the letters used by any other body, which would be the case if these were adopted. It would appear that the Registration Committee did not know of the Royal Cambrian Academy of Art (the Welsh Academy), founded over twenty years ago, with such names as Sir E. J. Poynter, P.R.A., Sir L. Alma Tadema, R.A., Professor Henker, R.A., and W. Goscombe John, A.R.A., on their roll of honorary members; their academicians using R.C.A., and their associates A.R.C.A.
I had the honor of being elected an associate some years ago, and at one of the annual meetings I remember some trouble arising owing to the letters A.R.C.A. being used not only by the Cambrian Academy, but by the Royal College of Art, South Kensington, and each of these bodies wanted the other to adopt some other letters. Yours faithfully,
G. A. HEMPHEYS."

Perhaps those who suggested the change will give us their reasons for the proposal.
G. A. HEMPHEYS.

SIR,—In the appendix to the Report of the Registration Committee I notice that there is a proposal to alter the name of the Institute to that of the Royal College of Architects, making the initials for Fellows and Associates F.R.C.A. and A.R.C.A. respectively. There is already an associateship of the Royal College of Art granted by the Board of Education to their art masters. It would be a pity to confuse the two.

L. SYLVESTER SULLIVAN.

SEA SAND FOR MORTAR.

SIR,—In answer to your correspondent, "Enquirer," the objection to the use of sea sand in mortar has been over-rated. It is well known that sea sand is impregnated with alkaline deliquescent salts, which possess the property of attracting moisture from the atmosphere and consequently causing a certain amount of dampness when used. These salts, however, after a short time become effete, after which no further dampness can occur.

The cohesive value of the sand is unaffected by the presence of salt, and what dampness does occur is usually slight, and cannot be seriously objected to.
CHARLES D. HAWLEY.

Ipsowich.
** In our opinion the use of sea sand in construction can only be dictated by the desire to save money, because it is well known that, owing to its fineness and the shape of the grains, sea sand makes weaker mortar for a given proportion of cement than coarser sands. The salt can be removed by washing, but clean sharp sand is preferable, as the cement adheres better, the grains offer greater resistance to movement under compression, and that the mortar is stronger. The most suitable sand is one with grains of variable size, so that the smaller particles fill the voids between the larger grains.—Ed.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XIII.

LABOUR-SAVING CONSTANTS (continued).

AS constants are given in Table VI. for hollow octagonal bodies it may be convenient to indicate the manner in which these have been derived, as in the case of the other forms discussed in Article XII.

Octagon.—(1) Determining the area of material in the cross section of a hollow octagon by taking the difference between the areas of two octagons calculated from the outside and inside dimensions, respectively, we apply the general rule for the area of any hollow polygon:—

$$A = \left(S \times \frac{r}{2} \right) - \left(s \times \frac{r}{2} \right)$$

where *s*, the length of the inner side, = *S* - (*2t* × *tan* θ), as explained in connexion with hollow hexagons.

But as the internal angle of an octagon = 135°, it follows that *tan* θ = *tan* 22.5°.

For an octagon the value of *n* = 8, by Table V. the value of *r* = 1.2071, and by any table of trigonometrical ratios we find the value of *tan* 22.5° = 0.4142.

Substituting these values, the above equation becomes

$$A = \left[S \times 8 \times \frac{1.2071}{2} S \right] - \left[\left\{ S - (2t \times 0.4142) \right\} s \times \frac{1.2071}{2} (S - 2t \times 0.4142) \right]$$

which reduces to

$$A = \{ S^2 - (S - t \cdot 0.8284) \} 4.8284$$

Then, as the weight of a hollow octagonal body = *A* × *lv*, the weight per foot length is *w* = [*S*² - (*S* - *t* 0.8284)] *c*, where the values of the constant are

$$c = (4.8284 \times 12 \times w) \text{ for dimensions in in.}$$

$$c = (4.8284 \times 1 \times w) \text{ " " " ft.}$$

Applying the equation to the case of a hollow octagonal cast-iron column 12 ft. long, with length of side = 6 in., and thickness of metal = 1 in., taking the dimensions in inches, and the weight of cast-iron per cubic inch at 0.26 lb., the value of *c* = (4.8284 × 12 × 0.26) = 15.0646, we have for the weight per foot length

$$w = \{ 36 - (6 - 0.8284) \} \times 15.0646$$

$$= (36 - 26.7454) 15.0646$$

$$= 139.42 \text{ lb.,}$$

then the weight of the column is 139.42 × 12 = 1673 lb.

(2) Determining the area of a hollow octagon by employing as factors the mean length of

side, the thickness of side, and the number of sides, we have

$$A = s_m \times t \times n$$

The mean length of side *s_m* = *S* - (*2* × $\frac{1}{2}$ × *tan* 22.5°).

Substituting the values of *tan* 22.5° = 0.4142 and *n* = 8, the equation becomes

$$A = S - (t \cdot 0.4142) t \times 8$$

The insertion of factors representing unit length and weight gives

$$w = S - (t \cdot 0.4142) t \times (8 \text{ } lv)$$

$$= S - (t \cdot 0.4142) t \times c$$

where the values of the constant are

$$c = (8 \times 12 \times w) \text{ for dimensions in in.}$$

$$= (8 \times 1 \times w) \text{ " " " ft.}$$

Applying the rule to the case of the column taken in method (1), and taking the dimensions in inches, with *c* = (8 × 12 × 0.26) = 24.96, we have for the weight per foot length

$$w = \{ 6 - (1 \times 0.4142) \times 1 \} \times (24.96)$$

$$= 5.5858 \times 24.96$$

$$= 139.42 \text{ lb.}$$

Then the weight of the column is 139.42 × 12 = 1673 lb., as before.

To facilitate calculations relative to the weight of hollow columns, beams, flues, and other conduits, or tubular bodies of various shapes, we give in Table VI. constants for different materials, by the aid of which the weight can be readily computed per foot length from the axes, or lengths of side, as the case may be, and the thickness of material, these measurements being taken in inches or in feet, as may be most convenient. This table has been calculated for use with the equations:—

- (1) Hollow Ellipse $w = (D_m + D_n) t c$
- (2) Hollow Square $w = (s_m \times t) c$
- (3) Hollow Hexagon $w = (S - t \cdot 0.5774) t c$
- (4) Hollow Octagon $w = (S - t \cdot 0.4142) t c$

One illustration has already been given showing the practical application of each rule, but the following examples will show more clearly the labour-saving character of the constants in Table VI.

Example (1): Find the weight of material in an elliptical drain 150 ft. long, with the major axis = 4 ft. and the minor axis = 3 ft., and a thickness of 6 in. of cement mortar.

By formula (1) the weight per foot length is $w = \{ (4 - 0.5) + (3 - 0.5) \} \times 0.5 \times 294 = 6 \times 162 = 612 \text{ lb.}$

Then the total weight of the drain is $W = 612 \times 150 = 91,800 \text{ lb.}$

Example (2): Find the weight of a brick chimney 20 ft. 9 in. square, with parallel sides 60 ft. high by 9 in. thick.

By formula (2) the weight per foot length is $w = (2.75 - 0.75) \times 0.75 \times 448 = 1.5 \times 448 = 672 \text{ lb.}$

Then the total weight of the chimney is $W = 672 \times 60 = 40,320 \text{ lb.}$

Example (3): Find the weight of lead, 8 lb. per foot superficial, required to sheath the outer walls of a hexagonal turret 8 ft. high, the length of each side being 3 ft. The weight of lead per cubic foot by Table IV. being 712 lb., the thickness per foot superficial will be $8 \div 712 = 0.0112 \text{ ft.}$

Therefore the length of side measured outside the lead will be $S + (t \times \tan \theta)$.

Hence by formula (3) with the + sign substituted for the - sign the weight per foot height of the turret is $w = (3 + 0.0112 \times 0.5774) \times 0.0112 \times 4272 = 3.0065 \times 47.85 = 143.8 \text{ lb.}$

Example (4): Find the weight of an octagonal tower of concrete, the height of the tower being 45 ft., the length of each side 7 ft., and the thickness of the walls 18 in.

By formula (4) the weight per foot of height is $w = (7 - 1.5 \times 0.4142) 1.5 \times 1040 = 9.568 \times 1040 = 9950 \text{ lb.}$

Then the total weight of the tower will be $W = 9950 \times 45 = 447,750 \text{ lb.}$

Other series of constants can be prepared in a manner generally similar to that indicated in this and the preceding article.

In Table VII. we give some data that will be found useful in calculating the weight of various solid bodies.

The constants in columns (1) and (1a) are suitable for calculating the weight of square

TABLE VI.—CONSTANTS FOR CALCULATING THE WEIGHT OF HOLLOW COLUMNS, BEAMS, FLUES, CONDUITS, AND OTHER TUBULAR BODIES OF DIFFERENT SHAPES AND OF VARIOUS MATERIALS.

Material. (Weight per cubic foot as in Table IV.)	Values of Constant per Foot Length.							
	Ellipse.		Square.		Hexagon.		Octagon.	
	Diameter and Thickness.		Diameter and Thickness.		Diameter and Thickness.		Diameter and Thickness.	
	In in.	In ft.	In in.	In ft.	In in.	In ft.	In in.	In ft.
	$c = 1.5708 \text{ in}$	$c = 1.5708 \text{ ft}$	$c = 4 \text{ in}$	$c = 4 \text{ ft}$	$c = 6 \text{ in}$	$c = 6 \text{ ft}$	$c = 8 \text{ in}$	$c = 8 \text{ ft}$
Brickwork	1.2	176	3.1	448	4.7	672	6.2	896
Cement	0.9	136	2.4	344	3.6	516	4.8	688
Cement Mortar	1.4	204	3.6	520	5.4	780	7.2	1,040
Concrete	1.1	204	3.6	520	5.4	780	7.2	1,040
Earthenware	1.2	180	3.2	460	4.8	680	6.4	880
Cast-iron	4.9	706	12.5	1,800	18.7	2,700	25.0	3,600
Wrought-iron	4.9	754	13.3	1,920	20.0	2,940	27.2	3,800
Mild Steel	5.3	769	13.6	1,960	20.4	3,000	27.6	3,840
Brass	5.5	793	14.0	2,020	21.1	3,030	28.1	4,040
Copper	6.0	862	15.3	2,196	22.9	3,234	30.5	4,292
Lead	7.7	1,118	19.8	2,848	29.7	4,272	39.6	5,686
Zinc	4.9	706	12.5	1,800	18.7	2,700	25.0	3,600

The constants in this table are calculated upon weights per cubic inch where diameter and thickness are intended to be taken in inches, and upon weights per cubic foot where diameter and thickness are intended to be taken in feet.

and rectangular piers, columns, beams, and bars, and the weight of water contained in rectangular tanks.

Example (1): Find the weight in hundredweights of a square concrete pier 20 ft. high by 36 in. square.

Taking the constant 0.00806, say 0.008, from column (1a), the weight per foot high is

$$w = 36^2 \times 0.008$$

and the total weight

$$W = 207.36 \text{ cwt.}$$

Example (2): Find the weight in pounds and hundredweights of 150 ft. run of 2-in. square steel bars.

Taking the constants 3.4 and 0.0303 from columns (1) and (1a) the weight is

$$W = 2^2 \times 3.4 \times 150 = 2040 \text{ lb.}$$

$$W = 2^2 \times 0.0303 \times 150 = 18.2 \text{ cwt.}$$

Example (3): Find the weight in pounds per foot run of cast-iron plates 4 in. wide by $\frac{1}{2}$ in. thick.

Taking the constant 3.12 from column (1) the weight per foot run is

$$w = 4 \times 0.875 \times 3.12 = 10.92 \text{ lb.}$$

Example (4): Find the approximate capacity in hundredweights of a rectangular tank with the inside dimensions of 36 in. wide by 20 in. deep by 6 ft. long.

Taking the constant 0.00385, say 0.004, from column (1a) the weight of water is

$$W = 36 \times 20 \times 0.004 \times 6 = 17.28 \text{ cwt.}$$

Example (5): Find the approximate weight in hundredweights of cement that can be stored in a rectangular bin with the inside dimensions of 30 in. wide by 38 in. deep by 7 ft. long.

Taking the constant for cement 0.00533, say 0.005, from column (1a) the weight is

$$W = (30 \times 38) \times 0.005 \times 7 = 39.9 \text{ cwt., say 2 tons.}$$

The constants in columns (2) and (2a) are specially applicable to calculations relating to the weight of solid cylindrical piers, columns,

and bars, and the water capacity of cylinders and pipes.

Example (1): Find the weight in hundredweights of a concrete column 10 ft. high by 4 ft. diameter.

Taking the constant = 0.00633 from column (2a) the weight is

$$W = 48^2 \times 0.00633 \times 10$$

$$= 145.8 \text{ cwt., say 146 cwt.}$$

Example (2): Find the weight in pounds per foot run of $1\frac{1}{4}$ in. diameter copper rods.

Taking the constant = 2.99, say 3.00, from column (2) the weight is

$$w = 1.25^2 \times 3.0$$

$$= 4.68 \text{ lb.}$$

Example (3): Find the capacity in hundredweights, pounds, and gallons, of a hot-water cylinder with the inside diameter of 2 ft. 11 in. and the inside length of 6 ft.

By columns (2) and (2a) the constants for water are 0.00303, and 0.34.

Then the weights are

$$W = 35^2 \times 0.00303 \times 6 = 22.3 \text{ cwt.}$$

$$W = 35^2 \times 0.34 \times 6 = 2,499 \text{ lb.}$$

And as 1 gallon of water = 10 lb.,

$G = 2499 \div 10 = 249.9$ gall., say 250 gallons.

Example (4): Find the weight in pounds and the number of gallons of water contained in a 4-in. internal diameter pipe 30 ft. long.

Here we have

$$W = 4^2 \times 0.34 \times 30 = 163.2 \text{ lb.}$$

and

$$G = 163.2 \div 10 = 16.32 \text{ gall.}$$

The constants in column (3) and (3a) will be found useful for calculating the weight of paving, floor and roof slabs, and metal sheets and plates.

Example (1): Find the weight in hundredweights of a concrete floor slab measuring 25 ft. long by 20 ft. wide, by $\frac{1}{2}$ in. thick, covered with tiles $\frac{1}{2}$ in. thick.

TABLE VII.—CONSTANTS FOR CALCULATING THE WEIGHT OF SOLID PIERS, COLUMNS, BARS, AND RODS OF VARIOUS MATERIALS.*

Material.	Weight of 12 cub. in. (= 1 ft. long or high by 1 in. sq.)		Weight of 12 cylindric in. (= 1 ft. long or high by 1 in. dia.)		Weight of 144 cub. in. (= 1 ft. sq. by 1 in. thick or deep.)	
	lb.	cwt.	lb.	cwt.	lb.	cwt.
Brickwork	0.9648	0.777	0.00634	0.611	0.00545	0.633
Cement	0.9487	0.567	0.00533	0.469	0.00418	0.638
Cement Mortar	0.9752	0.962	0.00806	0.709	0.00683	0.987
Concrete	0.9665	0.798	0.00713	0.627	0.00559	0.957
Earthenware	0.9665	0.798	0.00713	0.627	0.00559	0.957
Cast-iron	0.260	3.12	0.0279	2.45	0.02.9	37.50
Wrought-iron	0.277	3.33	0.0287	2.61	0.0233	40.00
Mild Steel	0.284	3.40	0.0303	2.67	0.0238	40.63
Brass	1.292	3.50	0.0313	2.75	0.0245	42.08
Copper	0.317	3.81	0.0304	2.99	0.0246	43.75
Lead	0.412	4.44	0.0314	3.88	0.0249	59.33
Zinc	0.269	3.12	0.0279	2.45	0.0249	37.50
Water	0.0369	0.432	0.00366	0.310	0.00303	5.19

* In using columns (1) to (2a) transverse dimensions must be taken in inches and length or height in feet. In using columns (3) and (3a) thickness or depth must be taken in inches and superficial dimensions in feet.

By column (3a) the constants for concrete and tiles are 0.0067 and 0.0356 respectively, and the weights are

$$\text{Concrete } W = 4.75 \times 0.0067 \times 25 \times 20$$

$$= 229.66 \text{ cwt., say 230 cwt.}$$

$$\text{Tiles } W = 0.625 \times 0.0356 \times 25 \times 20$$

$$= 26.75 \text{ cwt., say 27 cwt.}$$

∴ Weight of floor slab = 230 + 27 = 257 cwt.

Example (2): Find the approximate weight in pounds and hundredweights of two steel plates $\frac{1}{2}$ in. thick and of size sufficient to cover a pair of doors each 7 ft. high by 3 ft. 6 in. wide.

Taking the constants 40.83, say 40.8, and 0.364, from columns (3) and (3a), the weight of the two plates will be

$$W = 0.25 \times 40.8 \times 7^2 = 500 \text{ lb.}$$

$$W = 0.25 \times 0.364 \times 7^2 = 4.46 \text{ cwt.}$$

Example (3): Find the weight in pounds per square foot of 20 S.W.G. sheet zinc (thickness = 0.036 in.).


Taking the constant = 37.5 from column (3) the weight is

$$w = 0.036 \times 37.5 = 1.35 \text{ lb.}$$

We do not think it necessary to give tables of equivalents and conversion factors, as such data are to be found in the various pocket-books published for architects and engineers. Our main object in this and the preceding article has been to suggest the manner in which data can be employed in the preparation of labour-saving constants.

Illustrations.

ST. BARTHOLOMEW CHURCH, STAMFORD HILL.

 HIS church was erected with funds derived from the sale of the church and site of St. Bartholomew, Little Moorfields.

The materials consist of red brick and Douling stone, with tiled roofs. The fall in the ground eastward gave an opportunity of placing the morning chapel, which is vaulted in brick, and the vestries under the chancel. The pulpit, given by the Bishop of Islington, and the font (both of which are excellent specimens of Sir Christopher Wren's work) came from the Church of St. Bartholomew, Little Moorfields.

The contractors were Messrs. Dove Bros., and the architect was Mr. W. D. Caroe.

WAYSIDE NOTES IN EAST ANGLIA: THE GABLES OF BROADLAND.

THE architectural student who has wandered in the vicinity of the Norfolk Broads and in other parts of East Anglia where reeds were at one time the accepted roof-covering of all buildings, whether for domestic or commercial purposes, must have been struck with the variety and quaintness of the gables. These gable-ends are generally of brick carried up above the thatch, and the outlines consisted of graceful curves, and pediments finished and coped with ordinary bricks. On the external face the ends of the principal timbers of the roof are tied in with iron straps having ornamental wrought-iron elaborated with scrollwork, dates, initials letters forming perhaps the name of the owner, or with plain, hammered spear-ended bars sometimes single and sometimes crossed at right angles.

The bricks were smaller than the usual brick of to-day, rising 12½ in. to five courses, and were 8½ in. long and 4½ in. wide. Flint and rubble were often introduced where the former was plentiful locally, in conjunction with the brick, and it may even be that this rubble once formed part of still more ancient buildings. Now and then rubbed arches were introduced, as at Potter Heigham, but, as a rule all bricks were handmade, and the mouldings were simple and moulded also, not cut.

The dates of these gables are XVIIIth and XVIIth century, the earlier forms, such as the crow steps, being almost XVIIth century. Here and there we find Georgian fronts put on to these early buildings, as an example I have given from Beccles shows.

Again, we have evidences of buildings converted from domestic purposes to commercial requirements, as at Martham and Beccles. Then, again, we see this brick treatment introduced into ecclesiastical buildings, as

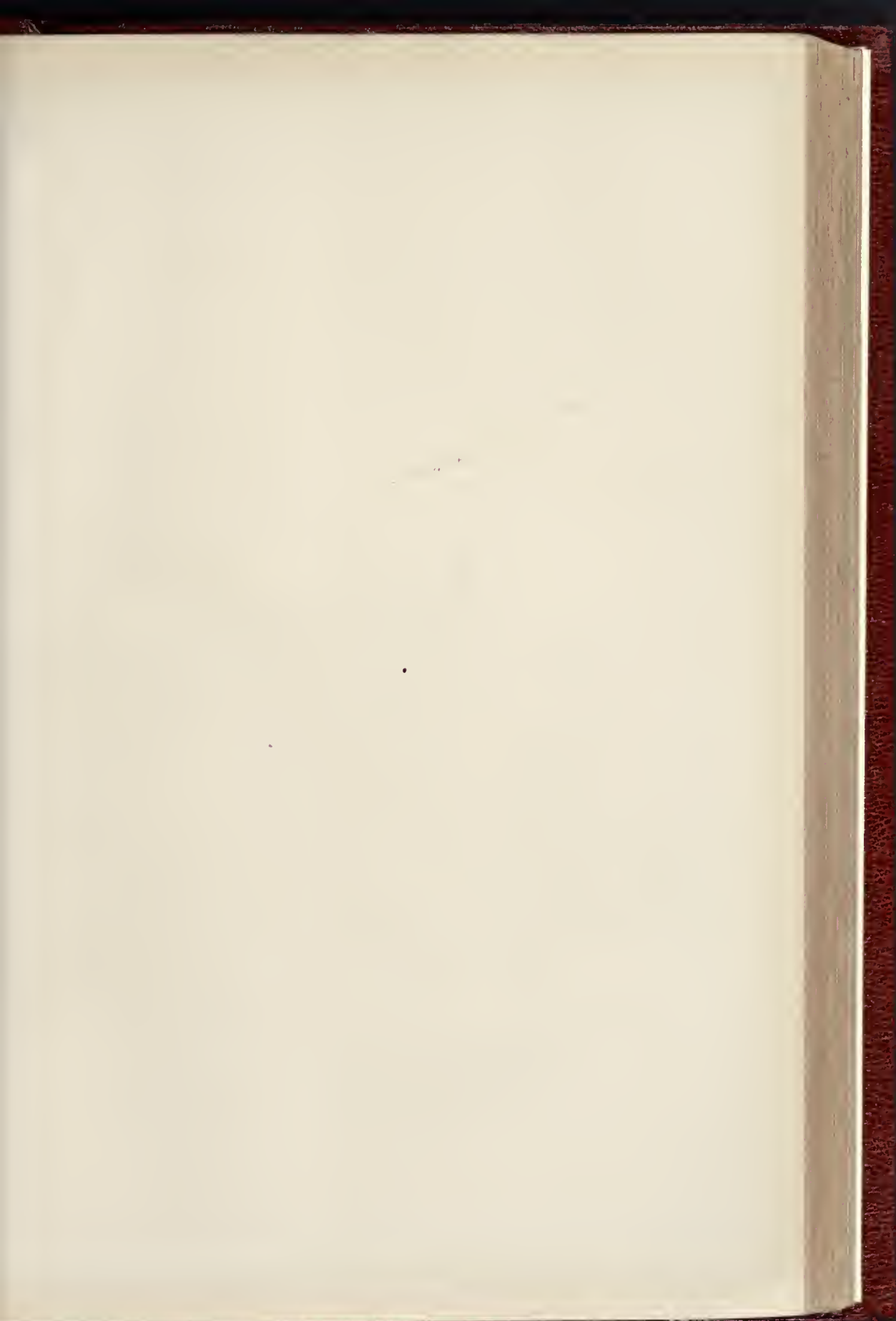
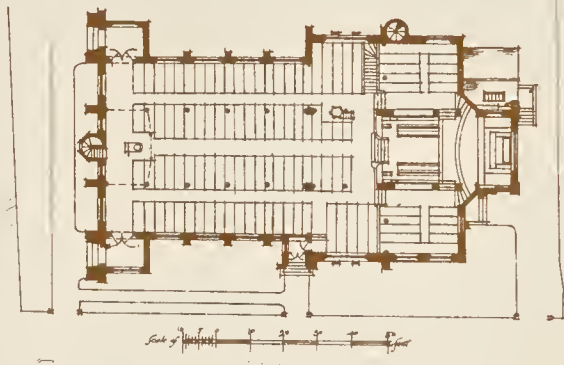


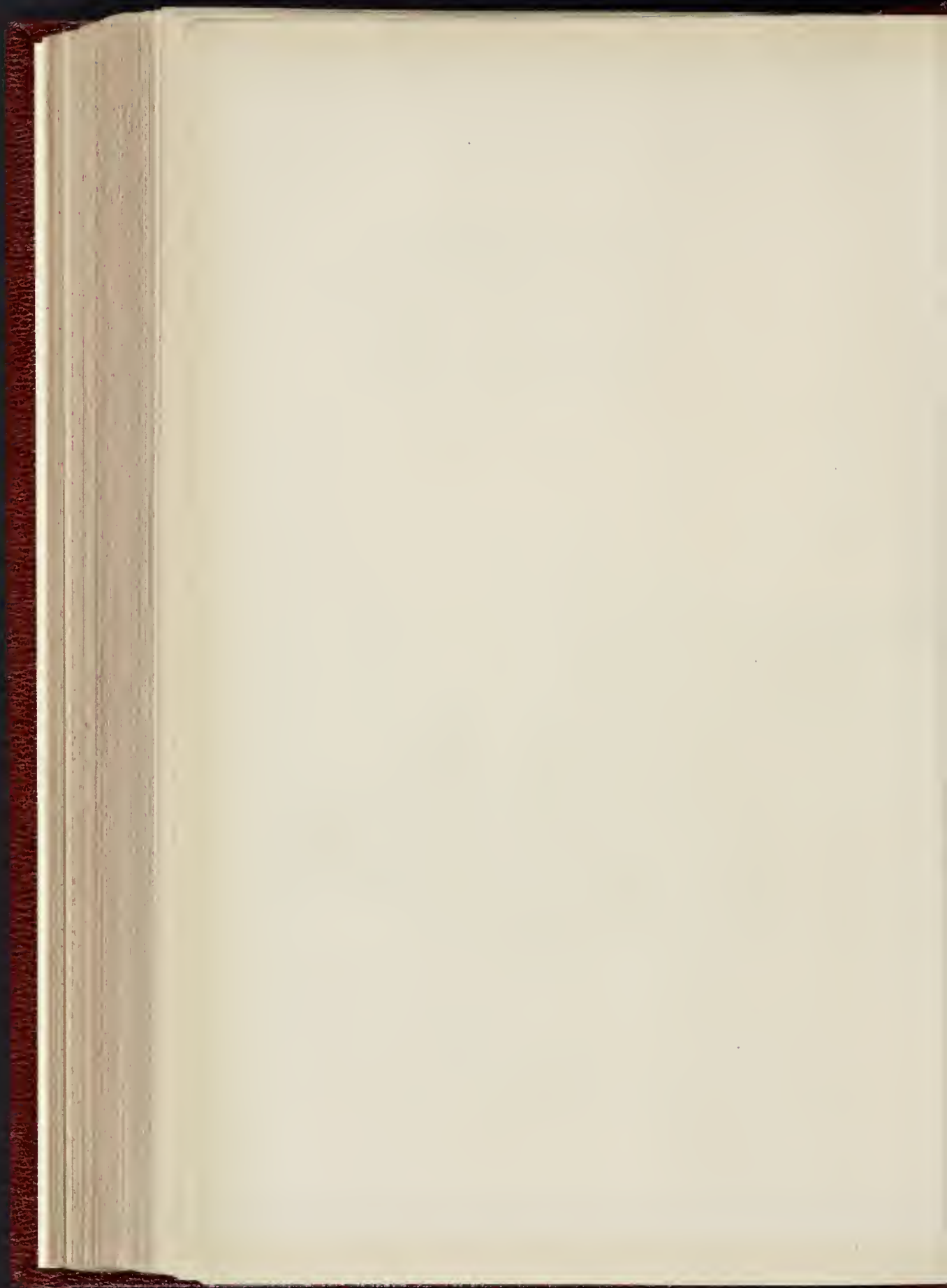


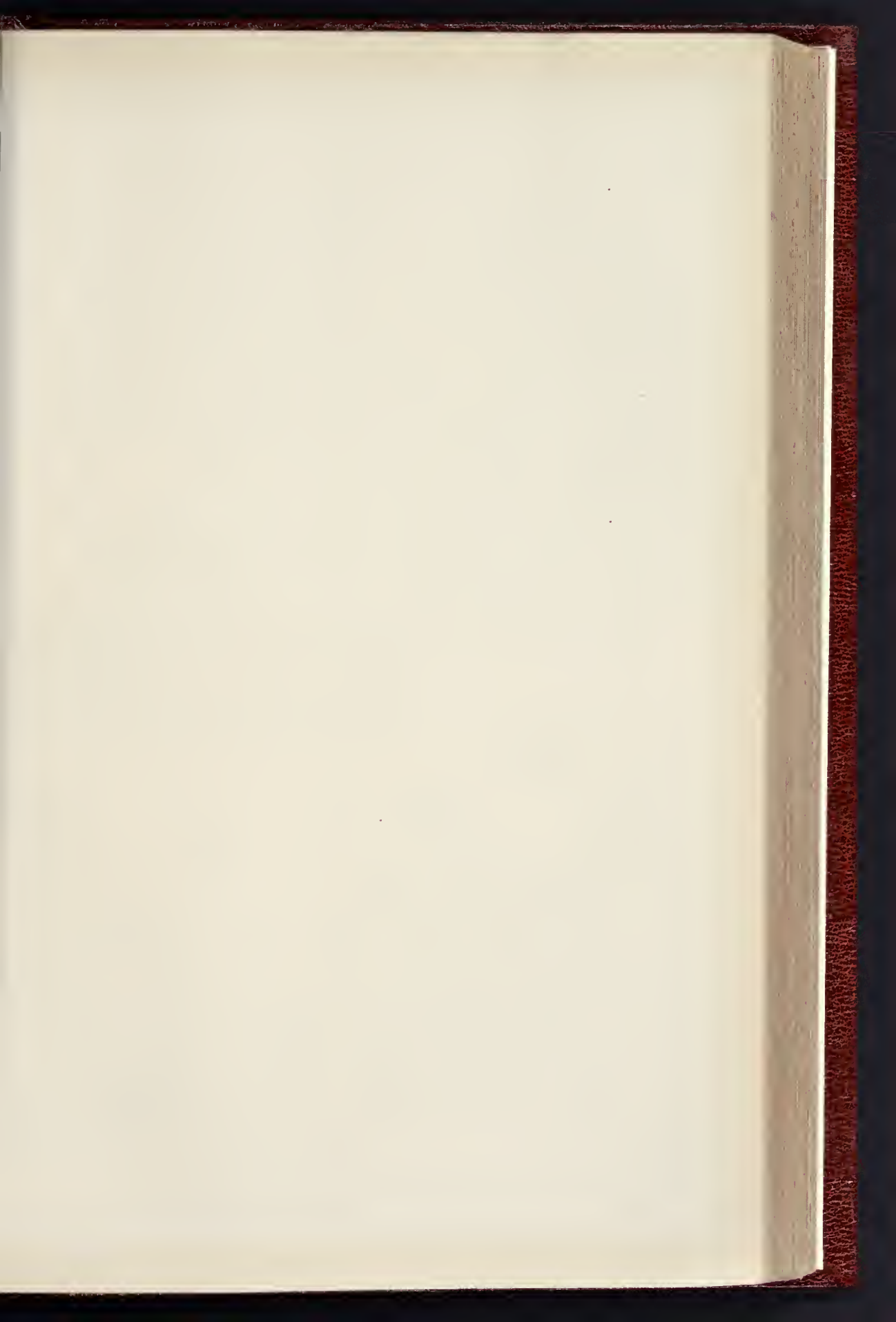
PHOTO LITHO. SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET, PETER LANE, E.C.

CHURCH OF ST BARTHOLOMEW, STAMFORD



ILL.—MR W D CAROE, F.R.I.B.A., ARCHITECT.





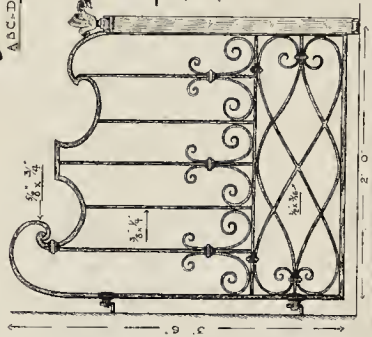
— Sign Bracket : German : 15th Century. —



A.B.C. Details of Treviso Leafwork.

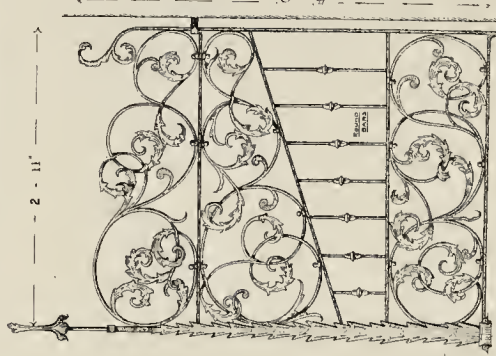
ALL SCROLLWORK $\frac{3}{8}$ ROUND FINISHING FLAT AT ENDS

- Portions of —
- two Gates. —
- Italian : —
- 17th Century.

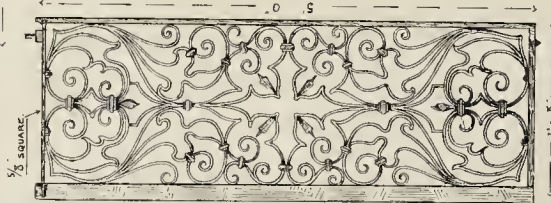


A FEW EXAMPLES OF WROUGHT-IRONWORK OF HISTORIC PERIODS, SKETCHED FROM THE ORIGINALS IN SOUTH KENSINGTON MUSEUM BY LEONARD DAKIN.

— Grille : Italian : 18th Century. —
— SCROLLS $\frac{3}{8}$ SQUARE. —
— FLAT STRAPWORK CENTRE. —



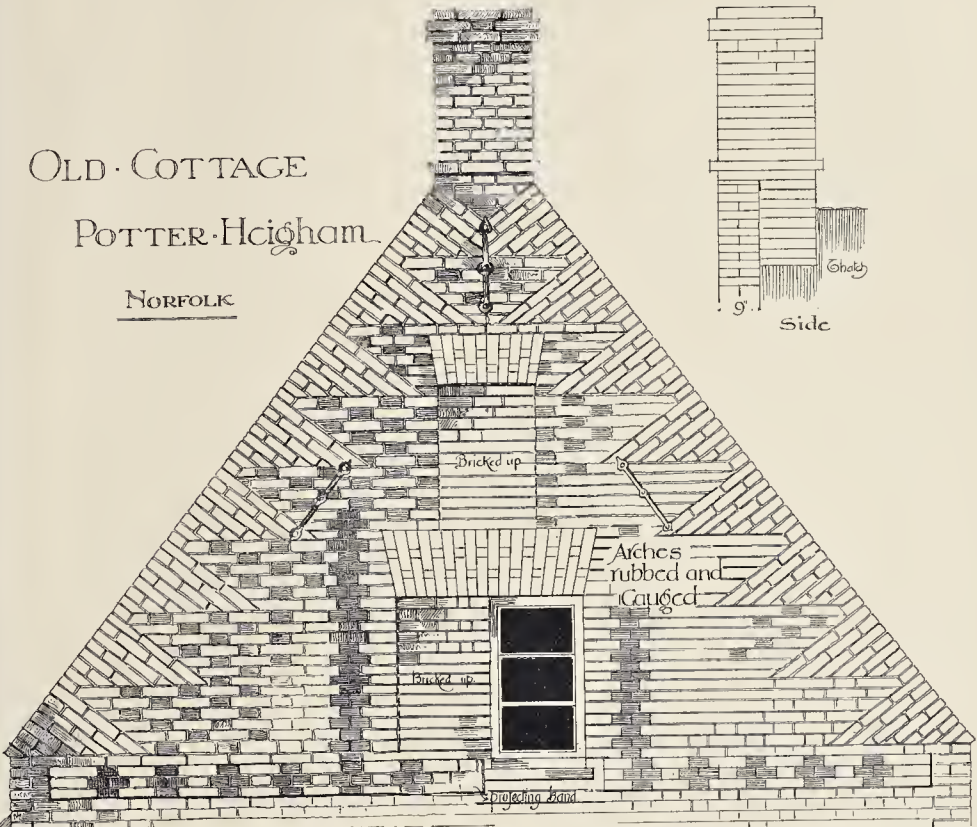
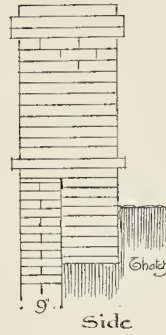
— Portion of Gate : German : 17th Cent. —



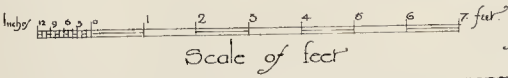
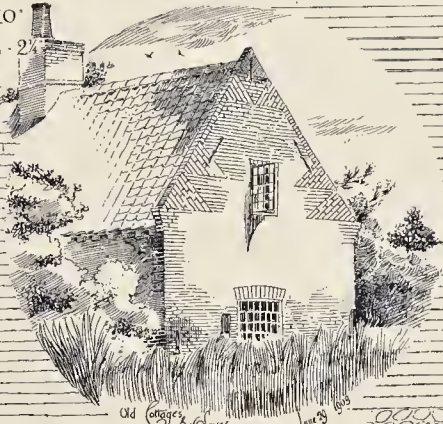
OLD COTTAGE

POTTER-HIGHAM

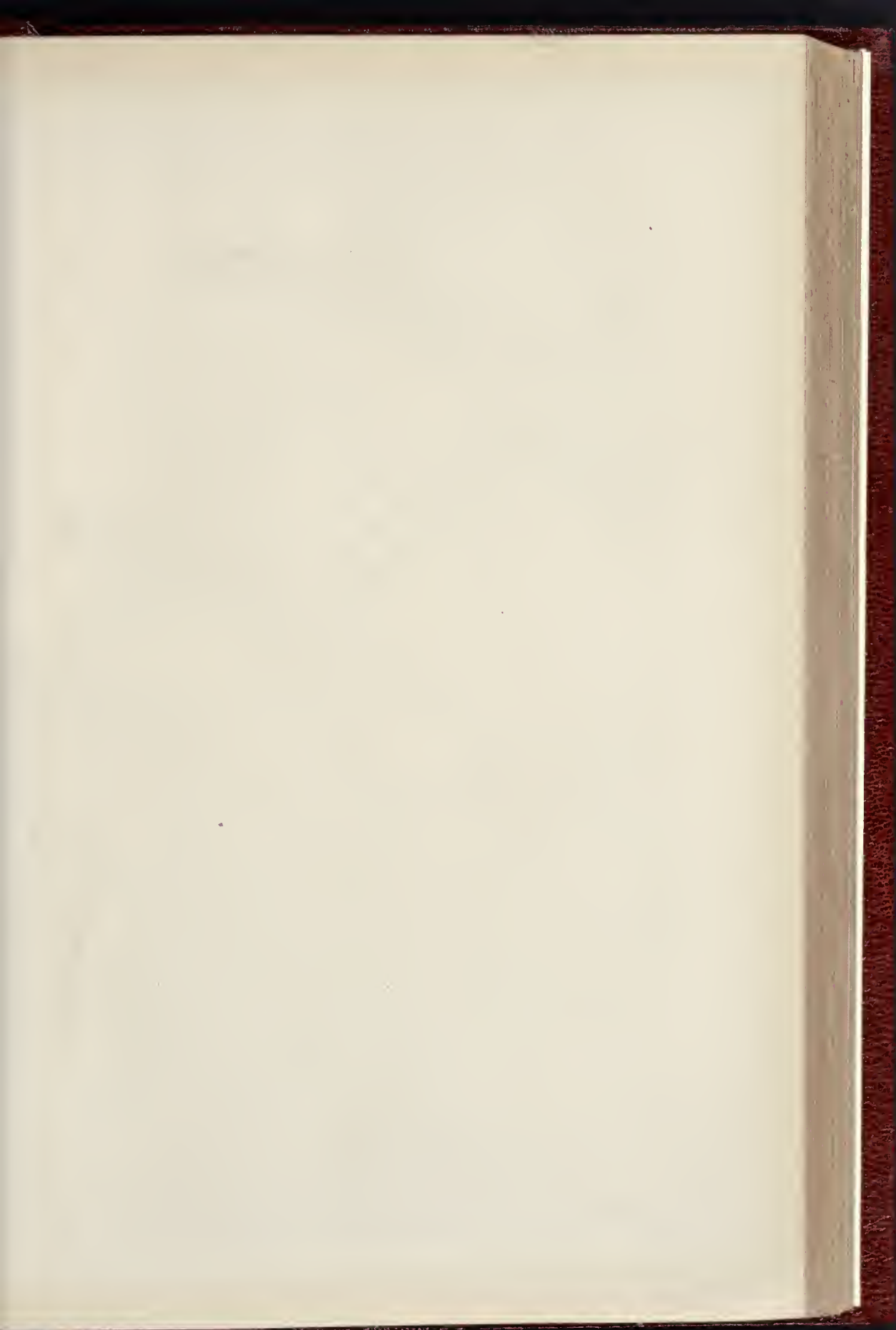
NORFOLK



four courses rise 10'
 Flemish bond bricks 2 1/2"
 All headers dark

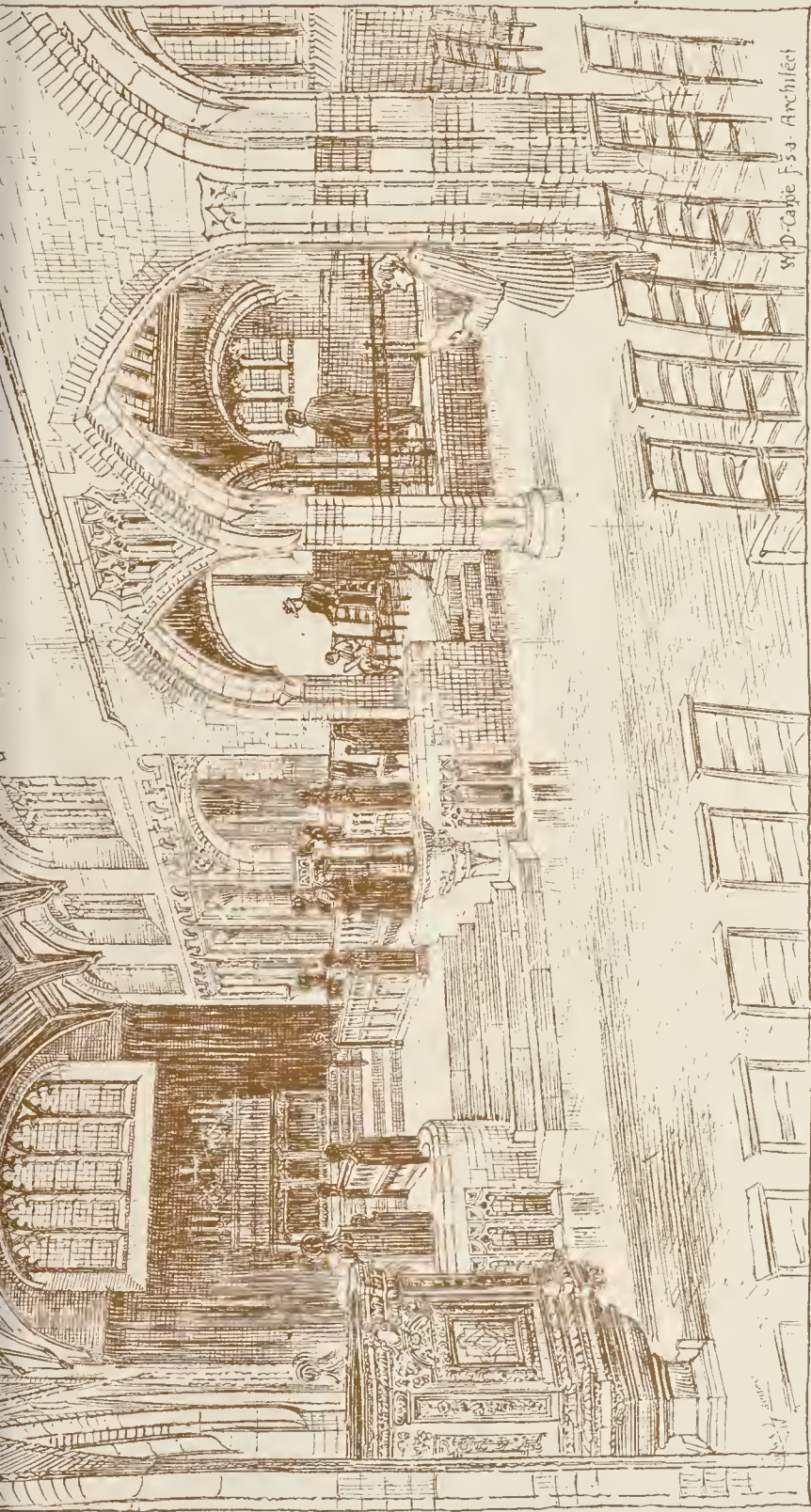


John S. Gorden
 mason et del
 July 9, 1903

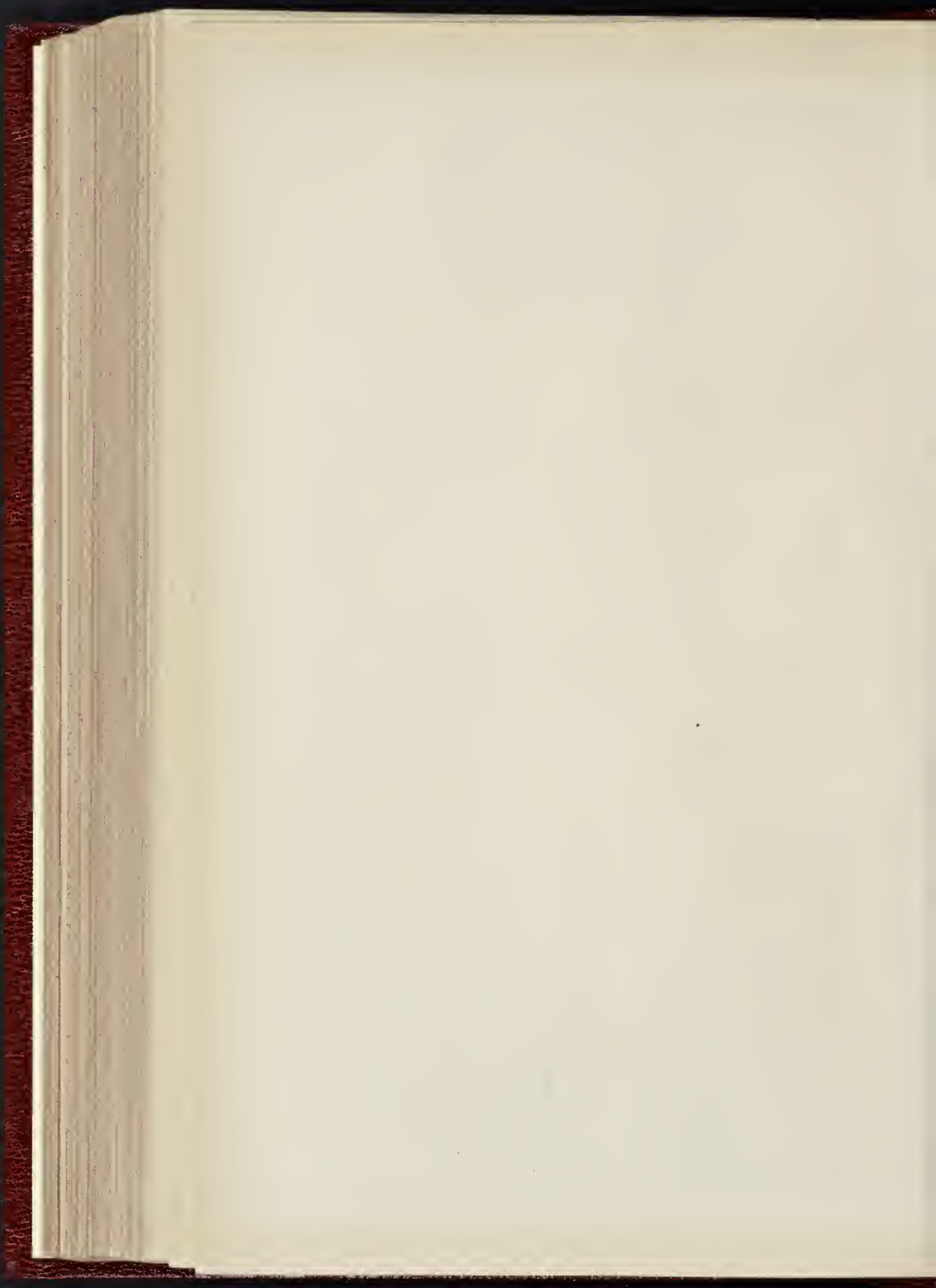


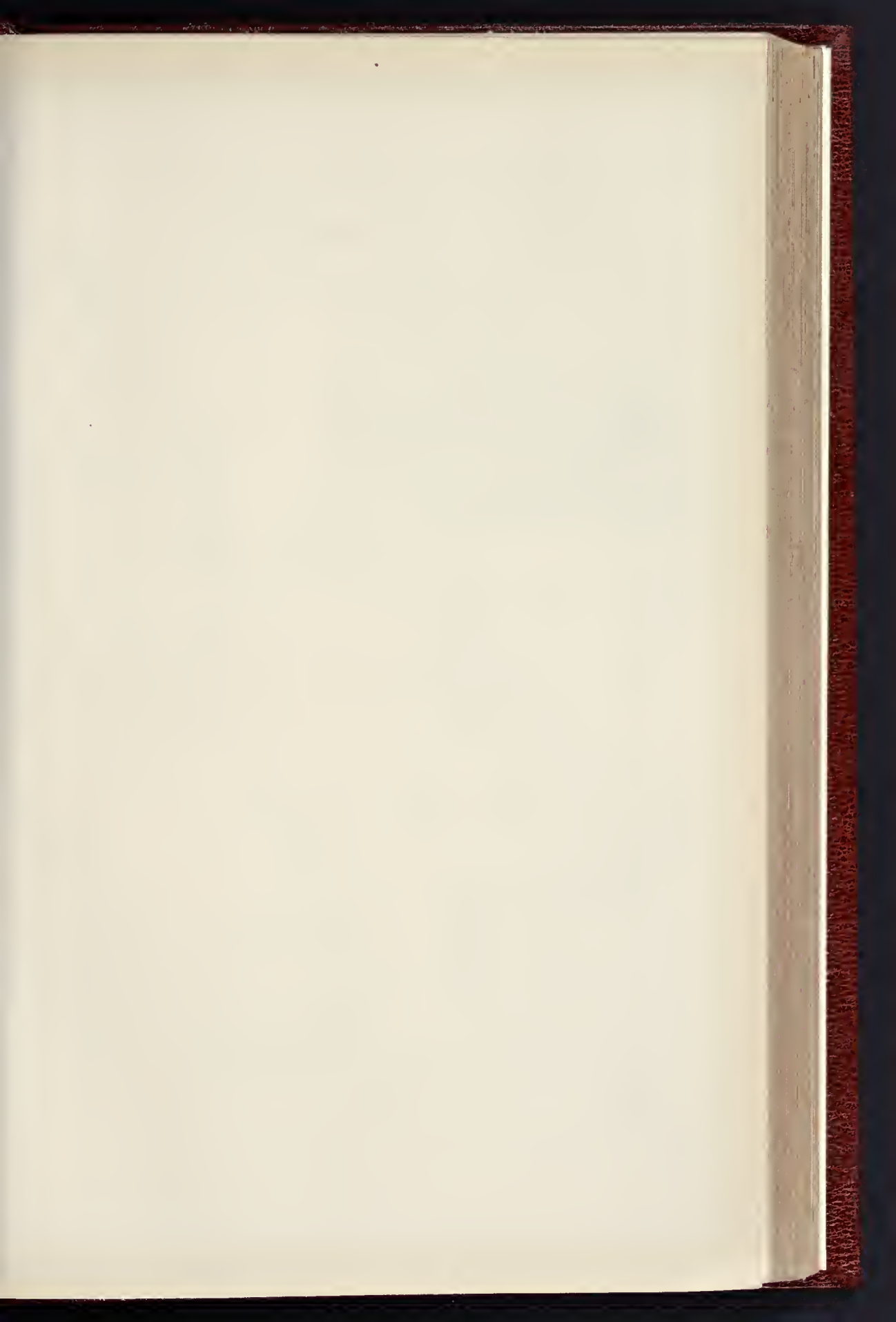
THE BUILDER. APRIL 7, 1906





CHURCH OF ST BARTHOLOMEW, STAMFORD HILL.—Mr. W. D. CARPE, F.R.I.B.A., ARCHITECT



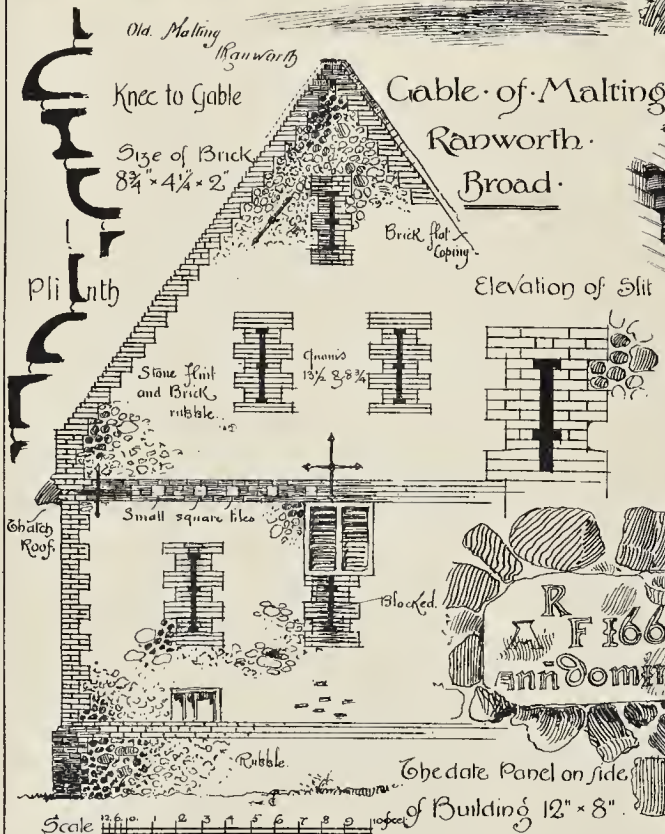
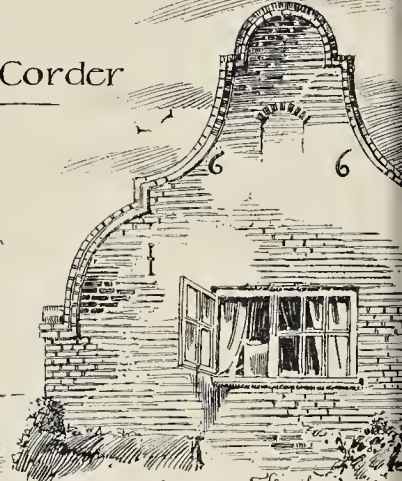


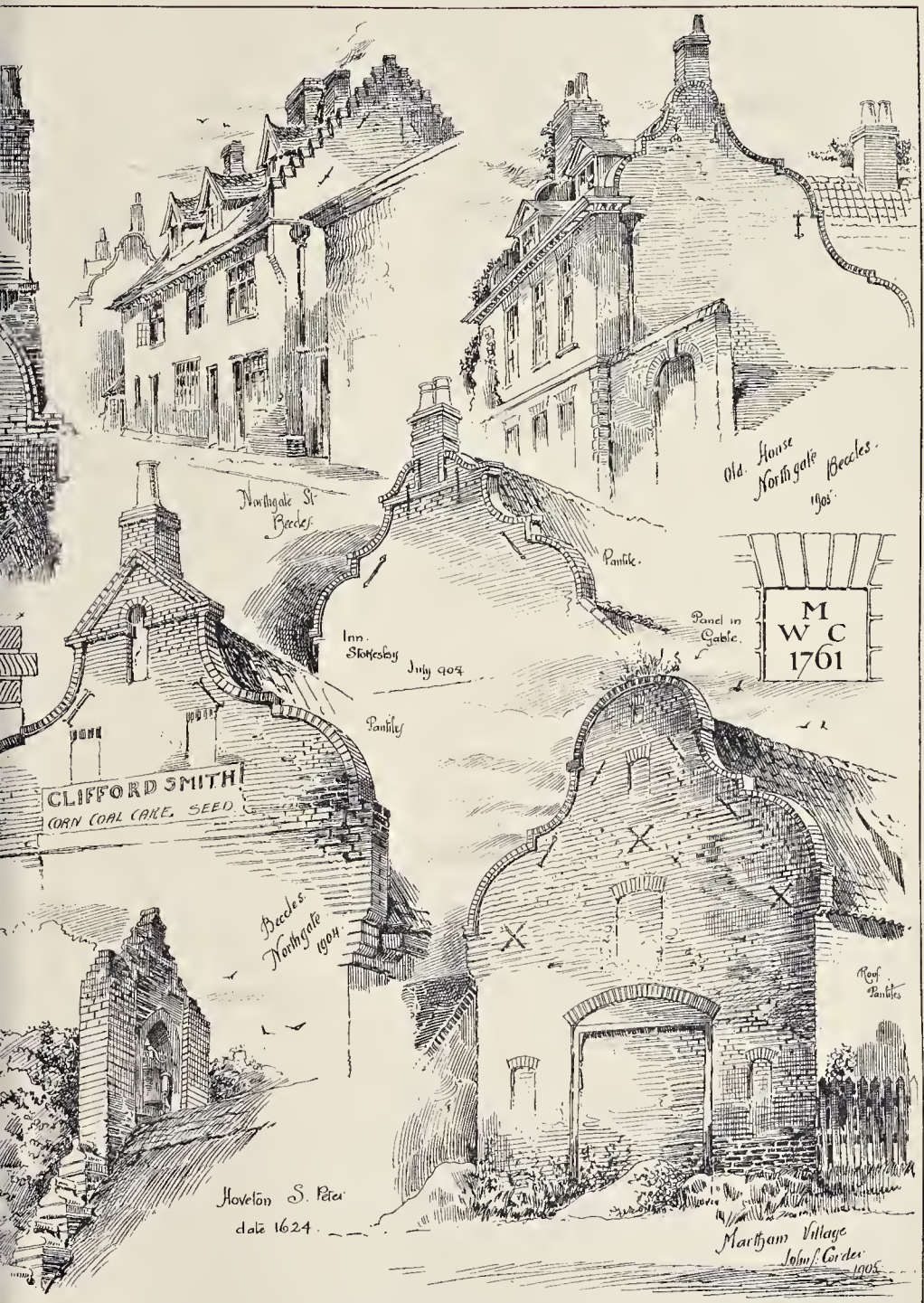
WAYSIDE NOTES IN EAST ANGLIA

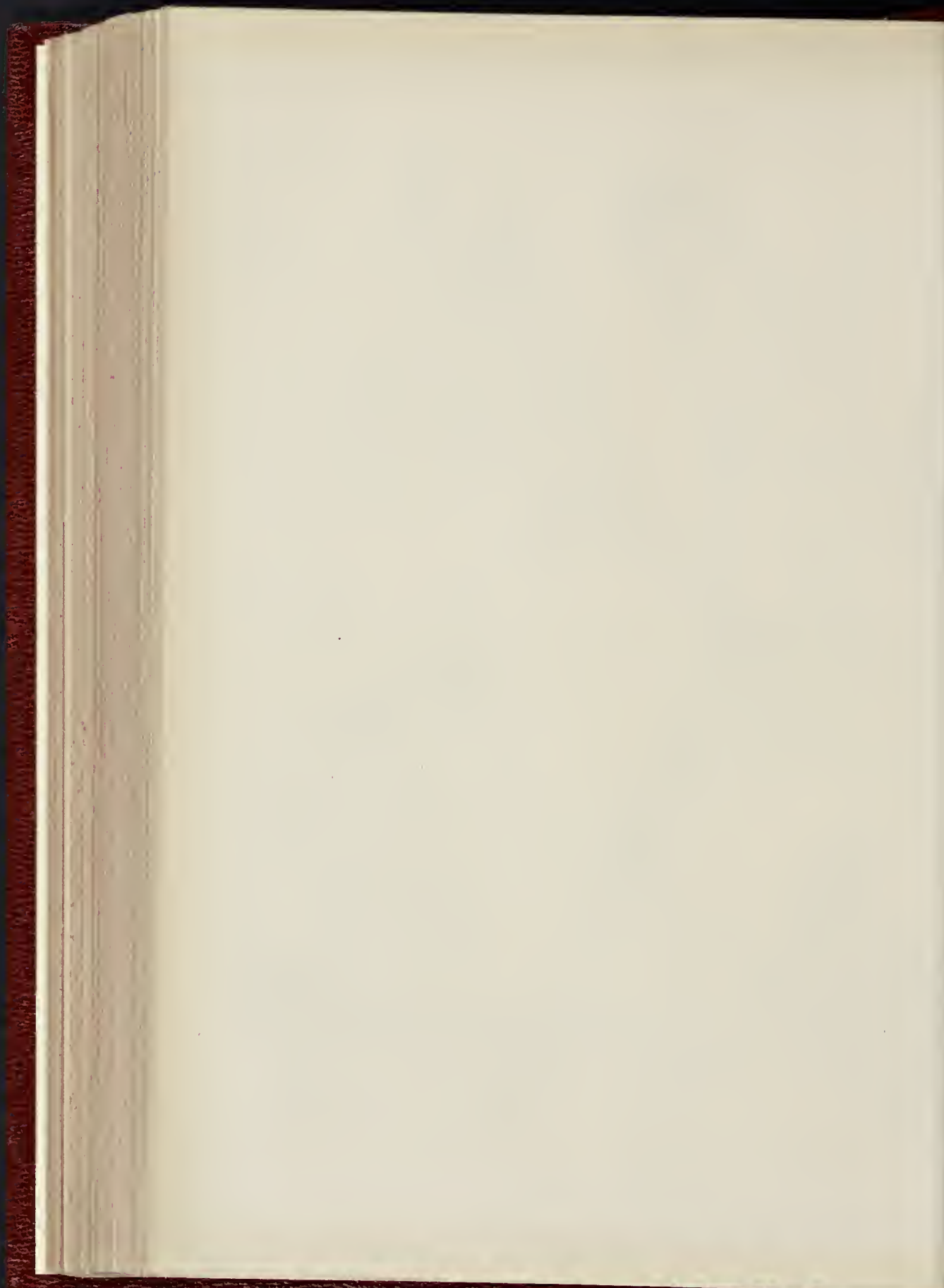
Gables in Broadland

by

John S. Corder







videnced by the interesting church at Hoveon, which has many points worthy of study. All these examples indicate a strong Flemish influence, and point to the fact that the revival of the manufacture of bricks became active in Norfolk and Suffolk towards the close of the XVIIth century, and that then the timber-constructed buildings were disappearing, and were being superseded by those constructed of the more permanent and weather-proof material.

JOHN SHEWELL CORDER.

EXAMPLES OF WROUGHT-IRON WORK.

THE sheet of wrought-iron work represents few examples of the style and class of work turned out by smiths of the XVIIIth and XVIIIth centuries. Many modern craftsmen might with advantage take a lesson from these old Continental specimens. The smith of the present century has lost much of the cunning of his forefathers, and, as a general rule, cannot afford, in these times of hurry and competition, to work for art's sake as in the days of old. Much of the beautiful detail is, therefore, lost by the metal-worker of the present day, and that must have been at one time a work of leisure to the craftsman is now but an ordinary toil. L. D.

THE OLD COTTAGES, POTTER HEIGHAM AND ST. OLAVES.

THE Cottage at Potter Heigham stands opposite the post office close to the railway station. It is of somewhat unpretentious proportions and low elevation, and is constructed of brick resting on a rubble plinth foundation—the roof being of the usual red hatch. Though it has never probably been a residence of much importance, yet it displays much care and thought and skill in dealing with simple materials so as to produce a pleasing and harmonious effect and sound construction. The bricks are best kiln bricks, 2½ in. thick, with plain oiled plinth and corbels; dark headers were freely introduced, producing simple patterns, and the arches are cut and rubbed. No window is placed at the end on first floor, the upper panel being probably a date panel with the owner's initials—see other examples, as at Martbam. The tumbling in of the coping with continuous kneelers gives a great sense of quaintness to the whole, and the gable end is tied into the roof members with wrought straps. The gable end at St. Olaves is of similar construction, it slightly varied in design; this roof was so originally thatched.

JOHN SHEWELL CORDER.

Engineering Societies.

SOCIETY OF ENGINEERS.—At a meeting held at the Royal United Service Institution on Monday, the 2nd inst., Mr. Maurice Wilson, President, in the chair, a paper was read on "Harbour Exigency Works," by Mr. Frank Latham, Borough Engineer of Penzance, of which the following is an abstract:—After describing the construction of the heavy swing-bridge at the Penzance Harbour, the author proceeded to deal with the works which were rendered necessary owing to the unsafe condition of the retaining walls and defective foundation under the main structure. The weight of the bridge, when open, had caused the foundation to slide, and the retaining walls to be thrust towards, and there was a tendency for the structure to be let down sideways into the harbour. The opening and closing gear had become crumpled, and required immediate attention. The author then described the methods adopted by him in rectifying the slipping structure, commencing from the king down and rebuilding of walls and the rapping up of others, to the remedial measures adopted under and around the pier-path and lifting-gear. The manner in which the work was effected caused no interruption of the traffic over the bridge, and cranes were provided by which it could be opened and closed for passing vessels almost at any stage during the progress of the work. He next described the design and construction of the wrought-iron dock gates at the ft. entrance to the floating dock. The gates consist of inside and outside skin

plates, built up on a framework of steel angle iron, and strengthened by division stay plates which divide each gate up into several watertight compartments. Each gate is calculated to weigh 50 tons. There is provision for partially overconing the concussion of the waves, and for neutralising the buoyancy of the gates during high water. Certain suggestions made by the late Mr. James Abernethy, which were adopted, are referred to. An unforeseen weakness revealed itself during a storm in 1900, and the gates suffered considerable damage, one gate becoming a total wreck. The author described the methods he adopted in beaching the water-logged gates, the various details of reconstruction, and the features introduced by which the defect was rectified. The work of reconstruction was one of great urgency, and was continued without cessation from start to finish. The work was subjected to hydraulic test previous to fixing. The author then described the method adopted by him in exigency cramping. The masonry over the dock gates had commenced to lift through being severely shaken by shocks from the gates during storms. The masonry was expeditiously made secure by further mishap. Mr. Latham then described simple but effective cramping, thus averting an effective method adopted by him in reconstructing a length of harbour wall, which had suffered considerable damage. The work was completed without interfering with the overhead traffic or disturbing the filling behind the wall, and the cost was comparatively small. He further described the method adopted in removing and reconstructing a pier head in deep water, in which advantage was taken of the old wall to protect the new one, thereby saving the cost of a temporary dam.

BOOKS RECEIVED.

MODERN SCHOOL BUILDINGS, ELEMENTARY AND SECONDARY. By Felix Clay, B.A., architect. Second Edition, revised and enlarged. (B. T. Batsford, 25s.)

THE COUNTRY GENTLEMEN'S ESTATE BOOK, 1906. Edited and compiled by William Broomhall. (The Country Gentlemen's Association.)

APPEARANCES, OLD AND NEW. By Lewis F. Day. Second Edition, revised and enlarged. (B. T. Batsford, 3s. 6d.)

THE "FIFTY-FOUR" HOUR WAGES RECOVERER. By a Retired Banker. (Edinburgh: Johnstone, Hunter, & Co. 2s. 6d.)

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the managers of the Metropolitan Asylums District was held on Saturday last week at the offices, Victoria-embankment, E.C.

The Proposed Consumptive Sanatoria.—Among the correspondence received was a letter from the Local Government Board, stating that they had considered the subject of the proposed establishment by the managers of sanatoria for the treatment of consumption, but that the information at present before them did not appear to afford sufficient justification for the very heavy outlay which would be involved in the proposal.

East Cliff House.—Plans of the proposed accommodation for the laundry staff at this institution were approved and ordered to be submitted to the Local Government Board. The cost of the proposed building is 600l.

Tooting Bec Asylum.—The Asylums Committee submitted a lengthy report from the Tooting Bec sub-Committee relative to the accommodation for patients in that asylum, and recommended:—

"That the proposal to increase the number of beds for patients at Tooting Bec Asylum be approved, and that application be made to the Local Government Board to sanction the normal accommodation for adult patients at that institution being at once increased from 750 to 855, and from the latter figure to 1,062 when the two additional blocks have been erected."

This was agreed to.

The Congress of School Hygiene.—The action of the Children's Committee in appointing Mr. Corbett and Dr. Elliott S. Browne to represent the Board on the Organising Committee of this congress was approved.

Joyce Green Hospital.—Roads.—It was agreed that certain of the roads at this hospital should be repaired in accordance with the report of Mr. W. Harston, the cost being estimated at 1,757l. The matter was referred to the Works Committee.

North-Eastern Hospital.—The provision of thirty-six pedal-spray lavatories in certain wards at this hospital was authorised, and this also was referred to the Works Committee to be dealt with.

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

Street Works.—The following recommendations of the Streets Committee were agreed to:—

That the carriage-way of Doggate Dock be retold with 3 in. by 7 in. Aberdeen granite cubes in cement grout upon a concrete foundation at an estimated cost of 550l.

That the carriage-way of Goddard-street (St. Paul's-churchyard to Knight-riding-street) be paved with cross-slated wood blocks at an estimated cost of 240l.

That the carriage-way of West Smithfield be paved with cross-slated deal blocks laid on 8 in. of concrete at an estimated cost of 4,800l.

That the contracts with the Improved Wood Pavement Company for maintaining the carriage-way pavements of the undermentioned streets be extended as under:—Cannon-street (Abchurch-lane to St. Paul's-churchyard), for fifteen years (subject to the right of the Corporation to terminate the arrangement at the end of five or ten years) at 1s. per yard super, per annum, being a decrease of 3d. per yard super, per annum on the existing contract. Shoe-lane (Fleet-street to St. Bride-street), for fifteen years (subject to the right of the Corporation to terminate the arrangement at the end of five or ten years) at 10d. per yard super, per annum, being the same price as the existing contract.

That the carriage-way of Finsbury-circus, between West-street and Circus-place (now paved with macadam), be repaved with cross-slated deal blocks at an estimated cost of 800l.

Loan Exhibitions.—On the motion of Mr. William Rome, it was referred to the Library Committee to consider and report as to the desirability of holding a loan exhibition of pictures in the Art Gallery in the summer of 1907, and the probable cost.

Milan Exhibition.—It was agreed, on the motion of Sir Thomas Brooke-Hitching, to grant a sum not exceeding 100l. towards the cost of the expenses in connexion with the loan of exhibits from the Corporation to the forthcoming Milan International Exhibition, 1906.

Obituary.

MR. WOODS.—The death on March 26 at his residence in Bournemouth is announced of Mr. Thomas Hoade Woods, of "Durrants," Croxley Green, aged seventy-six years. Mr. Woods was, until recently, the senior partner of Messrs. Christie, Manson, & Woods, of King-street, St. James's, whose service he entered in 1846, and of whom he became a partner twelve years afterwards. On the retirement of Mr. James H. Christie from the firm seventeen years ago Mr. Woods and Mr. H. F. Taylor became the senior partners, and then Mr. Woods, through ill-health, retired in October, 1903. During his long connexion with the house he played a leading share in the dispersal at auction of a large number of famous art-collections, amongst them being the Bernal, Bicknell, Gillett, Hamilton Palace, Dudley, and Adrian Hope collections. Mr. Woods enjoyed a high reputation as a judge of the merits and value of pictures, and had gathered for himself some choice examples.

General Building News.

ST. SAVIOUR'S CHURCH, GUILDFORD.—The opening ceremony took place on the 26th ult., by the Bishop of Winchester. The church has been erected at a cost of 9,500l. from designs by Mr. Herbert A. Legge, of London. It is of Bargate stone, with Bath stone dressings, and provides seating accommodation for 750. The contractors were Messrs. Goddard & Sons, of Farnham. Warming by Messrs. Kite & Co., London, and electric installation by Messrs. Fentum Phillips, of Guildford.

ST. STEPHEN'S CHURCH, BRIMMINGHAM.—Mr. W. H. Bidlake is appointed architect for the rebuilding of the church which was built in Newtown-row, in the parish of St. George, in 1843-4, for 800 sittings, after designs, in the early decorated style, of R. C. Carpenter. It formed the fourth of the ten churches erected in Birmingham under Sir Robert Peel's Act of 1843-8 and 7 Viet. c. 37. It is cruciform in plan. The red sandstone employed for the structure has fallen into decay. Various minor repairs having been made from time to time it was found necessary to pull down the entire west front, which was rebuilt of red brick, with terra-cotta, facings in 1886, by Mr. Bidlake, who at the same time decorated the interior.

ST. MARGARET'S CHURCH, HOLLYWOOD.—A tower has recently been added to this church. Mr. Frank Freeman, of Bolton, was the architect, and Mr. Joseph Clough, of Failsforth, the builder for the work.

SETTON - IN - ASHFIELD CONGREGATIONAL CHURCH.—The opening ceremony of this church took place on Wednesday. The building occupies a prominent corner site, and is designed in late Gothic—freely treated. The facings are of pressed red bricks, and the dressings of Matlock stone. A lofty tower forms a feature at the corner of the block. The contract has been carried out by Mr. J. Greenwood,

of Mansfield, the amount being 3,982l. The architects are Messrs. George Baines & Son, Clement's-lane, Strand, London, W.C.

WESLEYAN CHURCH, PENARTH.—The memorial stones of a new chapel have just been laid at Penarth at the west corner of Albert-terrace. The entire scheme for the new church and schools, which will cost about 12,000l., includes a chapel to seat (with the galleries) about 750, a school to accommodate about 500 scholars, an assembly-hall to accommodate 250, and church parlour for about 100. A chancel is provided in the chapel, where the choir will be located, the organ-chamber being adjacent. The school buildings consist of central hall and galleries, fourteen classrooms, and a large infants'-room. The material to be used in the walls is local stone, with Newbridge stone facings and Bathstone dressings. Electric light will be used throughout. The contract price is 9,982l., the builder being Mr. D. T. Price, Penarth, and the architect Mr. Henry Budgen, Cardiff.

PRIMITIVE METHODIST CHURCH, CHESTER-LE-STRÉE.—On the 24th ult. the new Primitive Methodist church, which has been erected in Durham-road, Chester-le-Strée, was opened. The whole scheme provides for a church, school, and a number of vestries. Only the church is being built at present, the school and some of the vestries being left for a future occasion. The church is 56 ft. long and 41 ft. wide. It provides seating accommodation for 400 people, 300 on the ground floor and 100 in the gallery. On the ground floor a vestry is provided for the minister, together with a room, which will be temporarily used as a kitchen vestry. The design is Gothic, the exterior being finished with Lumley facing bricks and stone dressings. All the interior fittings are of pitch pine. The windows are filled with stained glass supplied by Messrs. Davidson & Walker, Newcastle-on-Tyne. The building is heated by the improved small bore hot water system, installed by the R. J. Ward Company, Newcastle-on-Tyne, who also supplied the roof ventilators. The cost of the building has been about 2,500l. The whole of the work has been carried out under the supervision of the architects, Messrs. Boyd & Groves, Blackcliff-street, Newcastle. The contractor for the building was Mr. C. Groves, Chester-le-Strée.

PRIMITIVE METHODIST CHURCH, LONG EATON.—A new Primitive Methodist church was opened at Long Eaton on the 22nd ult. The church, which is a portion of the scheme of complete church and school, has been designed in a late period of Gothic architecture. A square tower is erected on one corner of the front, terminated by a spirelet. The windows are traceted, and all filled with coloured lead lights. The seating is of Orhan, stained green, and on a circular plan. Two vestries, etc., are provided. The church will seat about 500 persons, the contract being 2,544l. The whole work has been carried out by Mr. John Bull, builder, Long Eaton, from the designs, and under the superintendence, of Messrs. George Baines and R. Palmer Baines, architects, London.

CHURCH RESTORATION, MILSTON, WILTS.—The parish church of St. Mary, Milston, has just been re-opened after having been restored. The walls, which were formerly very crumbled, have been put into the straight and underpinned, the stonework has been renovated where necessary, and a new tile roof has been put on. Inside, the most noticeable feature of the restoration is the opening-up of the oak timbers of the chancel roof, which were previously covered with lath and plaster. The walls have been re-plastered, though care has been taken to preserve as far as possible some old inscriptions and decorations. The interior of the nave roof has been renewed, a new heating apparatus has been installed, and other minor improvements effected. The diocesan architect, Mr. C. E. Ponting, F.S.A., of Marlborough, drew the plans, and the contractors were Messrs. Kite, of Salisbury.

CHURCH RESTORATION, CASTLEFORD.—The condition of some portions of the Castleford Parish Church has for some time occasioned grave concern. Recently the three great piers supporting the tower have shown increasing signs of surface fracture, and of steady subsidence. Messrs. Berry, engineers, of Huddersfield, were instructed to resort to underpinning, in order that the structure and foundations of the faulty piers might be thoroughly examined. When this was done it was discovered that the piers had had practically no foundations whatever, and that they had only been shells of stone filled with rubble. Since August last the lower portions of the piers have been entirely rebuilt of solid stone resting on thick beds of concrete. The clearstories and arches have also been rebuilt, and by the end of the present month the entire work will be completed. The total cost of the undertaking, including the relaying of the transept floors, washing the interior walls, etc., will, it is expected, amount to 1,250l.

THE RESTORATION OF HEXHAM ABBEY.—A meeting of the Hexham Abbey restoration committee was held on the 30th ult. at Hexham, when it was decided to hold a public vestry meeting on April 11 for the purpose of applying

for a faculty with a view to proceeding with the rebuilding of the nave according to the plans submitted by Mr. Temple Moore and the late Mr. T. Spencer's trustees. The late Mr. T. Spencer gave 16,000l. for the building of the nave. The repairs that are being carried out at the north end of the north transept are rapidly nearing a completion.

MAGDALEN CHAPEL, NORWICH.—Mr. Eustace Gurney has bought from Mr. Walter Ryse the old Magdalen Chapel in Mowdun-lane. The building has been sold to Mr. Gurney on the understanding that all the architectural features shall be preserved. The building is to be carefully restored under the advice of Mr. J. Owen Bond, architect, Norwich.

JEWISH SYNAGOGUE, STOCKTON.—The foundation-stone has just been laid for Hartington-road, Stockton, of a new synagogue. The building, which has been designed by Mr. T. W. Richardson, architect, will occupy a site of 26 ft. by 76 ft. It will be in the Renaissance style, the front being faced with Accrington red pressed bricks and artificial stone dressings. The main entrance will open into a tiled vestibule with ladies' and gentlemen's cloak rooms on either side. From the ladies' cloak-room a staircase will give access to the ladies' gallery, with accommodation for fifty persons. From the vestibule the Synagogue, which will be 29 ft. long by 23 ft. wide, will be entered by means of folding doors, and there will be a recessed entrance. There will be a recess in the east wall, and in front of this will be the usual platform. In the rear of the Synagogue there will be a classroom 24 ft. by 13 ft., with a separate entrance for the children from the street.

SCHOOLS, BYELEET.—A new school has been erected for the managers and building committee of the Byfleet National Schools, by Messrs. Martin Wells & Co., from the designs of Messrs. Jarvis & Richards, architects to the Surrey Education Committee.

SCHOOL EXTENSIONS, FISHSILL, SHEFFIELD.—Sir Charles Eliot, Vice-Chancellor of Sheffield University, recently opened a new department for infants, which has been added to the Fishsill Council School, Pitsmoor. The new building, which will accommodate 350 children, comprises a central hall and six classrooms. The cost of erecting it and making alterations to the original buildings has been 5,600l. This does not include the cost of fittings. Mr. J. R. Wigfull was the architect for the work.

SCHOOL, KINGSTON-ON-THAMES.—The new elementary schools in Bonner Hill-road, Kingston, have just been opened. The site of the new school abuts upon Bonner Hill-road and Oil Mill-lane, and is about two acres in extent. Competitive designs for the building were invited, and the first premium was awarded to Mr. F. W. Roper, of Adam-street, Adelphi, W.C., under whose supervision the work has been carried out by the contractors, Messrs. Burges & Sons, of Wimbledon. Mr. R. Squelch, on behalf of the Education Committee, has acted as clerk of the works. The buildings are in two blocks, the infants being accommodated in the smaller block, while the boys are accommodated on the ground floor, and the girls on the first floor of the larger building. Each department is provided with a central hall, in which the whole school can assemble, and there are eight classrooms in each of the three departments, which are likewise provided with teachers' rooms, cloak-rooms, and lavatories. Accommodation is provided for 1,144 children, viz., 400 infants, 372 girls, and 372 boys, and the total cost, including site, fittings and furniture will be about 21,000l. The school buildings are lighted throughout with electricity.

POLICE STATION, GLASGOW.—The new Central Police Office in St. Andrew's-square, Glasgow, which has just been opened, was designed by Mr. A. B. McDonald, the City Engineer, and will cost 40,000l. The main frontage to St. Andrew's-square, facing eastwards, is about 157 ft., and that to St. Andrew's-street is 91 ft., both frontages being built of red terra-cotta bricks, with red stone dressings and cornices. The principal entrance is from St. Andrew's-square, through a passage-way to the quadrangle, on the right of which are the entrances to the lieutenants' and detectives' bar and detectives' rooms, also to the chief superintendent's rooms. On the left are the mortuary, lavatory, dog-house, van sheds, and harness room, with the stableman's house above it. On the west side of the quadrangle are stables for six horses, stores, a large muster hall, a lamp room, and rooms for inspectors and sergeants. On the left of the main entrance are the chief constable's office and the rooms of the police-surgeon, also a room which will be used as a museum for the display of a curious and interesting collection of relics connected with criminals. The registrar's rooms enter from St. Andrew's-street, and there is a separate entrance for witnesses and the public from St. Andrew's-square, also a private entrance for the chief-constable and the presiding magistrate. The basement is occupied by the boiler-house, clothing stores, and book rooms. On the first floor is a court hall, with two witness

rooms adjoining. The cells are immediately behind the court hall, occupy two floors, and number sixty-seven. They are finished with concrete floors and ceilings and enamelled brick walls. Immediately adjoining the court hall are the magistrate's room, with separate lavatory, the library, a waiting-room, the chief-constable's rooms, public and private rooms, and the chief clerk's rooms. On the second floor are the rooms of the procurator fiscal and the assessor, also stores for productions. On the third floor are stores for clothing and the tailors' workshops, etc. The buildings are heated throughout by hot-water pipes and radiators.

CENTRAL LIBRARY FOR EAST HAM.—At the meeting of the East Ham Town Council on Tuesday the Libraries' Committee reported having gone into the question of proceeding with the erection of the proposed Central Library on the Town Hall site. They will submit full details and particulars of the scheme at the next meeting of the Council.

BATHS, NEWCASTLE-ON-TYNE.—The foundation-stone has just been laid of the new Corporation baths and wash-houses at the corner of Gibson-street, Newcastle. The new buildings are being erected from the designs of Mr. F. H. Holford, the City Surveyor. The bathing hall will be 88 ft. by 58 ft. 6 in., and will be built on the amphitheatre plan, with three tiers of steps on each side. There will be two club-rooms, one 26 ft. 6 in. by 14 ft. 9 in., and one 16 ft. 6 in. by 15 ft. 9 in., which can also be used as artists' rooms during the winter months. The dressing-boxes will be made to fold against the wall, and this will allow for about 600 spectators. The pond will be boarded over during the winter months, and the hall fitted as a gymnasium, or the apparatus can be removed and the hall used for entertainments, with accommodation for about 900 people. Separate entrances will be provided for men and women, the women's entrance leading to five slipper baths and the wash-houses. There will be a small waiting-room at the entrance, which is to be used as a crèche. The wash-house will be approached by a corridor 6 ft. wide, and will contain forty-two washing-stalls, with a similar number of driers, and two hydro-extractors. There will be one mangling and ironing room, with a callender, mangles, ironing-tables, etc. On the first floor, which will be approached from the men's entrance only, there will be four first-class slipper baths, fitted with lavatory basin and a spray bath; seven second-class spray baths and eight second-class slipper baths. Each of these fifteen baths will have two dressing-boxes. On the second floor will be provided a five-roomed house for the resident superintendent and a large store-room for establishment purposes. The wall on the inside of the building will be lined with glazed bricks, and the outside faced with stone. The building work is being carried out by Messrs. J. & G. Douglass, and the engineering work by Messrs. W. Dix & Co. The buildings are to cost 16,334l.; the boilers, laundry machinery, tanks, etc., 3,850l.

WORKERS' DWELLINGS, NEWCASTLE-ON-TYNE.—New dwellings in Walker-road have been erected by the Newcastle Corporation for the accommodation of poor families in the city. There are 63 houses to be erected, or 126 dwellings—112 two-roomed, and 14 one-roomed; each dwelling being provided with a scullery with set and wash-up sink, a larder or food-cupboard, a yard, and a separate water-closet to each dwelling. The following is a description of the single-room dwellings:—Each dwelling is self-contained, and comprises a living room, 16 ft. 9 in. by 12 ft. 9 in., with a bed recess 6 ft. 6 in. by 5 ft.; a scullery 7 ft. 6 in. by 7 ft., containing a sink and set pot, a food cupboard, and a water-closet. The block is two stories in height, the rooms being approached by a stone staircase in the centre, with a balcony along the front for entrance to the upper dwellings. Each dwelling has its own entrance-door. There is through ventilation provided by windows in both the front and back walls of the general room. An iron rod with rings near the ceiling is provided in front of each bed recess for the purpose of hanging a curtain and screening the bed from the room. The walls are plastered with adamant plaster. The two-room dwellings are in two-story flats, each flat being self-contained, and, with the exception that the front room of the upper floor is considerably larger than that of the ground-floor, the dwellings are practically the same. The ground-floor dwelling comprises a living room or kitchen 12 ft. 6 in. by 10 ft. 10 in.; a bedroom 12 ft. 6 in. by 10 ft. 3 in.; a scullery 8 ft. 9 in. by 6 ft., with sink and set-pot, a food cupboard, a coal-house, water-closet, and a yard. The upper dwellings have similar accommodation, excepting that the bedroom is 17 ft. 4 in. long, with an average width of 9 ft. 9 in. Each dwelling has a separate entrance and yard. The two-roomed dwellings are to be let at 4s. 3d. per week downstairs, and 4s. 3d. per week upstairs, and the one-roomed at 2s. 3d. per week. An open space is to be provided in Hawick-crescent, to be used as a playground for children, containing an area of about 800 sq. yds. The buildings are faced with red pressed bricks to the

streets, with common bricks at the back. The work is being carried out by Messrs. W. Franklin & Sons, Ltd., under the direction of the City Architect, Mr. H. Holburn.

SANATORIUM, BLACKROCK.—The first portion of the extensions to Blackpool Sanatorium has just been opened. The extensions provide for considerable additions to the administrative block, a portion having been built in front of the old block. The new administrative block contains a suite of rooms on the ground floor. In addition, on the ground floor, is a nurses' dining-room, a servants' hall, and a sitting-room for the nurses, also a dispensary and matron's office combined. The kitchen has a granolithic floor. There is a large store-room for groceries and dry goods close to the kitchen, and also two other store-rooms. On the two upper floors are seventeen bedrooms for servants and nurses, and two bath-rooms and other necessary accommodation, besides linen cupboards. Electric light is laid on to all rooms, and the house is warmed by radiators supplied from a calorifier in a cellar. Another calorifier supplies hot water to the various parts of the house. The main additional accommodation for patients is a large new pavilion, running, as do the old blocks, east and west. It has accommodation for twenty-two beds, ten in each of the large wards, and one in each of two small wards opening out of the large wards.

The nurses' duty room is in the centre of the block, and opening on to the main hall separating the male from the female wards. At the end of each ward are two sanitary annexes, entered from the ward by cross-ventilated passages, and containing baths, etc., for adults and children. Hot water is supplied by a storage calorifier. The wards are heated and lit under each window. The floors are of narrow teak planks, planed smooth, and finished with Ronuk. The walls are finished in Keene's cement and Ripolin paint. Shorland's Manchester grates, with chimney breasts of green glazed bricks, and with green tile hearths, are placed at each end of each large ward, and one in each small ward. The wards are lighted by incandescent electric lamps. A glass-roofed verandah runs along the south side of the building, and at the centre is another annex, forming the principal entrance, and containing a scullery, doctor's room, food lift, and staircase leading to the children's play-room, which occupies the centre of the building over the nurses' duty room and the main hall. There are also store-rooms on this floor. The other block for patients consists of a double isolation block, one portion entered from the north side and one from the south. On each side is a three-bed ward, two single-bed wards, a kitchen and a lavatory. The old disinfecting and laundry block has been pulled down and a new disinfecting-house and laundry combined has been erected. The laundry consists of sorting-room, wash-house, drying-room, ironing-room, and delivery room. Near this block, and parallel with it, is the new boiler-house. A new chimney 60 ft. high has been erected. The cost of the extensions, including furnishings, is expected to be about 16,500. The architect was Mr. F. T. Waddington, and the contractor Mr. J. Eaves.

MUSIC-HALL, SUNDERLAND.—A new music hall is to be erected on the site of the old Bishop's wearmouth rectory. The contractor and architects for the work are respectively Mr. J. W. White and Messrs. W. & T. R. Milburn, of Sunderland. The contract price is said to be between 20,000 and 30,000.

LEEDS CONGRUOUS BLOCKS.—The first completed building of the Beckton-street Workhouse Infirmary extensions has just been opened. Block "A" marks the first step towards the accomplishment of a scheme which will involve an outlay of 100,000. Three years ago, after consulting Mr. Saxon Snell as to the best manner of utilizing the ground at their disposal at Burmantofts, and obtaining the approval of the Local Government Board, the Guardians commissioned Messrs. Thomas Wynn & Sons, architects, of Leeds, to prepare detailed plans. The new scheme, when complete, will provide for the erection of new kitchens and general stores, receiving and delivery rooms. For males containing 186 beds; sick and venereal wards for females (183 beds), male venereal wards (20 beds), maternity wards (26 beds), infectious diseases wards for ten males and a similar number of females, and children's wards containing 66 beds. Altogether, the new accommodation will be for about 500 beds, bringing the total for the infirmary to between 900 and 1000 beds. In addition the old nurses' home will be considerably enlarged, and an operating theatre and a mortuary erected. A set of observation wards will be arranged for. The buildings will be lighted by electricity, the new accommodation will be ready for installation of the electric light at the workhouse, a sub-station has been built in the grounds, power being received from the Corporation.

PROPOSED THEATRE, SUNDERLAND.—A company has been formed, under the name of the King's Theatre, Sunderland, Ltd. for the purpose of acquiring a theatre and shops to be erected in accordance with plans prepared by Mr. Wm. Hope, architect, Newcastle. The proposed theatre will accommodate about 2,540

persons. The auditorium will be arranged on the two-pier principle, comprising stalls, circles, pit, and gallery; the tiers will be entirely supported by cast-iron columns on a platform. The stage will be 42 ft. deep from the curtain to the back wall and 80 ft. wide; the auditorium will be 72 ft. wide.

NEW THEATRE, CARDIFF.—A new theatre is in course of erection in Park-place, Cardiff. Messrs. James Allan & Sons, Cardiff, are the contractors, and Messrs. Old-road, Ashton, & Ford, London, the architects for the work.

GRAND STAND FOR THE WARWICK PAGEANT.—Messrs. Saunders & Sons, Ltd., of Cirencester, have secured the contract, amounting to 1,500l., for the erection of the grand stand in the Castle ground. The stand is to seat about 5,000 persons, and is divided into seven blocks by six gangways. The whole structure is in timber and carries a light shalter roof. Messrs. F. P. Trespass & E. M. Richards, C.E., are responsible for the design, which has been approved by Messrs. Baker & Shelford, of London.

PUBLIC LIBRARY, ASHTON.—A new public library has been erected on a site at the junction of Wigan-road and Market-street, Ashton. The work was carried out at a cost of 5,843l. from plans prepared by Messrs. J. B. & W. Thornley, architects.

CLAREMONT HALL EXTENSION, PENTONVILLE.—The work of extension has just been begun at Claremont Hall, the London Congregational Union's Central Mission in Pentonville. A site is to be created, comprising men's institute and other premises, to relieve the crowded state of the present institute. The plans were drawn by the architect, Mr. Alfred Conder, of Westminster.

POST OFFICE, HULL.—The contract for the superstructure of the new Post Office now in course of construction at the corner of Leger-street and Alfred Gelder-street, Hull, has been obtained by Messrs. Arnold & Son. The total estimated cost of the building and fittings is 53,000l.

Sanitary and Engineering News.

SANITARY CONDITIONS AT SUTTON BONNINGTON (NOTTS).—The following is taken from Dr. Spencer Low's Report to the Local Government Board on the occasion of an outbreak of enteric fever at Sutton Bonnington, in the Leake Rural District:—"A most offensive nuisance, to which the attention of the Inspector of Nuisances and Medical Officer of Health had from time to time been directed, is occasioned by the overflow from a tank receiving the sewage of a large residence on the higher ground above Sutton Bonnington. Liquid from this tank passes in an open drain within a few feet of a large house beyond which point the drain is piped some 200 yds. to one of the sewage dykes. On account of smell from this drain the windows of this house have, on one side, to be kept closed at times. At the date of my first visit the stench from this open drain was almost nauseating. This nuisance is but a few yards from a farm where a District Councillor resides. I am told that the gentleman owning and occupying the house causing this offensive condition claims that he has a right to continue disposing of his effluent (crude sewage on the date of my visit) in this way. The officers of the Council do not seem to contemplate action in the matter. Some wells that I saw had, on chemical analysis, been shown to be polluted, and certain measures had been taken to improve them. However, since the wells in these villages (with one exception as far as I learnt) are sunk in the superficial gravel, are near garden land, are often not far distant from privy middens, and are steyned with brick with open joints, wells generally must be regarded as affording water of questionable quality at all times, and on occasion water distinctly dangerous owing to the pollutions to which they are liable. Whether or not these wells were the cause of the limited outbreak of enteric fever to which this Report refers, there can be no question that, given specific pollution of the subsoil water in the district, many wells might become agents in spreading this disease. The first and most pressing need of the villages of Normanton and Sutton Bonnington is a safe water supply."

WATERWORKS, SELBY.—The foundation-stone of the new Selby Waterworks, to be erected on land purchased from the Earl of Londesborough, at Brayton Barff, about two miles south-west of Selby, was laid on the 29th ult. The estimated cost of the new undertaking is 30,000l. The new works comprise an engine-house, boiler-house, coal depot, and workshop, the former being 30 ft. by 30 ft. in dimensions. The buildings are to be of red brick, with stone facings, and have two towers, under which are the pumps and bore holes, the latter being 400 ft. in depth. The pumps, engine, and boilers are to be duplicated, and the engines will be capable of pumping three-quarters of a million gallons of water per day. The reservoir covers a site of about an acre,

with a holding capacity of 800,000 gallons of water, and is 150 ft. above the level at Selby, and 170 ft. above that of the ordnance survey. The water will be conveyed to Selby by gravitation. The engineers of the new scheme are Mr. Percy Griffith, M.Inst.C.E., of London, and Mr. Bruce Gray, A.M.Inst.C.E., Surveyor to the Selby Urban District Council.

WATER SUPPLY, MALVERN.—On the 29th ult. a supplementary water supply, which will more than double the present one, was opened at Malvern. The work has been carried out under the superintendence of Mr. W. O. Thorp, the Town Surveyor, and the cost, inclusive of the Act of Parliament (4,600l.) will be about 25,000l.

RECONSTRUCTION OF GOUROK GASWORKS.—The opening of the reconstructed gasworks at Gourock took place a short time ago. The extension, involving the erection of new buildings and additional apparatus, entailed an outlay of about 6,000l. A new retort-house has been built, and on the ground adjoining have been placed the condensers and purifiers. The lime stove is immediately above the purifiers and by means of pulley blocks and lime brackets the purifiers are charged with lime through a canvas chute. Mr. James M'Giechrist, of Dumbarton, has been the engineer of the reconstructed works. The leading contractors for the new works were Messrs. W. & J. Steel, masons, Greenock; Alexander Black, joiner, Gourock; Mr. Hision Paisley, retorts and large chimney, Messrs. Blakeney, purifiers, and Messrs. Houston, Greenock, roofers.

DRAINAGE SCHEME, BURNBAM.—The ceremony of cutting and turning the first sod of the new Burnbam drainage scheme took place recently. The scheme was prepared by Mr. Arthur Gladwell, Surveyor to the Eton Rural District Council, whilst the tender of Messrs. Jackman & Sons, contractors, of Slough, has been accepted for carrying out the work.

Foreign.

AMERICA.—The Managing Committee of the John Stewardson Memorial Scholarship in Architecture, announces, by authority of the Trustees of the University of Pennsylvania, who act as trustees of the Memorial Fund, a competition for a scholarship of the value of \$1,000, the holder of which is to spend one year in travel and in the study of architecture in Europe under the direction of the Committee. Candidates must be under thirty years of age, and must have studied or practised architecture in the State of Pennsylvania for the period of at least one year immediately preceding June 1, 1906. Candidates are required to pass preliminary examinations in freehand drawing, the history of architecture, construction, and language. The preliminary examinations will take place at the School of Architecture of the University of Pennsylvania early this month.

Miscellaneous.

GOOD FRIDAY WEEK.—In consequence of the Easter holidays, next week we go to press a day earlier than usual. All communications for the Editor must reach him by first post on Wednesday morning, except lists of tenders, which will be received up to 10 a.m. of the same day.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. D. Santoni & Co., electrical, mechanical and general engineers, have removed from 20, Ely-place to Alba Works, 15 to 17, Beauchamp-street, Brook-street, Holborn.—Messrs. Mountain & Son (Leeds), plasterers and makers of fibrous plaster, have divided their business into two branches. Mr. Arthur Mountain will carry on the business, as heretofore, of cement merchant and wholesale dealer in laths, plaster of Paris, etc., at 47, St. Paul's-street, Leeds, under the style and firm of "J. P. Mountain & Son." Mr. Fred Mountain will trade in his own name and carry on the business of plastering under the style of "Fred Mountain," 31, Manor-road, Holbeck.

MOVING THE WITTENBERG LIGHTHOUSE.—With the object of obviating the constant dredging hitherto necessary and to provide for a wider navigation channel the Hamburg Department for Commerce and Navigation recently decided to remove the Wittenberg lighthouse tower to a new site about 30 ft. to the south of its original position. The tower stands 115 ft. high and weighs 60 tons, and on account of its great height and the small area occupied, more difficulties had to be overcome in the work of removal than would have been the case had a considerably larger building been displaced. New foundations were prepared on the selected site, and a sliding way between the old and new foundations was built of girders on which steel rollers were fitted to facilitate the movement of the tower. The necessary motion was communicated to the structure by means of a strong hand-driven winch

with the aid of a wire rope, and in order to avoid any displacement of the lighthouse in the case of rough weather a second winch was installed in the opposite direction. To avoid the risk of longitudinal oscillation, two other winches were installed, one in front of the tower and the other behind, wire ropes from these being attached to the top of the lighthouse; and to guard against lateral oscillation, two wire ropes attached to crabs were placed on either side, these crabs running on girders laid parallel to the sliding way. The actual work of removal occupied only thirty-two minutes, and was successfully performed without interfering in any way with the operation of the lighthouse.

THE ROCHESTER CARD RECORDER.—Various types of ingenious time-recording appliances are now generally used in large industrial works. As compared with the old-fashioned system of booking, the automatic registration of time certainly saves cost and obviates the possibility of disputes. It is capable of development in such a way that all the time devoted to work in the week shall be mechanically registered upon a card for each workman, this card constituting his pay voucher. To provide for job work special cards can be provided—in addition to the weekly time card—constituting the order to proceed with the work, and furnishing an exact record of the time spent upon it. The Rochester card system as applied to these classes of work is one that works well and is perfectly fair to employer and employed. Each man on entering the works, or his particular shop, takes his week's card from the "out" rack and, dropping it into the recorder, pulls a lever which causes the day, hour and minute to be printed in the proper space and column. The workman then places the card in the "in" rack and begins work. Similar registration takes place at meal times and at the end of the day. As every man prints his own time sheet in indelible ink, there is no risk of dissimulation on either side, and clerical labour in the office is materially reduced. For dealing with job work the foreman is supplied with "job-cards," which are allocated to various men by being placed one at a time in a rack having a compartment for each man. Each man takes a card from his compartment on entering the shop and immediately registers his time upon the card. When the job has been finished he again registers the time and drops the card into the "finished-job" receptacle. The workman is then in the position of not earning anything until another card has been drawn from his compartment and stamped in the recorder. Thus he has no temptation to loiter away a few minutes, for the luxury will be at his own cost instead of that of his employer. Hence he loses no time in starting another job. Of course no mechanical contrivance can prevent a man from dawdling over his work, the only safeguard against this being efficient supervision by the foreman, and comparison of time records for similar jobs by the official staff. The system briefly described above has the further advantage that it keeps the foreman up to his work, because he is virtually compelled to see that a job is always ready in advance for each man.

CEMENT FOR BRITISH SOUTH AFRICA.—During the six months ended December 31, 1905, cement was imported into British South Africa from the United Kingdom to the value of 59,000*l.*, and from Germany and Belgium to the value of 103,000*l.*

BUILDING AND PAVING WORKS IN BULGARIA.—A consular report states that the Municipal Council of Sofia have approved the terms of a new loan of 1,400,000*l.*, bearing 5 per cent. interest and repayable in fifty years, of which 272,000*l.* is to be appropriated for the purpose of carrying out the following works:—Baths and adjoining hotel, 72,000*l.*; street paving, 120,000*l.*; sheds and slaughter-houses, 40,000*l.*; water pipes, 20,000*l.*; drain pipes, 12,000*l.*; repairs to canals and bridges, 8,000*l.*

MARSEILLES CEMENT MARKET.—The annual report of Mr. Gurney, British Consul-General at Marseilles, gives the following list of prices for cement prevalent in Marseilles at the time of writing:—Artificial Portland, in barrels of 200 kilos, from 44 to 45 francs; ditto, in barrels of 180 kilos, 46 francs to 47 francs; ditto, in barrels of 100, 48 francs to 50 francs; Natural Portland, in barrels of 200 kilos, 36 francs to 45 francs; ditto, in barrels of 180, 38 francs to 37 francs; ditto, in barrels of 100, 40 francs to 42 francs; Valentine Superior, in barrels of 300 kilos, 30 francs; ditto, in barrels of 250, 31 francs; ditto, in barrels of 100, 36 francs to 37 francs; Valentine Ordinary, in barrels of 300 kilos, 25 francs to 26 francs; ditto, in barrels of 250, 26 francs to 27 francs; ditto, in barrels of 100, 31 francs to 32 francs; Roquefort, in barrels of 300 kilos, 25 francs to 26 francs; ditto, in barrels of 100, 30 francs to 27 francs; ditto, in barrels of 100, 30 francs to 31 francs.

VANADIUM STEEL.—Owing to the present high price of vanadium it is not practicable to make use of this metal in the production of steel for ordinary structural work. The chief source of vanadium hitherto has been a vanadium lead ore mined in Spain, but other sources of supply are now being opened, and it is probable that with a

considerable reduction of price the use of vanadium steel will be widely extended. In the course of a paper on "Vanadium as a Steel-Making Element" read before the Liverpool section of the Society of Chemical Industry, Mr. J. Kent-Smith remarked that the nickel-vanadium steels, although showing great strength, were far below the chrome-vanadium steels in resistance to alternations of shock and torsional strain, and that for this reason far more was to be expected from the latter alloy. In ordinary mild steel, such as is employed for structural purposes, it is possible to increase the breaking stress to a considerable extent by heat treatment, but this affects the resistance to impact in a much greater ratio. On the other hand, a chrome-vanadium steel, after being annealed has a resistance to dynamic shock about double that of high carbon steel, and at the same time exhibits a very high resistance to torsion. Mr. Kent-Smith stated that one variety of chrome-vanadium steel, after special heat treatment, was found by experiment to withstand a tensile strain of 103 tons per square inch, at the same time showing high resistance to dynamic shock and torsional strain. Such a combination of properties has not been attained with any other steel, and may justly be described as phenomenal.

ANDERSON'S PATENT SLIDE-RULE.—Various ideas have been brought forward from time to time for realising the principle embodied in the slide-rule in such a way as to secure the practical accuracy of that valuable instrument. The length of an ordinary rule cannot well be increased beyond about 20 in., and even in that size the expansion and contraction of the material with temperature variations is apt to cause a certain amount of inaccuracy. Rotary types of rule have been made, with a sliding scale giving exact readings to four figures, but the use of such instruments is far more limited than that of the ordinary slide-rule. The slide-rule invented by Lieut.-Colonel Anderson, and made by Messrs. Casella, is based upon a novel application of the logarithmic principle, and consists essentially of upper and lower fixed scales with a sliding scale and cursor. But the scales, instead of forming a series in one horizontal line are split up into a series of parallel lines, the graduations of each line being separated from those of the next line by a common geometrical ratio. The various lines are identified by numbers shown in the margin at each end of the scales, these numbers enabling the operator to obtain exact readings to one decimal place beyond that given by an ordinary slide-rule of the same length, and one great advantage is that by the calibration adopted results are directly obtainable for a range between 0.1 and 10,000*l.* At first sight the instrument seems to be a little complicated, but anyone of average intelligence will soon learn to use it with facility and confidence. In our opinion this invention embodies a most useful extension of the slide-rule principle, which thoroughly deserves the examination of architects, surveyors, and others who have to perform laborious calculations in daily practice.

MERSEY DOCKS AND HARBOUR BOARD.—The Select Committee of the House of Lords, of which Lord Dartrey is Chairman, have ordered to be reported to the House for third reading a Bill promoted by the Board for the construction of two new docks and a half-tide basin at the north end of Liverpool, the embankment and enclosure of a part of the adjoining foreshore, and the building of another dock at Birkenhead. The outlay upon the works is computed at about 4,500,000*l.*

BRIDGEWATER CANAL BILL.—The Select Committee of the House of Lords, of which the Duke of Bedford is Chairman, have passed the preamble of a Bill introduced by the Manchester Ship Canal Company for enabling the working of minerals underneath the Bridgewater Canal, about six miles between Monton Bridge and Leigh the canal passes through a rich portion of the Lancashire coalfields. The Bill is promoted at the initiative and charges of the Earl of Ellesmere, who has undertaken to indemnify the company against any loss that may result from subsidence of the soil caused by the mining of the coal.

LIVERPOOL UNIVERSITY.—The Council of the University have elected Mr. Robert Carr Bosanquet to the newly-established chair of classical archaeology. Mr. Bosanquet, Craven student, Cambridge, 1894-6, has, during six years past, been director of the British Museum at Athens. As a condition of his appointment he will take leave of absence for at least one term in the year, that he may thereby be enabled to conduct practical research work and so to keep in touch with current exploration.

THE LABOUR MARKET IN THE COLONIES.—The April circular of the Emigrants' Reform Office (31, Broadway, Westminster, S.W.) states that the emigration season to Canada has commenced, and there is a good demand for general labourers and navvies for railway construction, and a fair demand for mechanics, especially those in the building trades. Emigrants to Canada should beware of strangers, and always apply to the Dominion Land or Immigration Agents. Two Acts affecting emigrants have

recently been passed by the Commonwealth of Australia. The first Act prohibits the landing in Australia of any person who fails to pass the dictation test; that is to say, when an officer dictates to him not less than fifty words in any third language, fails to write them out in that language in the presence of the officer. The second Act repeals the former law as to contract labour, and should be carefully attended to by immigrants. It enacts as follows:—

"A contract immigrant—i.e., an immigrant to Australia under a contract or agreement to perform manual labour in New Zealand or elsewhere otherwise prohibited by law, land in the Commonwealth if the contract is in writing, and is made by or on behalf of some person named in the contract, and resident in Australia, and its terms are approved by the Minister for External Affairs." Cheap assisted or nominated passages are now granted to suitable emigrants from New South Wales, Queensland, and Western Australia. The principal demand is for experienced farm labourers and female servants. There is no special demand for mechanics or miners, but competent men who land with a little money to keep them for a time can generally find work. Reduced passages to New Zealand at 10*l.* a head are granted to persons with a small capital, and navvies without capital who are able to work at railway construction, and to their wives and children, and to experienced farm labourers and domestic servants who will possess 5*l.* on landing. All these persons are required to be employed by all these persons. There is a good demand now for as early as possible to the High Commissioner for New Zealand, 13, Victoria-street, London, S.W. No one may enter Cape Colony unless he possesses 20*l.* on arrival, or has secured employment beforehand according to a prescribed form of agreement. There is no improvement in the building trade at Cape Colony, and building trade employees are specially warned not to go to the Cape at the present time in search of work. In Natal labour is plentiful in all trades, and mechanics in the building trade are warned against going there to seek employment. No one may enter the Transvaal without a permit. No permit is granted to any one unless he possesses 20*l.* on arrival, or has secured *bond fide* employment beforehand. Though the output of gold, coal, and diamonds has increased, and more white men are being employed, yet there are a great many persons out of employment in Johannesburg, Pretoria, and other towns, and no one should go there now on the chance of getting work. Business in the building trades has been very slow, and no building trade employees should go out now in search of work. The cost of living remains very high.

HARMS FIRE PREVENTION COMMITTEE.—The Czar has conferred the noble medal "For Zeal" with the ribbon of St. Stanislaus, upon Mr. James Sheppard, member of the Executive of the British Fire Prevention Committee, and Chairman of its International Fire Library. The King has granted permission to Mr. Sheppard to wear the medal. Mr. Sheppard was the Hon. Meeting Secretary at the International Fire Prevention Congress of 1903.

LONDON FIRE BRIGADE AND FIRES.—According to the annual report just issued of the Fire Brigade of the London County Council, the following fires in connexion with the building trade occurred in the Metropolitan area in 1905:—Buildings, 2 serious fires (September 13 and September 17), and 24 slight fires. Causes: Boiling over fat, 1; boiling over tar, 1; children playing with matches, 1; defective electric circuit, 1; fumigating, 1; light thrown down, 6; spirit lamps exploding, 1; spark from fire, 1; stove improperly set, 1; unknown, 10. Buildings (under repair and building): 1 serious fire (August 29), and 24 slight fires. Causes: Boiling over fat, 2; burning rubbish, 1; escape of gas, 2; candle, 1; hot ashes, 4; light thrown down, 8; lime slaked by rain, 3; lime slaking, 1; spark from watchman's fire, 1; watchman's fire, 1; mineral oil torch, 1; unknown, 7; foul fire adjoining, 1; spark from furnace, 1; vapour of spirit coming in contact with lamp, 1; house decorations, 3 fires. Causes: Children playing with fire, 1; escape of gas, 1; unknown, 1. Building material manufacturer, 1 serious fire (July 20), cause unknown. Timber merchants, 1 serious fire (October 25); 5 slight fires. Causes: Light thrown down, 1; spark from locomotive, 2; swinging gas bracket, 2; unknown, 2.

CRYSTAL PALACE ENGINEERING SCHOOL.—On Wednesday the 11th inst., at twelve noon, Sir Alexander Binnie, President of the Institute of Civil Engineers, will take the chair on the occasion of the one-hundredth distribution of certificates to the students of the Crystal Palace Company's School of Practical Engineering.

WEST RIDING EDUCATION COMMITTEE'S BUILDING CONTRACTS.—At a meeting of the Education Committee of the West Riding County Council, held on the 27th ult., at Wakefield, considerable discussion arose on the acceptance of tenders for the erection of some new elementary schools. According to a statement made by Mr. H. Smith, certain contractors had been allowed to amend their tenders after they had been sent in. Here,

he felt, there was opportunity for abuse, and he moved that the tenders should be sent back to the Committee. Mr. J. H. Watson said the Committee were satisfied that the tenders were already made, and that in future contractors who did so must pay the penalty of having their names struck out altogether. Mr. J. P. Hinchcliffe, chairman of the Committee, agreed that the mistakes made were bona fide but felt that in future the authority ought to have a more stringent form of tender. The Chairman renewed that some of the work was already in hand. After further discussion the amendment was lost. The Elementary Sub-Committee recommended that the Accommodation and Attendance Sub-Committee should be empowered to accept "all tenders for repairs or the erection of any public elementary school, provided that they fall within the estimates." This gave rise to another debate. In the end the resolution was passed, with the proviso that the sub-Committee's powers should be subject to confirmation by the larger Committee.

DISTRICT SURVEYORS' RIGHT TO PRACTICE.—A District Surveyor draws our attention to a sentence in paragraph 10 of the 10 which implies that a District Surveyor has said that a district surveyor shall not carry on private practice within the area of his own district; which of course is not the case. The sentence was inadvertently worded; it should have run "shall not carry on practice in his own district except subject to supervision."

BUILDING MATERIAL.—Mr. John Roche asks the Chief Secretary of Ireland whether he will give instructions to those responsible for making out the specification for building the College of Science in Dublin that the superior quality of the Ballinacree limestone shall be taken into account. Mr. Keenan replies in the Parliamentary Papers that the architects of the Royal College of Science have lately been making a special study of Irish building materials, and have come to the conclusion that, subject to prices being satisfactory, large quantities of them can be used in the building. It would not, however, be possible at this stage to state what particular stone will be employed.

WELSH SLATE TRADE.—In Wednesday's Parliamentary papers Mr. David MacIver asked the President of the Board of Trade whether, having regard to the magnitude of the trade in slates, especially in Carnarvonshire, and to the depression in that trade at present existing owing to the importation of slates from abroad free from any contribution to the Imperial Revenue or local rates and taxes, he would be prepared favourably to consider a proposal that all foreign slates should pay an import duty, at all events equivalent to the Imperial and local rates which are incident to those produced in this country. Mr. Lloyd-George, in reply, states that the slackness in the slate trade appears to be rather attributable to the general depression in the building trade of the United Kingdom than to the import of slates into this country, which he found was less than in any of the past five years. The figures for the last five years were—1901, 273,000; 1902, 286,000; 1903, 467,000; 1904, 340,000; and 1905, 262,000. He was not prepared to recommend the imposition of an import duty on slates.

THE GRAND THEATRE, IPSWICH.—This property, which has been let on the market, comprises the theatre, leased for forty-two years from March, 1894, at a rent of 2,185, per annum, the scene-dock and store-room in Torrens-street, the "White Swan" public-house, and No. 44, High-street—yielding an aggregate income of 2,363, a year. The Grand Theatre, at one time the chief suburban play-house in London, has had a chequered existence. It was originally built on the site of the Philharmonic Music Hall (burned in September, 1882) by Mr. E. Toms, contractor, at a cost of about 15,000, after Mr. Frank Matcham's designs, in the early Renaissance manner; the fire-proof stairs, landings, and corridors were by Messrs. Charles Drake & Co., the interior decorations by Mr. J. M. Beekinder. After the fire on December 29, 1887, it was rebuilt by Messrs. G. H. & A. Bywaters, Mr. Matcham being the architect, and re-opened on December 1, 1888, with seating room for 2,500 persons. The house was again almost quite destroyed by fire on February 26, 1900, and rebuilt, with many improvements, by Mr. Matcham, who designed the hand-painted panels of the walls and ceiling. In October, 1902, the theatre (as a going concern), with all fixtures and adjoining houses, was let for an unexpired term of thirty-four years, at a yearly rent of 2,300, and five leasehold redemption policies for 27,960, were sold at the Mart for 10,000.

CHURCH OF ST. PETER, ST. PANCRAS.—An appeal is made for help in raising a fund of 4,000, which is needed for the repair of St. Peter's, in the square, the parish is of the Church was built in 1822-6 amongst the brick-fields, and before the laying out of the square, from designs after the Ionic order of H. & H. W. Inwood, and in many respects closely resembles the (new) parish church, by the same architects.

The principal front has a hexastyle portico, having double perpendicular shafts instead of fluted in the columns, and a pediment raised upon a stepped platform. The east front has a projecting centre between two wings which contain the vestries. The tower consists of two round stories, each in the form of a peripteral temple, with stylobate and entablature. The galleries are supported by nine reeded shafts or columns both within and six on the west. The details of the interior are highly enriched, and the columns both within and without present three examples of the order. The church cost nearly 17,000, and has room for 1,830 persons.

CEMENT TRADE OF THE UNITED STATES.—Official returns show that the imports of cement into the United States in 1901 was 377,956,944 barrels; in 1902, 798,195,089 barrels; in 1903, 927,180,235 barrels; in 1904, 418,561,431 barrels; and in 1905, 338,630,739. The number of barrels exported was 373,934, in 1901; 340,821, in 1902; 285,463, in 1903; 774,940, in 1904; and 1,026,502 in 1905. In regard to the growth of the Portland cement industry in the States, it appears that the number of works, which in 1890 was only 16, had increased to 50 in 1900, to 65 in 1902, to 78 in 1903, and to 83 in 1904, whilst the quantity produced rose from 335,500 barrels in 1890 to 8,482,020 in 1900, to 17,230,644 in 1902, to 22,342,973 in 1903, and to 26,505,881 barrels in 1904. Needless to say, whereas the British Commerce in New York, that the cement mills are mostly constructed on the most modern principles, Rotary kilns are the rule, and in many cases electrical power is used throughout the plants. In this, as in nearly all the industries of the United States, everything is done to reduce the cost of manufacture, especially in the way of employing machinery, in order to dispense with manual labour as much as possible.

BUILDING AND BUILDING MATERIALS IN POLAND.—Mr. Murray, British Consul-General at Warsaw, in his annual report on the trade of Poland and Lithuania, mentions that very little building was done in 1905, and the demand for materials was accordingly small, added to which very little credit was given for building purposes, and in many cases where it had been granted was withdrawn. An additional reason for the small amount of building carried out was the increase in the wages of masons to 25c. remaining over from 1904, bricks were cheap, the price being 11. 5s. to 11. 7s. per 1,000. There are about fifty brickworks in the environs of Warsaw, with a production of about 4,000,000 bricks, and their owners had a bad year in 1905, not only on account of the small demand, but also owing to the compulsory raising of the wages of the workers, which increased the cost of making bricks by 5s. per 1,000. Fire-bricks continue to be imported from the United Kingdom for use in factories and bakeries. For the past three years cement works in Poland have been doing badly on account of over-production. The attempt made in 1904 to form a new syndicate of manufacturers to replace that which was formed at the end of 1903 was renewed in 1905, but was unsuccessful, it being again found impossible to come to an agreement. Prices during the past year were practically the same as those ruling in 1904, that is to say, 1s. 80c. to 2s. 10c. (3s. 9d. to 4s. 41d.) per barrel of 360 lbs. at the works, and 2s. 60c. to 2s. 80c. (5s. 5d. to 10s. 10d.) at the town of Warsaw. Of the nine cement works now existing in Poland one only were unable to work during the past year owing to want of capital. The remainder contrived to carry on for nine months out of the twelve, and were less adversely affected by strikes than were factories in general, as the hands went on strike at a time when the demand for cement was small. Although the Government, on account of the disturbed state of the country, and also, it is said, from motives of economy, diminished its orders to a considerable extent, the consumption of cement by private firms increased, and, owing to the low price, they were enabled for certain purposes to use cement in place of granite. As was the case in 1904, no cement works in Poland paid any dividend at all, and there were no transactions in their shares, which have no market value.

Legal.

ACTION AGAINST THE LONDON COUNTY COUNCIL.

In the King's Bench Division on the 4th inst. the hearing was concluded of the case of Platten v. the London County Council, an action by the plaintiff claiming damages from the defendants including 925l. the cost of rebuilding premises, and 700l. for loss of trade and goodwill. Mr. Footc, K.C., and Mr. Lewis Thomas appeared for the plaintiff, and Mr. Dickens, K.C., and Mr. F. P. Daldy for the defendants.

It appeared that the plaintiff was the lessee and occupier of No. 175, Mare-street, Hackney, where he carried on the business of a provision dealer. Defendants are the owners of land and

premises adjacent to the plaintiff's premises. Plaintiff's case was that in November, 1904, defendants wrongfully removed the adjoining buildings and wrongfully and carelessly left the walls, and made excavations in a negligent manner and without proper support. In consequence of this the plaintiff's premises were deprived of support and were badly shaken and rendered unsafe and dangerous, and a portion of the parapet was torn down. As a result of the defendants' work the defendants served him with a dangerous structure notice, requiring him to do certain things for the safety of the building. For these acts the plaintiff claimed damages.

Defendants, by their defence said they acquired the premises in question for the purpose of street improvements, and whilst they were taking down the premises they suddenly collapsed. Defendants denied that they wrongfully or carelessly removed the walls or made the excavations alleged. Defendants said that, with the exception of the parapet, no portion of the plaintiff's house was supported by the defendants' buildings. Defendants further said that plaintiff's building was in no way affected by the collapse of their buildings. They denied all the plaintiff's allegations, and in the alternative paid into court the sum of 51l. as being sufficient to satisfy plaintiff's claim.

The case resulted in a verdict for the plaintiff for 1,390l. and judgment was entered accordingly.

NORWICH ANCIENT LIGHT CASE.

MR. JUSTICE FARWELL, in the Chancery Division on the 3rd inst., concluded the hearing of the case of Hyde and others v. the London and Provincial Bank.

This was an action by the plaintiffs against the defendants for an injunction to restrain the defendants, their servants, agents, and workmen, from erecting or keeping erected upon the site in London-street, Norwich, any building so as to darken or obstruct any of the ancient lights of the plaintiffs' premises in London-street, on the opposite side of the way, in such a manner as to cause a nuisance or illegal obstruction to the ancient lights of the plaintiffs' premises, as the same were enjoyed prior to the demolition of the buildings occupying the site in question.

Mr. Jenkins, K.C., and Mr. Nisbett appeared for the plaintiffs, and Mr. W. H. Upjohn, K.C., and Mr. Wood for the defendants.

Mr. Jenkins, in opening the case, said this was an action with regard to the obstruction of ancient lights to the property of the plaintiffs, who occupied premises on one side of London-street, against the defendants, who acquired some old premises on the opposite side of the road. Those old premises they had demolished, and had proceeded to erect a new building on the site of the old building, and were carrying it to such a height as would darken or obstruct the light coming to the plaintiffs' premises. The first thing he would have to do was to prove that these were ancient lights, and next he would have to establish that the defendants' building would interfere with those lights.

Mr. Robert Bray, a builder and resident in Norwich since 1862, said he knew the plaintiffs' premises, and remembered them being occupied by a Mr. Dixon. It was an old house, and witness was engaged to put an addition to it. In 1886 Mr. Dixon employed witness to do some work on the ground floor of the house. Witness gave evidence in support of the plaintiffs' contention that the lights were ancient.

In the result it was stated that the case had been settled, the defendants agreeing to limit the height of their building in accordance with an agreement arrived at with the plaintiffs.

ACTION AGAINST AN URBAN DISTRICT COUNCIL.

The hearing was concluded on the 3rd inst. in the Court of Appeal, before Lords Justices Vaughan Williams, Stirling, and Morlon, of the case of Foster v. the Warlington Urban District Council, on the defendants' appeal from a judgment of Mr. Justice Walton in the King's Bench Division.

In this case the plaintiff, Mr. J. D. Foster, the owner of an oyster business at Emsworth, near Chichester, sought an injunction to restrain the defendants from placing or maintaining their sewer outfalls in the neighbourhood of his oyster storage beds on the foreshore of Emsworth Creek, and from delivering sewage on to the same, and to contaminate the same, and to render the oysters therein liable to become infected and unsafe for human food, and to cause a nuisance to the plaintiff. The plaintiff also claimed damages for loss and injury to his business caused by the alleged nuisance. The defence was that the plaintiff was himself a member of the defendant Council and drained crude sewage into the tidal waters at Emsworth Creek, and that as a member of the Council the plaintiff was a party to the resolutions of the said Council in connexion with all matters relating to the sewage of the defendants' district. Defendants further denied the title of the plaintiff to the said storage beds.

Mr. Justice Walton came to the conclusion that the plaintiff had a good title to the soil of the beds, and that his right had been in fact disturbed by the deposit of sewage matter by the defendants. His lordship refused to grant an injunction, but gave judgment for the plaintiff for damages, the amount of which was by consent reserved for further consideration. Hence the present appeal.

Lord Justice Vaughan Williams, in the course of a long and elaborate judgment, said there could be no doubt that the plaintiff's oyster beds had been polluted by the sewage, and that was admitted. Some of the oysters were in 1902 supplied for a banquet at Winchester, with the most lamentable result. In his judgment there had been such an occupation of the beds for such a length of time as to entitle the plaintiff as against the defendants, who had no interest in the foreshore, to sustain his action for the injury done by the sewage to the oysters kept in the beds. He thought there was ample evidence that the injury done was caused by acts done by the defendants. In these circumstances he was of opinion the judgment of Mr. Justice Walton was right.

Lords Justice Stirling and Moulton concurred, and the appeal was accordingly dismissed with costs.

Patents of the Week.

APPLICATIONS PUBLISHED.*

5,681 of 1905.—L. BROUSSAS: *Trussed Bricks, Tiles, Slabs, or the like, and Constructions formed Thereof.*

This invention relates to a system of trussed brick constructions. In a form of construction for erecting ceilings and floors lower bricks are used of dove-tail shape, and provided with a groove for the insertion of the base rod or iron. The tie iron is hooked to said rods, and their other ends are either simply bent or are connected to another rod in the upper brick. Between the beams or joists so formed are arranged a certain number of other bricks, slabs, or tiles, forming the ceiling and floor respectively.

7,120 of 1905.—W. BRUGOS: *Flushing Cisterns for Water-Closets, and the like.*

This relates to an apparatus for starting the syphonic flush of cisterns used in connexion with water-closets, and the like. According to the invention there is employed within the cistern a quadrant-shaped vessel or chamber, which is open to the cistern along its base and is connected to the inlet end of the syphon. Within this vessel or chamber is fitted a pivoted flap, which is adapted to be operated by a suitable lever or levers arranged in connexion with an ordinary chain pull. The vessel or chamber is provided with a small internal projection or stop to limit the downward movement of the pivoted flap.

7,681 of 1905.—H. G. WAREL: *Surface Apparatus for Use in Heating or Cooling.*

This relates to a surface apparatus for use in heating or cooling, and consists in the combination of elements each composed of two stamped recessed metal plates, each perforated with two holes and joined everywhere at the edges with a specially-constructed frame between them acting as a stay, together with two tubes screwed only at the ends, distance tubes between the elements, and nuts and jointing washers, all metal being wrought.

8,324 of 1905.—S. SKINNER: *Mortising Machine.*

This relates to mortising machine, and consists in reciprocating the tool-holder by means of a rack fixed thereon, and a toothed quadrant gearing with the rack, and adapted to be turned out of the path of the rack teeth during the adjustment of the tool holder. The invention further consists of a pinion and crank for adjusting the rack, normally held away from the rack, but released by the quadrant before it leaves the rack, and an adjustable stop for limiting the movement of the rack and tool holder in one direction.

8,339 of 1905.—C. BARTER: *Apparatus for the Heating of Water and other Fluids.*

This relates to appliances for heating water and other fluids, the combination comprising a hollow body part formed with apertures at its upper extremity, through which the liquid can flow into the interior, a steam nozzle secured at the lower extremity of the said body part, and a perforated tube arranged in alignment with the said nozzle and adapted to deliver the heated liquid in a jet or spray.

10,290 of 1905.—V. PERRETT and L. PERRETT: *Presses used for Pressing Sand-Faced Bricks.*

This relates to a press for pressing sand-faced bricks, and consists in the method of adjusting the effective weight of the wheel upon the vertical screw shaft so that it commences to revolve

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

by its own weight at the top of the stroke, thus turning the screw shaft and increasing its speed until at the bottom of its stroke by its momentum, which presses the disc down upon the half-finished brick below, by means of levers to which adjustable weights can be applied and connected with the holder which carries the movable die so as to balance its weight more or less as desired.

12,831 of 1905.—H. J. DURNFORD: *Fasteners for Window Sashes, Doors, and the like.*

This relates to fasteners for window sashes, doors, and the like, having a pivoted arm which engages with a catch on a separate catch plate. The inner end of the arm has a small sleeve with a projecting pin or pins which engage with holes in a plate connected to the back plate of the fastener. A small pressure spring placed above the sleeve presses down the sleeve and locks the pins automatically when the arm is brought to the fastened or shut position. To unfasten the arm it is necessary to lift the sleeve and thus disengage the pins, when the arm can be turned back. The sleeve may carry a small knob, hook, or button for this purpose.

15,832 of 1905.—R. V. HUMPHREYS: *Device for Ventilating Greenhouses, Conservatories, Sheds, Outhouses, and the like.*

This relates to a device for ventilating greenhouses, conservatories, sheds, outhouses, and the like, comprising upright longitudinal members provided with projecting pieces, and distance or strengthening pieces, a hood formed with a central part and side inclined portions, arms pivoted to the said hood and the members, an additional covering piece formed with a projecting part designed to engage a groove or recess in the said hood, with means for raising and lowering the said hood.

20,296 of 1905.—P. BAUR: *Machinery for Preparing or Treating Loom, Clay, and the like.*

This relates to a machine for treating or preparing loam, or clay, or like material, and consists of a rotary perforated cylinder or cylinders, one or both ends of which is or are open, and means whereby the material is pressed into the interior thereof, and is discharged from said interior through the said open end or ends.

21,191 of 1905.—F. SCHUI: *A Combined Water-Closet Basin and Flushing Apparatus.*

This relates to a self-acting water-closet, the feature of which is that the closet seat is so connected with the valve for admitting the pressure water that when the said seat is pressed down it opens the said valve, whereby the flushing chamber is filled with flushing water and the air locked in the chamber is compressed, and when the seat is released it closes the valve so as to shut off the pressure water and opens the passage for flushing water, so that the latter is forced by the compressed air in the chamber out of the latter into the closet basin.

26,663 of 1905.—G. E. HAMMOND and J. W. P. TURNER: *Door Chains.*

This relates to door chains, and consists of a staple, ring, or bar, attached to a plate obliquely or the plate slotted obliquely to carry the door chain, so that the chain must fall by its own weight obliquely to the further side of the staple, ring bar, or slot, hanging quite clear of and away from the door. The object of this oblique staple, ring or bar, is to prevent the usual damage now caused to doors and door frames by the chains at present in use hanging too close to the door posts.

16,840 of 1905.—H. EARLE: *Colour Washes for Brickwork and Other Surfaces.*

This relates to the manufacture and use of colour washes for brickwork and other surfaces produced by compounding together, by mixing and grinding to a very fine condition, equal or substantially equal, quantities by weight of plaster, ground flints, and a sufficiency of concentrated size, with the addition of a quantity also by weight of such mineral colouring matter or matters as are adapted to give to the wash which results from the admixture of the dry powder produced with water the desired colour or shade of colour.

18,241 of 1905.—T. W. ADSHEAD: *Fenders or Curbs for Fireplaces.*

This relates to a curb or fender for fireplaces, provided with end dogs and corner cover caps, and consists in casting in one piece or making integral with the corner cover cap the side or cheek of the dog, or both the side or cheek and its support or leg.

2,704 of 1906.—C. F. HALL: *Manufacture of Faced or Enamelled Bricks, Slabs, Tiles, and the like.*

This relates to the manufacture of a brick, slab, tile, or the like, having an enamelled metal plate or plates attached to its surface, and consists in introducing the said plate, which is roughened or scored on the back or provided with keys or flanges, face downwards into the mould before the introduction of the material

of which the brick is composed, so that during the compressing operation the said plate becomes firmly attached to the material.

3,337 of 1906.—P. J. ROBERTS and H. G. ATKINSON: *Building Blocks for Constructing Fire-proof Partitions, Walls, and the like.*

The object of this invention is to construct building blocks with connecting edges, which break up the usually straight lines of connexion into lines of undulating character, thus effecting preventing the formation of long straight breaks or cracks in the finished wall, whilst at the same time the slabs interlock with each other to a certain extent, and thus are caused to support each other and relieve the central portion of the floor from bearing the entire weight of the central portion of the structure. To accomplish this the connecting edges of the slabs are formed with regular undulations composed of repetitions of a complete curve, each slab having each of its edges formed in one or more complete curve or curves. A slab might thus be square, having each of its edges shaped to the pre-determined complete curve; and the sides and the ends would contain either single curves or multiples of the same, but would not contain any incomplete portion.

4,743 of 1905.—S. PRIEST: *Wall-Tie or Means for Holding Together the Two Divisions of Cavity Brick Walls.*

This relates to ties for hollow walls, and consists in the combination with the longitudinal wires, of wires twisted respectively around said longitudinal wires for a certain distance, which are carried across the intervening space between said longitudinal wires, so that they cross one another at an angle about midway between said longitudinal wires, when each is twisted around the opposite longitudinal wire, the operation being repeated as often as necessary to make a tie of a pre-determined length.

7,118 of 1905.—P. F. DESWARTE: *Means for Facing Bricks, Batters, Dykes, and the like.*

This relates to a construction composed of bricks, or slabs of cement, or other appropriate material for facing banks, batters, dykes, and the like, and is characterised by the fact that the adjacent edges of the bricks constituting a semi-circular joint are shaped in such a manner as to leave between these edges when the banks have been assembled a certain angular space permitting the banks to turn around their joint.

8,821 of 1905.—T. A. WILLIAMS: *Construction of Floors in Buildings.*

This relates to the construction of floors in buildings, and consists of levers formed with horizontally-grooved or slotted ends, and projecting soles, and having their end portions shaped to enable them to be threaded diagonally with either right-handed or left-handed inclination between the pair of suitable girders and then turned transversely thereto, so as to abut against the girders and contiguous rows of bricks.

25,072 of 1905.—P. LASSABLIÈRE: *Process and Apparatus for the Disinfection of Premises, Articles, and such like.*

This relates to a process for producing and utilising formic aldehyde for disinfection, and consists in causing formic aldehyde to become disengaged in a pressure chamber where the pressure is maintained between limits determined by means of a valve adapted to permit the gas outlet to be closed until the pressure rises to a pre-determined maximum, and a retaining valve adapted to automatically close the gas outlet when the pressure falls below a pre-determined minimum, with the object of avoiding the polymerisation of the formic aldehyde, which becomes produced when the pressure falls below a determined amount.

26,809 of 1905.—A. C. DAVES: *Appliance for Use in Cleaning Floors, and the like.*

This relates to an appliance for use in cleaning floors and the like, which comprises a scrubbing brush and a flannel or floor cloth mounting the brush in a suitable holder, so that by rotating it on its pivots from its operative to its imoperative position it moves the flannel or floor cloth into its operative position and maintains it in its position distended over the back of the scrubbing brush.

26,298 of 1904.—J. R. TEMPERLEY, J. TEMPERLEY, and W. ALEXANDER: *Transporting Appliances, and the like.*

This relates to a transporter having a single rope or chain hoisting gear, in which a hoisting drum is driven indirectly from a motor through epicyclic gearing and a traversing drum arranged to positively traverse the carriage in both directions is independently driven, but is connected to said epicyclic gearing, the arrangement being such that while the operation for imparting vertical movement is in progress, the operation of traversing may be commenced and simultaneously carried on quite independently, i.e., for effecting the operation for imparting vertical movement, and vice versa.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxx. Certain conditions, beyond those given in the following information, are imposed in some cases, such as; the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

Competition.

* **NO DATE.—BELFAST.—EXHIBITION OF HOUSES, NOVEMBER.**—The Belfast Garden Estates Company offer 700l. in prizes for the best designed and most economically built houses. The awards will be made by the assessor, Mr. Maurice B. Adams, F.R.I.B.A. Full particulars at office on the estate, Cliftonville-circus; or from the agents, Messrs. R. J. McConnell & Co., 37, Royal-avenue, Belfast.

Contracts.

BUILDING.

APRIL 9.—HAYFIELD WOODHOUSE.—SCHOOL.—Alterations and interior fitting and painting, at the Woodhouse Provisional School, for the West Riding C.C. (Education Department). Specifications for the several works may be obtained on application. Tenders to Mr. Hy. Lindley, divisional clerk, Education office, Leeds, by April 9.

APRIL 9.—HECKMONDWICK.—LIBRARY.—Public library, for Heckmondwike U.D.C. Specifications, etc., Henry Stead, architect, Heckmondwike. Sealed tenders to Mr. Arthur Macaulay, Clerk to the Council, Heckmondwike, before 12 o'clock noon, April 9.

APRIL 9.—LEADS.—URINALS.—A three of urinals in Parliament-street and additional entrance to urinal at Victoria Cattle Market, for the Sanitary Committee. Particulars at the City Engineer's office, Municipal-buildings, Leeds. Tenders at the Town Clerk's office not later than 10 a.m. on April 9.

APRIL 9.—LOCHORE.—HOUSES.—A block of twelve workmen's houses, at Lochore, for the Fife Coal Company, Ltd. Plans, etc., from Mr. John Houston, architect, Dunfermline. Offers to be lodged with the Fife Coal Company, Ltd., Leven, on or before April 9, by 10 a.m.

APRIL 9.—LYNN.—GALLERY AND PUBS.—New gallery and public printing and painting, at the London-road Wesleyan chapel. Plans, etc., at office of Messrs. Jarvis & Son, architects, Paradise-parade, Lynn. Tenders by the 9th inst.

APRIL 9.—UPPER TILNICHILL, ABERDEEN.—HOUSE.—A new dwelling-house at Upper Tillichill Farm, Plans, etc., with the tenant, Mr. George McAlhau, or with Messrs. Walker & Duncan, architects, 3, Golden-square, Aberdeen, whom they receive tenders up to April 9.

APRIL 10.—ARMLEY.—SHEDS.—Sheds, boiler-house, and 100-ft. chimney to works in Charnwood-road, Armley, Plans, etc., from Messrs. Beckwith & Webster, 2, Basinchill-square, Leeds. Tenders by April 10.

APRIL 10.—BRAMPTON.—HOUSES.—A pair of houses at Brampton. Plans and specifications at Messrs. Dickinson's, Constable-st., Brampton. Estimates to be forwarded to the Rev. J. Rutherford, Rose Cottage, Brampton, on or before April 10.

APRIL 10.—PENTONVILLE MILITARY HALL.—A mission hall at Haxhollow, Pentonville, for Calvary Baptist Church. Tenders to Mr. Arthur Lloyd Thomas, A.M.I.E.C.E., architect and engineer, Church-street-chambers, Pontypool, by April 10.

APRIL 10.—WALKER.—COOKERY CENTRE.—The Corporation invite tenders for erection of a building in connexion with the cookery centre of the Education Department of the Borough of Walsend, at the Richardson Dress School. Plans, etc., on application to the Borough Surveyor, Mr. George Hollings, Corporation Offices, High-street, Walsend. Tenders, marked "Tenders for Cookery Centre," on or before April 10, to Mr. W. V. Mulester, Town Clerk of Walsend, 26, Sandhill, Newcastle-upon-Tyne.

APRIL 12.—ABERTHAW.—SCHOOL.—Glamorgan C.C. invite tenders for temporary iron school building at Abertidwr, near Capelrhilly, in the county of Glamorgan. Plans, etc., from Mr. T. Mansel Franklin, Clerk of the Glamorgan C.C., Glamorgan County Offices, Westgate-square, Cardiff. Tenders, sealed outside "Tender for Abertidwr Iron Building," will be opened by the Education Committee on the 12th inst., and should reach the Clerk on the previous day. The tenders are in a separate specification, and will be comprised in a separate contract.

APRIL 12.—KENDAL.—ALTERATIONS.—Alterations and additions to Kendal Infirmary, for Mr. J. Curwen, architect and sanitary engineer, 26, High-zate, Kendal, up to April 12, upon which date tenders must be sent to architect before noon.

APRIL 12.—LICHFIELD.—HOUSES.—Pulling down of old cottages and erecting two dwelling-houses and domestic offices in Stone-street for the Trustees of Milley's Hospital, Lichfield. Plans, etc., at Mr. William Perry, 39-41, Bore-street, Lichfield. Tenders, endorsed "Stone-street," received by Mr. Hubert H. Brown, steward, Bird-street, Lichfield, not later than noon, on April 12.

APRIL 12.—NEWQUAY.—SCHOOL.—Alterations and improvements to Newquay Council School, for Cornwall Education Committee. Forms from the architect, Mr. B. C. Andrew, Education Office, St. Austell, endorsed "School," to be sent to Mr. F. R. Pascoe, Secretary, Education Office, Truro, on or before Thursday, April 12.

APRIL 12.—STREYTON.—COTTAGES.—A pair of cottages at Streyton, for Mr. George Lambert, M.P. Plans and specifications at office of Mr. Herbert Reed, architect, 12, Castle-street, Ketter. Tenders to be delivered on or before April 12.

APRIL 13.—KIRKBY-FURNESS.—BANK.—New bank premises at Kirkby, for the Lancaster Banking Company. Plan, etc., on application to Mr. Jas. Waver, care of Messrs. Settle & Brundill, Ulverston. Sealed tenders, endorsed "Bank," to be sent to Mr. Waver by 12 noon on April 13.

APRIL 14.—COPPEMANN.—COTTAGES.—Two cottages at Coppehmann, Pontypool, for the Wesleyan Trillion Mission. Plans, etc., at office of Messrs. A. O. Evans, Williams & Evans, architects, Pontypool, to whom tenders are to be sent on or before the 14th inst.

APRIL 14.—HALIFAX.—ALTERING SHOP.—Altering and remodelling shop in Northgate (late occupied by Horner's). Plans, etc., from Messrs. Jackson & Fox, architects, 7, Lawson-street, Halifax. Tenders by 12 noon, April 14.

APRIL 14.—NEWHAVEN.—SHEDS.—Leith Harbour and Docks Commissioners invite tenders for the erection of small sheds for stores at Newhaven Harbour. Drawings, etc., may be obtained on application at the office of the Superintendent, Mr. Peter Whyte, M.Inst.C.E., Tower-pier, Leith. Tenders to be lodged with Mr. A. Nord Paton, W.S., Clerk to the Commission, 31, Melville-street, Edinburgh, on or before April 14.

APRIL 14.—NORMANTON WOODHOUSE.—SCHOOL.—Parties desirous of tendering for all or any of the following trades should send in their names to the undersigned on or before the 14th inst.: New school at Normanton Woodhouse, and alterations to existing Norman Woodhouse Provisional School (builder, joiner, slater, plasterer, ironfounder and plumber, painter). A deposit of 1l. is required. Mr. J. Vickers-Edwards, County Architect, County Hall, Wakefield.

APRIL 15.—QUEENSTOWN.—HOUSES.—Six houses at Queenstown, for the Queenstown Naval Dwellings Company. Tenders to be sent to Messrs. W. H. Hill & Son, architects, 28, South-wall, Cork, by April 15. Detailed quantities may be obtained from the architects on payment of 1l.

APRIL 16.—AVIMORE.—MANSE.—For the mason, joiner, slater, plasterer, plumber, and painter work of the Refectory and Avimore United Free Manses. The plans may be seen at Mr. Fraser's, Inverurie, Avimore. Sealed offers to be sent to Mr. J. D. Macleod, architect, 108, George-street, Edinburgh, not later than April 16.

APRIL 17.—HERNE BAY.—POLICE STATION.—For the enlargement of the county police station at Herne Bay, ordered by the Board of Joint Committees. Plans, etc., on deposit of 2l., at the office of the County Architect, 8, Weck-street, Maidstone. Sealed tenders, endorsed "Herne Bay Police Station," are to be delivered to Mr. Charles Turner, Clerk, Sessions House, Maidstone, at the Sessions House, Maidstone, not later than 5 p.m. on April 17.

APRIL 17.—ULVERSTON.—HOUSES.—The Swarthmoor and Ulverston Co-operative Society invite tenders (whole or separate trades) for the erection of five houses in Clarence-street, Ulverston. Drawings, etc., at the office of the architects, Messrs. Settle & Brundill, 30, King-street, Ulverston. To be enclosed in a sealed envelope, endorsed "Tender for Five Houses, Clarence-street, Ulverston," and to be delivered to the architects' office by noon on April 17.

APRIL 18.—ABERAVAY.—HALL, INSTITUTE, AND LIBRARY.—Public hall, institute, and free library at Aberavay, Abercrombie, for the Committee. Plans, etc., at office of Mr. E. Roderick, architect, Clifton-street, Abercrombie. Sealed and endorsed tenders to be sent to Mr. W. V. Price, Bryn offa, Hill-street, Aberavay, not later than April 18.

APRIL 18.—NEWHAVEN.—CIVIC OFFICES, etc.—The U.D.C. of Newhaven invite tenders for the works required in the erection of new Council offices and fire station in Fort-road, Newhaven. Specification, etc., may be seen at the office of Mr. F. J. Rayner, architect, 34, Meeching-road, Newhaven, from whom copies of the bill of quantities and forms of tender may be obtained on deposit of a postal order value one guinea. Tenders, under seal, and marked "Civic Offices," to be delivered to Mr. Edward Knightley, Clerk to the Council, Council's Offices, Newhaven, not later than 4 p.m. on April 18.

APRIL 18.—ROTHWELL.—HALL.—The Hinshel Guardians invite tenders for the erection of an engineer's house at their new workhouse, Rothwell Hall, in accordance with the drawings and specifications prepared by the architect and endorsed "F.R.I.B.A., 30, King-street, South Shields." Forms, etc., to the architect on or before Saturday, April 7, accompanied by a deposit of 1l. Tenders to Mr. F. Hill, W.S., Clerk to the Guardians, Ulverston Offices, Ulverston, Leeds, by 10 o'clock on the 18th inst.

APRIL 18.—TEBBURY.—CHAPEL EXTENSION.—Extension of North English Baptist Chapel, Tebbury, Rhondda Valley, for the Trustees. Sealed and endorsed tenders to be delivered to Mr. William Lawrence, The Institute, Trocroy, on or before noon of April 18. Plans, etc., from Mr. W. D. Morgan, architect, Victoria-church-avenue, Pontypool.

* **APRIL 19.—MERTON, SURREY.—FOUR SHOPS.**—Plans and specifications of Mr. H. R. G. S. Smallman, 8, Queen-street, E.C. Tenders opened at 12 noon, April 19.

APRIL 19.—NORMANS RIDING.—HOSPITAL.—Blaydon, Ryton and Whickham Joint Hospital Committee invite tenders for the enlargement of the galvanised iron isolation hospital at Normans Riding, for the purpose of the erection of administrative, laundry, and discharging blocks and two pavilions. Forms, etc., on application to Mr. J. B. Renton, Council Offices, Whickham, R.S.O., upon payment of 1l. Sealed tenders, endorsed "Tender for Hospital," must be delivered to Mr. Henry Dalton, Clerk, Blaydon-upon-Tyne, by April 19.

APRIL 20.—DROGHEDA.—HOSPITAL.—Hospital in Drogheda, for the Drogheda Cottage Committee. Drawings, etc., with the hon. secretaries, Greenhills, and copies from Mr. Frederick Shaw, architect, St. Laurence-street, Drogheda. Sealed tenders to be sent to Mr. Sidney Smith and Rosa Smith, hon. secretaries, Greenhills, Drogheda, by April 20.

APRIL 20.—SIRLOWY VALLEY.—HOUSES.—Twenty-five (more or less) houses near Nine Mile Point Collieries, Sirlowy Valley. Plans, etc., at the office of Mr. R. L. Roberts, Abercrombie. Sealed tenders, endorsed "Tender for Houses," to Mr. T. Thomas, Nine Mile Point Collieries, near Cross Keys, Mon., by April 20.

APRIL 20.—WELLS-ON-SEA.—SCHOOL.—Enlargement of Wells-on-Sea, Norfolk, School. Plans, etc., at office of Mr. A. P. Scott, architect, Castle Meadow, Norfolk. Deposit of 1l. 1s. Tenders, by noon, April 20, to the Secretary, Norfolk Education Committee, 57, London-street, Norwich, endorsed "Tender for Wells-on-Sea School."

* **APRIL 23.—CONVY.—NURSES' HOME.**—For the Convoy and Warwickshire Hospital. Plans, specifications, etc., of Herbert W. Chaitway, Trinity-churchyard, Coventry, and forms of tender to be obtained upon depositing 3l. ss. Tenders, sealed and endorsed "Nurses' Home," to be sent to Ellis E. Crisp, Coventry and Warwickshire Hospital, Stonehouse, Coventry, not later than 10 a.m. April 23.

* **APRIL 24.—BOSTON.—NEW POST OFFICE AT BOSTON.**—For the Commissioners of H.M. Works and Public Buildings. Drawings, specification, conditions, and form of contract may be seen on application to the Postmaster between 11 and 4. Bills of quantities and forms of tender at unaccompanied address: Secretary, H.M. Office of Works, Storey's Gate, S.W. Tenders, endorsed "Tender for Waterlane Schools," to be addressed and delivered to Mr. John W. Benton, Clerk to Council, Town Hall, Hford, Essex, on or before April 24.

APRIL 30.—DUBLIN.—MOTOR-CAR SHED.—Great Northern Railway Company (Ireland) Directors invite tenders for a motor-car shed, 135 ft. long by 30 ft. wide, of galvanised corrugated iron, etc., with steel principals, at their Amiens-street Terminal, Dublin. Drawings, etc., at the office of Mr. W. H. Mills, Engineer-in-Chief, Amiens-street Terminal, Dublin, or copies of them at the office of the District Engineer, Belfast, and forms of tender at either of the above-mentioned places on payment of 2s. each (not returnable). Tenders, endorsed "Tender for Motor-car Shed," should be delivered to Mr. H. Morrison, Secretary, Secretary's Office, Amiens-street Terminal, not later than 10 a.m., April 30.

APRIL 30.—TYWARDEATH.—CHURCH RENOVATION.—Renovation and alteration of the Wesleyan Church, Tywardreath, Par Station. Plans and specifications may be seen at the residence of Mr. Caleb Thomas, architect, Mr. E. C. Jury, No. 1, Alma-villas, Trengissey-road, St. Austell. Tenders, sealed and endorsed "Church Tenders," must be sent to Mr. Caleb Thomas, Tywardreath, Par Station, on or before April 30.

* **MAY 2.—PARESTON.—EXTENSION OF QUAY AND CONSTRUCTION OF A SHED AND BRIDGES IN CONNECTION THEREWITH FOR THE GREAT EASTERN RAILWAY COMPANY.**—Copies of specifications and quantities can be obtained and drawings seen on application to Engineer, at Liverpool-street Station, E.C. Tenders, after April 17 between 10 and 4, 10l. bid, will be charged each applicant for the specification and quantities, schedules, and form of tender, to be returned conditionally. Tenders to be sent through the General Post Office addressed to the Secretary, Liverpool-street Station, E.C., by 10 a.m., May 2.

NO DATE.—ABERDEEN.—CROSS.—FRESTON CROSS.—The U.D.C. of High. Particulars from Mr. Geo. Bennett Mitchell, architect, 148, Union-street, Aberdeen.

NO DATE.—BLAENAU FESTINIOG.—SCHOOL OFFICES, etc.—Mentioned Education Committee invite tenders for new offices and rearranging the playgrounds at the Boys' Higher Grade School and Slate Quarries Schools, Blaenau Festiniog. Plans, etc., from the County Architect, Mr. A. M. Howard Jones, Plas Ynys Borth, R.S.O.

NO DATE.—BURTON-ON-TRENT.—SHOP AND PREMISES.—Pulling down of old buildings and erecting of shop and premises in Station-street, Burton-on-Trent.

A copy of the quantities, when ready, will be supplied on payment of 2s. Apply to E. R. Ridgway, architect, Long Eaton.

No DATE.—CARP—WAREHOUSE.—New warehouse premises, Tredwell-street, Cardiff. Plans, etc., at the Tredwell Estate Office, Pearl-street, South, or at the office of Mr. Alfred Lewis, estate agent, 5, St. John's-square, on payment of 1l. 1s.

* No DATE.—LOCKS (BOARDS)—CONCRETE STORE (Principally Steel Construction and Galvanised Iron Drawings, specification, and conditions of contract may be seen, and bills of quantities obtained, on payment of one guinea, to be returned conditionally. Tenders to Fred Bath, architect, Crown-chambers, Salisbury.

No DATE.—SHIPLEY.—VILLA.—Detached villa, in Nablane Shipley. Send names to Messrs. Fairbank & Wall, architects, Craven Bank-chambers, Bradford.

No DATE.—WEREHAM.—HOUSE.—Erecting a house at Weraham.—For plan and specifications, apply Mr. F. Beeton, Weraham, Stoke Ferry, Norfolk.

ENGINEERING, IRON, AND STEEL.

APRIL 9.—MACHINISTS.—BRIDGEWORK.—Three collar dams, bridge construction, in the River Dovey, near Muchyniell. Tenders, marked "Offer dam," to reach Mr. J. R. Dix, Corris Railway, Corris, not later than April 9.

APRIL 9.—MACHINISTS.—THE PAVING, SEWERING, AND HIGHWAYS COMMITTEE invite tenders for the reconstruction of Oxford-road Bridge, over the Cornbrook. Specification and form at the City Surveyor's office, Room 11, Manchester, on payment of two guineas. Tenders, enclosed in the official envelope and addressed to the Chairman of the Paving, etc., Committee, to be delivered at the City Surveyor's office not later than 10 a.m. on Monday, April 9.

APRIL 11.—BOOULE.—SEWERHEADS AND ALTERATIONS TO STREET AND CAST-IRON PIPES.—The Corporation invite tenders for (a) alterations to street pipe work (b) alterations to cast-iron pipes and other similar work (c) four "Down-take" superheaters, to the Electricity Works, Pinegrove, Booter's Forms, etc., to be obtained from the Borough Electrical Engineer, on depositing the sum of one guinea. Tenders, endorsed "Superheaters and Covers," to be addressed to the Chairman of the Electric Power and Lighting Committee, Town Hall Boole, and delivered at Town Clerk's office not later than 10 a.m. on April 11.

APRIL 11.—NEWPORT.—WATER SUPPLY—EXTENSIONS TO HAMSTEAD AND THORLEY WATER SUPPLY.—The Isle of Wight R.D.C. invite tenders for the following contracts: (a) Shaftlet.—The providing and delivery of the quay, and Yarmouth, I.W., of about 64 tons of 3-in. cast-iron spigot and socketed pipes; contract (b) Shaftlet.—the excavating for, carting, and laying of about 237 yds. of 3-in. cast-iron pipes, to include the connection to the existing main, and the provision and fixing of sluice valves, hydrants, air valves, etc., and certain services; contract (c) Thorley.—The same for about 3,360 yds. of 3-in. cast-iron pipes at Thorley. Details of the work can be obtained from contract (a) and (b) (Shaftlet) from Mr. A. Buxton, surveyor, Hilarway, The Avenue, Freshwater, I.W.; and for contract (c) (Thorley) from Mr. H. Newland, Castle-street, Carisbrooke, I.W. Sealed tenders, on forms to be obtained at offices of Mr. H. Eldridge Stratton, Clerk to the Council, R.D.C. Offices, 30, Pale-street, Newport, I.W., and endorsed respectively tenders for contract "A," "B," or "C," as the case may be, to be delivered by 5 p.m. on April 11.

APRIL 11.—STOCKPORT.—MAINS.—Stockport Gas Committee invite tenders for a supply of 3-in. and 4-in. cast-iron mains and for irregulars from 3 in. to 8 in. Specifications, etc., from the engineer, Mr. S. Menier. Tenders, marked "Mains," must be addressed to the Chairman of the Gas Committee, and be delivered at the Town Clerk's office, on or before April 11 next ensuing.

APRIL 11.—WREXHAM.—BRIDGE.—For widening bridge at Southsea, Wrexham, for the R.D.C. Plans, etc., at office of Mr. T. Rees Evans, District Surveyor, Johnstown, near Raebon. Sealed tenders, endorsed "Bridge, Southsea," to No. 9, Temple-row, Wrexham, by April 11.

APRIL 12.—ABERDEEN.—BRIDGE.—Steel girder bridge over the River Don in the Parish of Monymusk, including masonry pier, abutments, and wing walls, and the construction of approach roads and apartment works. Plans, etc., at the office of the engineers, Messrs. Walker & Duncan, civil engineers, 3, Golden-square, Aberdeen, on payment of two guineas. Sealed tenders, endorsed "Tender for Monymusk Bridge and Road," to be lodged with Mr. Wm. Marison, County Clerk, County-buildings, Aberdeen, before noon on April 12.

APRIL 16.—CYDERBANK.—CYLINDERS.—Trustees of the Clyde Navigation invite tenders for construction of a culvert 192 ft. by 10 ft. by about 275 yds. in length for a diversion of the Yoker Burn, between the Lanarkshire and Dunbartonshire Railway and the River Clyde, and also for excavating and embanking about 100 yds. from sludges ground between Yoker Burn and the Green-road, Form, etc., from Mr. W. M. Aston, the trustees' engineer, 15, Robertson-street, Glasgow. Sealed tenders, marked "Tender for Yoker Burn Culvert," to be lodged with Mr. T. B. Mackenzie, General Manager and Secretary, 16, Robertson-street, Glasgow, not later than 10 a.m. April 16.

APRIL 18.—NEWCASTLE.—DUNES.—Directors of the Cambrian Railways Company invite tenders for the supply and delivery at Town by the Cambrian Railways route of about 25 tons of steelwork in plate girders. Particulars on application at the engineer's office, Oswestry. Sealed tenders, endorsed "Steelwork," to be sent to Mr. C. S. Dennis, Secretary, Oswestry, so as to reach him at the Company's office, Oswestry, not later than 9 a.m. on April 18.

APRIL 23.—BAMFORD.—FILTERS.—Derwent Valley Water Board invite tenders for the construction of the Bamford Filters and the treatment to Grindelford of the section of the Derwent aqueduct, in the county of Derby. The work will comprise:—Reneching filters, 3,500 sq. yds.; sand filters, 21,000 sq. yds.; cut and

cover, 7 mls.; 45-in. pinelaying, 73 miles, with valve-houses, sluice crossings, etc. Specifications, etc., from Mr. Edward Siddeman, M.I.C.E., Engineer to the Board, or Mr. O. B. Steward, Clerk to the Board, Bamford, near Sheffield, on payment of five guineas, to be delivered not later than nine o'clock on April 23.

APRIL 23.—BLACKBURN.—SEWAGE PUMPING STATION.—Sewage pumping station at Witton Eyes for the Blackburn Corporation. Forms, etc., may be obtained from the Borough Engineer, Town Hall, Blackburn, at the office of Mr. William Stubbs, Borough and Water Engineer, Municipal Offices, Blackburn. Sealed tenders, properly endorsed, to be delivered at the Borough Engineer's office, by 12 noon on April 23.

* May 8.—DEPTFORD.—CONSTRUCTION OF FOOTBRIDGE FOR DEPTFORD BOROUGH COUNCIL.—Drawings and specifications to be seen at the Borough Surveyor's office, Town Hall, Deptford, after April 23. Bills of quantities, on payment of 1l. deposit, to the Town Clerk, to whom names should be sent by April 17, and tenders by 4 p.m. May 3.

May 15.—RIVERS, LAKES.—WATERWORKS.—The Corporation invite tenders for:—Contract No. 1, supplying and fixing slow-speed steam engine (surface condensing, horizontal or cross compound horizontal), pumps, condensers, and necessary alterations to existing steam pipes, delivery mains, etc.; contract No. 2, sinking and lining an 8-ft. diameter well; contract No. 3, supplying and fixing one 24 ft. by 6 ft. 6 in. cast-iron boiler and a 4-hp. economiser, with all the necessary settings, chambers, and alterations to existing flues; contract No. 4, supplying and fixing a cast-iron tank, 13 ft. by 9 ft. by 4 ft. 6 in.; and No. 5, alterations to engine-house and mechanics shop, Forns, etc., from Mr. J. H. Webb, Waterworks Engineer, Town Hall, Deptford, on and after April 17, on receipt of a deposit of 3l. 3s. for contract No. 1, and 1s. each for contracts Nos. 2, 3, 4, and 5. Sealed tenders, endorsed "Tender for Waterworks," to be delivered, enclosed in the official envelope, to Mr. J. J. King, King's Lynn, on or before May 12. TENDERS.—SOCIETATE.—DUST DESTROYER.—Southgate refuse destructor, for the supply and erection of the specification and full particulars may be obtained from Mr. C. G. Lawson, C.E., Surveyor to the Council, on depositing a Bank of England note for 5l. with him. Sealed tenders, endorsed "Tender for Refuse Destructor," must reach Mr. J. J. King, Clerk to the Council, Council Offices, Palace Green, London, N., not later than Saturday, June 2 next.

LIGHTING, HEATING, ETC.

APRIL 9.—BANGOR.—ELECTRIC LIGHTING OF FOUR HOMES FOR ACUTE CASES, HOSPITAL, NURSES' HOME, AND OFFICES FOR EDINBURGH DISTRICT LUNACY BOARD.—Specifications for Edinburgh District Lunacy Board, Hiplyte J. Blanc, R.S.A., architect, 10, West-square, Edinburgh. Offers must be lodged with Mr. James Kyd, Clerk, Edinburgh District Lunacy Board, Castle-terrace, Edinburgh, not later than 10 a.m. of Monday, April 9.

APRIL 10.—BRISTOL.—ELECTRIC LIGHTING.—Bristol Dock's Committee invite tenders for the electric lighting of the Tobacco Warehouse at Cumberland Basin, Bristol, and the maintenance of a deposit of three months after completion. Forms, on proforma Committee showing that the Secretary of the Docks has been paid a deposit of 100 l. in advance, to be sent to the Engineer's office, Cumberland-road, Bristol. The tenders, endorsed "Tender for Electric Lighting, Bristol," and addressed to the Secretary of the Docks Committee, 15, Queen-square, Bristol, must be delivered to him before 10 a.m. on April 13.

APRIL 12.—WITHINGTON.—ELECTRIC LIGHTING.—Electric lighting of workhouse and hospitals at Withington, for Chorlton Guardians. Specifications, etc., from Mr. G. Peck, A.M.I.E.E., 16, John Dalton-street, Manchester, upon payment of a deposit of three guineas. Tenders not later than 9 a.m. on April 12. Plans, etc., at the office of Mr. J. H. James, Clerk to the Guardians Union Offices, All Saints, Manchester.

MISCELLANEOUS.

APRIL 9.—LONDONDERRY.—FENCING.—Londonderry and Dinas Powis R.D.C. invite tenders for 353 lin. yds. of sheet iron fencing, 6 ft. 6 in. high, with wrought-iron angles. Specifications at office of Mr. J. H. James, Clerk, Park House, Cardiff, by noon on April 9.

APRIL 10.—LEEDS.—BROOMS, ETC.—Sanitary Commission invite tenders for supply of brooms and brushes. Forms of application to Mr. J. J. Hann, Superintendent, Dock-street Depot. Tenders, properly endorsed, to be sent to Mr. Robert E. Fox, Town Clerk, not later than April 12.

APRIL 10.—WARRINGTON.—EARTHENWARE DUCTS, ETC.—The Electricity and Tramways Committee of supply of slacks; (2) one year samples of earthenware ducts or bunks as required. An alternative tender may also be sent in for slacks delivered at quantity required daily is 20 tons. The earthenware system of ducting for the Corporation's drawing-in Mathias, A.M.I.E.E., Borough Electrical and Tramways Engineer, Howley, Warrington, on payment of one guinea. Tenders, endorsed "Tender for Slacks of Ducts," to be sent to Mr. J. H. James, Clerk to the Chairman of the Electricity and Tramways Committee, Town Hall, Warrington, not later than 12 o'clock noon on April 10, addressed to the Chairman of the Electricity and Tramways Committee.

APRIL 13.—HANDSWORTH.—FURNISHER.—The Education Committee invite tenders for the furnishing of a school at Rookney-road, Handsworth, in accordance with plans and details prepared by their architects (Messrs. Wood & Kendrick, of High-street,

West Bromwich, and Colmore-row, Birmingham) Forms, etc., on or before April 13, at the offices of the architects, High-street, West Bromwich. A deposit of one guinea must be forwarded with the application.

APRIL 13.—HELSTON.—STEAM ROLLER, ETC.—HELSTON R.D.C. invite tenders for the supply of the following:—(1) One 10-hp. compound steam road roller (convertible into a traction engine if required, but the Council do not now invite tenders for traction wheels), with all necessary tools, together with a winding drum and wire rope. (2) A road scarifier, such as would be usually affixed to a 35-hp. roller, as aforesaid; (3) a portable stone crusher, with all necessary belts and tools. Parties tendering for the supply of this machine should quote for machines of the following size at the mouth, viz.:—10 in. by 9 in., 14 in. by 8 in., 12 in. by 8 in., and should also give the weight of each machine, the width of wheels of which should not be less than 6 in.; (4) a water cart, to contain about 200 gals.; (5) a travelling living van for two men, complete with all necessary fittings for immediate use. Tenders should be sent to Mr. A. F. Ratcliff, Clerk to the Council, Helston, not later than the 13th inst.

APRIL 14.—LEITH.—BEATERS.—The Commissioners for the Harbour and Docks of Leith invite tenders for the rendering of the following:—(1) Leith Lower-placed, Whit Sunday, 1906, of the sheds, warehouses, offices, and other buildings at the Harbour and Docks. Particulars on application at the office of the Superintendent, Mr. Peter Whyte, M.P., Leith, Leith, Leith, Tenders to be lodged with Mr. Victor Leith, Leith, Leith, Leith, on and after April 14. (2) Mr. Victor Leith, Leith, Leith, Leith, on and after April 14.

* APRIL 18.—BRENTWOOD.—THE BRENTWOOD BATH AT BRENTWOOD FOR THE HACKNEY UNION.—Specifications, conditions, and forms of Mr. F. R. Coles, Clerk to the Hackney Union, to be sent to the Town Clerk, Leith, Leith, Leith, Leith, on and after April 9, to whom sealed tenders, endorsed "Repairing the Bath, Leith, Leith, Leith, Leith," should be sent by 2 p.m. April 15.

APRIL 18.—GLASGOW.—JOBING WORKS, ETC.—The Corporation invite lists of prices for the undermentioned jobbing work and supply of the following articles and materials during the year from June 1 next to the end of the year:—(1) painter work, (2) mason work, (3) plumber and joiner work, (4) ironmongery, (5) timber, (6) glass, (7) lime and cement, and (8) paints and oils, etc. Forms, etc., may be obtained at the office of Mr. W. C. Menzies, the Manager, 22, King-street, Leith, Leith, Leith, Leith, on and after April 9, to whom sealed tenders, marked "City Improvements Department: Offer for Jobbing Work, etc.," must be lodged with the Superintendent on or before April 18.

PAINTING.

APRIL 9.—MANCHESTER.—PAINTING.—The Paving, Sewering, and Highways Committee invite tenders for painting various bridges over the Rochdale and Chorlton canals. Specification and form at the City Surveyor's office, Room 11, Manchester, on payment of 1l. deposit. Tenders, enclosed in the official envelope and addressed to the Chairman of the City Surveyor's office, not later than 10 a.m. on Monday, April 9.

APRIL 10.—CLEVEDEON.—PAINTING.—North Brirley Joint Hospital Board invite tenders for the painting of the exterior of their hospital buildings and premises situate in Oakenshaw-road, Clevedon, also for a considerable amount of painting work, inside. Specifications, etc., on application to Mr. W. H. Clough, Clerk to the Board, Town Hall, Clevedon, to whom tenders, endorsed "Tenders for Painting," are to be sent not later than April 10.

APRIL 11.—BENNETT.—PAINTING.—Painting, etc., at the Workhouse, Town Hall, Clevedon. Specifications, etc., upon application to the Master, Workhouse, marked externally "Painting, etc.," to be sent to Mr. Albert James, Clerk to the Guardians, 15, High Park-street, Clevedon, not later than April 11.

APRIL 11.—WAVERTON.—PAINTING.—Totteth Park Guardians invite tenders for painting, etc., at their Children's Home at Church-road, Wavertree, according to specification to be shown at a deposit of one guinea on application to the Superintendent. Tenders, marked externally "Painting, etc.," to be sent to Mr. R. B. James, Clerk to the Guardians, 15, High Park-street, Liverpool, on or before April 11.

APRIL 12.—MANCHESTER.—PAINTING.—Manchester Education Committee invite tenders for the cleaning, painting, and decorating of the Municipal School of Art, Cavendish-street, Manchester. Specifications may be obtained at the Municipal School of Technology, Sackville-street, Manchester, on a deposit of 1l. 1s. Tenders, addressed to the Chairman of the Education Committee, Manchester, 15, High Park-street, Manchester, not later than April 12.

APRIL 12.—PONTYPRIDD.—PAINTING.—Painting and decorating, Wilton-road, Pontypridd, for the trustees. Specification may be seen with Rev. W. Lewis, The Grove, Pontypridd, and sealed tenders to be delivered to Mr. R. A. Lewis, Lloyd's Bank, Pontypridd, on or before noon of April 12 next.

APRIL 15.—DUBLIN.—PAINTING, ETC.—Painting, decorating, Wilton-road, Pontypridd, for the trustees. Specification may be seen with Rev. W. Lewis, The Grove, Pontypridd, and sealed tenders to be delivered to Mr. R. A. Lewis, Lloyd's Bank, Pontypridd, on or before noon of April 15 next.

APRIL 20.—VOLVERHAMPTON.—VOLVERHAMPTON EDUCATION COMMITTEE invite tenders for (1) painting of schools; (2) installing heating apparatus, Wilton-road, Pontypridd, in connexion with the installation of heating apparatus, Wilton-road School; (4) asphalted work roads; (5) furniture for new classrooms. Estimates and tenders for installing hot-water apparatus at Wilton-road School, are requested to send in their names to Mr. Horatio Authority, Town Clerk and Clerk to the Education Committee, 15, High Park-street, Manchester, not later than Tuesday, April 10. Particulars on application may be obtained on application to Mr. T. H. F. Fennell, Architect to the Committee, 10, Queen-square,

Wolverhampton. Tenders, addressed to the "Chairmen of the Public Health and Purposes Sub-Committee, Education Offices, Town Hall, Wolverhampton," must be received not later than April 30.

RAILWAYS.

APRIL 24.—**RYTON.—RUEVA.**—The Directors of the Stockport, Collyer, Ltd., Hereford, Ryton, & North Tyne, desire tenders for the construction of a line of railway, about 1 mile 6 fur., in length, from Stargate to Greenside, in the parish of Ryton, in the county of Durham, the permanent way material being supplied by the contractor. On payment of 3s. 3c. forms, etc., may be obtained at the offices of Mr. T. W. Brackett, C.E., 40, Grey-street, Newcastle-on-Tyne. Sealed tenders, endorsed "Tender for Stargate and Greenside Railway," addressed to Mr. F. R. Simpson, Hedgedale, Blaydon-on-Tyne, must be delivered before 10 a.m. on April 24.

ROADS, SANITARY AND WATER WORKS.

APRIL 9.—**DROITWICH.—DRAINAGE WORKS.**—Drainage and other works to be executed at the sewage farm, for the Corporation, Plans, etc., at the Borough Engineer's office, 11, Grosvenor-street, 11, 1s. will be required for the quantities. Tenders must be on the Council's form of tender, sealed, and endorsed "Sewage Farm Drainage," to Mr. S. J. Tombs, Town Clerk, Town Hall, Droitwich, by 12 noon on April 9.

APRIL 9.—**HALTWH.—IMPROVEMENTS.**—The Highways Committee of the Halifax Corporation invite tenders for the execution of private improvement works in Ashbourne-grove and adjoining Back and Cross-streets. Forms, etc., on application to Mr. James Lord, C.E., Borough Engineer, Town Hall, Halifax, Tenders, sealed, and endorsed "Ashbourne-grove," to Mr. Keighley Walton, Town Clerk, on or before April 9.

APRIL 9.—**MOLLY.—SEWER.**—Laying about 150 yds. of 9-in. diameter pipe sewer in the main line, for the Highways Committee. Plans, etc., on application at the office of Mr. W. E. Putnam, Borough Engineer and Surveyor, Town Hall, Halifax, Tenders, sealed, and endorsed "Reinforced Sewer," to be delivered at the Town Clerk's office, Town Hall, Morley, by noon on April 9.

APRIL 9.—**STANHOPE.—ROADWAY.**—Roadway and other work in Stanhope. Plans, etc., on application to Mr. G. W. Egglestone, Stanhope. Sealed tenders, marked on the outside "Graham-street," to Mr. F. H. Thompson, solicitor, Stanhope, on behalf of the owners, by April 9.

APRIL 9.—**YARDLEY.—DRAINAGE.**—Yardley Rural District Council invite tenders for the provision and construction of the following surface water sewers, viz.:—22 yds., or thereabouts, of 24-in. pipe sewer; 130 yds., or thereabouts, of 21-in. pipe sewer; 260 yds., or thereabouts, of 18-in. pipe sewer; 231 yds., or thereabouts, of 15-in. pipe sewer; 183 yds., or thereabouts, of 12-in. pipe sewer; 480 yds., or thereabouts, of 9-in. pipe sewer; also of the following foul-water sewers:—480 yds., or thereabouts, of 15-in. pipe sewer; 285 yds., or thereabouts, of 12-in. pipe sewer; together with gullies, lamp-holes, flushing shafts, and other works appertaining thereto. Drawings, etc., may be seen on application to the Engineer and Surveyor, Mr. Arthur W. Smith, at the Council House, Sparkhill, near Birmingham. Forms, etc., can be obtained on payment of three guineas to Mr. F. L. Thompson, Clerk of the Council, The Council House, Sparkhill, near Birmingham. Sealed tenders, endorsed "Hay Mills Drainage Works," to be addressed and delivered to the Clerk not later than noon on Monday, April 9.

APRIL 10.—**BANGOR.—WIDENING.**—Bangor U.D.C. invite tenders for the widening of Abbey-street, Bangor, according to plan and specification prepared by Mr. C. E. Taylor, Surveyor. Plans and specification at office of Mr. J. Milliken, Clerk of the Council, Town Hall, Bangor. Tenders will be received till 12 o'clock noon, April 10.

APRIL 10.—**BEDFORD.—SEWERS.**—The Corporation invite tenders for laying about 176 lin. yds. of 12-in. and 750 lin. yds. of 9-in. pipe sewers in Kimbleton-road and district, together with the construction of manholes and lamp-holes, etc. Particulars from N. Greenhalgh, A.M.I.S.E.C.E., Borough Engineer, Bedford, Tenders, sealed, and endorsed "Tenders for Sewers," and addressed to the Chairman of the Streets and Buildings Committee, to be delivered at the Borough Engineer's Office, Town Hall, Bedford, by 12 noon, April 10.

APRIL 10.—**NORTH SHIELDS.—PAVING.**—Excavating, laying concrete foundation, and paving with Whitt stone sets and granite sets in Tynewood-road, North Shields. Sealed tenders, endorsed "Tenders for Paving," to be delivered at the Borough Engineer's Office, Town Hall, Bedford, by 12 noon, April 10.

APRIL 10.—**PAISLEY.—SANITARY FITTINGS.**—The Town Council invite offers for sanitary fittings for a public conveniences at the West End Cross. Plans, etc., obtained at the Master of Works Office, 15, Church-street. Sealed offers, marked "Tender for Sanitary Fittings at West End Cross," to be lodged with Mr. F. Martin, Town Clerk, Municipal Buildings, Paisley, not later than 10 a.m., Tuesday, April 10.

APRIL 11.—**CHURCH STREET.—DRAINAGE WORKS.** etc., at the Workhouse, Church Street, for the Guardians. Plans and specifications for the Workhouse Church-street. Sealed offers, marked "Tenders for Sanitary Fittings at West End Cross," to be lodged with Mr. F. Martin, Town Clerk, Municipal Buildings, Paisley, not later than 10 a.m., Tuesday, April 10.

"Tender for Drainage." The contractors to take their own quantities.

APRIL 11.—**PORTH.—WIDENING.**—Rhonda Urban District Council invite tenders for widening and improvement of Tynewydd Hill, Porth, Forms, etc., at the Public Office, Porth, on deposit of the sum of 1l. 1s. Sealed tenders, endorsed "Tynewydd Hill," must be delivered by April 11, and addressed to the Chairman of the Council, Council Offices, Porth.

APRIL 12.—**CASTLEFORD.—STREET WORKS.**—Improvement in Smawthorpe-lane (back), Ambler-street, Richmond-street (back and front), for the U.D.C. Specifications, prepared by the Surveyor (Mr. William Green) to the Council, at whose office the same can be seen. Sealed tenders, endorsed "Street Improvements," to be sent to Mr. H. H. Brouniet, Clerk to the Council, Council Offices, Castleford, not later than 12 noon Thursday, April 12.

APRIL 12.—**COWPEN.—ROADS.**—Cowpen U.D.C. invite tenders for providing and laying about 1103 lin. yds. of Whinstone or granite kerb in Morph-road, from Kitty Brewer to Cowpen-row, within their district. Form, etc., at the offices of Robert Grievs, Surveyor to the Council, South-street, Waterloo, Blyth. Tenders, endorsed "Tender for Kerbing," not later than 4 p.m. on April 12.

APRIL 12.—**LIVERSEDGE.—ROAD WORKS.**—Kerbing, flagging, and paving on concrete bed (5,700 sq. yds.) required to be done on the Leeds and Whitehall-road, and the Birstall and Huddersfield-road for the U.D.C. Plans, etc., from Mr. Frank Langley, Borough Engineer, Surveyor to the Council, Liversedge, and, on April 12, sealed tenders, endorsed "Tender for Main Road Paving," are to be delivered to Mr. Thos. Mitchell, Solicitor and Clerk to the Council, Council Offices, Liversedge, not later than 4 o'clock p.m. Deposit of two guineas.

APRIL 14.—**LEITH.—CASEWAY.**—Commissioners for the Harbour and Docks of Leith invite tenders for laying caseway required on the quays of Leith Harbour, at Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. Plans, etc., at the office of the Superintendent, Tower-place, Leith. Tenders to Mr. Victor A. Noel Paton, W.C. Clerk to the Commissioners, on or before April 14.

APRIL 15.—**MOTHERWELL.—SEWERS.**—Town Council invite tenders for 275 lin. yds. of 18-in. fireclay pipes, and about 1,480 lin. yds. of 15-in. fireclay pipes, together with the construction of the necessary manholes, etc. Drawings, etc., at the Borough Engineer's Office, Town Hall, Motherwell, where copies of the Schedule may be had, on payment of 10s. Sealed tenders, marked "Outfall Sewer to Toadale Burn," must be lodged with Mr. James McCallum, Engineer, Town Hall, Motherwell, not later than noon, April 15.

APRIL 18.—**BRADFORD.—PAVING.**—Bradford Corporation invite tenders for paving, flagging, etc., of portion of Flockstone-street, from Gladstone-street to Amberley-street, Back-road on the north side of Flockstone-street, and the Back-road adjoining houses numbered 111 and 113, Flockstone-street. Forms, etc., at the City Surveyor's Office, Town Hall, Bradford. Separate tenders for each street, endorsed with the name of the street, and marked "Tender for Private Street Works," to Mr. Frederick Stevens, Town Clerk, Town Hall, Bradford, by April 18.

APRIL 18.—**SHILDON.—ROADS.**—For excavating, leveling, paving, metalling, channelling, etc., of All Saints-road, Bouch-street, and Back Bouch-street (from St. Charles-street to Charles-street), the Shildon and East Thicket U.D.C. Plans, etc., on application to the surveyor, Mr. M. Turanull, Shildon. Separate tenders, properly endorsed, to be sent to Mr. J. T. Pomeroy, Clerk, Coanons Offices, Shildon, by April 18.

APRIL 18.—**STOCKLIEGH.—WIDENING.**—Widening of a portion of the main road from Crediton to Galburry in the parish of Stocklief, Pomeroy, at the Crediton R.D.C. Mr. S. Pridham, surveyor of Cheriton Fitzpaine, from whom all particulars can be obtained. Tenders to Mr. William Pope, Clerk, 31, High-street, Crediton, by April 18.

APRIL 19.—**CONWAY.—ROADS.**—Foundations, Drainage, Ryton, and Whickham Joint Hospital Council invite tenders for the foundations, plumbing, drainage, etc., in connexion with the enlargement of the Galvanised Isolation Hospital at Normans Ridling. Forms, etc., from Mr. J. E. Renton, Council Offices, Whickham, R.S.O., upon payment of 1l. Sealed tenders, endorsed "Tender for Foundations," to Mr. Henry Dutton, Clerk, Blaydon-on-Tyne, by April 19.

APRIL 20.—**PRESTON.—STREET WORKS.**—Leveling, paving, flagging, channelling, and making road Great Towley-street, Donald-street, Cave-street, Redmans-street, Samuel-street, Lowndes-street, and Emmannel-street, for the Corporation. Forms, etc., at the office of the Borough Surveyor, Town Hall, Preston, to whom sealed tenders, endorsed "Tender for Paving, etc.," must be delivered by 12 noon on April 20.

APRIL 21.—**CONWAY.—ROAD WORKS.**—Making up of Marine-avenue, Dock-road, for Corporation. Forms, etc., from Mr. E. A. Delamotte, Borough Engineer and Surveyor, Town Hall, Conway, upon payment of a deposit of 1l. Sealed tenders, endorsed "Tenders for Marine-avenue and Dock-road," to Mr. P. E. Perry, Town Clerk, Castle-street, Conway, by April 21.

APRIL 21.—**HARBOROUGH.—THE HILL.—STREET WORKS.**—The U.D.C. invite tenders for the making up of the following private streets, viz.:—Burton-road (part 2), Yancher-road (part 2), Merivale-road, Bowen-road, Heath-road, Alma-road, Alma-crescent, Waldron-way. Forms, etc., obtained from Mr. J. Percy Bennett, Engineer and Surveyor to the Council, on deposit of 5s. Bank of England note. Sealed tenders, endorsed "Private Street Works," to reach Mr. John Strachan, Clerk to the Council, on or before April 21.

APRIL 25.—**LONDON.—DESTROYING AND FILLING IN.**—Disused Sewer in FINSBURY-PARKWAY (BETWEEN LONDON-WALL AND WEST-STREET) FOR THE CORPORATION OF LONDON.—Specifications can be seen at office of tenders may be obtained. Tenders to be addressed

"Town Clerk, Public Health Department," and delivered at office of the Hallkeeper, Guildhall, E.C., between 12.30 and 1.30 p.m., April 23.

APRIL 23.—**LONDON.—PAVING WORKS IN ASPHALT.**—WYON AND STONE FOR THE CORPORATION OF LONDON.—Specifications can be seen at office of Engineer to the Corporation, where forms of tender may be obtained. Tenders to be addressed to Town Clerk, Public Health Department, and delivered at office of the Hallkeeper, Guildhall, E.C., between 12.30 and 1.30 p.m., April 23.

APRIL 23.—**STANLEY.—STREET WORKS.**—Stanley U.D.C. invite tenders, by schedule of prices, for the execution of the works to be carried out in the formation of several private streets at South Moor. Plans, etc., seen at, and forms from, Mr. Jos. Routledge, Surveyor, Council Offices, Stanley, on the 11th, 16th, and 22nd insts. Sealed tenders, endorsed "Street Works," to be sent to Mr. John Geo. Ridley, Clerk to the said Council, Stanley, R.S.O., on or before April 23.

APRIL 25.—**ST. COLUMB.—SEWERS.**—R.D.C. of St. Columb Major invite tenders for the construction of sewers, from 7 in. to 9 in. in diameter, with man-holes, lamp-holes, and other appurtenances, and of certain works in connexion with the preparation of lands for sewage irrigation. The total length of sewer is intended to be about 2,500 yds. Bills of quantities, etc., at the office of the Engineer and Surveyor, Mr. R. Handford Worth, 42, Fore-street, St. Columb Major, Cornwall. Tenders must be delivered at the office of the Clerk, on the 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, and 1st insts. Sealed tenders, endorsed "Tenders for St. Columb Minor Sewerage," and addressed to the Clerk.

APRIL 30.—**CARLISLE.—SEWAGE.**—The Corporation invite tenders for the following works:—Contract No. 1.—The erection and construction of pumping station, sedimentation tanks, filters, etc.; contract No. 2.—centrifugal pumps, motors, etc.; elevators with motors. Parties desiring to submit tenders may inspect the drawings, etc., and obtain specification, bills of quantities, and forms of tender, and other particulars, in the case of contracts Nos. 2 and 3, on Friday, the 6th inst., and in the case of contract No. 1, on Wednesday, the 11th inst., upon application to Mr. Henry S. Marks, M.Inst.C.E., 260, Colchester-street, Carlisle. Sealed tenders, endorsed "Tenders for Sewage Works," not later than 10 a.m. on April 30.

MAY 2.—**HAYES.—SEWERAGE WORKS.**—The U.D.C. invite tenders for the construction of 312 lin. yds. of 12 in. diameter and 156 lin. yds. of 9 in. diameter cast-iron pipe sewers, and 953 lin. yds. of 9 in. diameter glazed stoneware sewers, together with all necessary manholes and other contingent works, to be laid in Wood End-green, Angle-lane, Moran's-lane, and Grango-road, within the said district. Forms, etc., at the Surveyor's office upon the deposit of the sum of 2l. Sealed tenders, endorsed "Tender for Sewers," and addressed to "The Chairman of the Works Committee," to Mr. C. Dudley Lewis, Clerk, Council Offices, Hayes, Middlesex, not later than 4 p.m. on May 2.

STONE, MATERIALS, AND STORES.

APRIL 9.—**AYLESBURY.—GRANITE.**—Aylesbury R.D.C. desire tenders for 1,707 tons of granite and 400 tons of slag for the repair of the roads under their jurisdiction. Forms, etc., from Mr. E. B. Parrott, Clerk to the R.D.C., 1, Bourton-street, Aylesbury, to whom tenders must be delivered by or before 12 o'clock at noon on April 9, and a sample must be forwarded, free of expense, with the tender.

APRIL 9.—**BRIGHTON.—WOOD-PAVING BLOCKS.**—For 30,000 Jarrah wood-paving blocks, 3 in. by 12 in. by 4 in. (actual finished size), delivered at the Harbourside road siding, or the Corporation. Sealed tenders, addressed to Mr. Hugo Talbot, Town Clerk, Town Hall, Brighton, and endorsed "Tender for Jarrah Wood-paving Blocks," must be left at the Town Hall, Brighton, before 10 o'clock, April 9.

APRIL 9.—**LEEDS.—STONE.**—The Highways Committee invite tenders for the supply of Yorkshire flags, kerbs, pavars, and setts, during the year ending March 31, 1907. Forms, etc., at the Highways Office, 155, Kirkstall-road. Samples of the several kinds of material are deposited at the City Engineer's Office, 155, Kirkstall-road, and must be inspected before tenders are sent in. Tenders, endorsed "Tenders for Yorkshire Stone," and addressed to the Highways Committee, must be sent in by the Town Clerk's office not later than noon, April 9.

APRIL 9.—**LONDON.—WOOD PAVING.**—Jarrah, black butt, and other hardwood paving blocks, and of creosoted yellow deal paving blocks, Islington Borough Council. Specifications, etc., from the Borough Engineer, Mr. J. Patten Barber, at the Town Hall, Upper-street, Islington, N. Sealed tenders, endorsed "Tender for Wood Blocks," must be received by Mr. Wm. F. Dewey, Town Clerk, Town Hall, 1 Upper-street, Islington, N., not later than Monday, April 9.

APRIL 10.—**RADSTOCK.—ROAD MATERIAL.**—The U.D.C. of Radstock invite tenders for the supply of about 1,350 yds. cube of limestone block, or alternatively for 1,600 tons of blue limestone, broken into cubes 10 to 14 in. across, and 2 1/2 to 3 in. thick, or of about as many quantities (both block and broken) in basalt and granite respectively. Prices to be quoted for delivery either upon the various roads within the said district, or at the G. W. and D. Railway Stations, Radstock. Tenders are further invited for the supply of team labour for general hauling and streets watering. Forms of tender may be obtained from the Council's Surveyor, Mr. G. H. Gibson, Radstock, Bath, to whom tenders, sealed and endorsed, should be sent so as to reach him not later than April 10.

APRIL 10.—SOUTHAMPTON.—STORES.—The Corporation invite tenders for the supply of stores, etc., required in the Borough Engineer's Department during a period of twelve months. Specification and form of tender may be obtained upon application to Mr. J. A. Crowther, Borough Engineer, Tenders, endorsed "Tender for Stores," must be delivered at the Town Clerk's office before 2 p.m. on April 10.

APRIL 10.—WHICKHAM.—ROAD MATERIAL.—Whickham U.D.C. invite tenders at a price per ton, free on rail at the nearest station, to quarries for the supply of broken flint, limestone, and hand-broken Whinstone for the half-year ending September 29, 1906. Sealed tenders, endorsed "Tenders for Road Metal," to be delivered to Mr. Thomas Lambert, solicitor, Clerk to the Whickham U.D.C., Town Hall, Gateshead, not later than 12 o'clock noon on April 10, Forms from Clerk.

APRIL 11.—HORSHAM.—STONE.—Horsham R.D.C. invite tenders for the supply of granite R.D.C. invite tenders for the supply of granite (total, about 7,000 cubic yds.), delivered to the various railway stations in their district. Also for cartage of materials from railway stations to the roadsides. Form of tender to be obtained of the surveyor, Mr. Wm. Dengate, 58, Park-street, Horsham, to whom pre-paid samples must be sent. Tenders, marked "Highways Tender," to reach Mr. A. C. Coole, Clerk to the Council, 9, Carfax, Horsham, on or before April 11.

APRIL 11.—MANCHESTER.—MATERIALS.—Cleansing Committee of Manchester Corporation invite tenders for twelve months' supply of coal, also quantity of post and rail fencing, and 47 tons of 30-lb. steel rails, turnouts, crossings, etc., and 2,374 crossties from Mr. Robert Williamson, Superintendent of the Cleansing Department, Town Hall, Manchester. Tenders by 5 o'clock on Wednesday, April 11.

APRIL 11.—ST. AUSTELL.—DRAIN PIPES.—Socket drain pipes in such quantities and at such times as may be required by the surveyors of the Council up to March 31, 1907, for the St. Austell R.D.C. Each tender must state the net price for first and second qualities of 4 in., 6 in., 9 in., and 12 in. pipes of 2 ft. lengths respectively, delivered carriage paid at Par or St. Austell Railway Stations. The Council do not require less than a 4-ton truck load to be offered

at any one time. Particulars of Mr. A. J. Blight, highway surveyor, Trelowth, St. Austell, and sealed tenders, marked "Tenders for Pipes," must be sent to Mr. John Stephens, Clerk, St. Austell, by April 11.

APRIL 12.—DEVONPORT.—STORES.—The Corporation invite tenders for the supply of general stores for a period of twelve months. Particulars and form of tender at the office of the Borough Electrical Engineer, Newport-street, East Stonehouse, Tenders, sealed and endorsed "Tender for Electricity Stores," to Mr. R. J. Fittall, Town Clerk, Devonport, on or before noon, April 12.

APRIL 12.—GRAVESEND.—ROAD MATERIALS.—The Corporation invite tenders for the supply of the following road materials, etc.—Basalt or Penlee Elvan stone; Cherbourg quartzite; best pressed Staffordshire blue bricks; Penmanmawr granite; Keulish ragstone chippings. Forms, etc., may be obtained on application at the office of the Borough Surveyor, Mr. F. T. Grant, Town Hall, Gravesend. Sealed tenders, endorsed "Tender for the Supply of—" must be delivered at office of Mr. H. H. Brown, Town Clerk, not later than April 12, with samples of the materials.

APRIL 12.—WEST SUFFOLK C.C.—GRANITE.—Particulars and form of tender on application to A. Ainsworth Hunt, County Surveyor, Sudbury, Suffolk. Tenders on or before April 12. APRIL 14.—LEITH.—TIMBER, ETC.—Commissioners for the Harbour and Docks of Leith invite tenders for the supply of timber, iron, and stores required by them from May 1, 1906, to May 1, 1907. Particulars from the Superintendent, Tower-place, Leith. Tenders to be lodged with Mr. Victor Neel Paton, W.S., Clerk to the Commission, 31, Melville-street, Edinburgh, on or before April 14.

APRIL 14.—RUSKINGTON.—MATERIALS.—For supply of granite, slag, and ironstone to Ruskington Station (carriage free) during the season, for the Ruskington U.D.C. Forms may be had on application to Mr. Ernest H. Godson, Clerk, Sleaford. Tenders, with samples, stating price per ton, to be sent to Mr. J. E. Trafford, surveyor, Ruskington, by April 14.

APRIL 14.—SUTTON BRIDGE.—ROAD MATERIAL.—Sutton Bridge U.D.C. invite tenders for the supply of road materials as follows:—XX granite, 292 tons; X

granite, 81 tons; 13-in. slag tailings, 195 tons; granite chips, 40 tons; paving sand, 20 tons; shingle, 170 yds.; 14-in. ballast, 82 tons; Wansford stone, 60 yds.; Tenders, marked "Tenders for Road Metal," to be sent to Mr. Leopold C. Harvey, Clerk to the Council, Holbeach, on or before April 14. Samples may be addressed "The Surveyor, Old-tells Hall, Sutton Bridge."

APRIL 15.—HOUGHTON-LE-SPRING.—SLAG.—Houghton-le-Spring R.D.C. invite tenders for machine-broken blast-furnace slag and slag riddlings. Full particulars from the Surveyor of the Council, Mr. B. Ralfour, M.Inst.C.E., Houghton-le-Spring, R.S.O. Sealed tenders, addressed to the Chairman of the Highways Committee, R.D.C. Offices, Houghton-le-Spring, R.S.O., endorsed "Tenders for Road Material," to be sent not later than 10 a.m., April 19.

APRIL 19.—RUTLAND.—ROAD MATERIAL.—Rutland C.C. invite tenders for about 700 tons (more or less) of broken granite, granite chippings, screenings, to be delivered free at various railway stations, from May to November next. Also for team labour for the delivery of the granite from the various railway stations to the main roads within the above-mentioned district. Forms, etc., from Mr. B. A. Adam, Clerk of the Council, Oakham, Tenders, endorsed "Tender for Road Materials" or "Tender for Team Labour," by April 19.

APRIL 24.—CHESTNUT.—CLINKER.—The U.D.C. invite tenders for hard, clean, destructor clinker, equal to a sample to be approved by the Council's Surveyor, to be delivered in truck loads to Waltham Cross Station, G. B. Railway. The quantity required is about 2,500 tons to be delivered within six months at a rate not to exceed 100 tons per week. Sealed tenders, endorsed "Clinker," and addressed Chairman, Chestnut, U.D.C., Manor House, Waltham Cross, to be delivered on or before 4 p.m., Tuesday, April 24.

APRIL 25.—DEBOROUGH.—GRANITE.—Deborough U.D.C. invite tenders for the supply of about 500 tons of granite, delivered at Deborough Station, Midland Railway. Forms of tender may be had on application to Mr. D. J. Diver, Surveyor, to whom samples are to be sent on or before April 24, endorsed "Tenders for Granite."

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*SUPERINTENDENT OF INDUSTRIAL TRAINING	Metropolitan Asylums Board	150l.	April 15
*CLERK OF WORKS	Tottenham Education Com.	3l. 3s. per week	do.

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*BUILDING MATERIALS—At 22 and 23, Grosvenor-square, W.	White, Berry, & Taylor	April 10
*WOODWORK, MACHINERY, ST. LEGNARDS-ON-SEA.—On premises, Bordon Camp, Hants	Dawson & Harden	April 11
*BLACKWORKS AND BUILDINGS AS GOING CONCERN	B. C. S. Evenden	April 18
*CONCRETE SLAB-MAKING PLANT, ETC.—Thatched House Hotel, Manchester	S. Walker & Son	April 20
*CORNER FREEHOLD BUILDING SITE, BULFETT ROAD—At the Mart	Edward Rushton, Son, & Kenyon	April 24
*FREEHOLD BUILDING SITE, WANDSWORTH ROAD, S.W.—At the Mart	Fuller, Horsey, Sons, & Cassell	April 25
*FREEHOLD BUILDING, ALDERSHOT LODGE, ALDERSHOT	Fuller, Horsey, Sons, & Cassell	do.
*BUILDING LAND, VINEYARDS, GREENHOUSES, ETC., POTTERS BAR.—At the Mart	Driver, Jones, & Co.	May 8
*REGISTER OF PROPERTIES	Miller, Son, & Co.	May 11
	Fuller, Horsey, Sons, & Cassell	No date
SOME RECENT SALES OF PROPERTY:		
ESTATE EXCHANGE REPORT.		
March 21.—By SIMMONS & SONS		
Nottingham—Bllington-pk., l.g.r. 130s., u.t. 57½ yrs., g.r. 20l.	1,750	
Holloway—38 and 40, Medina-rd., u.t. 55 yrs., g.r. 9l. 10s., y.r. 60l.	580	
Finsbury Park—22, Woodstock-rd., u.t. 61 yrs., g.r. 6l. 10s., y.r. 4l.	280	
37, Lennox-rd., u.t. 55 yrs., g.r. 6l., y.r. 32l.	300	
Acton—1 to 23 (odd), Stanley-gdns., l., w.r. 322l. 16s.	3,000	
By P. W. TALBOT & CO.		
Kenish Town—70, Rhyel-st., u.t. 44 yrs., g.r. 32l., y.r. 30l.	120	
14, Prideswide-pk., u.t. 42 yrs., g.r. 9l. 10s., e.r. 40l.	280	
Hampstead-road—55, Stanhope-st., u.t. 9 yrs., g.r. 6l. 3s., e.r. 52l.	150	
By WORSFOLD & HAYWARD (at Dover)		
Dover, Kent—42, Victoria-st., l., w.r. 14l. 19s., 3 and 4, Norman-st., u.t. 20½ yrs., g.r. 2l., y.r. 45s.	360	
68, Church-rd., l. B.	200	
5, Graville-st., u.t. 50½ yrs., g.r. 1l. 10s., p. 2 and 3, Durban-hill, u.t. 17 yrs., g.r. 2l. 2s., e.r. 31l. 4s.	150	
217, London-rd., l., y.r. 102l. 10s.	340	
March 23.—By W. H. SHINER & WINTER (at Bristol)		
Nailsea, Somerset—Nailsea Court Estate, 104 a. 2 r. 6 p. f. (in loc.)	4,500	
Congresbury, Somerset—A freehold close, 9 a. 2 r. 8 p.	495	
By HARDS & BRADY (at Woolwich)		
Woolwich—Sandwich-st., l.g.r. 18l., reversion in 15 yrs.	2,010	
Greenwich—47, Royal-hill (s.), l., y.r. 30l.	415	
By PERKINS & SOVS (at Eastleigh)		
Eastleigh, Hants—132 to 138 (even), Southampton-rd. (shop, stores, and houses), u.t. 96½ yrs., g.r. 7l. 8s., y.r. 80l. 5s.	945	
By FULLER, MOON, & FULLER (at Croydon)		
Croydon—59 to 77 (odd), Borough-hill, l., w.r. 195l.	11,895	
296, 298, and 300, Whitehorse-rd., l. (s.), y.r. 102l.	1,140	
Morland-rd., four named residences with workshop and land, u.t. 92 yrs., g.r. 10l. 4s., y.r. 124l.	900	
Beddington—Windmill-rd., freehold building land, 4 a. 3 r. 0 p.	1,610	
Conslodon—Victoria-rd., etc., 33 freehold buildings plots (in lots)	1,656	
Mitcham—Commonside-end, "Vine Cottage," c., y.r. 13l.	120	
March 23.—By BLAKE & DANFORTH		
Greenwich—87, 91, 97, and 99, Vanbrugh-hill, and 52, Walton Tree-rd., u.t. 34½ yrs., g.r. 12l. 8s., w.r. 99l. 2s. 9d.	690	
23 to 26, Whitworth-st., u.t. 19½ yrs., g.r. 5l. 14s., w.r. 27l. 16s.	150	
Deptford—51, Brookmill-rd., u.t. 58½ yrs., g.r. 3l., w.r. 22l. 12s.	250	
Finchley—3, Lincoln-rd., l., e.r. 50l.	600	
Streatham—43, Stockfield-rd., l., e.r. 50l.	250	
Southwold, Suffolk—27, Stradbroke-rd., l., y.r. 18l.	250	
By GLEBERT & HOW		
Stroud Green—180, Stroud Green-rd. (s.), u.t. 32½ yrs., g.r. 20l., p.	700	
122 and 124, Fernie Park-rd., u.t. 74½ yrs., g.r. 17l., e.r. 31l.	575	
99, Underwick-rd., u.t. 89 yrs., g.r. 6l. 8s., e.r. 34l.	280	
By J. S. HOLLAND		
Bow—216, Bursell-rd., u.t. 60½ yrs., g.r. 7l., y.r. 45l.	360	
By MONTAGU & ROBINSON		
Clapton—Rushmore-rd., l.g. rents 78l. reversion in 8½ yrs.	1,800	
Notting-hill—37, Basset-rd., u.t. 69 yrs., g.r. 10s., e.r. 120l.	880	
Finsbury—26, Gee-st., and 12, Ludlow-st., l., w.r. 46l. 16s.	545	
Stoke Newington—103 and 105, Bouverie-rd., u.t. 64 yrs., g.r. 11l., y.r. 62l.	2705	
Dalston—48 and 50, Lansdown-rd., u.t. 42½ yrs., g.r. 10l., y.r. 62l.	540	
Poplar—41, St. Leonard's-rd., u.t. 36 yrs., g.r. 2l., w.r. 32l. 10s.	115	
Eastcote, Middx.—1, 2, and 3, Park-cottages, c., w.r. 44l. 4s.	300	
By T. B. WESTCOTT		
St. Pancras—7, Goldington-cres., u.t. 38½ yrs., g.r. 5l., e.r. 45l.	410	
By MADISON, MILLS, & MADISON (at Diss)		
Banham, Norfolk—A freehold farm, 63 a. 2 r. 25 p.	185	
Wintarthing, Norfolk—Two enclosures of land, 11 a. 2 r. 30 p. c.	210	
Wingfield, Suffol.—Two enclosures with cottage, 15 a. 1 r. 36 p.	100	
March 24.—By BRITON, KNOWLES, & CO. (at Gloucester)		
Upleadon, etc., Glos.—"The Hay Farm," 132 a. 1 r. 27 p.	2,075	
Huccote, Glos.—Two enclosures, 17 a. 1 r. 4 p.	810	
March 26.—By ELLIOTT, SON, & BORTON		
Oxford-street—No. 143 (s.), u.t. 35 yrs., g.r. 1 r. 27 p.	7,350	
By MORRAN, BAILES, & CLARK, l.		
New Cross—6, 8, 10, and 12, Camplin-st., u.t. 54½ yrs., g.r. 18l., w.r. 148l. 4s.	1,000	
By FRED. VABLEY & SON		
Finsbury Park—30, Woodberry-g., u.t. 69 yrs., g.r. 12l.	755	
March 27.—By C. RAWLEY, CROSS, & CO.		
Victoria Park—428, Giza-rd., l., w.r. 38l. 16s.	300	
By DEBENHAM, TEWSON, & CO.		
Strand—Burdigh-st., the site of a Church of St. Michael (with the fabric), area 4,450 ft. l.	20,500	
City—Upper Thames-st., l.g.t. 220l., reversion in 51½ yrs.	5,050	

Table of property listings including addresses, owners, and values. Includes entries like 'By C. W. DAVIES & SON', 'City-road-40, Alfred-st., n.t. 204 yrs., gr. 2f., s.t. 50L', and 'By H. H. BULWER', 'Deptford-5, Hoopwell-st., ut. 62 yrs., gr. 4f. 15s., wr. 36L 8s.'.

Table of property listings continuing from the previous page. Includes entries like 'By H. H. BULWER', 'Deptford-5, Hoopwell-st., ut. 62 yrs., gr. 4f. 15s.', and 'By CHEESTERTON & SONS', 'Kennington-93 and 95, Peck-st., l., yr. 50L'.

MEETINGS.

FRIDAY, APRIL 6. Architectural Association.—Mr. E. Greenop on "Valuations, Compensations, and Light and Air," 7.30 p.m. Royal Institution.—Mr. W. Bate Hardy, M.A., F.R.S., on "Physical Basis of Life," 9 p.m.

SATURDAY, APRIL 7. Royal Institution.—Professor J. J. Thomson, M.A., on "The Corpuscular Theory of Matter," VI. 8 p.m. Edinburgh Architectural Association.—Associates' visit to Consland Cement Works. Architects Association.—Sixth spring visit to New Scotland Yard extension, 2 p.m.

MONDAY, APRIL 9. Clerks of Works' Association.—Twenty-fourth annual meeting, Carpenters' Hall, London Wall. Paper by Mr. John Davies.

TUESDAY, APRIL 10. Institution of Civil Engineers.—Messrs. T. E. Stanton; D. Sec. M.Inst.C.E., and L. Bainton on "The Resistance of Iron and Steel to Reversals of Direct Stress," 8 p.m.

WEDNESDAY, APRIL 11. Association of Engineers-in-Charge.—Sir C. S. Forbes, B.Sc., on "The Origin and Progress of Acetylene, and its Adaptability to Various Uses," 7.30 p.m. Architectural Association Discussion Section and Junior Institution of Engineers.—Joint meeting at No. 15, Tufnell-street. Paper by Mr. S. N. Eyslander on "Ferro-Concrete," 7.30 p.m. Edinburgh Architectural Association.—Associates' business meeting, 8 p.m.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 18s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 36s. per annum. Remittances payable to J. MORGAN should be addressed to The Publisher, "The Builder's" Chamber-street, W.C.

PRICES CURRENT OF MATERIALS.

Table listing prices for various materials. Includes sections for BRICKS & C., GLAZED BRICKS, and various types of bricks and tiles. Includes entries like 'Hard Stocks..... £ s. d. 1 7 0 per 1000 alongside, in river.' and 'Best Portland Cement..... 5 3 0 per ton.'

STONE. BATH STONE—delivered on road wag. s. d. gons, Paddington Depot..... 1 6 1/2 per ft. cub.

YORK STONE—Robin Hood Quality. Scappled random blocks. 2 10 in. sawn two sides landings to sizes (under 40 ft. super.)..... 2 3 per ft. super.

SLATES. In. In. 20x10 best blue Bangor £ s. d. per 1000 of 1200 at r. d.

TILES. Best plain red roofing tiles... 42 0 per 1000 at rly. depôt. Hip and Valley tiles... 3 7 per doz.

WOOD. BUILDING WOOD. At per standard. Deals: best 3 in. by 11 in. and 4 in. £ s. d.

JOINERS' WOOD. At per standard. White Sea: Second yellow deals, £ s. d.

LEAD, &c. Per ton, in London & s. d. Lead—Sheet, English, 3lb. and up.

WOOD (continued). JOINERS' WOOD (continued). At per standard. White Sea: Second yellow deals, £ s. d.

Pitch-pine: deal, extra. Under 2 in. thick extra. Yellow Pine—First, regular sizes

JOISTS, GIRDEES, &c. In London, or delivered Railway Vans, per ton. Rolled Steel Joists, ordinary £ s. d.

METALS. Per ton, in London. Iron—Common Bars £ s. d.

Sheet Iron Galvanised, flat, ordinary quality. Ordinary sizes, 6 ft. by 2 ft.

LEAD, &c. Per ton, in London & s. d. Lead—Sheet, English, 3lb. and up.

COPPER. Strong Sheet..... per lb. 0 1 0 Thin..... 0 1 1

LEAD, &c. (continued)—Per ton, in Lon. ton. £ s. d. Bra s—Strong Sheet..... per lb. 0 11

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES. 15 oz. thirds..... 24d. per ft. delivered.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES. Hartley's..... 2d. per ft. delivered.

VARNISHES, &c. Per gallon. Fine Pale Oak Varnish..... £ s. d.

PUBLISHER'S NOTICES.

Nat. Tel., 412, Gerard. Telegrams, "The Builder, London." THE INDEX (with TITLE-PAGE) for VOLUME LXXIX

CHARGES FOR ADVERTISEMENTS. COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER SOCIETIES

SITUATIONS VACANT, PARTNERSHIPS, APPOINTMENTS, SHIPS, TRADE AND GENERAL ADVERTISEMENTS.

PREPAYMENT IS ABSOLUTELY NECESSARY. * Stamps need not be sent, but all sums should be remitted by Postal Order, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to HARRIS' clock p.m. on THURSDAY, but "Classification" is suspended in the case of any which may reach the Office after HARRIS' clock p.m. on this day.

ADVERTISEMENTS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

ADVERTISERS IN "THE BUILDER" may have Replies addressed to the Office, Catherine Street, Covent Garden, W.C., free of charge. Letters will be forwarded if addressed and enclosed are sent, together with sufficient stamps to cover the postage. Unpaid replies will not be returned to the advertiser.

AN EDITION Printed on THIS PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week. READING CASES (By post, carefully packed) 1s.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications...

TENDERS.

* * * Next week communications for insertion under this heading must reach us not later than 10 a.m. on Wednesday, as, owing to the Easter holidays, we go to press a day earlier than usual.

* Denotes accepted. † Denotes provisionally accepted.

AMMANFORD.—For rebuilding the Co-operative Stores at College street, Ammanford, for the Ammanford Co-operative Society, Ltd. Mr. D. Jenkins, Llandoilley, architect. Jones Bros., Tynydd, Ammanford* £300

BEXLEY.—For the erection of a new school at Bexley, East Wickham, for the Kent Education Committee.—Mr. W. R. Wilford H. Robinson, Surveyor to the Committee.—
F. Johnson & Sons £4,238 10 0
R. Kent 4,145 0 0
Enness Bros. 4,090 0 0
J. Chinnam & Sons 3,983 2 10
West Bros. 3,940 0 0
E. J. Strange 3,854 0 0
G. & Sons 3,830 0 0
W. Follock 3,800 0 0
R. O. Foster 3,782 0 0
Richard 3,697 0 0
R. H. Denn & Sons 3,688 0 0
J. Southam 3,677 4 6
J. L. Lonsdale £3,654 0 0
W. M. Patrick 3,591 0 0
J. N. White 3,562 7 6
W. H. Ray 3,549 0 0
Thomas Edge 3,500 0 0
Martin, Wells, & Co. 3,490 0 0
W. A. Stratton 3,469 0 0
G. E. Willis & Sons Ltd. 3,364 0 0
Friday & Ling 3,355 0 0
R. G. O. Foster 3,047 0 0
Richard 3,047 0 0
E. Streather 3,302 0 0
L. J. Gurrick 3,047 0 0
Wellington 3,259 0 0
† Recommended for acceptance.

BRIDGEEND.—For street works, for the Urban District Council, Messrs. W. Williams, Surveyor, Bridgeend.—
W. L. Jones £344 1 8
J. Rhys Jones 300 6 11
Coychurch, W. Jenkins, & Sons 299 17 10
I. C. Hitt & Sons 282 0 3
end* £245 17 5

BROMLEY.—For the erection of four shops, for Messrs. Ansell Bros., in Bromley, Kent. Mr. A. L. Guy, architect.
A. L. Renwick £2,680
Perry Bros. 3,196
Hughes & Co. 3,059
Marrables 3,000
Knight 2,920
Ellis & Co. £2,890
Watt 2,773
Kennard Bros. 2,741
Lewisham* 2,711

BROMPTON.—For the laying of about 415 yds. of 9 in. sanitary pipe sewer, and 110 yds. of 6 in. ditto, together with the construction of the necessary manholes, ventilating shafts, and interception tanks in the village of Brompton, near Northampton, for the Rural District Council, Mr. George Easdale, Surveyor, Northampton Rural District Council, Northampton.—
C. Bushby & Sons £289 0 0
T. Wood & Sons 249 11 4
T. Wroughton 180 0 0
T. Hodgson 218 15 0
W. Wiske* 160 0 0
D. Oakley 194 10 0

BURNHAM (Surrey).—For the erection of two shops and a dwelling house, Victoria-street, for Mr. Samuel Sperring, Mr. Charles Hiscock, architect, Burnham.—
Mears Bros. £674
T. Stockham 642
Gleed Bros. 649
W. Lythan 552

CHELMSFORD.—For new girls' school, Messrs. F. Chinnellor & Wykeham Chinnellor, architects, Chelmsford.—
F. Johnson £7,874
McCormack & Son 7,623
Thomas & Edge 7,422
H. J. McKay 7,531
Holliday & Greenwood 7,431
Hammond & Son 7,422
Central Lofts 7,372
Battley, Sons, & Co. 7,392
Moss & Co. 7,290
J. Gowers 7,160
J. J. Faran 7,029
Shepherd & Co. 7,011
Parnell & Son 6,979
W. T. Madgson £6,974
G. Hodges 6,985
H. R. Ches. 6,929
R. McKay 6,878
Everett & Son 6,875
F. & J. D. Davey 6,827
Potter & Son 6,800
Grimwood & Sons 6,784
Seales & Robins 6,715
Parren & Sons 6,623
H. H. Evans 6,587
Young & Son 6,529
Norwich* 6,472

CHINGFORD.—For sewage purification works (proposed extensions, buildings, etc.) for the Urban District Council. Mr. W. S. Sturges, Engineer, Chingford. Mr. W. Turner Stretcher, engineer, Waltham Abbey.—
J. & T. Bines £2,941 15 0
L. Hewitt & Sons 2,650 0 0
L. J. W. Deau, Ltd. 2,150 0 0
G. G. Rayner £2,335 0 0
W. & G. French 2,300 0 0
Buckhurst-hill* 2,300 0 0

CHINGFORD.—For additions to the Prince Albert public-house, for Messrs. Whitbread & Co. Mr. A. Dixon, architect.—
P. Bull £1,129
G. Elsey 1,060
J. C. Mather 1,044
Whitman & Pothler 993
W. Shurmer & Sons, Ltd. 990

CHIPPENHAM.—For alterations and additions to the Westland schools, Wood-lane, and for new infant's school, for Wiltshire County Council (General Education Committee). Messrs. Silcock & Reay, Architects, 47, Milson-street, Bath.—
Alterations and additions to Westman Council School. Wood-lane.

F. Amery £1,995 9
A. J. Colbourne 1,797 8
Downey & Rudman 2,117 0
Porse & Son 2,498 0
Light & Co. 2,331 0
B. Lizey 2,089 0
Long & Sons 1,777 0
W. R. Moody 2,000 0
W. H. Brown 1,990 0
J. G. Norman 2,163 11
W. Webb 2,015 0
J. G. Rayner £2,456 0 0
W. & G. French 2,456 0 0
Buckhurst-hill* 2,456 0 0
W. Shurmer & Sons, Ltd. 990

CLEETHORPE (Lincs).—For constructing underground conveniences in Sea-road, not including sanitary fittings, for Cleethorpe-with-Thrusdale Urban District Council. Mr. E. Rushton, Engineer and Surveyor, Council House, Cleethorpe.—
R. Taber £1,972 18 0
J. H. Thompson 1,975 0 0
Hewins & Goodland 1,653 0 0
W. Ion 1,646 15 0
Simons & Brown 1,600 6 6
W. G. G. 1,579 7 6
T. Wilkinson 1,488 3 6
Wilkinson & Houghton 1,428 17 3
G. W. Brown, 377, Grimsby-road, Cleethorpe* 1,365 0 0
(Surveyor's estimate £1,490.)

CLIFTON.—For the execution of work in connexion with laying 400 lined yds. of 15-in. intercepting sewer (Doulton's Lambeth stoneware pipe sewer, with patent joints), also taking-up and relaying 108 lined yds. of main sewer in Manchester-road, Clifton, near Manchester, for the Barton-upon-Irwell Rural District Council. Mr. Hooley, C.E., surveyor, Union Office, Patricroft.—
L. Dean & Co., Yorking-street, Manchester* £469 18

COLE.—For making-up of Leicester-road, for the Urban District Council, Hale. Mr. F. E. Boaz, Surveyor.—
W. Lambert & Co. Boyson £1,139 19 0
M. Taylor £1,200 0 0
J. Hamilton & Co. 1,123 0 0
M. Taylor 1,185 12 1
Bettell & Co. 874 16 3
Sale* 874 16 3

HALSTEAD.—For whitening and fencing a portion of Station-road, for Sevenoaks Rural District Council. Mr. R. Bailey, Surveyor, Sundridge, Sevenoaks.—
P. Bowen, Halstead, Sevenoaks* £159 13 0

HIGHAM FERRERS (Northants).—For 2,000 yds. of pipe sewers in the main streets, for the Corporation. Messrs. Sharnam & Archer, Surveyors, Welington.—
Jauber & Son £2,224 9 3
R. Marriot £1,645 0 0
A. E. Palmer 1,656 0 0
F. Barlow 1,612 0 0
Henson & Son 1,571 0 0
Sidons & Freeman 1,770 0 0
Rushton* 1,500 0 0
Goodman & Harrison 1,697 0 0
Murdock 1,665 5 0
Winsor 1,374 0 0
H. Bennett* 1,665 5 0
(Engineers' estimate £1,591 0 0.)

KING'S NORTON.—For the enlargement of King's Norton Union Infirmary, and for a nurses' home at Selly Oak, near Birmingham. Messrs. C. Whitwell & Son, architects, Birmingham.—
W. Bishop £36,777
T. Barnsley & Sons 36,826
T. Loud & Sons 36,000
W. H. Gibbs 33,150
T. A. Cole & Son 36,000
W. Moss & Sons, W. Sapeote & Sons 35,877
T. Bowen & Son 35,690
G. B. Jackson 35,290
J. Dallow 35,658
Accepted subject to the approval of the Local Government Board.

LANGLEY PARK.—For erecting sixteen houses, for Amfield Plain Industrial Co-operative Society. Mr. G. T. Wilson, architect, 22, Durham-road, Blackhill, Co. Durham.—
R. Thompston, Gateshead £2,348

LEYTONSTONE.—For furnishing new Board room and offices at the Urban Workhouse, for the W. Ham Board of Guardians. Mr. J. Williams Dunford, architect, 100, Queen Victoria-street, E.C.—
Shannon Co. £810
J. P. White 565
Waring 800
Parkstone Joinery Co. 842
G. E. Barnes 760
Walker & Sons 750
Lockhart & Sons 627
Shoolbred & Co. 625
Wallace & Co. 709
Hamptons 605
Loyds & Co. 682
J. R. Roberts, Stratford 651
Gouldalls 651
Hewetsons 675
North & Sons 690
Lewis & Co. 675
Fort of England 669
Furthing Co. 573

LEANDRIE.—For building a dwelling-house at Gorsla, Llandobie, for Mr. Thomas Jones, Greenfield House, Gorsla, Llandobie, R.S.O. Mr. David Jenkins, Llandoilley, architect.—
L. Davies, Penygros, Llandobie, R.S.O.* £390

LLANDILO.—For building a pair of semi-detached villas in Clarendon-road, Llandoilley, for Mr. D. Jones Morris Dwyer House, Llandoilley. Mr. David Jenkins, Llandoilley architect.—
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W. R. King 309
L. Kazak 300
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R. Dawson, Ltd. 158 0 0
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British Westinghouse Electric and Manufacturing Co., Ltd. 10,322 15 0
Evered & Co., Ltd. 10,029 18 0
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 D. Davley 630 0 0
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The Builder.

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APRIL 14, 1906.

ILLUSTRATIONS.

Porch, Old Beaupré, Glamorganshire.....	Measured and	Drawn by Mr. W. Eaton, A.R.I.B.A.
Tottenham Town Hall, Fire Station, and Public Baths.....		{ Mr. Arnold S. Taylor, A.R.I.B.A., and
		Mr. R. Jemmett, Joint Architects.
1. General View.		
2. Front of Public Baths Building.		
3. Staircase, Town Hall.		
Shere Church, Surrey.....		From Photographs by S. Yeo.
1. View from South-East.		
2. View from West.		
3. Jamb of Arch, South Aisle.		
4. South Arch under Tower.		

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The Church of Shere.



N the midst of the beautiful and well-wooded Surrey village of Shere, about halfway between Guildford and Dorking, stands the old parish church of

St. James, so dear to artists. The building, apart from its general attractiveness and picturesque surroundings, possesses distinctly interesting and somewhat unusual architectural features, and has emerged comparatively seatless from a recent restoration.

There was a church here at the time of the Domesday Survey, when Shere was in the hands of the King, and the advowson subsequently passed to the successive lords of the manor. In 1243, Roger de Clare, lord of Shere, sold to the abbot and convent of the Cistercian house of Netley, Hants, for 300 marks, the tilled land and pasture which lay between their manor of Gomshall and the highway from Guildford to Dorking, together with the advowson of the church of Shere. Pope Innocent IV., in the following year, sanctioned, under certain restrictions, the appropriation of the church of Shere to the abbey; and at the time of the taxation of 1291 this church was a vicarage, the appropriated rectory being worth the large annual sum of 23*l.* 6*s.* 8*d.* Gomshall Grange, in this parish, was at that time worth 10*l.* a year, a sum considerably in excess of the other granges

of the monks of Netley. They also held 100 acres in Shere manor, and many liberties and privileges, both at Shere and Gomshall (*Vic. County Hist. of Hants, ii.*, 146-7). By the time, however, when the extant episcopal registers of Winchester diocese begin, at the opening of the XIVth century, Shere was a rectory in lay patronage; but how the change was brought about has not been ascertained. Towards the close of the XIVth century the abbey of Netley recovered the patronage, but not the appropriated tithes, and Shere rectory remained in the gift of the abbot and convent until the dissolution of the monasteries.

The church consists of chancel, nave, south aisle (with chapel extension to the east), central tower and spire, short north transept, and south and west porches. The following are the inner measurements:—Length of nave, 42 ft.; of crossing under the tower, 15 ft.; and of chancel, 33 ft.; yielding a total length (including the width of the two tower arches) of 98 ft. The width of the nave is 19 ft., and of the chancel, 20 ft. The length of the south aisle up to the archway into the old south transept is 46 ft., and from that point to the east end of the south chapel of the chancel, 42 ft.

The growth and development of this church can be traced without much difficulty. In all probability the church on this site in pre-Conquest days, in the midst of a well-wooded valley, was of timber: if of stone, it is possible that some of the core of it may be left in the north wall of the nave. This Saxon

church, whatever was its material, sufficed for the use of the inhabitants under the invading Normans until well on in the XIIth century, when a church of some size and importance was erected here in the later Norman style that prevailed in the days of Stephen. The church of this date consisted of nave, central tower, short transepts, and a short chancel, which probably terminated in an apse. Of this Norman church there are certain parts remaining which are quite obvious. In the first place there is the enriched and removed doorway under the south porch. But it is the tower which shows the importance of this church fabric in the later Norman days. Externally there is a double semi-circular window, with substantial and renewed mullion of masonry between the two lights, in the centre of the second stage of the north wall. On the south side of the tower the Norman string can be seen, which formed the weathering for the roof of the transept, and the upper part of a buttress of the same date is visible on that side at the eastern angle, which is absorbed in the XIVth century buttress that shows in the aisle below. The semi-circular Norman arch, worked in chalk, which opened from the tower basement into the south transept, now shows plainly on both sides in the interior of the church. The four archways of the crossing were substantially rebuilt in the XIVth century. The preservation of the outline of the Norman arch on this one side seems due to the fact that when this replacing of the old arches was in progress there were signs of a collapse on

the south side, and hence the Norman arch stones were not taken away, but the archway was partially filled up, and a smaller new arch, only 6 ft. in width, inserted. The west and east rebuilt archways under the tower measure 12 ft. in width, and that on the north side 9 ft. The new stair turret, in the south-west angle of the tower, has two small lights on the south face, which must have originally been external. The small pointed doorway in chalk stone to this stair turret is in the inner side of the south wall of the tower just clear of the jamb stones of the Norman archway. Some of the stones run through from the arch to the doorway, but the upper part of the doorway is clearly later than Norman times.

In the outer rubble walling of the east end of the chancel are various small squared stones, which are, beyond doubt, of Norman workmanship, and represent part of the reused material of the old Norman chancel. One of them, of larger dimensions, seems to show a part of the apse curve. In the south wall of the south chancel chapel, 13 ft. from the eastern buttress, is a shallow buttress with no set-offs, having a width of 2 ft., and only projecting $7\frac{1}{2}$ in. from the wall surface. Most of the actual masonry of this buttress, as well as its form of construction, point to a Norman date, and it can only be concluded that it was taken down and reused in much the same form when a chapel was added at the south side of the old chancel.

In the first half of the XIIIth century the church underwent considerable extension. Doubtless the prosperity of the immediate district grew when lands and privileges came to the monks of Netley. With prosperity would come an increase of population, and, as the monks at that time held the advowson as well as the appropriation of the church, it may with confidence be assumed that the Abbey of Netley was chiefly responsible for the enlargement of the fabric, and for its beautifying in the newer and eminently English style of architecture that then prevailed. The work was probably done about 1745. Of this Early English work the traces are abundant. The beautiful western doorway is an admirable example of the deep-cut mouldings of this date, and it has single detached jamb shafts. A section of the mouldings of this doorway is given in Parker's *Glossary of Gothic Architecture* (1846 edition, vol. II., p. 83), where he assigns to it the date *circa* 1230. The nave was relighted; a lancet window remains on the north side of the western porch, and another in the recess of the north wall of the nave. An aisle of some size was thrown out on the south side of the nave, from which it is separated by an arcade of three arches. This aisle was opened out at the east end into the enlarged south transept, which was extended eastward as far as the rebuilt Norman buttress already described, thus forming a new Lady Chapel, for here, as we know from wills, stood the altar of the Blessed Virgin. The archway out of this aisle into the chapel is of much beauty and of costly design. The jambs on each side are ornamented with four tall detached shafts of Purbeck marble, fitting into base moulds and capitals of the same material. Several of these

shafts, which are 6 ft. 2 in. high, are monoliths.

This aisle retains a lancet window at the west end, on the south side of a larger window of later insertion, and there is another of like dimensions in the south wall immediately to the east of the porch. The south wall of the extended chapel has a pair of larger lancets, but these have been altered and somewhat debased at a much later date.

During the extensive XIIIth century alterations, an upper stage was added to the low centre Norman tower. This stage, which contains the bells, is lighted on each side by three lancet lights, save that the centre one on the west side has been filled up to admit of a clock face. The tower is surmounted by an octagon wood and shingle broach spire, which was doubtless originally designed at the time of the general reconstruction of the church in the XIIIth century. Most of the main timbers are, we believe, of that date, and are natural limbs of oak.

There is no proof in any of the chancel windows of that part of the church being extended *circa* 1250, but the outer walling of the east end puts this matter beyond doubt. Careful examination shows that the eastern angular buttresses of the chancel are certainly later than the east wall, and are of advanced XIVth century date. This wall, as has already been mentioned, contains a fair amount of reused Norman material. It, therefore, clearly follows that the small Norman chancel was taken down and extended up to its present extent in the XIIIth century.

But much the most remarkable and exceptional of the Henry III. alterations remains to be noticed. The south doorway of the south aisle is a fine and enriched example of Norman moulding. Notwithstanding all the destructive tendencies of English mediæval church builders, as style succeeded to style, the Early English designers not infrequently removed with care a Norman nave doorway to the new outer wall when they were adding an aisle. A score of such cases will readily suggest themselves to the mind of anyone who has a large acquaintance with England's old parish churches. But in the case of Shere the builders when re-erecting the old south entrance to the Norman church in the new wall added a slender shaft to each jamb, and inserted amid the old Norman mouldings a section of Purbeck marble, later moulding in a line with the shaft capitals. The shaft bases are also identical with those of the arch across the south aisle. The effect is at once curious and rich. We know of no like instance.

There is one more important detail of this date, namely, the good example of an Early English font of Purbeck marble, which now stands at the west end of the nave. The top of the bowl is 2 ft. square; it is supported by a central shaft, with four small shafts at the angles. This font was considered sufficiently noteworthy to obtain special mention in Parker's *Glossary* (i., 170); it is illustrated in Manning and Bray's *Surrey* (1801), i., p. 525; and again in Hussey's *Churches of Kent, Sussex, and Surrey* (1852), p. 341.

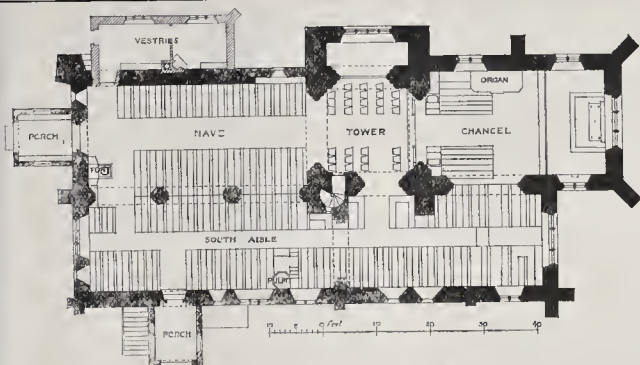
The next step in the fabric story of Shere church occurred in the XIVth

century, when the Norman arches that had been left under the tower probably began to give way owing to the additional weight of the raised tower and of the spire. At all events three of the archways were entirely rebuilt, whilst the fourth on the south side had to be strengthened by being partly built up and partly sustained by a smaller pointed arch. At the same time great buttresses were erected on the north side of the tower, the Norman transepts being removed, and a shallow transept formed on that side between the projecting buttresses, which have undergone frequent repair at later dates. The four-light XIVth century window of this transept is of a bold and unusual but not very attractive design.

The XIVth century alterations included the prolonging eastward of the south aisle, the insertion of an archway between this south chapel and the chancel, the buttressing of the chancel, and the insertion of windows in the chancel and chapel of that date. There are two two-light pointed windows on the north side of the chancel and one on the south. The three-light east windows of both chancel and chapel are of very nearly similar design and size. The centre of the upper tracery consists of a circle containing a group of four quatrefoils. On the whole the XIVth century work of this church may probably be assigned to the period when there was some revival after the paralysing shock of the Black Death of 1349, namely about 1360. The masonry of the chancel gable shows clearly the alteration of the pitch that was made in the walling of Henry III.'s time, when the big window of Edward III.'s date was inserted.

In the latter part of the XVth century certain alterations were made in the church, consisting mainly, as was usually the case, in new and enlarged windows. The walls of the nave seem to have been somewhat raised at this period, when a two-light square-headed window was inserted in the west gable over the porch. A three-light window, of a quasi-clear-story character, was also inserted over the lancet in the north wall of the nave at its eastern end. We know from early pictures what was the former nature of the window; some years ago it was foolishly restored after a quasi-Early-English fashion. Here there is an arched recess, into the back of which this lancet appears to have been rebuilt. This archway must have originally opened into a small chapel or tomb recess. About the same date alterations were made in the south aisle; a three-light window being inserted in the west end and another in the south wall beyond the porch. To the east of this last-named window is another two-light debased window, without tracery, and having a straight mullion running up the centre. This was probably a lancet light, clumsily enlarged in the churchwarden era to give more light to the "three-decker," which until recently stood in this place.

In the parish chest is preserved a valuable old churchwarden's account-book which goes back to the reign of Henry VII. Various interesting particulars were printed from it in Manning and Bray's *Surrey* as to "Church Ales" for providing funds, for church rates were unknown in pre-Reformation days. From



Plan of Shere Church. (The Vestries are Modern.)

this hook we find that the church itself was re-roofed with shingles about the year 1500.

There are some interesting entries in this account-book of the year 1547 relative to the rebuilding of the church porch, which was probably the one over the south entrance:—

"I'm payed for the carryng of tymbre to the Pytt and for ij. sawyers that dyd helpe lade yt for the new porche, iij*s*.

I'm payed to the sawyer for the sawyng of tymbre for the porche, iij*s*, viij*d*.

I'm payed for the sawyng of the porche at another tyne, iij*s*, iij*d*.

I'm payed for maylles for the selles of the kastors of the porche, iij*d*.

I'm payed for the maylles for to tacte on the bordes, iij*d*.

I'm for iij. lode of tymbre for the porche, xij*s*.

I'm for the carryng of the same tymbre to the church, x*d*.

I'm for expences in meatt and drynke when the old porche was taken downe and the setting of the new porche up, xij*d*.

I'm payed to John Frances for the working and framyng of the porche, xxx*s*.

I'm for iij. tytell bordes whyche was framyd in the porche, and for the tymbre of the box, iij*d*.

The last of these entries refers to the "poore mens boxe," which was made the same year at a cost of vs. x*d*.

The west door of the church is a fine piece of panelled joinery, well studded with nails. In the upper part is a shield of arms—two bendlets and a canton, impaling a bend, and the date 1626. It is interesting to note that the older villagers still speak of this as "the new door," though nearing three centuries in age. It has a good key-plate.

In Cracklow's *Lithographic Views of Surrey Churches*, published in 1823, a north-west view of Shere shows that the spire was at that time only partially shingled; much of the lower part was leaded, the lead being applied after the usual diagonal fashion. But if the south-east view of the church in Manning and Bray's history (1804) is to be trusted, the upper part of the spire was then leaded, and the lower part boarded. The shingles were entirely renewed at the recent restoration.

There were five bells in the tower *temp.* Edward VI.; they had been cast in 1509. The number was afterwards increased to six, and the whole ring was recast in 1712. The old bell-cage was described by the Society for the Protection of Ancient Buildings (Eighteenth Report, 1895) as "an handsome piece of old English carpentry"; it was, however, at that time altered to admit of the addition of

two new bells, so that the tower now contains a tunable ring of eight.

Considerable repairs were done to the church in brickwork during the Georgian era, apparently towards the close of the XVIIIth century. The pillars of the arcade between the nave and south aisle were renewed in brick and cased over thickly with plaster, so as to assume the stout octagon shape which they now present. At the same time the shafts and mouldings of the beautiful archway at the east end of the aisle were similarly cased, but all that has been happily removed. A west gallery, with a handsome oak front, was then erected across the western bay of both nave and aisle. Entrance to the gallery is gained through an outer doorway, which is reached by a flight of eleven wide stone steps against the west side of the south porch. A curious wide-based five-sided buttress of brick, at the north-west angle of the nave, is apparently of the same date.

A most careful and admirable restoration of this church was effected in 1895, under the direction of Mr. W. Samuel Weatherley. None of the special features of this interesting village church were destroyed. Even the west gallery, which is good of its kind, was retained, together with the outer means of access, so characteristic of a particular period of church alteration, and now so very rarely seen. Both choir and clergy vestries were urgently required, and they were placed in an unusual but happily-conceived situation against the north wall of the nave at its western end, where there was previously a long stretch of blank wall. There is no attempt to imitate any part of the old church in these low-roofed vestries, but they are comely and do not clash with the ancient fabric; they tell the tale of their own later date after a quiet fashion, but, to avoid any possible mistake, bear the date of 1895 over the west entrance in plain figures. This is just as it ought to be.

In the refitting of the church one great improvement was effected. In 1814 the ringing floor of the tower became unsafe, and was taken down. From that date up to 1895 the bells had been rung from the ground floor right in the centre of the church, and open to all the worshippers. This unsightly proceeding came to an end in 1895, when the old upper ringing floor was replaced.

There is a XIVth century piscina

niche in the south wall of the chancel. In the north wall of the chancel near the west end is a quatrefoil opening about 3 ft. from the ground, and close to it is a squint, which would command a view of the high altar. The height of both openings are between 5 ft. and 4 ft. from the ground, at a convenient elevation for anyone kneeling on the further side of the wall. The quatrefoil opening was doubtless for the communicating of the recluse or anchorite who occupied the small outer cell built on to the chancel in that position. There are plain traces outside of the lean-to roof of this cell. The remains of such cells on the north side of the chancel, with like communications, are occasionally met with elsewhere, as at Michaelstow, Cornwall, and Romburgh, Suffolk.

The beautiful combined Norman and Early English doorway within the south porch has other interests besides its decorative mouldings and work of two periods. No fewer than seven of the small incised early sundials may be noticed on its jambs, such as were cut from time to time to enable the priests to keep their canonical hours. Their presence proves that there was originally no porch to the south entrance, and shows positively that this was the old south doorway and not the west doorway, as has been supposed by some. Another sundial may be noticed in the masonry of the rebuilt Norman buttress of the south chapel. There may also be noticed on these jambs a number of diminutive incised crosses. The supposition that these are marks made by Canterbury pilgrims is a possible though not very probable one, as they are met with occasionally in non-pilgrim localities. The supposition is perhaps rendered more probable by the fact that one of these marks is the cross of Jerusalem, showing perchance the visit of one who had made the Holy Land pilgrimage.

In this porch is an usually large parish chest, over 7 ft. long; it seems to be probably of early XVth century date.

There is an Elizabethan chalice and pateu-cover pertaining to this parish church, of the year 1569; it was, however, during recent years transferred to the district church of Peaslake (Surrey Arch. Coll. xi., 52).

There is distinct interest pertaining to the monumental remains in Shere church. The oldest is a small brass effigy of Robert Scarelyf, rector, in Eucharistic vestments, with a brief inscription recording his death in 1412, and asking for prayers for his soul. His will, at Lambeth, is of great length. He left special vestments to this church and a picture for the Lady altar. There was to be no display at his funeral, but his black hier cloth was to contain 24 yds. of material, which was afterwards to be divided among poor parishioners. He left various small bequests, and the residue of his effects were to be shared among poor couples of Shere, and in marriage portions for poor maidens of his parish.

There used to be an altar or raised tomb on the south side of the chancel to John Touchet, Lord Audley, who died on September 20, 1491, bearing his effigy in brass. This was taken down in 1747, and the effigy laid on the chancel floor.

Only the upper half of it, and part of the inscription now remains; it is in plate armour, and measures 19½ in. in length.

There is a small brass effigy of the wife of John Redford at the east end of the south chapel, and of Oliver Sandes in the window-sill of the north transept. Rubbings of these brasses when perfect are in the British Museum (Add. MSS. 32,490, D. 9; K. 33; QQ. 22, 21).

Lord Audley, in 1486, granted the manor of Shere to Sir Reginald Bray, who held prominent court appointments in the reigns of the last two Henrys and Queen Mary. He was a benefactor to the royal chapel of St. George's, Windsor, where he erected the Bray Chapel in the south aisle. The Bray crest or badge of a flax-breaker appears frequently in the ornamental work of that chapel, and also occurs in the remains of the old glass in Shere church. The registers, which begin in 1547, have many entries of the Bray family, who still hold the manor; the earliest of which tell of the baptism of Reginald, son of Sir Edward Bray, Kt., on May 1, 1556, and of the burial of Lady Magdalen Bray on March 8, 1563. Against the south wall of the chancel is a tablet to the memory of William Bray, the Surrey historian, who died in 1832, aged ninety-seven.

The old churchwarden's accounts show that this church, in addition to altars to our Lady and to St. Nicholas, had images of St. Anthony, St. Roche, St. John the Baptist, and Our Lady of Pity.

We desire to record our indebtedness to the rector, the Rev. F. C. Hill, under whose auspices the happy conservative restoration of 1895 was carried out, particularly for the loan of the ground plan of the church.

THE TRIBUNAL OF APPEAL.

WE fear that the memories of many of our London County Councilors are shorter than that which evidently belongs to our correspondent, "Haud Immemor," whose letter we print in another column. *Litera scripta manet, verbum ut inane perit*, and history has a way of sometimes reversing itself, as will be seen by comparing the report of the meeting of the London County Council in our issue of the 24th ult., with a "Note" which appeared in the *Builder* of November 4, 1893, commenting on the case of *Regina v. The Members of the Appellate Tribunal*. In that case an application was made to the Queen's Bench Division on October 26, 1893, for a *certiorari* to set aside the decision of the Tribunal as to the general line of building on the ground that one of the members of the Tribunal was actually the Chairman of the Building Act Committee, which had ordered the prosecution, and was therefore biased. In those days the County Council appointed one member of the Tribunal. The following is taken from the *Times* Report, October 27, 1893:—

"Mr. Justice Charles, in giving judgment, said the question did not affect only Mr. Ellis, the applicant, but the general principles of the administration of justice. Dr. Longstaff, Chairman of the Building Act Committee of the London County Council, was also a member of the Appellate Tribunal as to

the 'general building line.' There was a resolution in November, 1891, of the Building Act Committee to proceed against Mr. Ellis as the building owner of the houses. Dr. Longstaff being the Chairman, and proceedings were accordingly taken against Mr. Ellis. The magistrate had to ascertain what 'the general line of building' was, and he adjourned the proceedings to ascertain it, and when he had ascertained it he made an order for demolition of the houses. There were appeals against that order, and also against the decision of the architect as to the 'general building line,' and on the latter appeal Dr. Longstaff sat. Was it right that he should so sit? Surely not; for he was Chairman of the body which directed the proceedings. That there was general misconduct no one would suppose, but there was a general rule of law against anyone taking part in a judicial proceeding in which he had probably a bias. And though Dr. Longstaff had taken no part in the resolution, still he was Chairman of the Committee; and though no doubt he had not been guilty of any conscious misconduct, there was a probability of bias, and therefore the decision was invalid, and the application must be acceded to.

"Mr. Justice Wright concurred. Rule absolute."

To-day some members of the London County Council openly proclaim that they want "to get another Tribunal." Twelve years ago the constitution of the then Tribunal was changed, and it was changed by taking away from the Council the power to appoint one single member to the Tribunal; moreover Parliament enacted that "No member or officer of the Council shall be a member of the Tribunal of Appeal." We recommend the Building Act Committee, therefore, to ponder a while over the difficulty of combining judicial and administrative functions, and to think twice before making an ill-founded allegation of bias against a Tribunal which, ever since it was purged of its "member of the Council" in 1894, has been free from the taint of partiality.

NOTES.

THE PANAMA CANAL. WHATEVER type of canal may be ultimately adopted by the American Congress,

the control of the Chagres River will be an important factor. The problem presented by the regulation of this waterway is probably one of the most difficult for solution in connexion with the Panama Canal, and is responsible for a good deal of the controversy that has arisen among engineers with regard to the general subject. In view of the possibility that a lock-canal may be finally thought to be more advisable than a sea-level canal, the paper by Mr. A. G. Menocal now before the American Society of Civil Engineers possesses some interest. Its object is to submit for discussion a modification of the route recommended by the Isthmian Canal Commission of 1899-1901, by which the author believes the River Chagres may be kept under absolute control, its channel left free to carry off flood waters, and an abundant supply of water kept close at hand for

the operations of the canal, without increasing the estimated cost of the works, while at the same time reducing the time required for execution. The author's proposal is illustrated by a plan, which gives in a convenient manner the present and the proposed routes. Under this new scheme the Chagres River would be crossed by means of a combined dam and viaduct with control works, the dam to impound the river at an elevation of about 109 ft. above mean sea-level, and the viaduct to carry the canal over the river. The structure would be of reinforced-concrete, and being founded on hard rock should possess ample strength and all the conditions of stability and durability essential in a work of this character. The author is entitled to speak with some authority on the subject, having been the engineer-in-charge of the United States Government surveying expedition of 1875. Although the combined dam and viaduct would cost a large sum of money, it is believed that the expenditure would be more than off-set by savings elsewhere, and the project is one that will deserve serious consideration if the final verdict should be in favour of a lock canal.

THE ENLARGEMENT OF THE HOUSE OF COMMONS. IN the current issue of the *Nineteenth Century* the Editor very appropriately republishes, with its illustrations, the article furnished by Mr. Charles Barry, and now out of print, on his proposed scheme for the enlargement of the House of Commons. Mr. Barry's scheme for enlarging the House laterally, by carrying up the slope of the seats further and providing new Division Lobbies partly under the upper ranges of seats, with no exterior alteration except a slight projection into the present area of the Commons' Court and the Star Chamber Court, is so simple and practical, and could be so easily carried out, that it is really surprising that this manner of getting rid of the anomaly of having a House of Parliament which can only provide seats for three-fifths of its members should not have been long since carried out. It is less expensive than any other scheme which has ever been proposed, with the advantage that it involves no architectural alteration of any importance in the building. We hope the republication of the article may lead to the scheme being seriously taken up by those in office, before some more drastic and less desirable interference with the building is proposed.

Vauxhall Bridge.

As mentioned in our report under the head of "London County Council" on another page, a model of Vauxhall Bridge has been prepared showing the structural portion as carried out, and two alternative designs for pylons at the ends, to be crowned with sculptured figures by Mr. Drury and Mr. Bertram Pegram. The faces of the piers are steel above the plinth line, containing panels with large figures in relief, which will be executed, as we understand, by Mr. Pomeroy and Mr. Drury in collaboration. Except for the pontoon-like steel casing under the projection of the footway, which we have always disliked, the design now looks admirable, and is

a different work indeed from the dreadful thing at first proposed. In regard to the pylons, we are inclined to think that No. 1 is the best in its general lines, but the insertion of a gilded bronze railing on the cornice, and near its outer edge (in order to provide a "practicable" gallery round the top) would interfere with monumental effect; and we doubt if it is wise to make these erections accessible standpoints with staircases, and if it would not be better to make them rather smaller, and treat them simply as pedestals for sculpture. We recommend a study, in this connexion, of the Paris bridge pylons, which are purely decorative.

Waterloo Bridge Lamp Standards. IN a letter in another column Mr. F. W. Troup draws attention to the fact that, in re-instating the original design of the lamp standards on Waterloo Bridge, a characteristic bit of the original design, the side wings of laurel leaves at each side of the pedestal, had been omitted. We of course noticed the omission at the time, but after having had the satisfaction, after much paper warfare, to see the original design in its main features re-instated, we were unwilling to prolong a controversy on the subject. Mr. Troup is quite right, however, in saying that these details form a characteristic feature in the design, and also that they could be easily replaced, and we hope it will be done.

Football Stand Construction. THE failure of another football stand, reported last week, although not involving any very serious consequences, comes as an additional reminder that the perils encountered by spectators of football matches seem to be fully as great as those popularly ascribed to referees. Some failures that have occurred in the past are attributable largely to faulty design, and in no small measure to impaired strength owing to long-continued exposure in all weathers. The last-mentioned consideration clearly suggests the desirability of concrete-steel as a material of construction. The great elastic strength, homogeneity, and durability of the combination render it most suitable for work of the kind indicated, and the example about to be set at Liverpool, where the new grand football stand will be built entirely in reinforced concrete, is one distinctly worthy of imitation. The structure, 378 ft. in length by about 41 ft. in width, will be supported on fifty-seven columns arranged in three longitudinal rows, and varying in height from 14 ft. to 22 ft. above ground level. The tops of the columns will be connected transversely by sloping beams, 12 in. wide by 16 in. deep, and the two longer columns in each set by a horizontal girder 9 in. wide by 12 in. deep. The transverse beams are to be connected longitudinally by joists 7 in. wide by 10 in. deep, and the framework so formed will be covered by a continuous slab 4 in. thick, upon which the seats and the usual stepped flooring will be placed. The stand has been designed by Mr. Archibald Leitch, M.I.Mech.E., on the Hennebique system, for a live load of 168 lb. per sq. in., in addition to the dead load of the structure itself.

New Data Concerning Eye-bars. IN connexion with the construction of the Quebec cantilever bridge, with the great river span of 1,800 ft., careful inquiry was thought desirable by the engineers into various matters, which are of relatively small importance in smaller structures. Among such subjects for study was the behaviour of eye-bars, and during the period of one year numbers of full-size bars were tested under tension up to about 24,000 lb. per square inch, with the effect of indicating how defective is general knowledge of such members. As a rule, it is not recognised that the elongation of an eye-bar actually takes place from out to out of the bolt-holes, and not from centre to centre of the bolts. Too frequently the elongation and elastic limit are determined over a given length of the bar, and the data so obtained are applied to the bar as a whole. And, again, it is often supposed that a set of bars working in parallel will take up equal shares of the strain, so long as this is below the elastic limit of the metal. All these assumptions are very clearly shown to be incorrect by the tests to which we refer, and which are fully described by Mr. Theodore Cooper in a paper recently read before the American Society of Civil Engineers. These tests indicate that in eye-bars with a minimum length of 50 ft., when subjected to tension on pins neld parallel, and for an average working strain of 21,000 lb. per square inch, the softest bar will only take about 17,600 lb. per square inch, or 84 per cent. of the average strain, and the hardest bar about 22,540 lb. per square inch, or 107 per cent. of the average. But in bars of short length, under high-working strains, the difference becomes so great that the employment of such bars is very undesirable. Therefore, in structures of great magnitude, where high-working strains are involved, long bars only should be used unless the stretch of the eyes can be overcome by special methods of manufacture and treatment of the metal.

Dust on Country Roads. THE present spell of dry weather has conclusively proved one thing—that dustless material for the roads has not been discovered. On some sections of the roads in Kent three different methods have been adopted, but far from proving dustless—the only difficulty is to determine which is the most dusty with motor traffic. Dwellers in towns, where the roads are watered, can have no idea of the condition of things in the country. Since the introduction of motor-cars a permanent cloud of dust hangs over the roads and the neighbouring land, and at the time a motor rushes past at 25 to 30 miles an hour the road is so obscured that carriages have to stop, for it is impossible to see any following vehicle coming, and the road remains invisible. When trees border the road this impenetrable cloud hangs over the road for a considerable time. In the interest of everyone, including the motorists, something will have to be done. It is curious if the law of nuisance cannot be applied to the raising of dust. A man must not annoy his neighbours by noise, smell, or vibration, but a stranger rushing along the roads can destroy the comfort, clothes,

and crops of those on or within half a mile of the roads with apparent immunity. Civility compels many motorists in dusty districts to slow down, but when native politeness is absent surely some civil action will lie? At present the motorist appears to enjoy the same freedom from civil responsibility for his actions that the trade unions so much covet.

House Refuse. THE case of Mayor, etc., of Westminster v. Gordon's Hotels, heard by the Divisional Court, has decided a point of interest under the Public Health (London) Act, 1891. The Hotel Metropole summoned the sanitary authority for neglecting to remove their house refuse. The answer of the authorities was that the refuse they were required to remove was not "house refuse," but "trade refuse," for which, under sect. 33 of the Act, they were entitled to make an extra charge. By sect. 141 of the Act "house refuse" is defined to mean "ashes, cinders, breeze rubbish, night soil, and filth"; "trade refuse" means "the refuse of any trade, manufacture, or business, or of any building materials." The refuse in question consisted of ashes from the grates, sawdust from the kitchen floors, empty sauce bottles and preserve tins, straw bottle cases, tea leaves, waste paper, egg-shells, and small quantities of broken crockery and glass. The Court held that this refuse, being of the same kind as would be produced in an ordinary dwelling-house, was "house refuse," and did not become "trade refuse" by reason of the house being used as a hotel. The Lord Chief Justice, however, intimated some doubt as to what the decision would have been if this refuse had come from a restaurant where there was no living accommodation. In the case of the Vestry of St. Martin's v. Gordon (1891), decided in connexion with a somewhat similar statute, Lord Esher defined "refuse of manufacture" as refuse from the material which is being manufactured into something else; "refuse of trade," refuse directly connected with the trade, not, for instance, ashes from fireplaces used to warm the operatives; and the word "business" he defined as extending the word "trade" to transactions which did not involve the buying or selling of any article. It must be remembered that if the refuse of hotels is large, so is also the amount paid by their owners in rates, and the municipalities' first duty is their public duty—they are not principally commercial undertakings.

Private Electric Lighting. IN some cases it is more economical to generate electricity by means of a private installation of prime movers and dynamos than to take it from the mains of the supply company. The problem, however, of deciding which procedure is the more economical is, in general, difficult, as the proper charge for maintenance and depreciation varies with local conditions, and depends on so many circumstances that at the best only a rough comparison can be made. In this connexion the paper recently read to the Leeds section of the Institution of Electrical Engineers on "The Cost of Electricity per Unit from Private Electrical Plants," by Mr.

W. Hartnell, will be found most useful. A careful enumeration is made of the items of cost in the case of twelve private plants. He divides the costs under the three headings of—(1) Capital outlay; (2) capital charges; and (3) operating charges. He has taken the customary 10 per cent. of the initial outlay for interest and depreciation, but we agree with him in thinking that 15 per cent. would in many cases be fairer. The greatest economy is obtained in factories where steam engines have to be employed, and the electrical machines are only adjuncts. Mr. Hartnell calls this a "half," or an "incomplete," electrical plant. In flour mills where high-class compound condensing engines are employed, and run with few stoppages for nearly the whole week, the cost of generating electricity is very small. In several of the cases he gives it is little more than a farthing per unit. On the other hand, for lighting three private houses the costs average about 6d. per unit. The general conclusion, therefore, is that in factories where an incomplete plant can be installed, and no reserve plant beyond a spare armature is necessary, it is much more economical to generate electricity privately; but for private house lighting it is, as a rule, cheaper to take electricity from the public supply mains.

Building in the Black Forest. SOME of our readers may have noticed in the *Times* a few days ago the brief account of a most serious disaster, in the fall of the Hotel Zum Hirsch in the Black Forest during a festivity to celebrate the opening of the house, by which it appears that forty-two people were killed and more than seventy seriously injured. It is to be hoped that we shall have some information as to the construction of the building which collapsed in this manner. It is too grave a matter to jest over, otherwise one might be amused at the naive manner in which the *Times* correspondent accounts for the disaster:—

"The accident is attributed to want of proper precautions. The roof of the building was only put on this morning, and the occasion, according to German custom, was celebrated by a banquet. It is said that the guests danced, and in view of the numbers present it was probably this that led to the collapse of the house."

Are we to understand that under the building regulations in the Black Forest a hotel can be built in so flimsy a manner that it is dangerous to dance in it?

Hoefnagel's Map of London, and its Date. ONE of the coloured maps in George Brann and Franz Hoefnagel's "Civitates Orbis Terrarum"—of which several editions were published at Cologne in 1572-1618—is a bird's-eye presentment of London by Hoefnagel, which hitherto has been considered to have been drawn in or about 1572. In a communication to the *Athenæum* Mr. Alfred Marks, who is an eminent authority on these matters, makes a notable contribution to the story of the view. Whilst we have not room for a full rehearsal of his arguments we may mention that Mr. Marks, beginning with the interval 1547-1561 upon the internal evidence of the map itself, reduces that period, step by step, to 1554-1558. He

points out that in 1554 were erected at Charing Cross the gallows for punishing those who took part in Wyatt's rebellion, and that after August, 1557, the style of "Suffolk-place" ceased to designate the riverside palace (Buckingham and Villiers streets) which Heath, Archbishop of York, acquired at that time and renamed "York House." Hoefnagel delineates the gallows at Charing Cross and marks "Suffolke-place." Despite the smallness of its scale his map is remarkable for the minuteness of details which, albeit disproportionate in themselves, give so striking an air of verisimilitude and precision to the view. One or two, indeed, provoke a smile, and yet there may be humour even in map-making. The clipping and the misspelling, or rather distortion, of many place-names, combined with the minute details, seem to indicate that a foreign hand had copied and re-engraved the map from one to a much larger scale. Nor can we readily believe that for a work of so wide a compass Braun and Hogenburgh (or Hohenberg) caused a new survey to be taken in every instance for their atlas. In some respects Hoefnagel's view is more faithful than that which for lack of more certain knowledge is generally ascribed to Ralph Aggas, of which we printed a brief historical description on December 23 last. Mr. Mark's surmise that the maps by Aggas and Hoefnagel have perhaps a common origin will not be gainsaid by those who are familiar with and compare the two works.

Messrs. Tooth's New Gallery. MESSRS. ARTHUR TOOTH & SONS have opened their new gallery in Bond-street with a very good exhibition. The exhibition rooms are on the first and second floors, not quite so convenient therefore as the old gallery in the Haymarket (though a very good lift is provided), and the first floor room is a little deficient in light for pictures; the upper room has an excellent light. The most important work in the lower room is M. Dagnan-Bouveret's "Dans la Forêt" (18), which we remember at a Salon exhibition some time since. Among the other works in this room are three diminutive Meissoniers (38, 39, 40) of the best order; a landscape by Cazin (28); two small but fine landscapes by M. Harpignies (17, 20); several small Corots; a beautiful little landscape by Mr. Davis, "Pastures by the Sea" (50), a replica of a larger painting; two fine but gloomy landscapes by J. Maris (21, 34); a fine example of that unequal painter Isabey, "L'Approche de l'Orage" (1); and a very charming and finely executed work by Lady Tadema, "A Sonnet" (54). But the best part of the exhibition consists in the collection (in the upper room) of landscapes, mostly pastels, by M. Lhermitte, every one of which is worth looking at, and some of which are among the finest things ever produced by this powerful and original artist; we may draw attention particularly to "Washing in the Mill Stream," "Le Passenur," "Troupeau de Vaches à la Rivière," "Reapers," and "Field Workers." This collection of M. Lhermitte's work is enough in itself to render the exhibition one of the most interesting of those open at present.

IMPORTATION OF FRENCH BUILDING STONES.

By W. R. PURCHASE.

In several of the daily papers it is stated that one of the "Paris-in-London" schemes on the new Aldwych site, now before the London County Council, is likely to be carried into effect, and that preference will be given to the original syndicate that brought forward the project which the London County Council rejected a year ago, having in the meantime modified the scheme so as to comply with our insular requirements.

A French architect, in conjunction with two eminent architects on this side of the channel, is, it is understood, preparing plans for these new buildings, which are to cost 1,600,000*l.*, and it is said that a "white stone" (this is the point I wish to emphasise) is to be used in the façades. Doubtless, the London County Council, who presumably have the control of these buildings, will give particular attention to this specific stone; for I notice that several French stones have lately been introduced into the London market having the names of "Palotte," "Euville," etc., and commonly termed "French Portland" (which name, however, is a misnomer), and used in various buildings in the metropolis, especially on public banks, etc., in the West-end. If it is suggested that either of these stones is to be used in the new buildings at Aldwych, evidence of its enduring qualities should be forthcoming.

Looking at these French stones from a practical point of view, I should like to offer a few remarks as to the result of my observations. These stones are apparently a portion of the great oolitic formation in Normandy; the "Palotte" being very similar to the Caen stone re-introduced into London in the forties and fifties of the last century, and used in the façades of Buckingham Palace and the palatial clubs of Pall Mall and St. James's-street, with such disastrous effects, for all of these buildings are in a bad state of decomposition, although several of them have been re-worked, painted, etc. Experience has, therefore, proved that Caen stone will not resist the dissolving power of water charged with carbonic acid gas, and as the rain-water of our large towns contains a large quantity of that gas, it is not safe to employ this stone in any position where water is likely to lodge, or even to be taken up by capillary action. It has been generally accepted as a dictum that most building stones last longest or show greater signs of durability in the locality in which they are quarried. This, however, does not seem to be the case with the Norman oolites, Caen stone in particular, for although the towns in the immediate neighbourhood of the quarries in which this stone is used have the advantage of clear dry air, unpolluted with coal smoke, yet the restoration of their churches and cathedrals proceeds apace owing to the stone disintegrating and falling to pieces.

This being so in its natural climate, it is obvious that the use of a similar stone in London in which the air is charged with various deleterious and destructive acids, is, without doubt, a great mistake, and will ultimately result in complete failure.

The "Palotte" is an extremely soft stone of a light cream colour; it is cut with a toothed saw, and wrought with carpenters'-shaped chisels and gouges, and finished off with the drag; if necessary, it may be sandpapered, and the stone can also be carved with a pocket-knife, so soft is its nature. An industrious mason may do almost as much work as he pleased in it, consequently a building may be executed in this stone in a shorter space of time than in any other. It may be urged that there is a generally-accepted opinion that a soft stone will become hard and durable by exposure to the atmosphere; this is true to a certain extent, although it is not of sufficient importance to warrant its appreciation in new buildings of an architectural character. All free-working limestones and oolites when newly quarried are in a "green" state, and are softer and more easily worked than after they have been exposed to the weather for several months; and this quality arises from a chemical change which takes place on the evaporation of the water, termed "quarry

sap," contained in the stones when lying in the quarry; but beyond this the stone will only get a little harder, and this only on the surface.

I repeat that the use of this French stone, if it is anything like the "Caen" stone, would be attended with danger, as it would yield easily to the action of frost and other destructive agencies.

A large building possessing features of architectural merit has recently been completed in the High-street, Kensington; it is in the style of the old buildings in the neighbourhood, the facework is of red brick, and the dressings—cornice, pediment strings, etc.—are of the "Pallotte" stone. A large amount of enrichment is in the tympanum of the pediment and main front, and to the onlooker it is an exceedingly fine building; the creamy white of the stone standing out in marked contrast to the red brickwork. It is, however, a serious matter to contemplate what will be the condition of this building after it has been exposed to the weather for a few years.

One of the other stones, the "Eville," is doubtless a better weather stone than the last described. It is of a whitish brown colour, coarse in texture, and somewhat crystalline in its composition; its texture, however, is far from uniform, coarse beds seem to predominate; these are open, and consequently porous, which renders the stone liable to be attacked by the deleterious agencies of the surrounding atmosphere. This stone apparently cannot be obtained in deep beds, as in one or two instances in a new building I noticed columns about 5 ft. in height, to all appearance face-bedded, the strata showing in a most pronounced form, and in a vertical direction when fixed. Defects also seem to be numerous in the stone; these have been concealed by the masons with the aid of "stopping," giving to the stone a somewhat spotted appearance in the building.

With regard to porous stones, it has been stated that those stones which readily absorb moisture should not be used for the external and exposed portions of buildings, as when frosts occur the freezing of the water on the wet surface continually peels off the latter, and eventually destroys the ornamental work upon it. This, however, is not a universal rule, as, although a stone may be very porous and absorbent, it may also be extremely durable, its durability depending upon the cementing substance which holds the grains together being strong enough to resist the physical forces acting upon the stone, such as the rain, frost, and wind. Examples of this are found in the durability of our own shelly oolites, such as Ancaster, Donling, Ham Hill, Box Ground, Ketton, Portland, etc., which form such a good series of building stones.

The policy of importing building stones from France, whether from economic reasons or otherwise, is at the present time questionable. If the stone imported was a special stone, the lasting properties of which had been well tested by time, and if it was better and cheaper than our own market could supply, it might be excusable; this, however, does not appear to be so, but on the contrary. In the grounds of a large public school at West Kensington a memorial is being erected in the form of a drinking fountain to the "old boys" who died for their country in South Africa. The design is classical, partaking of the Doric order; it is circular on plan, and consists of a platform of steps, on which rest half a dozen columns about 5 ft. in height, which support the entablature, and cornice, all being of "Eville" stone; it is surmounted by a wooden dome, covered with sheet-lead or copper. The fountains supplying the water are in the centre of the erection, and are also of stone. The gist of this matter is that all the stonework is supplied ready worked direct from the French quarries. This is humiliating. Here is a national memorial for English boys erected as an incentive to the younger generation, simple almost to severity in its design, with nothing complex about it, every portion of which could be done expeditiously and skilfully by English labour and with English material; and yet we have had to enlist the foreigner to give us—what? Certainly not a better stone, nor yet better workmanship, for even this

structure, although simple, has not been without its mistakes in execution.

The motives which prompted the "Entente Cordiale" are doubtless to be admired, but at the same time, we should not forget that "charity begins at home," and that the use of our own material would provide work for our craftsmen. In this country we have a number of good building stones, the durability and weathering qualities of which have been tried and are well known, consisting of sandstones, limestones, oolites, etc.; these stones have a range of colour in easy gradations from white to grey, cream, brown, red, and blue. The supply, too, is unlimited and easy of access; any quantity can be obtained at short notice, and the price can, or should at least, compare favourably with any French stone. Merchants at the present time have a large stock in hand, and it certainly would be only patriotic to use our own material in preference to others.

BRITISH SCHOOL, AT ROME.

THE fourth open meeting of the British School at Rome for the present season was held on Monday, April 4, in the library of the School. Mr. H. Stuart Jones, ex-Director of the School, read the first paper, dealing with certain points in the historical interpretation of the series of reliefs which decorate the column of Trajan, and which illustrate his two campaigns in Dacia in 101-102 and 105-106 A.D. He pointed out that the artist who designed them employed three methods of narration—the continuous style, marked by an unbroken background; the successive style, in which a series of individual scenes is shown, each scene being marked off from the next by some expedient—a brick in the background, a tree, or a change in the direction in which the figures are placed; and the panoramic style, in which a band of relief represents several scenes which are to be conceived of as going on simultaneously, and are to be interpreted as a whole. Using this criterion, he showed that the supposition adopted by Choribus and by Petersen that a junction of two armies is indicated early in the first campaign (as though Trajan had invaded Dacia by two different passes), on the ground that two bridges of boats over the Danube are seen, was not warranted; as a fact, Trajan's march was represented by some detached scenes, which led up to a continuous passage, ending in a battle, after which the Roman forces are checked by a fortified position—no doubt the Iron Gate pass. Early in the second campaign, on the other hand, the convergence of two armies was clearly shown; they were represented as on the march in the same direction, one below the other, on the same band of relief, being divided by a longitudinal strip of rock.

At the beginning of the second campaign another continuous passage represents the voyage of Trajan from Ancona, first to another Italian port, which could not certainly be identified, and eventually to the goal of his march—a country inhabited by friendly Dacians, no doubt a portion of the Roman province of Upper Moesia, to which they had been transferred after the first campaign. For it appears that after the first war was over the Romans evacuated Dacia, and Mr. Stuart Jones further concluded from the representations of the reliefs that the Dacian King actually carried offensive operations into the province of Upper Moesia. The exact point indicated was the centre (as yet unidentified) of the imperial worship in that province; the six altars shown, at one of which the Emperor is sacrificing, corresponding to the number of his predecessors to whom Divine honours had been decreed. Next, a panoramic view, which begins and ends with a group of *classarii*, or men of the Danube fleet, engaged in road-making through a difficult country, showed the relief of Roman positions which the Dacians were attacking. After this came detached scenes, showing the stone bridge over the Danube, with the Emperor sacrificing on the south side, while on the north he receives envoys. Then followed the representations of the final offensive campaign, the Roman success in which led to the incorporation of Dacia as a province of the Empire.

The second paper was read by Dr. T. Ashby, jun., Assistant Director of the School, on an unpublished panorama of Rome by Anton van der Wyngaerde.

about the middle of the XVIIIth century. The panorama was one of a series of four preserved in the Sutherland collection in the Bodleian Library, three of which had already been published, the first by Professor Lanciani in the *Bullettino della Commissione Archeologica Comunale*, 1895 (p. 51, Pl. VI.-XIII.); the second by Dr. Ashby in the same periodical (1900, p. 28, Pl. IV.-IX.); and the third in the *Mélanges de l'Ecole Française*, 1901 (p. 471, Pl. II.). The present view, at any rate, or its original must have been drawn at some time before September 27, 1557, the date of the flood which destroyed the Pons Aemilius, now known as Ponte Rotto, for the third time (see Lanciani, "Ruins and Excavations," p. 20), inasmuch as the bridge was here shown as intact. The point from which it was taken was about 150 yds. to the east of the church of S. Sabina, on the Aventine; on the extreme left is the island of the Tiber and the bridge already referred to, to the right of which are seen some of the buildings of the Forum Boarium and the Campus Martius, then the Capitol and part of the Forum, with S. Gioiio in Velabro. The central portion of the panorama was occupied by an interesting representation of the ruins of the Palatine, with the valley of the Circus Maximus in the foreground, and the view closed with the Caelian hill and the Aurelian wall near the Porta Latina, and (probably) the church of S. Prisca in the foreground. The changes which Rome had undergone during the past 350 years rendered such drawings as these of great value, and the positions of the various buildings were, as a rule, given with remarkable accuracy.

Dr. Ashby also read the third paper, an account drawn up by Mr. Thomas Ashby, sen., of certain Italian silver charms, such as horns, hands, *cimaruta*, sirens, sea-horses, etc. These charms were until a generation ago in common use, in Southern Italy and Sicily especially; and the first two classes were still frequently seen, though the rest were no longer worn. The *cimaruta*, or sprig of rue, is a compound charm, formed, as a rule, by the addition of various subsidiary charms to the main one, which, however, is not lost sight of, though in some instances conventionalised. The siren and sea-horse, on the other hand, which are figures in the round, while the *cimaruta* is in flat relief, are far more frequently found in isolation than combined, though to the latter buds of rue or lizard may occasionally be added, and both have, as a rule, bells. All these charms could be traced back to a classical origin; of the horn and the hand this was well known, but the virtue of the rue plant was strongly asserted by ancient writers, and both sea-horses and sirens were found in classical art, while the latter could be traced through the mediæval period down to the patterns of Italian embroideries and lace of a century or two ago.

All the papers were illustrated by lantern slides. The meeting was well attended by British residents in and visitors to Rome and by foreign scholars, including Commentatore Boni, Director of the excavations in the Forum; Professors Körte and Hülsen, of the German Archaeological Institute, etc.

GIRLS' SCHOOL, CLEWER S. STEPHENS, WINDSOR.—To meet the requirements of the Education Board, the managers of the Clewer S. Stephen's National Schools are erecting a new girls' school on a site in Vansittart-road. The new building will comprise six classrooms, all on the ground floor, and the central hall will hold 500 persons and be capable of extension by throwing into it two classrooms divided by removable partitions, which will accommodate an increased audience of 800 persons. Over the classrooms, etc., will be rooms and apartments for the head mistress and teachers. The block will be of red brick, and has been designed by Mr. J. Wightman Douglas, of Newcastle-on-Tyne, the contract having been entrusted to Messrs. W. Green & Son, of Clewer, for the sum of 2,382l.

SCHOOL EXTENSIONS, BARRY.—Plans were submitted by Mr. G. A. Birkenhead, architect, at a recent meeting of the governors of Barry County School, for alterations and extensions to the school for the accommodation of 350 scholars, at an estimated expenditure of 7,000l. Provision will also be made for a dining-room for 150 children and the installation of shower-bath apparatus for boys and girls. It was decided to submit the plans to the County Council for confirmation.

SOCIETY OF PAINTERS IN WATER-COLOURS.

The most important work at the Society's exhibition is undoubtedly that by Mr. E. R. Hughes which is hung in the central position at the top of the room—"The Valkyrie's Vigil" (68). Mr. Hughes is almost the only member who produces figure subjects which are of the highest class in importance and finish, and which have also the additional interest of poetic significance. In this picture the beautiful draped figure of the Valkyrie, holding a sword and helmet, is seated in the moonlight on the top of a battlemented tower; halfway below is the platform of a lower tower, and beneath that the moonlit city. Both the perspective effect and the light effect, which offer a very difficult problem, are very carefully worked out, and the whole will rank as one of Mr. Hughes's best works.

Next to this, we were interested in the new achievements of Miss Mildred Butler, who in this exhibition has gone quite beyond what former work of hers we can remember. "The Green Mantle of Summer" (2), in its combination of a meadow and heavy belt of trees behind with a study of peacocks in the foreground, strikes a new note, and is an admirable small drawing; but in "Dignified Leisure" (109) we have the combination of peacocks and landscape on a larger scale, in what is really a grand drawing, both in composition and its broad style of execution, and gives its author a new position among water-colour artists. A new name, if we mistake not among the contributors, is that of Mr. H. S. Hopwood, who paints interiors with figures in a broad style in which precision of detail is rather avoided. His first work, "The Mirror" (1), we do not care much for; but "Painting the Riding Light" (63), a cabin interior, is a fine work, and "Morning" (72), the interior of a room in which a girl draws the window curtain to admit the dawn, is still better. A foreign exhibitor, Herr Vosper, contributes another subject of this class, which may be labelled "interior with figure"—"The Blind Peasant" (32), a picture pathetic in the expression of the figure and striking in the colour combination of the costume. The exhibition is rather notable for subjects of this class; Mr. Paterson, known here hitherto as a painter of landscapes in a peculiar technique of his own, has gone into figures, one of them a roughly sketched portrait figure (47) in which the dress is very boldly treated; the other, a far superior work, is entitled "Betsy" (52), an interior with a housemaid on her knees in the kitchen; the character in the face is admirable, and it is worth notice how realistic is the effect of the circular stove or boiler, in regard to texture and appearance of the metal, while preserving entirely the artist's characteristic broad style of handling. This it is to know exactly what effect and what meaning resides in each touch.

Among other works in which figures are predominant are two by Mr. Anning Bell, "The Banners" (7) and "The Garden of Sweet Sound" (38). It is needless to say that the colour is fine in both these; the first-named work rather wants subject—it is simply a composition of figures for the sake of a composition: some of the figures are very interesting studies, and as a composition the whole is admirably designed; but one wants some kind of story in a picture of this kind. In "The Garden of Sweet Sounds," the figures, which are a complete colour-blend, so to speak, with the landscape setting, mean something; there is a rapt expression on all their faces which reminds one of—

"Heard melodies are sweet, but those unheard
Are sweeter."

There is a poetic suggestiveness in the picture. So there is, and fine colour also, in Mrs. Forbes's "The Muse of Herrick" (19). But Herrick is the very last kind of poetry it would remind us of; her "Good-bye" (50), a parting between two dimly-seen country lovers under a plantation with the moonlight struggling through, is a remarkable piece of effect. Mr. Walter West, illustrating "The Ladies of St. James's" (13) as characterised in a verse by Mr. Austin Dobson, takes us to another world of art, that of brilliant realism, charming too in its way, but not poetical except as Mr. Dobson's verses are poetical—the poetry of "Vers de Société," which has its value nevertheless when first-rate

in its kind; whereas Mr. Anning Bell's "Finding of the Head of Orpheus" (132) is only poetry reduced to commonplace in painting—commonplace of conception, that is; the colour is not commonplace. Mr. Dollman's "The Incantation" (69), where a witch prepares her charms under the gaze of sympathetic following of apes, is a clever piece of *diablerie*; he exhibits also a replica on a small scale (125) of his powerful design entitled "Famine," which was seen as an oil-painting at the Royal Academy. The sort of figure picture which we cannot put up with is such a thing as "Too Many Cooks" (161), which represents sheer vulgarity in art. Mr. Arthur Rackham's goblins we have had rather enough of, but at all events they are not commonplace, and in "Goblin Thieves" (240) he has some charming little figures among the mortals of the scene; and we know that no one can do more lovely children than he can, when he can put his goblins on one side.

In pure landscape there are a number of fine things; some of them exceptional. Among these we may reckon Mr. Colin Phillip's "A Break in a Thunderstorm" (102), with its green foreground, and the distant crag bright in the passing rays; one of the finest things he has ever done. We may note some of the others in the order of hanging, Mr. Thorne Waite's small "Findon Downs" (4) and his larger work, "A Gap in the Downs" (22), are fine examples of delicate distances expressed in pure water-colour style; in "The Rainbow" (26) he has made an experiment in the very difficult task of expressing a rainbow in water-colour, with the result that the rainbow really does look evanescent and aerial, but—it is deficient in colour. That is the difficulty; to express colour which is only a radiance in the air, and not a reflection from a solid object; but it is always interesting to see the experiment tried. In architectural subjects Mr. Albert Goodwin is splendid in his most unusual treatment of "Durham (in Grey of Dawn)" (10); and his "Venice" (142) is worthy of Turner in point of effect, with a more precise treatment of the architecture than Turner (in this class of picture) troubled himself about. We do not know what Miss Montalba is about in her Venice scenes this year; she represents sea which is nothing but a surface of wash. Mr. Herbert Marshall's "Frosty Sunset, Westminster" (35) is effective, but where does his spire on the left of the view come from? We have not been to look, but we cannot recall any such object. Mr. Reginald Barratt as usual treats architecture admirably, especially in his delicate little drawing of "A Garden Gateway" (42). Mr. R. W. Allan's "Stormy Weather" (44) is a masterly example of the effect to be got in sea pictures in water-colour by broad and bold indication of movement and line with no attempt at detailed modelling of the sea; what is lost in detail is gained in force and freshness. Mr. Robert Little's "Massa Carrara" (66) is a fantasia in colour which makes one think of Turner's answer to the man who said he did not see all those colours in nature—"Don't you wish you could, though?" Mr. Napier Henry has two very powerful torpedo-boat pictures; Mr. R. W. Allan again shows a fine run of sea in his coast scene "Whitehills" (129). Among other landscapes are to be mentioned Mr. Phillip's "Clearing after a Storm, Ballachulish" (146), almost as fine as the one already mentioned; Mr. Cuthbert Rigby's "Autumn" (157) and "Kentuere" (226); Mr. Eyre Walker's "The Valley of Desolation" (185) and after "Winter in Yorkshire Woodlands" (196), the latter a large and remarkable work; and (to return once more to architecture) Mr. T. M. Rooke shows a careful and effective study of the north side of "Notre Dame de Semur" (148). Altogether a very fine exhibition.

MASONIC HALL, BARRY.—The new Masonic Hall at Barry, which has been erected in Broad-street, has been opened. The building was carried out by Mr. W. T. Morgan, contractor, Cardiff, from the designs of the architect, Mr. J. A. Owen, Cadenton, Barry. It has a frontage to Broad-street of 35 ft., extending back for a distance of 100 ft. The ground floor comprises two look-up shops, a central entrance and vestibule, and a concert-hall. The concert-hall will be utilised for public-meetings, dances, etc. The first floor comprises another large hall and ante-room.

THE ARCHITECTURAL ASSOCIATION.

An ordinary general meeting of this Association was held on Friday evening last week at No. 18, Tufton-street, Westminster, S.W., Mr. E. Guy Dawber, President, in the chair.

The minutes and nominations were read and the following gentlemen were elected members, *i.e.*, Messrs. P. J. D. Webster, A. V. Sutherland Graeme, and W. W. Diggle. Mr. R. P. Bruce was reinstated as a member.

The Building Fund.

The Chairman announced the following further donations to the Building Fund:—

	£	s.	d.
Janne Boyd & Sons	25	0	0
Hippolyte J. Blanc	3	3	0
A. Ebb	1	0	0
W. Potch	1	10	0
E. E. Frank (double sub)	10	6	0
P. Hunter	10	6	0
C. W. Piper	10	6	0
H. D. Scaries Wood	10	6	0
G. Scheriff (double sub)	10	6	0
A. Whitlow	10	6	0

He also proposed a vote of thanks to the executors of the late Mr. R. P. Brevelon for donation of copies of photographs.

This was agreed to.

The Chairman then read the house list for session 1906/07, as printed in our issue for March 31. He also stated that Mr. E. W. M. Wonnacott had been nominated by Mr. E. R. Taylor and Mr. Alan Potter as a member of the Committee. Messrs. T. L. Dale, G. F. Blackburne Daniell, T. J. Weatherall, and R. A. V. Harrison were elected as scrutineers in connexion with the election.

The Intermediate Examination of the R.I.B.A.

The Chairman said that all the members would be glad to know that the following letter had been received:—

Royal Institute of British Architects,
9, Conduit-street, W.

DEAR SIR,—Your letter of February 14 has been laid before the Board of Examiners, who have reported thereon, and the Council will grant exemption from the Intermediate Examination of the Royal Institute to those students of the Architectural Association who have passed through the four years' course of the Architectural Association Schools in a manner that shall be found satisfactory by the Board,

Yours faithfully,
(Signed) W. J. LOCKE,
Secretary.

Henry Tainter, Jun., Esq.,
Hon. Secretary.

Architectural Association,
18, Tufton-street, Westminster, S.W.

The Chairman said they were all indebted to the Institute for having agreed to the suggestion made by the Association. It meant that those students who had already passed two years in the Day School and two years in the Evening School would, if their work was satisfactory to the Visitors, be exempted from passing the Intermediate Examination. It was hoped to arrange some class or course by which the students attending the Evening School would also be exempted. It was a step in the right direction, and showed that the Institute were recognising the Association schools as the best in the kingdom.

Valuations, Compensations, and Light and Air.

Mr. E. Greenop then read the following paper:—

"In acceding to the request of our Council to read you a paper on these subjects I wish to explain that I lay no claim to any special knowledge upon them. They were suggested to me, and I willingly offer you my consideration this evening a few observations which my limited experience suggests."

I confess that the title of the paper would not have been a tempting one to me in those rose-coloured studentship days which many of you are still happily enjoying. We all start with ideals, which I believe and hope aim higher than the prosaic matters of valuations, compensations, and light and air. Further, this Association exists for the purpose of training architects rather than surveyors, upon whom these matters usually devolve. Not that I hope any of us mind being termed 'surveyors,' a title honoured by age, and borne by greater men than any of us can reasonably hope to become. But we must take our world as we find it, and if we are to grapple successfully with it, we must observe the conditions which its manner of life and requirements impose. In other

words, there must be a considerable commercial element in our up-bringing to accompany the artistic training. Without this it is not, I think, possible for an architect to protect the public from whom we derive our means of subsistence. The client has a right to think that the most important factor when employing us is our ability to protect his pocket, and to enable us to attain this qualification something more than the artistic spirit must be added; we must, by diligent observation and study, make ourselves competent surveyors. The term 'surveyor' embraces many departments, but my observation, I think, may fairly cover them all.

With the hope that this short preface will be some justification for this paper at the Architectural Association, I will proceed to unburden myself of a few thoughts, which I trust may be useful to some of you. Were I by some wizard's aid suddenly transformed from an architect to a client, I should, if looking for an architect for my proposed building, choose one who, besides satisfying my artistic instincts, if I had any, was something also of a valuer, something of a land agent, and something also of a quantity surveyor. The more this text is considered the more convincing is the sermon that grows out of it, and, example being better than precept, I can recall—and I do not doubt many of my hearers can also—dire results to clients arising from deficiency under one or more of these heads—picturesque results maybe, but built upon an ill-digested financial foundation, leaving a legacy of a precarious 24 per cent. investment or less. The reason is not necessarily reckless misrepresentation, or roseate exaggeration born of the enthusiasm of a young architect to see his long-studied fancies moulded into reality, but ignorance of the broad principles of business and commercial life, which govern building operations equally with dealings in stocks and shares, or, indeed, any other commodity. Everything has its market price, and if we manufacture under such conditions as produce a total cost greater than the saleable value we have failed in applying a first principle of worldly wisdom, and our client may righteously be dissatisfied.

You will note that I am tuning these remarks down to a student's keynote, and this for two reasons—firstly, because any attempt on my part to pretend to put forward original ideas on the subjects of valuations, compensations, and light and air would be as out of place here as they would be presumptuous elsewhere; and, secondly, because I interpret the invitation of the Council to mean that I should say something to enable some of you who may be a little younger than myself to bring your ideas to a useful working focus. In doing this I shall doubtless say much that is everyday knowledge to men of my own age, for which I ask their indulgence. If I should appear to make too lavish a use of the personal pronoun or to speak dictatorially I must ask you to attribute it to the desire I have to avoid giving you what is readily available in the many excellent text-books on these subjects, and to speak only from my own experiences.

Valuations.

To speak first of valuations. What I understand by value is the price which would be given by the average investor ordinarily on the look-out for the commodity in question. It is conceived, and that is something less than the actual theoretical value, as every man expects to get something, however small, off the theoretical value; but, on the other hand, it may be more than would be obtained upon a forced sale in open market, where it is known to possible buyers that there is from some cause a necessity, more or less acute, to realise at once. The figure is not to be arrived at by running your finger down a printed table, followed by an elementary problem in arithmetic, but by the exercise of a judgment trained by observation and experience, with knowledge of the world and some study of human nature. A good pinch of common sense may be thrown in with the other ingredients.

A common object on a solicitor's bookshelf is a copy of Inwood's 'Valuation Tables.' I can recall instances in which, as events have transpired, a moderate charge of gun-cotton would have involved a preferable risk. As popular works on legal advice in the hands of a layman are to the lawyer, so is the book of valuation tables in the hands of the lawyer

to the surveyor. As this sounds like a rule-of-three sum, you may be looking to me for an answer; I should give it as—ultimate increased business to the professional man and corresponding loss to the unfortunate client. Said a solicitor once to me: 'We generally do these probate valuations ourselves. To my inquiry as to why he made the particular matter an exception, he replied: 'Well, we found we could calculate everything except the proper amount to be deducted for annual repairs and the number of years' purchase.' A reply like that would dispel a London fog. I think it must have been the same sunny temperament which induced the gentleman to instruct me that in valuing a fixed rent-charge I should have particular regard to the then standing price of Consols. However, here we were on common ground, and all I asked was that he would allow me to throw in for momentary consideration a theoretical pound of butter.

The young valuer cannot too clearly keep before him the principle that there is no value in land except for what you can make out of it. This may appear so obvious as to almost insult your intelligence, but it is singular how frequently it is insufficiently grasped. I was once asked by a member of this Association what price per foot super he could offer for a site off Fleet-street. When the full blast of this staggering query had passed over I suggested that, if he contemplated turnips, the price at the moment, having regard to the probable quality, would not probably justify his offering more than 30s. an acre. Doubtless by this time he has learnt, like the philosopher with the doubtful breakfast egg, to work from the other end. First find what crop is wanted, then calculate what that crop will cost you from seed time to harvest, and then what the crop is worth in the market when finally gathered. In other words, what building is appropriate for the position is the question to determine—the rest follows. Observation and inquiry alone can assist you here.

When valuing existing buildings one must, of course, have the necessary knowledge to enable one to estimate with accuracy the probable cost of repairs, the deductions for rates, and a deduction for possible loss of rent and similar contingencies. It is not unusual to see 10 per cent. upon the gross rental value deducted for repairs, but the experienced valuer prefers to take each case on its merits. A stuccoed house, for instance, requiring painting externally every three or four years, would obviously necessitate a much larger annual average outlay than a stone or brick-faced house of the same size; again, the age of the property, the class of tenant, and other such considerations may vary the conditions materially. The parochial rates in the pound are easily ascertained; they vary in London, as you doubtless know, from about 3s. 6d. to 12s. 6d. They are calculated on the net rateable value. I have not time to go into the question of the manner in which under the Rating Act of 1869 this net rateable value is arrived at, but it represents the theoretical net amount going into the landlord's pocket after he has paid out of the gross rent received such outgoings as are necessary to insure the property against fire risk and to keep it in a condition to command the rent. It is a popular error to deduct property tax from the gross rent when making calculations for the purpose of arriving at capital value. There is no such thing as property-tax; it is merely income-tax, mis-called because it happens to be derived from land or house property instead of from profits of business or the many other sources from which the tax is derived.

In the case of property of small annual value overseers are legally authorised, if they think fit, to allow a rebate to the landlord upon his paying the rates instead of the tenant, the advantage to them being that he pays whether the property is let or not, and they are not at the expense, trouble, and risk of collecting small sums from small tenants. Owing, however, to the increased difficulty of late years of raising sufficient money to meet their many demands, the overseers have in some cases ceased to allow the abatement, with the result that the landlords have refused to collect. It has proved to be an interesting corroboration of the belief that the working classes have been under the delusion that they do not pay rates, for, notwithstanding that the

amount of the rates has been deducted from the rentals, serious losses have been incurred to owners of such property owing to their inability to keep tenants, who consider additional burdens are being imposed upon them.

When you have finally got at your net income, you have then to decide upon what is the most important matter—namely, the number of years' purchase to be applied as a multiplier. In other words, what percentage would an investor require during the term in question, in addition, of course, to getting back his capital. Here the tables help you, as far as the mathematics go, but as regards the proper percentage to adopt you must decide this yourselves. In the case of a house, say, in Belgrave-square an investor would be content—indeed, would have to be so—if he could see, say, 4 per cent. for his money, whereas in the case of an inferior East-end wicker property the expectation of 8 or even 10 per cent. could be justified, the one being well assured, the other more or less precarious.

Valuations of property perhaps more often arise out of mortgage proposals than for other objects. Here I need hardly say the greatest care has to be exercised. Careful inquiry should be made in the neighbourhood in order to compare the rentals of the property in question with those surrounding it of similar character. This is not only a check upon possibly artificially-created rentals, but in the case of old-standing tenants it will occasionally be found that the property is under-rented. In making such investigation it is generally possible with a little humouring to get information of value from tenants, and it is well to follow up any clue, however unimportant at first sight, as one comes by chance sometimes on information not to be obtained by direct inquiry. Quite recently, by merely following up a casual remark made by a street loafer, I was enabled to get at some facts which I had been for weeks unsuccessfully attempting to obtain through ordinary channels. In weekly property a respectful and sympathetic attention to the recital of the varied complaints to which the flesh is heir, and of which the female members of this class would appear to enjoy an abundance, will be found profitable, and the continuation of the narrative into the third and even fourth generation backwards may, if borne with fortitude by the surveyor, prove to have a less remote bearing than would appear at first sight upon the subject he is specially concerned with. Old residents will compare the past and present character of the occupants of the houses, and drop many useful hints, which you will not find in your written instructions, the borrower not having thought it necessary to mention them. At times a visit to the local board or vestry hall to inspect the rate-books will be useful, as the rateable values nowadays are usually kept up to date, and, used with caution, are a very good guide as to value. I have always met with courtesy, and at times offers of assistance, at the hands of vestry clerks and their subordinates. Unless you are a ratepayer, a charge of 1s. is occasionally made, but your professional card handed in is frequently accepted as a substitute, the object of the charge being to prevent unnecessary inquiries by busybodies, who, having little to occupy themselves with, are over-concerned about their neighbors' affairs. On going to an unknown district examine the particulars displayed in the windows of the local house agents, usually in the neighbourhood of the railway-station. The results of sales at the Mart are reported in the daily papers and appear weekly in a handy form in the *Builder*.

Where the money to be lent is derived from trust funds it behoves one to be especially careful. The Trustee Act of 1893 throws the responsibility entirely upon the surveyor, as it should do; a trusteeship is a thankless office at best. Trustees are precluded by Act of Parliament from lending upon leasehold property having less than sixty years unexpired. This very much limits the opportunity of investment, and at the present time, when there is so much money always available, it would strike the lay mind as going a little too far on the safe side. It is possible to guarantee the loan made on a property by paying a premium to one of the existing guarantee societies, but, as the income is reduced by the amount of the premium, and they are fastidious in their choice, I am

unable personally to see that they are of much practical use in ordinary everyday transactions one has to deal with. Freehold ground rents are, as you know, a rich man's security. As a fact, they are generally a little cheaper than Consols, although, not being liable to loss on realisation by daily fluctuation or by having the return arbitrarily cut down by Chancellors of the Exchequer, they should be worth a little more. The average ground rent is considered sufficiently secured if it does not exceed one-fifth of the rack rental, but in important sites in the centre of great cities the ground rent will form the greater part of the rack rental.

I fear I have occupied more than its fair share of the time allotted to me to valuations, and must now pass on to the next heading.

Compensation.

Compensation in the sense in which we here use the term is payment for property compulsorily taken in the public interest. The circumstances which may arise are endless. The most frequent are perhaps those arising out of the formation of and additions to railways, the widening of roadways, the acquisition of land for schools, drainage, etc.

The proceedings are governed mainly by the Lands Clauses Acts, which are generally incorporated with the special Acts obtained by the various bodies acting as promoters. This is not the place in which to go into the procedure in compensation cases, which, as a fact, is looked after by the solicitors engaged. The surveyor's work is confined to making the claim, and supporting it in the witness-box falling a settlement privately. The claimant can elect to go to arbitration or before a jury of laymen, and generally chooses the latter. You are all familiar with the conflicting evidence given by eminent surveyors as to value in these cases. Of course, every allowance must be made for bias, over which the professional mind has a limited control, varying with the individual, but in some cases the evidence given would lead one to consider certain people are more than ordinarily affected. However, I think there is little harm done, for if the figures of the promoters and claimant are added and divided by two it is astonishing how closely the verdicts of juries approximate to the result. The young surveyor should be cautioned against the client who has inflated ideas as to his claim, or who imagines that, regardless of the actual value, the more you ask the more he will get. It is you, not he, who will have to go into the witness-box and be cross-examined as to how you arrive at your figures, and he will sit unruined in court whilst you are having a very uncomfortable time. With such clients it is safer to decline to act, or to limit your evidence to such as you can conscientiously agree to, making him understand that it is open to him to go into the witness-box, since he is so satisfied about it himself, to prove it. This generally brings about the result desired.

The ordinary principles of valuation, of course, apply to compensation cases. It is usual to add 10 per cent. to the actual value as the recognised solatium for having to part with your property against your will. In one of the recent draft Bills promoted by the London County Council it was provided that compensation should be paid in certain cases based on the amount which would be required by a 'willing seller.' As this was no doubt intended as a joke, we cannot do better than end compensations with it.

Light and Air.

It is mere trifling to introduce this subject and dispose of it in a few minutes, as I nevertheless am compelled to do in order to carry out my undertaking. You all know how such questions have arisen out of the crowding of buildings belonging to different owners in large cities and towns.

Of all the varied matters with which surveyors have to deal, I think light and air questions are the most unsatisfactory to everyone concerned, not excluding the professional men themselves, who, as far as my experience goes, are never in any way adequately compensated for their services. Those services have generally to be performed under great pressure as regards time, the work is fraught with much worry and anxiety, and if you happen to be on the dominant owner's side you are liable to have to listen to such terms as 'blackmail,' 'blood-sucking,' etc., from brother architects, who

do not want to be interfered with, however much in the wrong they may be. If litigation ensues the proceedings are usually long drawn out, and it is difficult to get the case properly appreciated without models and visits to the premises, which are costly matters. In the end the parties are probably far worse off than if they had settled their differences out of court.

As you are no doubt aware, there have been many methods put forward from time to time for ascertaining the amount of privation of light, but they are theoretical rather than practically conclusive, and the tendency now is rather to rely on the actual opinions of witnesses upon the question of the quality of the lighting before and after the alleged interference.

In endeavouring to make terms privately with your adversary the opportunity of getting an equivalent for the light obstructed by enlarging windows and skylights should be looked for. Glazed bricks are, I think, of doubtful value. They get dirty, peel off, and the amount of light gained from them is, I think, more imaginary than real. Were both sides to employ a reasonable surveyor and be reasonable themselves, I believe there are few cases which need be fought.

I endeavour myself to get these cases referred to a surveyor as sole arbitrator. It is a comparatively inexpensive method of dealing with the dispute, and it is generally speedily settled, the latter point of no little importance where buildings are going up.

I must almost apologise for mentioning the famous case of *Colls v. The Home and Colonial Stores*, so much having been heard of it, and so much more having been made of it, during the last few months. Put into a few words as possible, the House of Lords decided that, provided a sufficient light remained to the building affected, having regard to the use to which it was ordinarily put, no claim for damage could be sustained against the person building. The plaintiffs in the case made a claim for more than a sufficient light, in which they were supported by earlier decisions. The case was, however, of special interest as reviving and re-stating the existing, but dormant, law. The earlier decisions laid down that in order to obtain redress for interference with light you must show the interference to be of sufficient importance to amount to a nuisance, and in the older works on 'Nuisances,' such as 'Gibbons' Law of Fixtures and Nuisances,' you will find the question of light and air dealt with under the heading of 'Nuisances.' As was pointed out in the judgment in the *Colls* case, that which originally was in the nature of a negative right that your light should not be interfered with became gradually looked upon, owing to the tendency of the decisions, as a positive right in the nature of an easement. By its decision in this case the House of Lords brought us back to the point from which we had strayed. The result should, to my thinking, be satisfactory to every fair-minded man. It is the assertion of reason and honourable dealing over selfishness and cupidity.

At the same time, it might be imagined, from the statements one hears occasionally, that this case presented anyone who cares to avail himself of it with a definite charter to do precisely what he pleases in his building operations, as though his neighbour were entitled to no light at all, except such as the chartered gentleman, in the goodness of his heart, allowed him to retain by special favour. I have had people who knew so little of the case that they have scarcely been able to quote the name of it in an intelligible form, quote it against me as though it were a parting shot which settled the whole of my clients' rights, body and soul, for ever.

This, however, is not the case. A man can no more interfere with your rightly-acquired reasonable amount of light now than he could before the case of *Colls v. The Home and Colonial Stores* was tried. In leaving this subject I might mention that one of the lords justices in his judgment spoke approvingly of the value of the angle of 45 deg. as a test, and thereby gave, I hope, a new lease of life to it. It may not be very accurate or scientific, but it is very convenient and time-honoured. It is also readily understood by lawyers.

I may mention in conclusion that a Bill was promoted several years ago, with the combined aid of the Royal Institute of British

Architects, the Surveyors' Institution, and certain eminent lawyers, for the purpose of dealing with light and air matters on the lines of Part VIII. of the London Building Act, which, as you know, deals with party structures. The Bill is, I think, a most excellent one, but a private Bill of this nature is not hurried on, as you know, in Parliament, and I fear it will be a long time before we see it pass into law.

I have now only to thank you for so patiently listening to these, I am afraid, rather disjointed observations."

Mr. W. Woodward said he had much pleasure in proposing a hearty vote of thanks to Mr. Greenop for his interesting and valuable paper, which contained the important quality of humour so valuable in a paper of the kind. Mr. Greenop had given an excellent idea of the three subjects in a condensed form, and he had imparted some valuable information to the members. As to artistic training and the combination of the architect's business with that of the valuer, the quantity surveyor, and perhaps the land surveyor, if they dismissed land surveying as one of the valuable adjuncts to an architect's profession, they certainly ought not to omit quantity surveying. He had had reason to thank his old master for having in the first years of his experience in his office taught him the practice of quantity surveying; not only did it teach a student method, but in after life it enabled an architect to protect the pockets of his client to a considerable extent by the knowledge of measurements, and particularly by a knowledge of prices. A client did not employ an architect to make pretty drawings merely, and an architect could be as artistic with a knowledge of quantity surveying and valuations as he could be with an entire absence of those adjuncts to his profession. The term "surveyor" had been used almost with opprobrium in certain places, but there were surveyors who were not only members of the Association and the Institute, but were men of great artistic attainment. As to light and air matters, in giving evidence in the courts it was just as well carefully to avoid using the word "air," as the lawyers made a point that if a man no law affecting air. We knew that if a man interfered with light he interfered with air, but the law did not recognise that; it recognised it only in conjunction with light. As to Inwood's tables, certain solicitors, to his knowledge, knew how to use those tables as well as any surveyor. As to valuations, the whole thing turned on the surveyor's experience of what number of years' purchase he was to put down after arriving at all other figures, and the number of years' purchase was determined by an inquiry in the locality as to the character of the property. No one could be too careful in reference to the number of years' purchase, for there were many contingencies, such as unlettings, repairs, loss of rental, which resulted in the owner getting no adequate return for his investments. As to valuations, the surveyor was liable, particularly if dealing with trustees, for any error in his calculations or any mishap which might occur in consequence of his recommendations. A friend of his, a Fellow of the Royal Institute of British Architects, was induced by his own father's firm of solicitors to value a riverside property on the Thames. He valued it at 2,000*l.*, but the property was unlet, and proceedings were taken against the surveyor for negligence in preparing his report, and he was put to an expense of 1,100*l.*, although his fee had been only 2*l.* 2*s.* Words should be put in the report such as: 'If the house, or property, is let as such and such a rental to a substantial tenant on a repairing lease, then it will be worth so much.' If some such words were not put in the report the surveyor was likely to get into trouble. As to freehold ground rents, it was important to remember that if the present Government brought in a Taxation of Ground Values or Rating of Ground Values Bill, surveyors would have to be very careful in estimating the value of freehold ground rents and freehold property altogether. Mr. Greenop truly said that the young surveyor should be cautioned against the client who had an exaggerated idea as to the value of his claim. On the principle of adding the two valuations and taking half, it was obvious that the more one put on for the client the better would be the result. This method of

adding the two valuations was often adopted, and it was curious how often the result was an approximation of the real value. As to professional men who gave evidence in light and air cases, he agreed with the author that they were seldom adequately recompensed. If the witness were not a busy man the case might be remunerative, but the busy man who kept himself in readiness to give evidence in a case which did not come on for a long time and then lasted for days was rarely adequately compensated. Models were sometimes desirable in light and air cases, and sometimes, and generally, very undesirable. And as to angles and the determination of the loss of light by angles, he thought that that method was most misleading. Mr. Justice Kekewich held, and held properly, that angles were not the only determining factor in estimating the quantity of light; there was diffusion of light, which was of great importance; and as to evidence as to the number of degrees of light which may be lost or gained, that was very deceptive. The best method was to make a simple drawing. He partly agreed with what had been said as to glazed bricks, but if the use of white glazed bricks was a condition in a light and air case, it should be stated that they must be cleaned down periodically. As to Michelangelo's Taylor's Act, he had had occasion to read through it, and it seemed to provide for everything. When a surveyor was reporting to a solicitor it was very advantageous to state what deductions had been made, what the estimated rental was, and what number of years' purchase or rate of interest they had put down. The solicitor could not afterwards plead ignorance as to the basis of the valuation, and that was an important matter.

Mr. Max Clarke, in seconding the vote of thanks, said that one of the objects of those meetings was to teach the members to speak publicly, and he should like to see the younger members avail themselves more of the opportunity. It was the primary object of the Association that those who were trying to learn their profession should extract as much information as possible out of the lecturer, and especially on such a subject as they were now considering. The lecturer said it was essential in such matters as valuations, compensations, and light and air cases that they should have knowledge, but he did not say how they were to set about getting that knowledge. Did Mr. Greenop's clients suffer when he commenced this sort of work? That he should like to know. Something besides knowledge was required, and that was a feeling of responsibility to the client, and that was somewhat wanting among some architects at the present time. They forgot that they were employed by the client to do a particular thing to the best of their ability for the client. That was one of the first essentials in carrying out the profession of an architect, and still more so in valuation cases, particularly if it was trust money which was being expended on a valuation, for then the surveyor became absolutely liable. Of course, with architecture there was only a moral obligation, but he should like to impress that on them, too. They were useless without this knowledge, and they should devote a little more time to acquiring it. It was one of those occupations which it was impossible to learn in a train with half a sheet of note-paper; on the contrary, they must go about the neighbourhood where the valuation was to be made, and that was where they had a chance of using their brains.

Mr. Louis Jacob said it was a common thing in the case of shops for a little piece of ground to be left in front. That land was of no use for building purposes, and it was left as public property more or less, except that the shopkeepers put their goods upon it. It would be interesting to know how they were to estimate the value of such land. He should also like to know what was the usual basis in arriving at the difference between the value of property (a) in the case of a willing purchaser and a willing vendor, (b) in the case of a forced sale? It was most important to make the most stringent inquiries about property in neighbourhoods which they did not know very well, as some very shady tricks were resorted to in order to deceive the surveyor.

Mr. Green said he appreciated what had been said as to the difficulty of the young man who was called upon to make a valuation.

Mr. Matt. Garbutt said that whenever he

had had to look into a valuation and it had been a question of a client contemplating a purchase, he had found that they started with a high ideal—to use the language of the lecturer—and that was a high ideal of the value of the property for sale. Vendors generally entertained such notions, and one of the things the young valuer had to consider was how he might detect what often amounted to dishonest misrepresentations. Fictitious rental values were common. The tenant in occupation had documents which looked all right on the face of it, but they were dummies, and the rental the "tenant" was supposed to be paying was far higher than the ordinary market price. Should the client buy the place, the tenant disappeared, and when the client went into the open market with his property he suffered. In buying for personal occupation a man might be content with a return which looked absolutely insignificant when viewed in the ordinary way. If a man for his own pleasure put in a lot of decorative work, for instance, it frequently happened that if the property were sold it would not go for a figure proportionate to the actual cost. The question of the class of property had to be remembered particularly; if they were dealing with big residential property they must be careful to think of the possibility of the neighbourhood going down and the consequent fall in value. Property, on the other hand, which was exceedingly small and poor in character might be relied on to keep full of tenants, but then there were the stringent sanitary and other regulations, which involved landlords in large and frequently-recurring expenses, cutting down, sometimes almost to a vanishing point, the value of property which otherwise looked rather tempting.

Mr. John Murray, who had taken the chair in consequence of the President being compelled to leave the meeting, in putting the vote of thanks, said that to carry on an architectural practice successfully in these days it was advisable for an architect to have considerable knowledge of these subjects. In architectural design appearances were of importance, but in valuations they were apt to be very deceptive, and correct valuations could be arrived at only by considering many facts which were hardly discernible at once, and then it was that judgment, aided by knowledge of the world and some study of human nature, was so useful. It was also necessary to be up to date in these matters, and to keep a sharp look-out on what was going on around. The value of property was usually based upon the use to which it could be put and the return that such use would produce. As to compensations, he would advise younger members to be careful to have a proper basis for all assertions made in connexion with compensation values. The difficulties as to light and air were no doubt known to most of them, and it was desirable to keep in mind the words of the law, i.e., "it is not sufficient to say that it will alter the plaintiff's lights." "The law says it must be so near as to be a nuisance"—and a nuisance was a matter of opinion. When the Bill proposed by the Institute and others became law it should materially assist in the solution of these difficult questions.

A member said that if some of the young members had the same opportunity that the elder members had of seeing a proof of the paper before the day of the meeting more of them would take part in the discussions. The Chairman said that the supply of proofs was limited, and if each member received a proof before the meeting he was afraid that the lecturer would sometimes not have much of an audience, as members would not trouble to attend if they had the chance of reading the paper beforehand. But if a member wished to speak on any subject he would be supplied with a proof at any time. The vote of thanks was then heartily agreed to.

Mr. Greenop, in reply, said it was quite correct to say that they could not make a claim for air as distinct from light. But it was usual to tack it on to light, for there was a possibility that where light was interfered with the free passage of air was also. As to Mr. Woodward's friend who was mulcted in damages of £1,000, the first mistake he made was in taking on a job like that for a 2½% fee. A large part of the fees was for risks of having to

do some day what Mr. Woodward's friend had to do. The first thing that ought to have been done in that case was to estimate the rental value having regard to the fact that the property was empty. The neighbourhood might have gone down and property of the kind no longer be wanted. A careful man would have made inquiries in the neighbourhood. As to ground values and taxation, people who talked about taxing ground rents or values were either ignorant people or the demagogues who fattened on them, for ground rents were very much taxed now. A rack rental included ground rent, which paid local rates and imperial taxes, and what some people seemed to want was that the ground should be taxed twice over. On the question of taxing unused sites, the whole point of the 1869 Act was that property should only bear its burden of taxation when it was producing profit, and that was why charitable institutions and churches and chapels were not taxed, though if those buildings were used for profit-making purposes they were. As to the angles in light and air cases, the fallacy of the angle of 45 deg. was that a room might not be used at the time of day when it got the angle of 45 deg. Still, there was a value in adopting the angle of 45 deg., for lawyers understood it. He always advised clients if they could get an angle of 45 deg., not to proceed further with their objections, for it was no good going into court. As to whether his clients suffered when he commenced valuation work, he hoped they did not. When as an assistant he was sent to look at property in order to report to his master, he used to think how he should act and what he should do if these were his own jobs. His employer soon noticed that he studied the various matters for himself, and asked him for his opinions. When he started for himself, therefore, he felt as though he had been at the work all his life. Another practice he made was, if he had any doubt about matters of this sort, to think what he should do if he were about to lend his own money. If they always answered that question conscientiously they were not likely to make the client suffer. As to the question about the space in front of a shop, in estimating the value it should only be taken as a place for putting goods upon. As to how they should describe property if advising trustees, he advised them to keep closely to the wording of the instructions. They should not take the least responsibility beyond what the instructions pinned them to. They should answer the requirements closely, but should not talk about property being suitable unless asked to do so. One should not speak definitely as to matters which were not within one's personal knowledge. In buying for personal occupation one might give a fancy price, and not infrequently one again obtained a fancy price.

The Chairman said that the next meeting would be held on the 27th inst., when Mr. Walter Cave will read a paper on "Fenestration."

The meeting then terminated.

A MELBOURNE ARCHITECT ON COMPETITIONS.

A CORRESPONDENCE which is inserted in the last issue of the *Journal* of the Royal Victorian Institute of Architects is of sufficient interest to be worth quoting. A Melbourne bank which intended to build new offices addressed the following letter to a certain number of architects:—

"— Bank, Melbourne.
December 19, 1905.

DEAR SIRS.—My directors are considering the advisability of altering the building now occupied by the bank, and have decided to ask several architects to submit plans of the alterations which they think should be made.

I am directed to ask if you are willing to submit such a plan, in terms of inclosed memorandum, on the conditions that the architect whose design is adopted by the board will be employed to carry out the work, and that none of the other architects are to receive any remuneration for their designs, but will be entitled to have their plans returned.

The directors do not bind themselves to accept any of the plans submitted.

Yours faithfully,

Manager."

Then followed a general statement of the requirements for the building. From one of

the firms thus addressed the manager received the following reply:—

"DEAR SIR,—We are in receipt of your letter of the 29th inst., inviting us to submit designs for alterations to the building now occupied by the bank, in competition with several other architects. Our experience in this class of work is that the best results can only be obtained by the architect and proprietor being perfectly in touch with one another in working out the best way of meeting all requirements.

In the case of a competition, this condition cannot obtain, because the several competitors (in the interests of fair play) must necessarily be kept to a certain extent "at arm's length" from the proprietor.

If you should see fit to select an architect to act for you in the way above indicated, and should we have the honour of being selected, we should be prepared to exhaust the possibilities of the case by as many alternative sketch designs as might be necessary to obtain finality—only charging you our commission on the cost of carrying out the plan ultimately adopted.

Should you, however, still desire competitive designs, our views are so definite as to the correctness of the principle above laid down, that, while we thank you for the honour done us, we must respectfully decline to compete.

Yours faithfully,
— & —"

The matter came before the Council of the Victorian Institute, who, after commending the architects for the stand they had taken, passed a resolution that the correspondence should be inserted in the *Journal*.

THE SANITARY INSPECTORS' ASSOCIATION:

HYGIENE IN SMALL TENEMENTS.

AT Carpenters' Hall, on Saturday last week, before a meeting of the South-Eastern Centre of the Sanitary Inspectors' Association, Mr. John H. Clarke (Chief Sanitary Inspector, Chiswick) read a paper on "Hygiene in Small Tenements." He said that the present state of the law in regard to landlord and tenant was often a great hardship upon the small property owner. Wealthy owners might do much more to alleviate the unhappy conditions of housing in certain directions, but, on the whole, the majority did discharge their duties satisfactorily. Referring to the powers of sanitary inspectors, the lecturer said that notwithstanding the adverse decisions of the courts as to power of entry, he was in the happy position to state that during a period extending over fifteen years as a sanitary inspector he had never yet been refused admission to a small tenement, which was most gratifying, having regard to the circumstances which frequently necessitate such an inspection. He did not presume to suggest that the system adopted in his own department was by any means original, knowing as he did that a vast amount of earnest and good work was carried on by sanitary inspectors in every district so far as they were able in discharging the variety of duties which they were called upon to perform, and the inadequate methods which existed in many health departments, and which did not tend to cultivate that zealous interest which every assiduous officer should possess and take credit for.

For the purpose of systematic inspection he had allocated certain areas for inspection each month throughout the year, and under this system 2,250 artisan dwellings were inspected last year, out of which 907 were double tenements, the mode of inspection including particulars as to sanitary defects, population, and other general details which enabled them to check overcrowding, and to register all tenements not kept in a satisfactory condition, and which were consequently inspected from time to time until an improvement was attained. These duties, performed with tact, had resulted in a marked improvement throughout the district, and tenements which were once the object of indescribable filth were now in a much better sanitary condition, and the tenants were induced to take some interest in cleanliness. The inspections referred to were arranged to cover practically the whole of the artisan areas in his district, with a population of 15,175, of which 4,740 were children under twelve years of age. The infantile death-rate of this population during the last year was 118·2 per 1,000 births registered in the area of the working classes, and how many of these deaths arose from preventable diseases he was not prepared to state, but

it was certain that a large number of deaths had occurred from conditions which could be remedied if parents realised more fully the necessity for cleanliness and judicious feeding. On the contrary, the infectious diseases notified from these areas had decreased to 155 last year as compared with 267 in 1896. Whether that was due to systematic inspections or not the fact remained that nuisances of every description were promptly dealt with, and the districts in question must consequently be healthier and the material for the propagation of infectious diseases ceases to exist.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

VI.—NEW SCOTLAND YARD EXTENSION.

THE sixth spring visit of the session, held on Saturday, 7th inst., was an interesting occasion to those members of the Architectural Association who attended, as facilities were given for viewing an important public work—an extension to New Scotland Yard.

As in the older building, Mr. Norman Shaw, R.A., has designed the new block. Most of the working drawings, however, were prepared in the office of Mr. J. Dixon Butler, the police architect, whose presence at the visit under notice added materially to the success of the gathering. The design generally is a reproduction of the older work adapted to fit the limited area at disposal. The façades of the Embankment and the private road are shorter than the corresponding fronts of the existing building, and only the north-east angle of the latter, including gable and turret, is now reproduced. Other features, based on the present work, are introduced in prominent positions, but the whole extension interrupts the peculiar isolation which has for so long constituted one of the great values of the original offices.

The nature of the site involved structural difficulties of considerable magnitude. Chief among them is the carrying of parts of the south and east fronts on iron stanchions and girders above the District Railway and Westminster Bridge Station. In many instances, however, it is a welcome sight to observe massive blue-brick piers performing mighty acts of support in places where slender iron columns are nowadays so generally found. The accommodation consists principally of offices and stores, numbering approximately one hundred rooms, disposed throughout ten stories. Varying floor levels have been well arranged with the respective staircases and entrances.

Dartmoor granite is used for facing the three lower floors, varied with Cornish granite in the large doorways. The upper stages are finished with red brickwork, five courses to the foot, relieved with Portland stone bands and moulded window dressings, while the roofs are covered with green Westmorland slates. Internal construction is, of course, fireproof, the floors being finished with solid wood blocks and red-tile borders, 18 in. wide—a very attractive method for the particular purposes of the building. The barrel-vaulted ceilings in the main corridors are turned in brickwork.

The principal feature of the extension is, perhaps, the bridge connecting the old and new buildings. This is 60 ft. long, and consists of a covered way, carried on a massive granite arch of 35 ft. span. The general design follows that found on the present building at the same level. As an echo of this feature, the upper end of the private road will have a granite wall with large rusticated piers and wrought-iron gates. Arched openings will span the footways, and the piers will have massive lead urns.

The party of members afterwards assembled at the new police courts and station in Old-street, Shoreditch, recently completed from Mr. J. Dixon Butler's design. Again the architect explained the scheme, giving full information upon the planning and materials used. The accommodation comprises police offices with cells for prisoners, two courts and a duplicate set of magistrates' rooms, clerks' offices, prisoners' waiting-rooms and cells, etc. Portland stone, red brick, and Cornish granite are again the materials employed upon the exteriors, while a good modern feeling for breadth characterises the design of the interiors. The planning is most successful for a work of

this nature where some rooms are used in common with the two departments, and have yet to be arranged for separation upon occasion. It is not possible at the present time to fully describe the work, but it will be seen that this is, perhaps, one of the most important and successful police buildings in London of recent years.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Alderman Evan Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Bermondsey Borough Council 4,345*l.* for electric lighting purposes; Camberwell Borough Council 3,000*l.* for an open space, 685*l.* and 1,507*l.* for housing purposes, 1,750*l.* for laying out an open space, and 1,236*l.* for street improvement; and St. Marylebone Borough Council 48,545*l.* for electric lighting. Sanction was also given to the following:—**Borrowing** by Chelsea Borough Council 22,500*l.* for the erection of additional municipal offices; and borrowing by Westminster City Council 3,421*l.* for sewer reconstruction work, and 4,600*l.* for housing purposes.

Jobbing Works—Schedules of Prices.—The General Purposes Committee reported as follows:—

"Paragraph 13 of the order of reference of the Works Committee provides that the estimates, measurements, and certificates of the several certifying officers in respect of jobbing works shall be based upon schedules of prices agreed upon between the manager of works and the several supervising officers and approved by us. We have to report that we have approved such a schedule for use in connection with the certification of accounts for drainage and sanitary works executed by the Works Committee at schools. This schedule is based upon the schedule of 1902 for repairs to buildings executed under the supervision of the architect (Education), and upon the addendum thereto of 1905, and provides for an addition of 12½ per cent. to the prices in such schedule and addendum.

Mr. E. Collins moved, and Mr. Hunt seconded, that the paragraph should be referred back. It was unfair that there should be an addition of 12½ per cent. to the prices in the schedule. The schedule was already very high.

Sir Thomas Brooke Hitching said that the cost of building was much lower to-day than it was four years ago, and yet it was proposed to add 12½ per cent. to the schedule. In the open market the work would be done at the schedule price.

Canon Jephson said that the Works Department was simply doing what contractors had done over and over again.

Mr. Buxton said that they were told, when the Department was started, that they would be able to do away with the alleged huge profits of the contractors, and yet they were now told that what the Committee proposed was what contractors were doing.

Mr. McKimmon Wood said that the Department did the work at cost price.

Mr. E. White said that when work was put out to tender it generally cost less than the estimated cost of the responsible officer. He should like to know who prepared this schedule, and how old it was. He thought that 12½ per cent. was too high, but everything would depend on the schedule, and as to that the Council were in the dark. It was a sort of confidence trick, the Council being asked to trust the Works Department.

Mr. Gilbert said that the schedule was the School Board schedule of 1902.

Mr. Cautrey said that contractors who did work for the late School Board generally tendered at about 12½ per cent. above the schedule.

The motion was defeated, and the paragraph approved.

Proposed Schools.—The Education Committee reported as follows:—

"The Board of Education on May 27, 1902, sanctioned the erection of a school for the accommodation of 800 children, on the site in sub-division K of the West Lambeth (School Board) division, and compulsory powers were subsequently obtained over a site in Lawn-lane (Kennington). The total cost of erecting the school is estimated at 20,352*l.*

The Board of Education on August 6, 1901, sanctioned the erection of a school for the accommodation of 800 children in sub-division 4G of the West Lambeth (School Board) division, and compulsory powers were subsequently obtained over a site in Fountain-lane, Gerrard-lane, which is known as the Fountain-road site (Wandsworth). The total cost of erecting the school is estimated at 21,414*l.*

The Board of Education on July 27, 1901, sanctioned the erection of a school for the accommodation of 800 children in subdivision AR of the West Lambeth (School Board) division, and compulsory powers to obtain a site in over a site in Franciscan-road (Wandsworth) for the purpose.

The total cost of erecting the school is estimated at £19,600. The cost of the proposed special school is estimated at 3,762.

The Board of Education on January 23, 1900, sanctioned the erection on the Janet-street site (Poplar), of a school for the accommodation of sixty twenty-five children. The cost of the proposed special school is estimated at 3,762.

As regards the Law-lane and the Franciscan road schools, the Board of Education have approved the preliminary plans, but state that they consider the provisions of rooms for drawing and science unnecessary at these elementary schools. We are carefully considering this matter, and will submit a report thereon at a later date. If these rooms be omitted from the plans, the estimate, in each case, will be reduced. In the remaining two instances the consent of the Board of Education has been received to the preliminary plans of the proposed schools.

We do not propose at this stage to commit the Council to any expenditure beyond that involved in preparing detailed plans, etc. When tenders have been invited, we will submit the necessary estimates of the whole cost of the proposed works. We recommend—

That the estimate of expenditure on capital account of 1,562, submitted by the Finance Committee in respect of the preparation of working drawings, etc., in connexion with the schools proposed to be erected on the reconstruction sites, be approved:—(a) Kennington—Law-lane (new school); (b) Wandsworth—Fountain-road (new school); (c) Poplar—Franciscan-road (new school); (d) Poplar—Janet-street (special school).

The recommendations were agreed to.

Cost of Erecting Schools.—The Education Committee reported as follows:—

We submitted a report on December 5, 1905, with reference to the plans of new public elementary schools proposed to be erected on sites in (i) Law-lane (Kennington), (ii) Fountain-road (Wandsworth), and (iii) Franciscan-road (Poplar). We also submitted a special instruction on the Janet-street site (Poplar).

The Council, however, postponed the consideration of our recommendation in order that an inquiry be made into the cost of erecting public elementary schools, with a view to ascertaining whether it would be possible to effect any economies in the erection of school buildings.

On February 2, 1906, a report was presented with reference to this question, but our original recommendation respecting the preparation of plans was again postponed until we had submitted a further report on the subject.

The particulars of the accommodation of the proposed new elementary schools are as follows:—
(i) Kennington—Law-lane: New school—Boys, 256; girls, 256; infants, 228. (Three-story building planned for enlargement.) Halls—Boys, girls, and infants, 40 ft. by 28 ft. (Three-story building.) Classrooms—50, 48, 48, 40, 40, 40, boys, girls, and infants. Drawing classroom and science room, each 580 sq. ft. Area of playground on top of school building for girls. Heating by open fires and low-pressure hot-water apparatus. Ventilation by tobin inlet tubes and extract shafts. Area of site, 32,380 sq. ft. Area of playgrounds—Boys, 30 sq. ft. per child; girls and infants, 27 sq. ft. per child, including girls' playground on top of building. It is also proposed to erect a schoolkeeper's house.

(ii) Wandsworth—Fountain-road: New school—Boys, 275; girls, 275; infants, 290. Total, 840. (School planned for enlargement.) Halls—Boys', 57 ft. by 27 ft. 6 in.; girls', 41 ft. by 26 ft. (Two-story building.) Classrooms—Boys', 50, 45, 45, 45, 45; girls', 50, 45, 45, 45, 45. Drawing classroom and science room, 620 ft. area each, over halls. Infant's playhouse (building), hall, 54 ft. by 26 ft. 6 in.; classrooms, 50, 48, 48, 48, 48. Heating by low-pressure hot-water apparatus and open fires. Ventilation by windows, tobin inlet tubes, and extract shafts. Area of site, 86,900 sq. ft. Area of playgrounds—Boys', 75 sq. ft. per child; girls and infants, 70 sq. ft. per child. It is also proposed to erect a schoolkeeper's house.

We have again related this matter very careful consideration and have had the advantage of a conference with representatives of the Works Committee in regard to the specifications for the three new schools. It is the opinion of the Council that the meeting held on March 30, 1906, and which was also attended by some members of the Council interested in the construction of schools, the representatives of the Works Committee, and various other directions in which, in their opinion, the Council might, without materially reducing the efficiency of the schools, effect a reduction in their cost. These suggestions submitted by the Committee for their reference to works of any particular manufacturer; constructing the offices and covered playgrounds in a less costly manner; providing boarded flooring on the West Lambeth site; and for the heating installation to be tendered for by selected firms, who will submit their own scheme under a guarantee; using blue lias mortar instead of cement; and grouting the concrete for sills and copings, etc.

Four months have elapsed since we first brought our proposals before the Council, and on each

occasion on which our report has been considered, we have pointed out that there is very urgent need for the provision of elementary school accommodation, especially in the Wandsworth electors area. At the present moment temporary accommodation is provided in the district for 1,115 children, but, nevertheless, there is still a considerable number of children out of school. The provision of accommodation, and building operations are progressing very rapidly in the district. We desire particularly to emphasise this fact, and to remind the Council of the seriousness of further delay. The provision of such accommodation which the Council is under statutory obligation to secure. In order that steps with this end in view may be taken at the earliest possible date, specifications should be prepared embodying the modifications outlined above. We propose, in carrying out the works, that the specification as thus modified should be adopted. At the same time we suggest that tenders should be obtained, based upon both the original specification and the specification as now revised. The Council will thus be made aware of the actual saving that can be effected by the modifications proposed.

The subjoined table shows in detail the modifications, together with the estimated saving in respect of each item, so far as the Law-lane school is concerned.

(1) Fittings to teachers' and children's water-closets of a less costly nature	£290
(2) Board flooring rebated and secret nailed to the concrete to be substituted for wood-block flooring	160
(3) Blue lias mortar to be used for brickwork and concrete, except in the case of isolated piers, chimney stacks, and work below ground, and also in cases where the nature of the sites require foundations to be built in cement	272
(4) Stocks to be specified as "good best" stocks, and not as "picked"	10
(5) Stone curbs to be reduced and gravel fill to be used for sills and copings (general architectural features) instead of stone	390
(6) Drains underneath school buildings (if any) to be in iron, or other pipes outside building to be in stone	175
(7) Yellow deal for framing, and white deal for panels of cupboards, instead of pine, and also less expensive wood throughout the school, with the exception of the roof timbers	25
(8) Railings of a cheaper design	5
(9) Cheapening cost of playsheds, and substitution of iron columns for brick piers where possible	200
(10) Plaster to be specified as "render" and "set" instead of render, float, and set. Plaster carried to be omitted, and wood frieze moulding without cornice to be specified instead	108
(11) Providing salt-glazed down-pipes instead of perforated iron water-closets	151
(12) Omit N.A.P. fittings to windows and substitute running gear for window gearing	100
(13) Eight-inch galvanised iron cisterns in lieu of Alexander's pattern	11
(14) Screws only to glazing beads in lieu of cups and screws	10
Total estimated reduction	1,875.

Similar modifications with it is understood, effect a reduction of £1,990 in cost of each of the two schools in Wandsworth. The total cost of erecting the first portion of these schools, including furniture, fittings, and certain provisions for the completed school, and based upon the specification hitherto adopted, was estimated by the architect (education) at £20,332, £21,414, and £19,692 respectively. It will be seen, therefore, that the modifications now proposed will effect a substantial reduction in the cost of these schools.

In submitting these views to the Council, we think it right to point out that although a considerable monetary saving will be effected, this will be done at the cost of some sacrifice. Inasmuch as materials and work of a somewhat less high character will be provided for. We do not think, however, that the substantial efficiency of the schools will be impaired, although possibly in some details their appearance may suffer. We have some doubts whether their appearance will be not yet effected all the savings in expenditure which we think may be made in the erection of schools generally, as if modifications in the elevations and in cost throughout the whole building. We are applying ourselves to this large question, and will report again on the subject at an early date. We suggest, however, that in the three cases in question the Council should authorise us to proceed without further delay, as the modification of existing plans will necessitate very great delay and also involve considerable expense. We recommend:—

That modifications be made in the specifications for the new schools proposed to be erected on the sites in Law-lane (Kennington), Fountain-road (Wandsworth), and Franciscan-road (Wandsworth), as indicated in the foregoing report, and that tenders be invited, by public advertisement, for the erection of the schools based upon the alternative specifications.

Mr. Phillimore moved, and Mr. Hardy seconded, to refer back Nos. 2, 7, and 10 of the modifications on the ground that he did not agree with the proposals.

Mr. Stephen Collins, M.P., said he hoped the Committee would seriously consider before they did away with wood blocks, which were far preferable to simple board flooring laid on concrete; and several other members of the Council expressed the same opinion. Canon Jepson said that the report was in the nature of a compromise, and he sincerely hoped that it would be dealt with one way or the other that day. The work was pressing.

The Chairman of the Committee, Mr. Shepherd, read a letter from the Architect

(Education) against the proposal as to floors (No. 2).

Mr. Howell J. Williams said that straight board flooring laid on concrete was rapidly taking the place of wood block flooring, and he strongly recommended the economy.

Items 2, 7, and 10 were then put separately as amendments, and No. 2 was referred back and 7 and 10 were retained. The recommendation, as amended, was then agreed to.

Site for Training College.—The Education Committee recommended as follows, and it was agreed:—

"(a) That the estimate of expenditure on capital account of £5,502, submitted by the Finance Committee, in respect of the purchase of a site for the establishment of a training college for teachers, be approved.

"(b) That a training college for teachers be established in the north-east district of London, capable of accommodating 200 students."

Aldwych to Islington Electric Tramways.—The Highways Committee recommended, and it was agreed, after discussion:—

"(a) That the estimate of expenditure on capital account of 46,500, submitted by the Finance Committee, for the underground conduit system of electric traction, of the proposed extension of the Aldwych to Islington tramways from the Angel, Islington, and High-bury-street, to High-bury (N.L.R.) Station, namely:—

Trackwork, including rails, special work, etc.	£45,000
Cables, cable-ducts, and switchboard panels, etc.	3,500
Total	£46,500

"(b) That expenditure, on capital account, not exceeding £2,204, be sanctioned for the supply of the special trackwork required for the reconstruction of the tramways from the Angel, Islington, to High-bury (N.L.R.) Station.

"(c) That, subject to the approval of the Board of Trade being obtained to the system of electric conduit traction proposed to be adopted on the tramways, the offer of the Halford Steel Foundry Company, Limited, to supply, for a sum of £2,204, the special trackwork for the reconstruction of the tramways from the Angel, Islington, to High-bury (N.L.R.) Station, for electric conduit traction, be accepted; that the solicitor do prepare and obtain the execution of, a contract to give effect to the arrangement; and that the seal of the Council be affixed to the contract."

Tramways between High-street, Lewisham, and Lee Green.—They also recommended, and it was agreed:—

"(a) That the estimate of expenditure on capital account of 39,500, submitted by the Finance Committee, be approved in respect of the construction, for the underground conduit system of electric traction of the tramways authorised by the London County Council (Tramways and Improvements) Act, 1904, from High-street, Lewisham, via High-road, Lee, and Lee Green, to Lee Green, namely:—

Trackwork, including rails, special work, etc.	£36,000
Cables and cable-ducts	3,500
Total	£39,500

"(b) That the estimate of expenditure on capital account of 27,000, submitted by the Finance Committee, be approved, in respect of alterations to fittings necessary in connexion with the construction of a electric conduit tramway from High-street, Lewisham, to Lee Green."

Flood Relief Works.—The Main Drainage Committee recommended, and it was agreed:—

"That expenditure on capital account not exceeding 100,493. 5s. 4d. be sanctioned in respect of the construction of the Bermondsey and Southwark storm relief sewer, exclusive of that portion now in course of construction by the Works Committee; that the tender, amounting to 100,493. 5s. 4d., of the Tibour Contracting and Dredging Company, Ltd., in respect of the work, be accepted, subject to the names of satisfactory firms being submitted for the supply of ironwork, etc."

Vauxhall Bridge.—The Improvements Committee reported as follows:—

"The Council, on May 19, 1903, upon the recommendation of the late Bridges Committee, approved the design, then submitted, of the new Vauxhall Bridge and the proposed architectural and artistic treatment of the same, but reserved for future consideration the question of erecting propylæa on the abutment piers. Models have been prepared and designs submitted to us for propylæa which are suitable for erection on the bases as now constructed. We have therefore to the question whether any artistic treatment at all of the abutments should be attempted, we think that, unless something be done in this direction, the bridge will appear in every way incomplete and unsatisfactory. The alterations are, therefore, presented either of erecting propylæa on the abutments or of covering them with large groups of statues. There will be little difference in cost of the two schemes, and as, in our opinion, the erection of propylæa will produce a much better effect than groups of statues, we recommend that the Council should sanction the erection of propylæa. We have caused the models of the same, to be placed in the lobby of the Council chamber. One of the models (No. 1) is square and of plain design, of the other (No. 2) has rounded ends and some decorative treatment of the sides. The

total estimated cost of erecting, in granite, propylæa for both approaches to the bridge, in accordance with design No. 1, would be 12,600*l.*, while, if design No. 2 be adopted, the cost would be 15,120*l.* We think that design No. 1 would be in greater harmony with the general features of the bridge than No. 2, and we propose that it should be adopted, but we would ask the Council to authorise us, if necessary, to introduce some slight modification on the Lambeth abutment. We have also considered the arrangements to be made for the erection of suitable figures on the summits of the propylæa.

Mr. Alfred Drury, A.R.A., has been engaged in collaboration with Mr. F. W. Pomeroy, A.R.A. (Mr. Drury being the contracting artist), to model and cast the piers for the piers of the bridge, and we consider that he should also be entrusted to design and provide the figures for the propylæa. He is prepared to provide four subjects, different in design but in harmony with each other, in a composite material, for a total sum of 2,800*l.* The material, which we are advised is an excellent one, has been used, amongst other works, for the fountains at Versailles and for works at Hampton Court. We think that Mr. Drury's offer should be accepted, but that Mr. Bertram Pomeroy, who was originally suggested by the Bridges Committee to collaborate in the work, should be associated with him in the provision of two of the groups. The unexpended balance of the several votes passed by the Council for the construction of the bridge is amply sufficient to cover the cost of the works proposed, and we recommend:—

(a) That expenditure on capital account not exceeding 15,400*l.*, be sanctioned for the erection of propylæa, with suitable groups of statuary thereon at both approaches to Vauxhall Bridge.

(b) That granite propylæa be erected at both approaches to Vauxhall Bridge, in accordance with design No. 1 submitted to the Improvement Committee on March 28, 1905; and that the Committee be authorised to arrange for minor modifications of the design of the structure on the Lambeth abutment and for the execution of the complete work.

(c) That the solicitor do prepare and obtain the execution of an agreement with Mr. Alfred Drury, A.R.A., for the modelling and casting of a total cost of 2,800*l.*, of four groups of statuary, to be placed on the propylæa; that Mr. Bertram Pomeroy be associated with Mr. Drury in the case of two of the groups; and that the seal of the Council be affixed to the agreement (in duplicate).

As to the decorative treatment of the bridge, the Committee reported as follows:—

"This model to a scale of $\frac{1}{4}$ in. to a foot has been prepared to show in effect the decorative treatment of the finished structure, and the principles which guided the composition as a whole. It will be observed that the constructive steelwork has been accepted in its mercantile form and treated in the most legitimate manner, such artistic value as obtains being dependent solely on the fine sweep of the balustrade from end to end, and the bold curved projection to the footways. The decoration, which is in the hands of sculptors of distinction, and is thus of the best quality obtainable, is employed sparingly, and only to such parts as are of considerable importance in the design. The approaches, for example, are marked with granite propylæa rising to a height of 56 ft. from the pavement, crowned by symbolic decorative figures, while the points of support, over the cutwaters, are treated with bronze figures representing science, fine arts, local government, engineering, architecture, agriculture, education, and pottery. The foregoing treatment of the monument of the work is, it is submitted, justified on both economical and artistic grounds, for it will be seen that when the whole of the decoration is paid for, including the sum required for the proposed propylæa at both approaches, a balance of about 25,000*l.* on the sum voted for the original structure will remain. The result, it is thought, is such as will assure a dignified and satisfactory effect, worthy of the important work it is intended to complete."

The consideration of the matter was postponed.

Mansell-street.—The Swan Public-house.—The Improvements Committee reported as follows:—

"The widening of Mansell-street is being executed by agreement with the owners of the property required, the Stepney Metropolitan Borough Council having undertaken to assist by exercising, if necessary, any statutory powers which it may possess for the compulsory acquisition of property in these cases where the Council's negotiations are unsuccessful. Terms were agreed for the purchase of the portion of the site of the Swan public-house needed for widening the road to 50 ft. It was arranged that this width should be measured from the front of the buildings on the buildings on the opposite side of the road, but the premises were rebuilt with the frontage 50 ft. from the frontage of the buildings on the opposite side of the road, and not, as arranged, 50 ft. from the front of the forecourts. In cases where the Council acquires only a portion of a property for widening the road it is the practice to give the owners notice when it is proposed to rebuild the property, so that the Council's officials may be present when the new line of frontage is set out. In the absence, through illness, of the architect acting for the owners of the Swan public-house, the line of frontage was set out by one of his assistants without informing the Council of his action. The Council's officials thus did not know that the premises were being re-erected until the work had been practically completed. We are advised that, as the Council allowed the building to be erected without protest, it is for the specific performance of their contract, by setting back the frontage to the proper line, would be successful. The encroachment on the land purchased for the improvement is about 2 ft. 3 in. in depth, and comprises an area of about 33 sq. ft. As the result of prolonged negotiations, we have agreed with the owners of the property for the deduction, owing to this encroachment, of

500*l.* from the purchase money payable to them, and that when the premises are rebuilt the frontage shall be set back to the proper line without further compensation. This sum represents almost twice the *pro rata* cost of the land which has been unlawfully built upon, calculated on the basis of the total amount payable to the owners in respect of their interest in land and the disturbance to their trade, but excluding the cost of rebuilding. We recommend that the arrangement under which, in consequence of an encroachment upon land acquired for the widening of Mansell-street, 500*l.* has been deducted from the compensation payable to the owners of the Swan public-house, No. 54, Mansell-street, be confirmed."

An amendment was moved to refer the matter back, and this was carried.

Avery-hill—Refreshment House.—The Parks and Open Spaces Committee recommended that expenditure not exceeding 2,500*l.* be sanctioned in respect of the provision of a refreshment house, including all incidental charges, at Avery-hill.

Lord Welby, on behalf of the Finance Committee, moved as an amendment that the expenditure should not exceed 1,000*l.* He saw no reason why they should build a palace with marble halls in which children could eat penny buns.

Sir Algernon West, in seconding the amendment, said the Council had bought a white elephant in the shape of Avery-hill, on which they had already spent an enormous sum of money, and were committed to spend more in converting the vulgar palace erected by a former owner into a training college. The place was too far away to be of any use to Londoners.

A show of hands resulted in a tie, and on a division the amendment was carried by 40 votes to 34. After a further discussion the whole matter was referred back for reconsideration.

Ruskin Park—Laying-out Works.—The Parks and Open Spaces Committee recommended, and it was agreed, that the estimate of expenditure on capital account of 4,910*l.*, submitted by the Finance Committee, be accepted in respect of the laying out of Ruskin Park.

Proposed New Tramways—Widening of Blackfriars Bridge.—The Parliamentary Committee recommended, and it was agreed, that the solicitor do complete the agreement with the City Corporation with regard to the widening of Blackfriars Bridge and the construction of tramways thereon, and that the seal of the Council be affixed to the agreement.

Having transacted other business, the Council adjourned until May 1.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Lines of Frontage and Projections.

Kensington, South.—An addition to the porch in front of No. 9, Cambridge-place, Victoria-road, Kensington (Messrs. Totten & Willett for Messrs. Slingson, Rushforth, & Co.).—Consent.

Kensington, South.—Retention of a projecting sign in front of No. 184, Brompton-road, Kensington (Messrs. Boyton, Sons, & Trevor for Messrs. Cox & Yeman, Ltd.).—Consent.

Marylebone, East.—An iron-and-glass shelter in front of St. George's Hall, Langham-place, Marylebone (Mr. J. G. Buckle for Mr. J. N. Maskelyne).—Consent.

Woolwich.—A porch in front of Nos. 33 and 35, Plumstead-common-road, Plumstead (Mr. F. J. Gurney for the Plumstead-common-road United Conservative and Unionist Club).—Consent.

Battersea.—Porches to five houses on the eastern side of Latchmere-road, Lavender-hill (Mr. W. L. Ingram for Mr. J. Jenkins).—Consent.

Fulham.—The retention of an iron-and-glass hood over the entrance to an iron-and-glass house on the entrance to No. 22, West Kensington-mansions, North-end-road, Fulham (Messrs. Clarke & Co.).—Consent.

Kensington, South.—Retention of an iron-and-glass porch in front of No. 4, Addison-road, Kensington (Mr. E. K. Purchase for Mr. A. du Cros).—Consent.

St. George, Hanover-square.—The bringing forward of the frontage of No. 142, Brindley, and the erection of a porch and balcony in front of such building (Messrs. Thurogood & Martin for Miss A. de Rothschild).—Consent.

Strand.—A deviation from the plans approved for the erection of two glass-and-iron shelters at the Aldwych Theatre, to abut upon Aldwych and Drury-lane, Strand, so far as relates to an

alteration in the construction of the shelter at the main entrance to the theatre (Mr. W. G. R. Sprague).—Consent.

Dulwich.—That the application of Mr. W. L. Ingram for an extension of the period within which the erection of six houses and shops on the site of No. 174, Lavender-hill, and houses on the east side of Latchmere-road, Battersea, was required to be completed, be granted.—Consent.

Nevington, West.—Two iron-and-glass shelters at the Kennington Theatre, Kennington-park-road, Nevington (Messrs. McVey & Co. for Mr. R. Arthur).—Refused.

Strand.—An iron-and-glass shelter in front of Nos. 161A and 166, Strand (Mr. R. J. Worley for The Colonade, Ltd.).—Refused.

Chelsea.—A porch in front of No. 213, King's-road, Chelsea (Mr. D. Blow).—Refused.

Dulwich.—Buildings on the north side of Half Moon-lane, Dulwich, to abut also upon Holmdene-avenue (Mr. W. Graham for the trustees of the late Henry Fisher).—Refused.

Width of Way.

Camberwell, North.—Dwelling-house and a one-story office building on the western side of Harvey-road, Camberwell, southward of No. 6, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. W. Smith).—Consent.

Greenwich.—A building on the southern side of Lambeth-street, Greenwich, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. F. J. Gorham).—Consent.

Width of Way and Frontage.

St. George, Hanover-square.—Buildings on the site of Nos. 321 and 323, Oxford-street, to abut also upon Dering-street (Messrs. Gordon & Gunton for Messrs. Hitchings, Ltd.).—Consent.

Width of Way, Projections, and Constructions.

Holborn.—An external wood-and-iron staircase at the rear of No. 13, Great James-street, Holborn, to abut upon Cockpit-yard (Mr. C. I. Jones for Mr. G. Angold).—Consent.

Width of Way, Line of Frontage, and Space at Rear.
Stepney.—Buildings on the site of No. 11, Philpot-terrace, Stepney, to abut upon Nelson-street (Mr. E. H. Abbott for Mr. C. Martin).—Refused.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. W. C. Poole sanctioning the formation or laying-out of new streets for carriage traffic on the Fairfield House estate, Tooting, to lead from Mitcham-road to Tatterdown-street, and in connexion therewith the widening of a portion of Court-lane (for the Governors of Alleyn's College).—Agreed.

Dulwich.—That an order be issued to Mr. C. E. Barry sanctioning the formation or laying-out of a new street for carriage traffic to lead from Woodward-road to Court-lane, Dulwich, and in connexion therewith the widening of a portion of Court-lane (for the Governors of Alleyn's College).—Consent.

Wandsworth.—That the Council do consent to the application of Mr. C. W. Braine, on behalf of the Wandsworth and Putney Gas Light and Coke Company, for an extension of the time within which the roadways of proposed new streets for carriage traffic out of the east side of Merton-road, Wandsworth, were required to have been clearly defined throughout by posts and rails or so otherwise as the Council should permit and thrown open to the public as highways.—Agreed.

Buildings for the Supply of Electricity.

Hammersmith.—Additions at the generating station, Fulham Palace-road, Hammersmith (Mr. H. Hair for Hammersmith Borough Council).—Consent.

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

Correspondence.

WATERLOO BRIDGE LAMP STANDARDS.

SIR,—I am among those who were horrified at the removal of the original lamp standards from Waterloo Bridge, and therefore rejoice and congratulate you on the part you have taken in getting them replaced. The new standards were, I understand, carefully cast from one of the old ones, but apparently the side wings of laurel leaves which should abut on each side of the iron base have been overlooked. They were about 9 in. long and some 6 in. high, and by those who can remember the old lamps are missed at once on the recent restorations. These little adjuncts are clearly shown in the steel engraving published in Shaw's "Examples of Ornamental Metal Work" (1836), and, moreover, the rough part on the end of each lamp base where they

abuted can be seen on the new lamps, even though these are only castings taken from one of the originals. I have little doubt that if search be made in the same lumber heap from which the pattern standard was unearthed one of the wing-pieces might also be recovered, and with very little additional expense enable the lamps to be completed.

Having in your columns taken the initiative in this restoration, I would now suggest that you should urge the completion of the good work which is so nearly finished.

F. W. TROUP.

' PALE REPORTS AND PURPLE SPEECHES.'

SIR,—There has just been issued the "Annual Report of the Proceedings of the London County Council for the Year Ended March 31, 1905," in which is contained the Report of the Building Act Committee, signed by Fitzroy Hemphill (Chairman). From this Report I have taken the following extract:—

"Tribunal of Appeal.
The Tribunal of Appeal constituted under section 175 of the London Building Act, 1894, consists of the following members:—Mr. J. W. Penfold, F.R.I.B.A., L.S.L., appointed by the Council of the surveyors' Institution (Chairman); Mr. E. A. Gruning, F.R.I.B.A., appointed by the Royal Institute of British Architects, and Mr. A. A. Hindon, barrister-at-law, appointed by the Secretary of State for the Home Department.

There are some twenty-two matters which under the Act may be the subject of appeal to the Tribunal. During the year three appeals against the Council's decisions were lodged with the Tribunal, of which one was dismissed. In the remaining two cases amended applications were submitted to and approved by the Council."

In your issue of the 24th inst. Captain Hemphill, at a meeting of the London County Council, is reported to have said that—"As to the Tribunal, he did not intend to say that they (the Tribunal) were habitually unjust to the Council, but their decisions had been in the great majority of cases against the interests of the public and in the interests of the people who appeared before the Tribunal against the reasonable and fair decisions of the Council."

The following is an extract from the Report for the year ended March 31, 1904, of the same Building Act Committee, signed by the same "Fitzroy Hemphill (Chairman)."

"There are some twenty-two matters which under the Act may be the subject of appeal to the Tribunal. During the year thirteen appeals against the Council's decisions were lodged with the Tribunal, of which two were dismissed, three allowed, and eight not proceeded with. There were two appeals against the decisions of district surveyors which were allowed by the Tribunal subject to certain conditions. The effect of the Tribunal's decisions was practically to uphold the district surveyors' decisions."

Pending the appearance of the Council's Annual Report "for the year ended March 31, 1906," which presumably may be expected in the spring of 1907, when Captain Hemphill's words will most probably have been forgotten, it would be useful to have an explanation of this very serious discrepancy between the "printed reports" and the reported speeches of the members of the Building Act Committee, whose "reasonable and fair" proceedings are watched with considerable interest by many besides HAUD IMMEMOR.

R.I.B.A. PRIZE SUBJECTS.

SIR,—On page 371 of the *Builder* for April 7 you express a hope that there will be a better competition for the Essay Prize than has usually been the case; and I venture to suggest that the chief reason why the competition has been poor in the short period of time allowed for the preparation of the essay. The subjects for the year are not announced until the end of March, leaving less than nine months in which to collect the material and write the monograph; a competitor with the whole of this period at his disposal should find a difficulty in writing anything worth reading, and one with the evening only available for study must find it an impossibility. No doubt there is the same difficulty with the other set subjects, with the difference that designing is part of an architect's daily work. I feel sure there would be no lack of competitors if the subjects were announced in the March of the year before the competition, and can see no reason why they should not be.

A WOULD-BE ESSAYIST.

formerly belonged to the Cecil family (spelt "Cecwith"), but is now in the possession of the Bassetts, who have owned it for centuries.

Gwilt, in his encyclopædia, describing the use of the orders in Renaissance architecture during the reigns of James I. to Anne, mentions Beaupré Castle as having a porch of the Doric order, together with the Ionic and Corinthian, the capitals and columns of which are accurately designed.

The porch was built by Richard Bassett, as inscribed on the panels above the entrance doorway to same, the inscription being as follows:—

"Say, cowidst thou ever fynd or ever heare or see worldly wrefche or coward prove a faythfull frynde to bece. Rycharde Bassett having to wyfe Katherine daughter to Sir Thomas Johns Knight buyit this porch with the Tonnes* in Anno 1590 his yeres 65, his wife 60."

The entrance gateway, which was illustrated in our issue of August 19, 1905, is of

* Tonnes (wedding dowry).

earlier date, being built in 1586, but the detail is not so good as that of the porch.

In a panel over the entrance is the following inscription:—

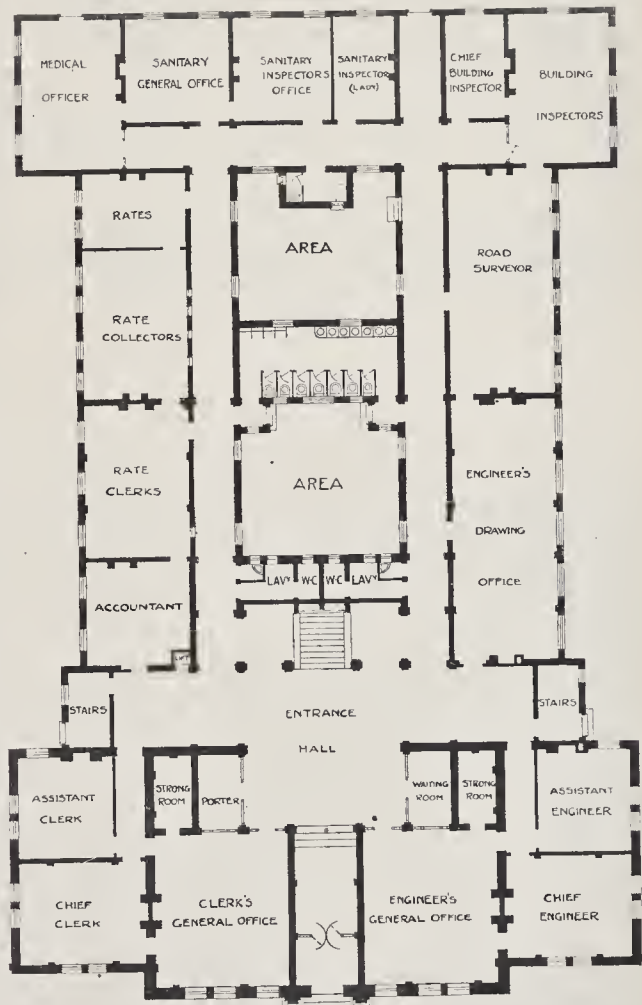
"Gwilt. Ang sy sa chw-lydd."

The greater portion of the buildings are in ruins, the roofs having in many cases fallen in, and very little now remains but the ivy-clad walls, the beautiful Renaissance porch, and the entrance gateway, the stonework of the latter being in a fairly good state of preservation, owing to the care bestowed upon it by the owner.

W. EATON.

TOTTENHAM MUNICIPAL BUILDINGS.

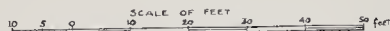
In this issue we illustrate the principal elevations, staircase, and ground plan, etc., of this group of buildings, which were the subject of a public competition in 1902, when Mr. J. Macvicar Anderson acted as professional assessor, and awarded the first premium to Mr. Arnold S. Taylor and



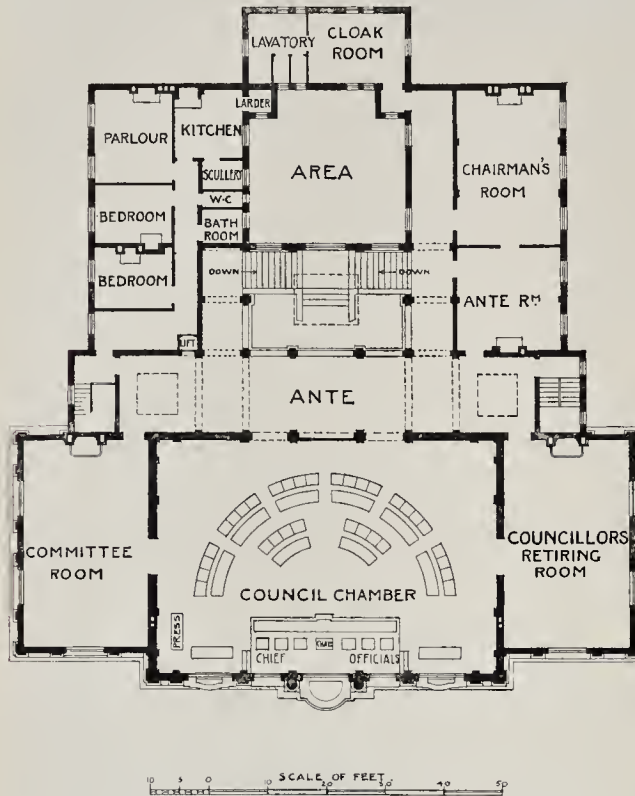
Illustrations.

THE ENTRANCE-PORCH, OLD BEAUPRE, GLAMORGANSHIRE.

LD Beaupré Manor House, or Castle, as it is sometimes called, occupies a commanding position, overlooking a beautiful valley on the outskirts of the village of Cowbridge, Glamorganshire, South Wales. It



New Town Hall, Tottenham. Ground Plan.



New Town Hall, Tottenham. First Floor Plan.

Mr. A. R. Jemmett, of Old Queen-street, Westminster, who have jointly acted as architects. The buildings were publicly declared opened in November last.

The site is a spacious one, and is fortunate in facing on to what is locally known as "The Green," and thus there is ample space in front to view the principal façade. The facings are of local red bricks and Portland stone from the quarries of Mr. F. J. Barnes.

The buildings have been designed to allow an entrance and exit to the depot yard at the back of the site by means of two roadways, each 10 ft. wide. The road next the baths gives access to the coroner's court and public entrance to the gallery of the council chamber in the municipal offices, as well as to the coal-store and boiler-house, artists' entrance, and the gallery and hall exits from the baths, whilst that next the fire-station gives access to the superintendent's entrance, the station yard, and the men's quarters.

The various buildings have been entirely isolated by these roadways for the better provision of light and air, and to enable the distinct character of each building to be better expressed on the elevation to "The Green."

Municipal Offices.

This block has been designed to keep the whole of the offices to which the public has daily access upon the ground floor. The council chamber and the committee-rooms are placed on the first floor to the front, where they form a fine suite of rooms for special occasions, and influence and give character to the elevation, producing a central feature for the whole group of buildings. The departments are arranged so that the principal offices are in the front, and the rooms to which the public have most need of access are near the entrance. The engineer's suite of offices, on the north side, has a north light to the drawing office, and

his department, extending through to the back of the building, obtains access to and control over the depot yard at the rear. On the south side the clerk's suite of offices has been provided, and is a counterpart of that provided for the engineer's department. The medical officer of health's department has been arranged on the west side of the buildings.

Public Baths.

These have been arranged to obtain an efficient and economical control and administration. For this reason the building is served by a single pay-box, which divides the entrances for men and women. These entrances are well controlled by the superintendent and matron respectively.

The first-class swimming-bath is 100 ft. by 35 ft., and the second-class bath 75 ft. by 25 ft. Arrangements have been made so that winter meetings and entertainments can be held in the first-class bath by a floor being placed over the pool. Ample entrances and exits, cloak-rooms for men and women, and artists' retiring-rooms with special entrances have all been provided.

There are thirty slipper baths, situated on the ground and first floors, so as to secure adequate light and cross ventilation. They are arranged so that the baths and waiting-rooms in both classes in each department can be controlled by one attendant.

The walls and ponds of the swimming-baths, douche-rooms, lavatories, and laundry are lined with ivory-white glazed bricks or tiles. The first-class swimming-bath is decorated with bands of coloured glazed bricks. The gangway round the bath is composed of terrazzo, with a curb of sand-faced Victoria stone. The roof of the bath is constructed with steel trusses and trussed purlins, and the centre portion is formed of plaster, as being better for the acoustics of the hall. The gallery is of fire-resisting construction carried on cantilevers, with wooden floor and iron railing.

Fire-Station.

The fire-station having a limited frontage, the engine-room, watch-room, and superintendent's office only are placed to the front; the rest of the rooms are conveniently grouped round the yard at the back of the engine room. Quarters for the six married men are provided at the rear of the station. Each man's quarters are self-contained, and communicate with the yard at the back. Quarters for single men are placed over the harness and engine-rooms, etc.

The superintendent's house, over the front part of the engine-room, is approached by the south roadway, and is in direct communication with his office and the engine-room.

The coroner's court, etc., has been made an independent building, situated behind the boiler-house of the baths.

The contract for the whole buildings has been carried out by Messrs. W. Lawrence & Son, of Tottenham and Waltham Cross, Mr. E. A. George acting as general foreman of the works, and Mr. G. Venables and Mr. W. T. Dewbury were clerks of works. The following sub-contractors were employed:—Messrs. Ashwell & Nesbit, of Leicester and London, for the complete heating installation in connexion with the baths and offices; Messrs. J. Westwood & Co., of Millwall, for constructional steelwork in roofs, etc.; Messrs. Leo Sunderland & Co., for the electric light wiring and telephones; Messrs. H. H. Martyn & Co., for the fibrous plasterwork in the council chamber ceiling; the Mosaic Manufacturing Company, of King's Cross, laid the floors in the entrance hall and corridors of offices and baths; Messrs. Jenkens & Son, of Torquay, executed the polished Hopton Wood stone balusters to the grand staircase, and supplied the dark Devonshire marble for the handrail and skirting.

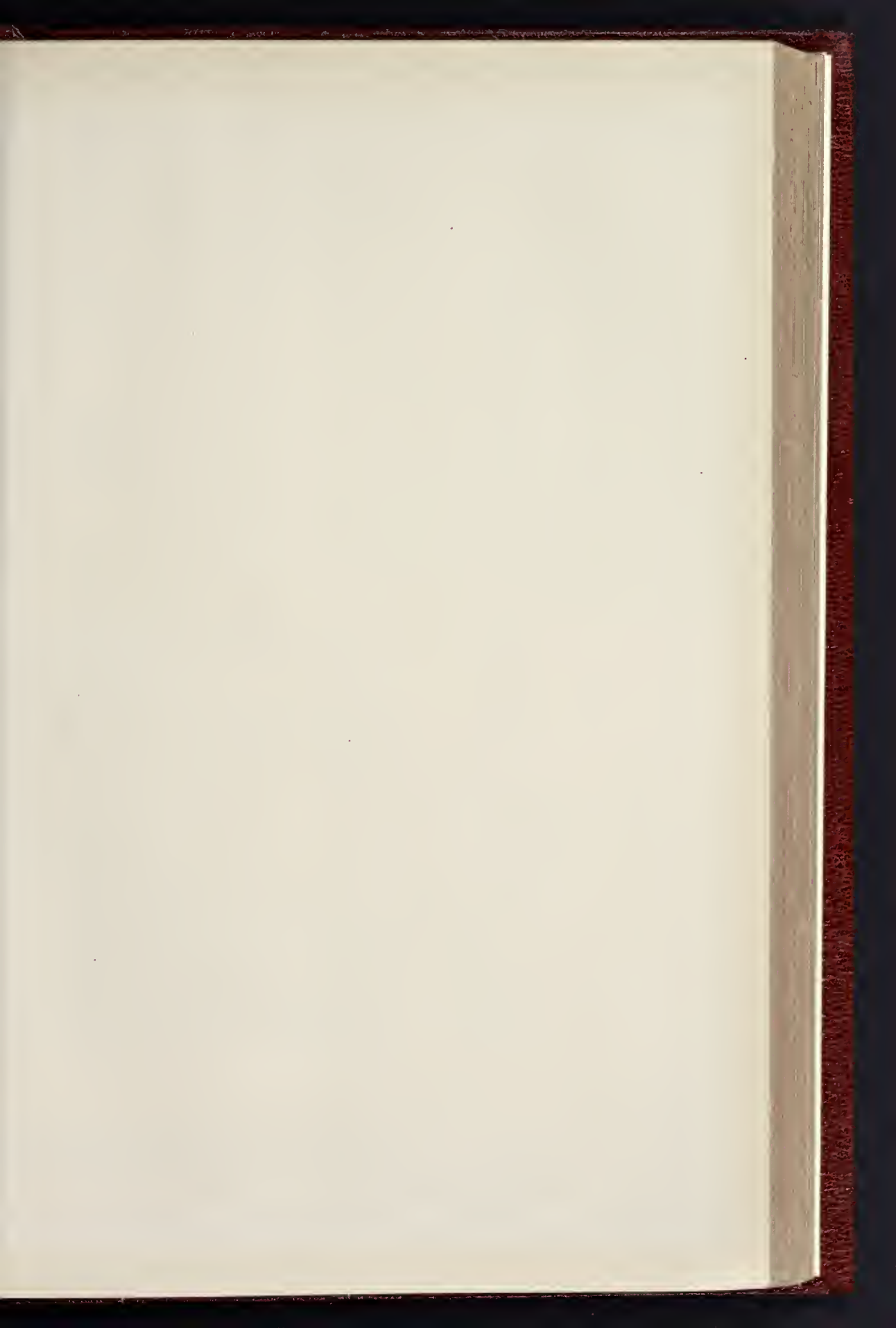
The total outlay on these buildings, exclusive of furnishing, has been approximately 60,000l.

SHERE CHURCH, SURREY.

The illustrations of this church, from photographs by Mr. Yeo, of Dorking, are given in connexion with the first article in this issue, to which the reader is referred.

Architectural Societies.

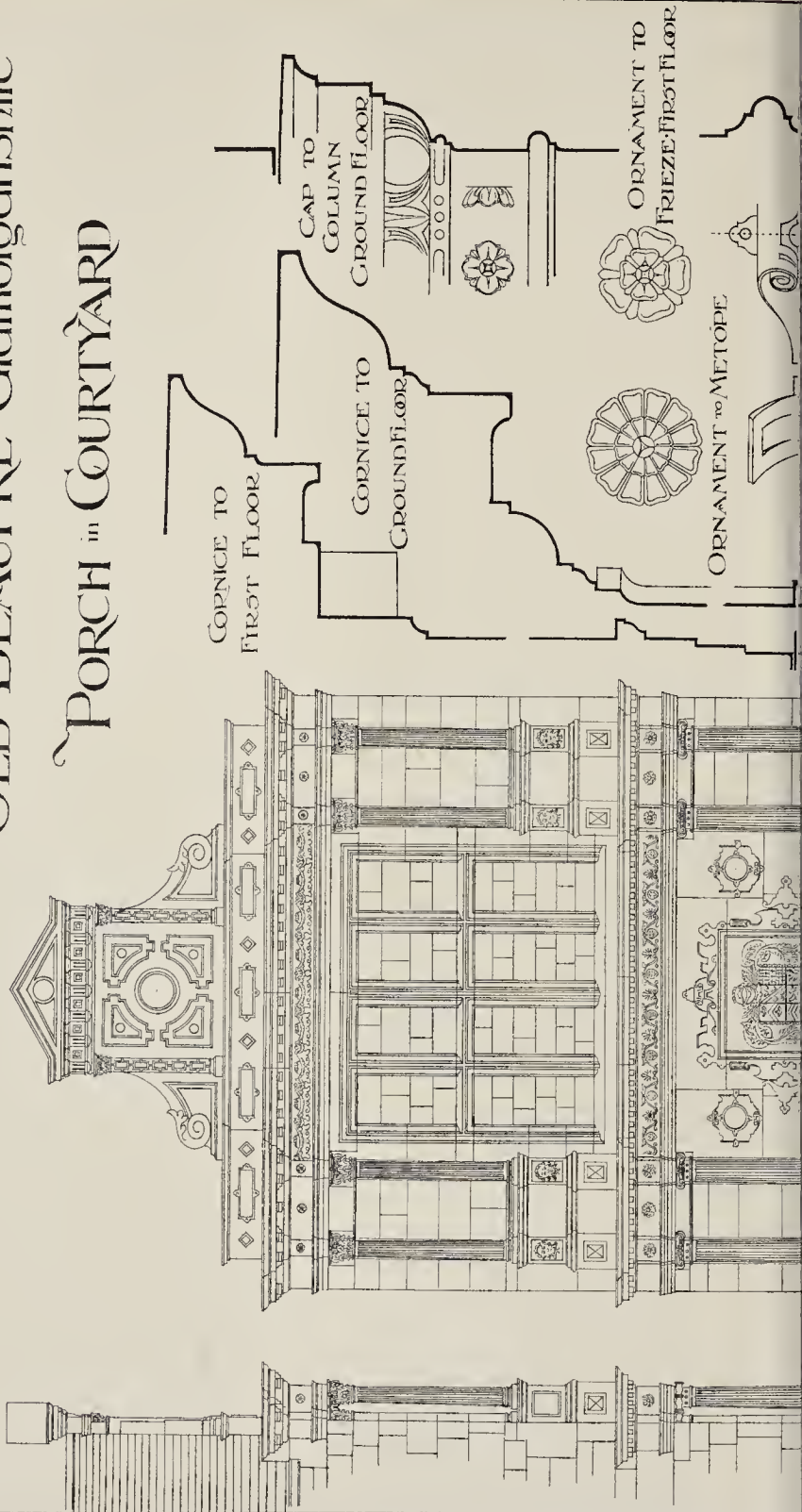
ABERDEEN ARCHITECTURAL ASSOCIATION.—The first annual general meeting of this society was held on the 31st ult., in Kenneway's Rooms, Union-street, Mr. Geo. G. Irvine, President, in the chair. The treasurer, Mr. A. B. Cheyne, submitted the financial report for the past year, which showed a balance in favour of the Association. The following office-bearers were then elected for the ensuing year:—Hon. President, Mr. W. Kelly; President, Mr. Geo. G. Irvine; Vice-President, Mr. J. B. Davidson; Hon. Secretary, Mr. B. Gibbon; committee, Messrs. J. Blake, J. Fordyce, A. B. Cheyne, R. S. Garrow, L. H. Ross, J. P. Thomson. At the close of the business meeting an "At home" was held, which was largely attended by members and their guests, the principal feature of which was an exhibition of working drawings lent for the occasion. The President, in the course of an introductory speech, said that this was their first year as an association, and their objects were to encourage good fellowship and the study of architecture amongst their members, and those working in any art or craft related to architecture. He referred to the rapid progress as a body which the Association had made pointing to its supplying a long-felt want, and, considering its first meeting was held last November, he thought it very satisfactory that they had, since that date, had a very successful session, at which lectures had been delivered on architectural subjects, and at which the attendance and the interest displayed had been most gratifying. He expressed the hope that, by the time the next "At home" took place, their ranks would be joined by every available man in Aberdeen. He drew their attention to the number of interesting drawings which, through the kindness of some of the most eminent architects of the day, they had been enabled to bring together—a collection of the very highest value and interest to their



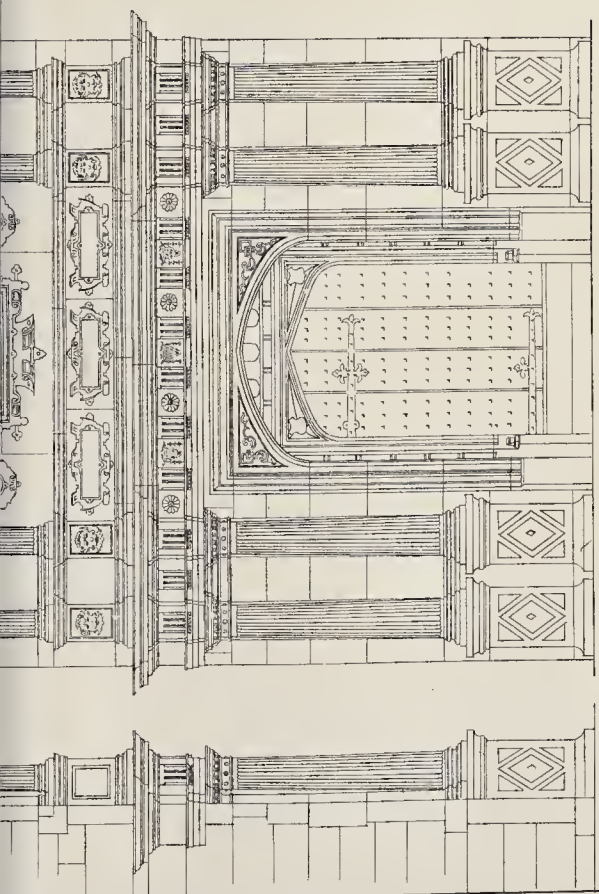
THE BUILDER, APRIL 14, 1906.

OLD BÈAUPRE Glamorganshire

PORCH in COURTYARD



BUILT THIS PORCH WITH
THE TONNE'S IN ANO 1600
HIS YEREZ 63 HIS WIFE 53

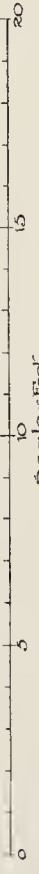


RETURN
ELEVATION

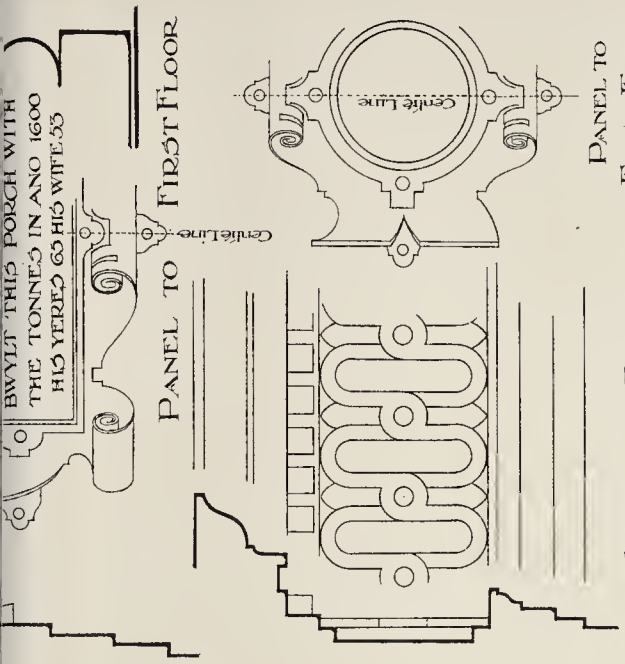
FRONT ELEVATION



PLAN



Scale of feet

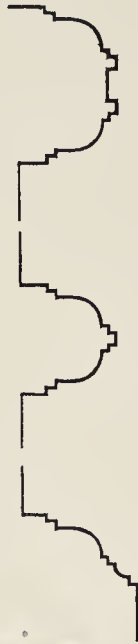


PANEL TO
FIRST FLOOR

PANEL TO
FIRST FLOOR

CORNICE
inside PORCH

PANEL TO
FIRST FLOOR



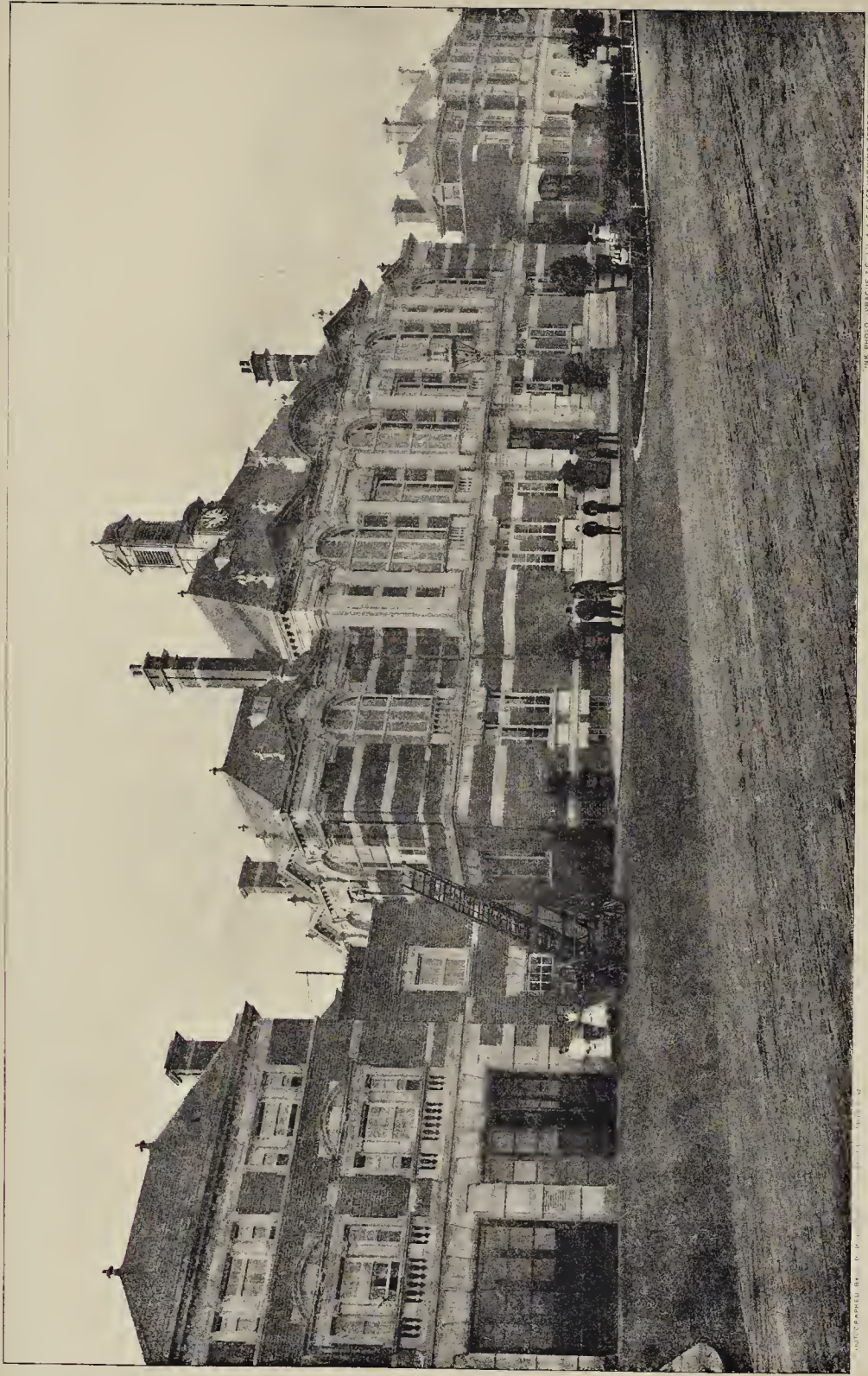
JAMB and MULLIONS to WINDOW
SECOND FLOOR

Measured and Drawn by M^r. WEATON, A.R.C.B.A.

PHOTO LITHO SWAGUE & CO. 115 EAST HANCOCK STREET BOSTON U.S.A.



THE BUILDER, APRIL 14, 1906.

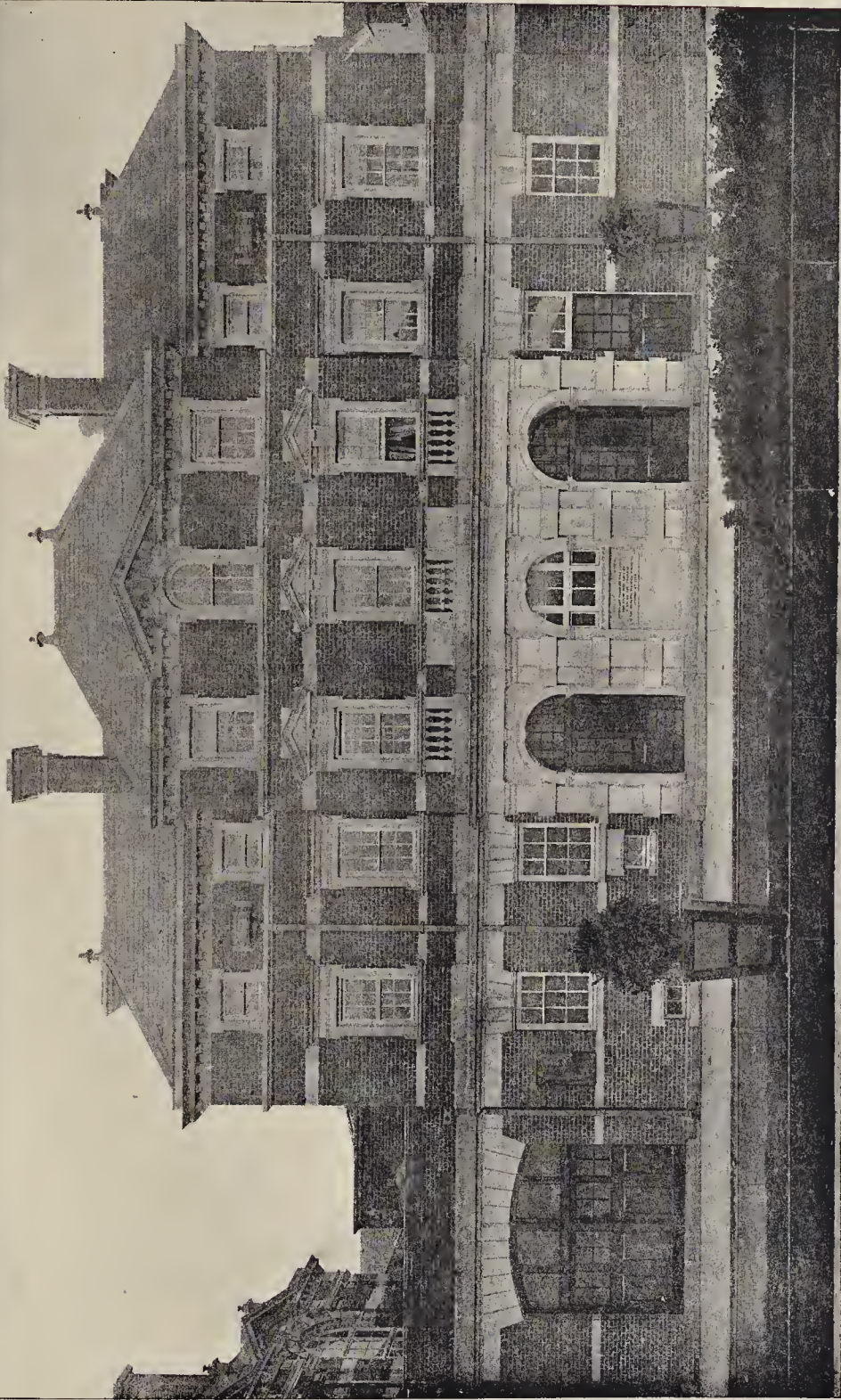


PHOTOGRAPHER BY H. D. C. 1906

GENERAL VIEW.

TOTTENHAM TOWN HALL, FIRE STATION, AND PUBLIC BATHS

NEW PHOTO PRAGUE & CO. 4 & 5 EAST HURDIS STREET LONDON E.C.

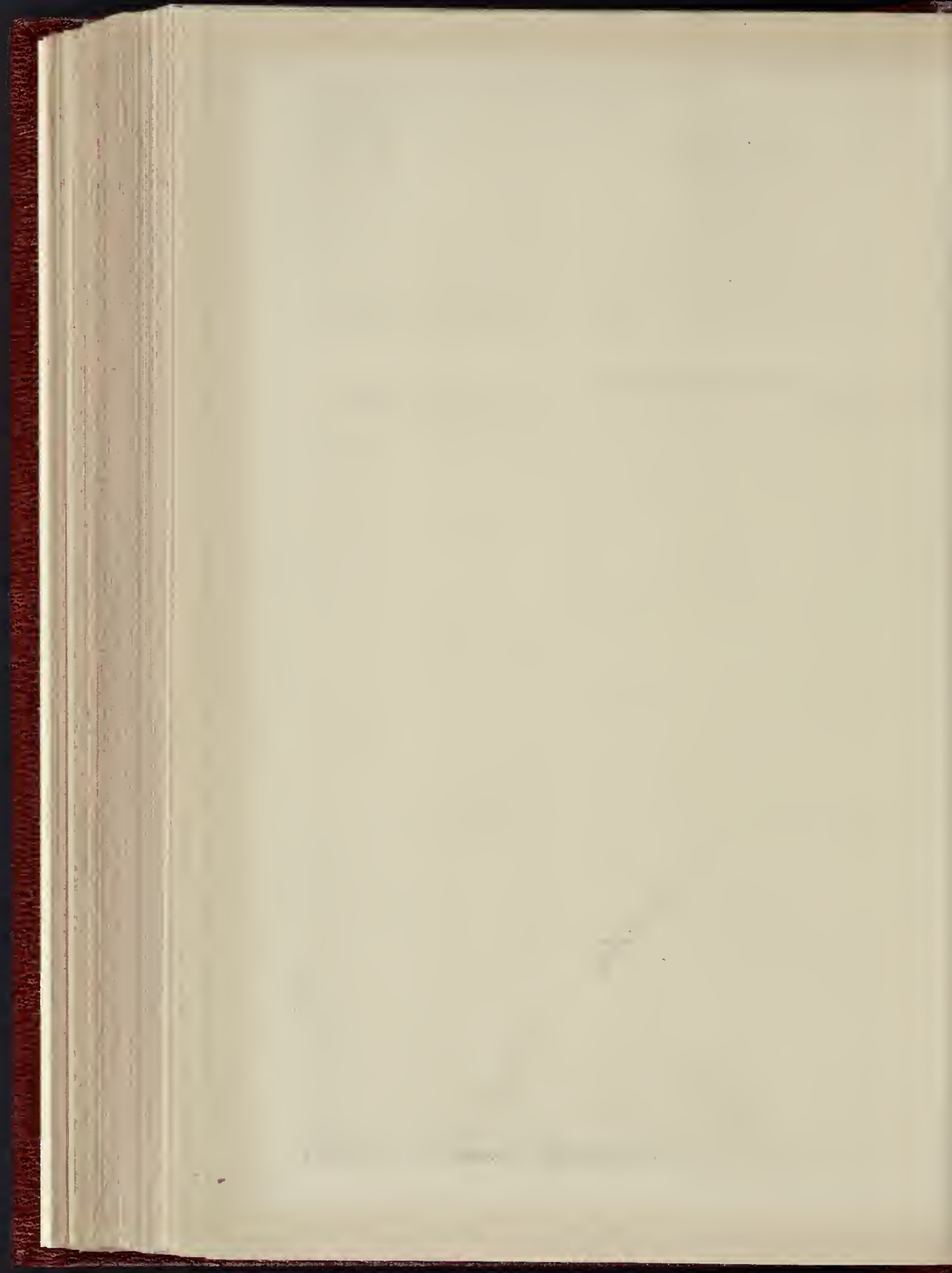


PHOTOGRAPHED BY 'S. P. BOLA' & CO., 11 OXFORD STREET W.

FRONT OF PUBLIC BATHS BUILDING.

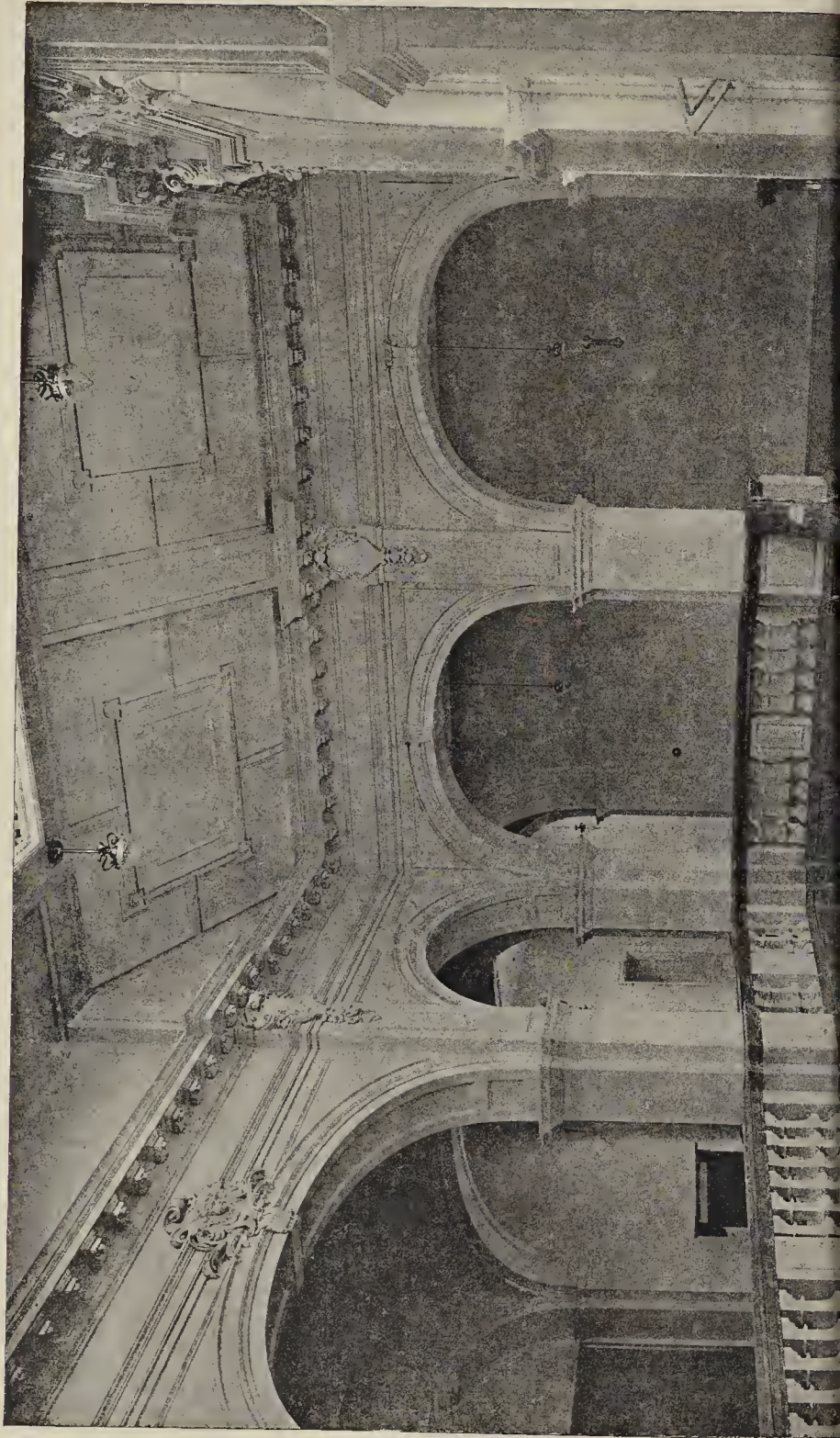
TOTTENHAM TOWN HALL, FIRE STATION, AND PUBLIC BATHS
MR. ARNOLD S. TAYLER, A.R.I.B.A., AND MR. R. JEMMETT, JOINT ARCHITECTS.

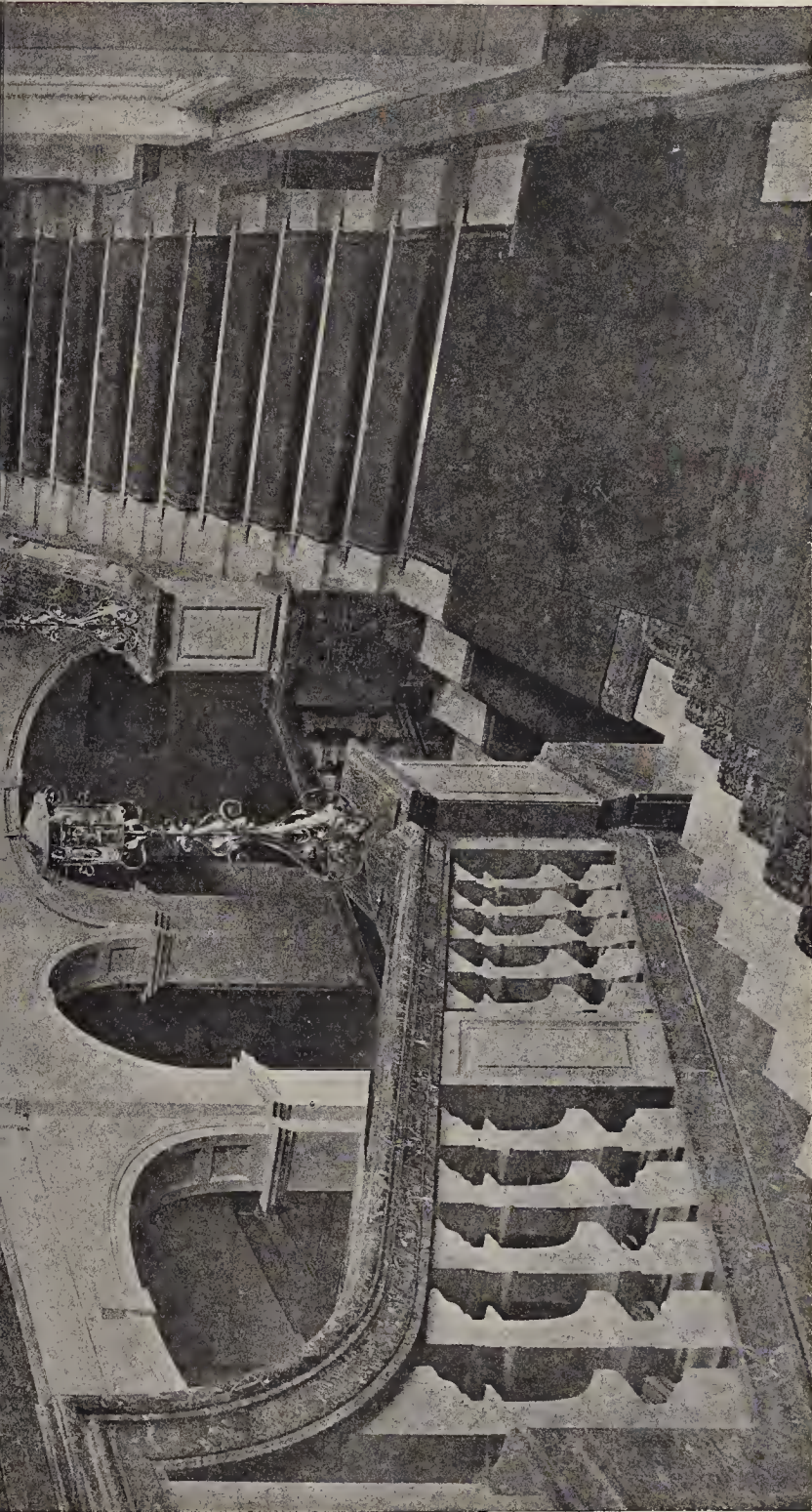
INK PHOTO SPRINGUE & CO. LTD. 4 & 5 EAST JERDING STREET FETTER LANE E.C.





THE BUILDER, APRIL 14, 1906.



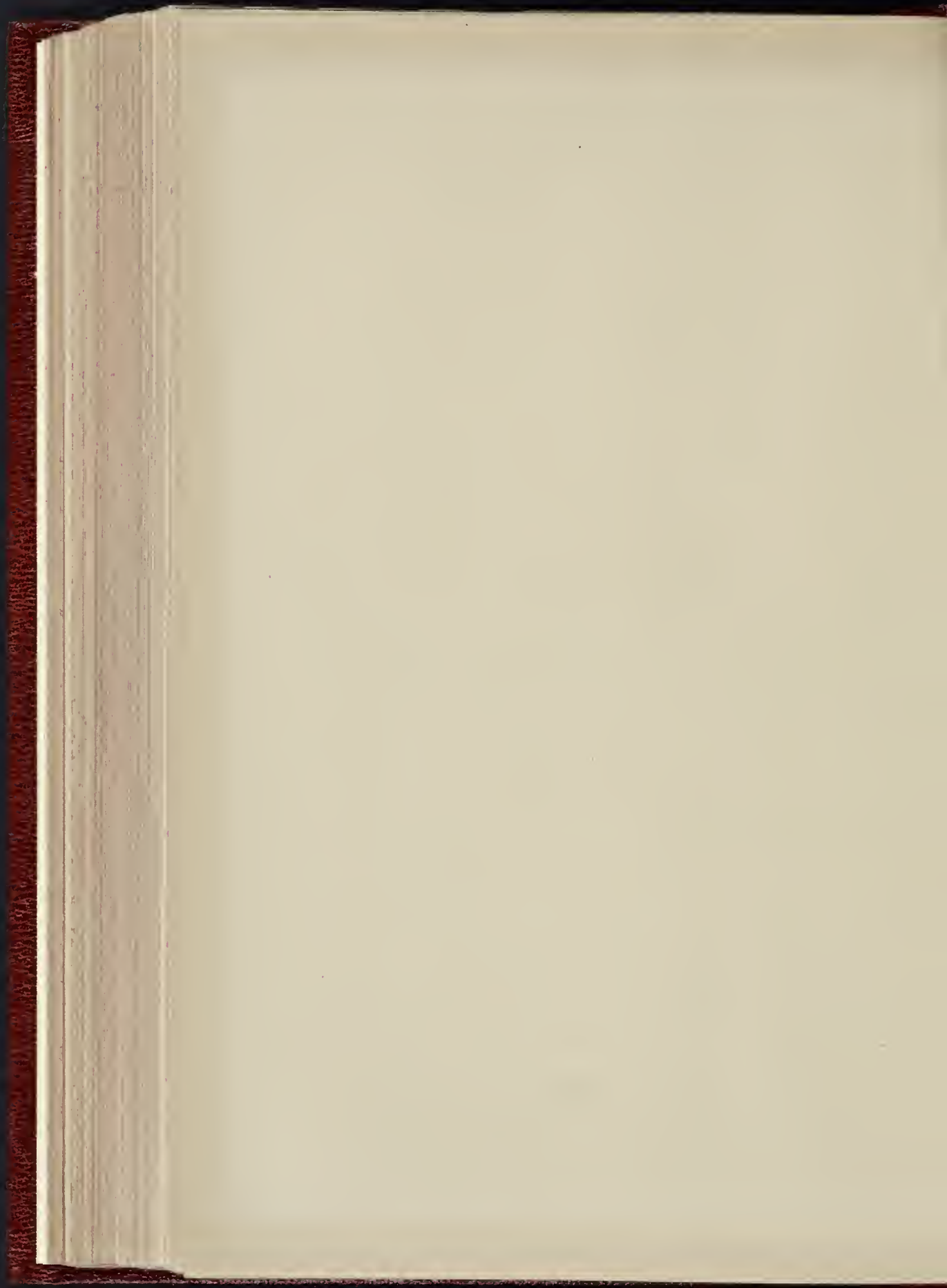


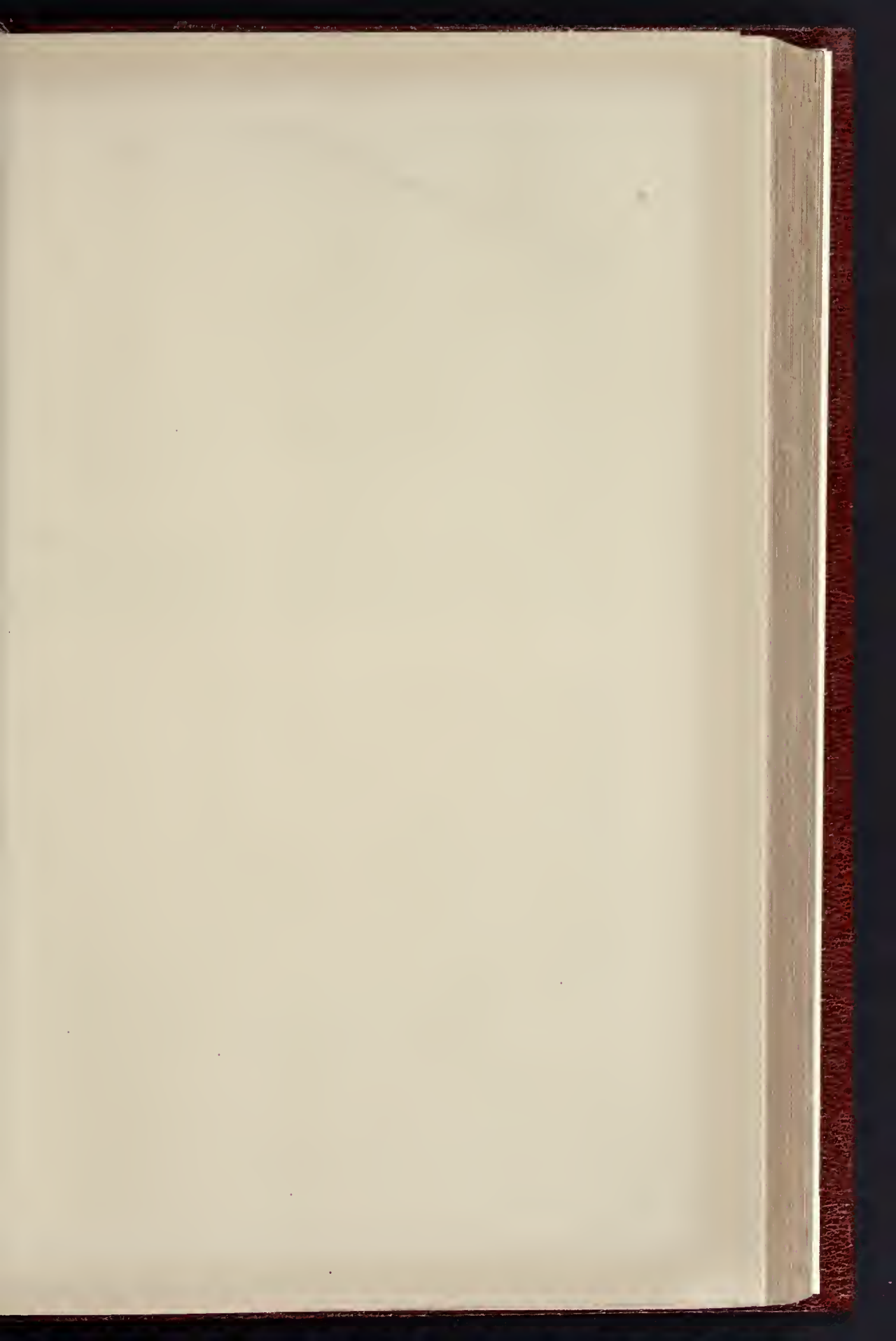
PHOTOGRAPHED BY T. N. BOLAS & CO., 45 FORD STREET, W.

STAIRCASE IN TOWN HALL.

TOTTENHAM TOWN HALL, FIRE STATION, AND PUBLIC BATHS.
MR. ARNOLD S. TAYLER, A.R.I.B.A., AND MR. R. JEMMETT, JOINT ARCHITECTS.

INK PHOTO SPRAGUE & CO., 114 & 115 EAST HINDING STREET, FETTER LANE, E.C.





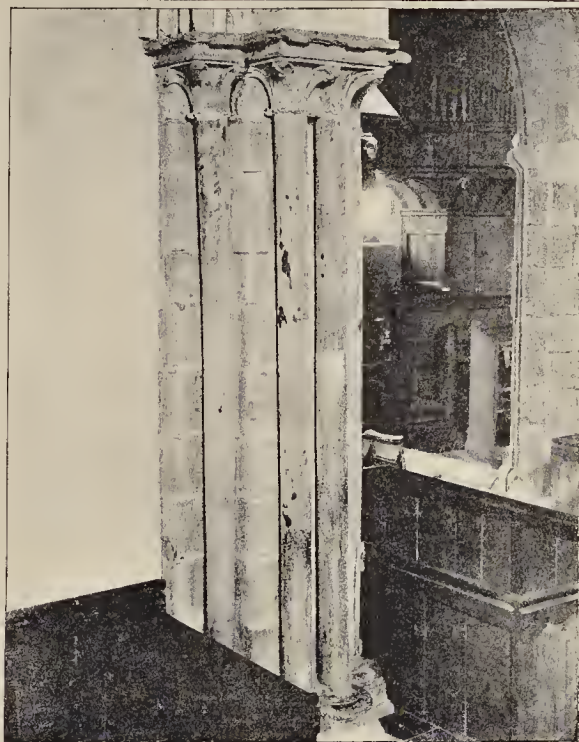


VIEW FROM SOUTH-EAST.



VIEW FROM WEST.

INA PHOTO SPRAGUE & C. Lth 4 & 5 EAST HARDING STREET FETTER LANE E.C.

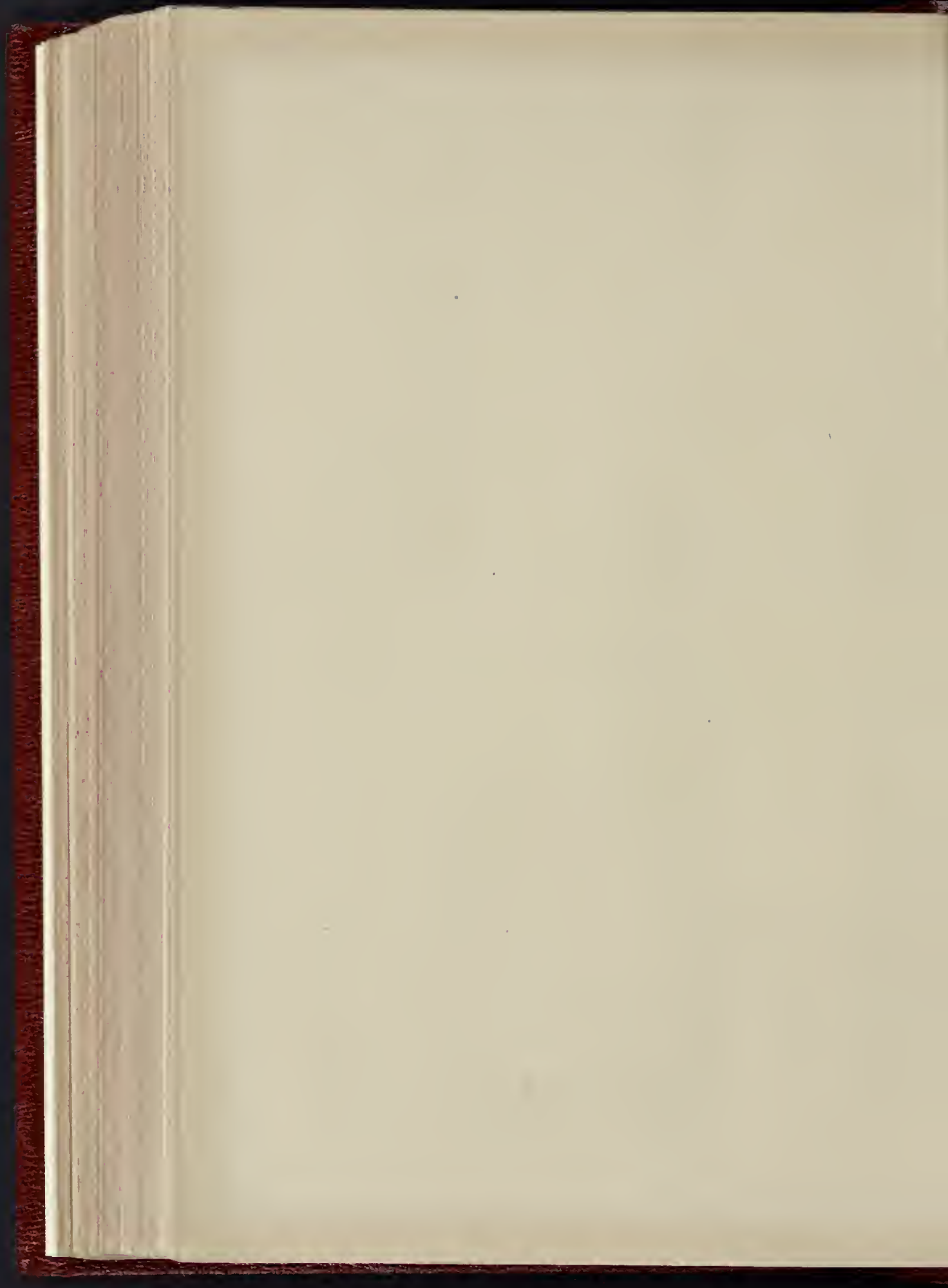


NORTH JAMB OF ARCH AT EAST END OF SOUTH AISLE.



SOUTH ARCH UNDER TOWER.

FROM PHOTOGRAPHS BY S. YEO: DORKING.



members, and for which they wished to express their warmest thanks to the gentlemen who had so freely and kindly lent them. In conclusion, the President expressed the thanks of the Association to the Governors of Gordon's College for their kindness in granting the use of their buildings for the meetings of the Association. During the evening a short musical programme was gone through, and the company inspected the working drawings kindly lent by architects from the south, including Mr. J. Belcher,

A.R.A., Mr. J. T. Micklethwaite, F.S.A., Mr. Arnold Mitchell, Mr. J. S. Gibson, Mr. Frank T. Verity, Mr. G. Gilbert Scott, and Mr. G. Washington Brown.

Competitions.

HOLBORN COUNCIL'S NEW OFFICES. — The Establishment Committee of Holborn Borough Council reported on Monday that

on the 14th ult. six architects were appointed to submit preliminary plans for the Council's new offices. Instructions had been framed for their guidance and to obtain uniformity in the plans submitted for selection. The Town Clerk informed the Committee that he had received letters from several of the architects appointed objecting to one of the provisions laid down in the Instructions, which was to the following effect:—"That the Council do not undertake to select any one of the architects submitting drawings as a future architect for the work." After careful consideration of the case the Committee were of opinion that as, apart from the small honorarium, the sole inducements for the architects to compete is the certainty of being called upon to undertake the work, should their plans be accepted by the Council, their request should be acceded to. This undertaking in no way binds the Council to accept any of the six plans sent in should such plans not meet with their views in matters of economy or suitability, but it merely meant an assurance to the architect that the Committee would not accept his plans or modifications thereof while employing another architect to superintend the work. They had accordingly decided (subject to the usual sanction) that such an assurance as indicated above be given to the architects.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XIV. LOGARITHMS.

N Article IV. a logarithm was briefly defined as "An artificial number representing the power to which a number (constant for each system and called the base of the system) must be raised in order to produce the natural number."

To illustrate this definition and the relation between a series of arithmetical and a series of logarithmical numbers let us consider the two series:—

- (a) 1 2 4 8 16 32 64 128 256, and so on.
- (b) 0 1 2 3 4 5 6 7 8, and so on.

Here the series (a) is in geometrical progression and its ratio is 2. Series (b) is in arithmetical progression and, as arranged, any one of its terms indicates the number of times the ratio 2 has been compounded to produce the corresponding term of series (a). Thus the ratio 8 : 1 is compounded three times of the ratio 2 : 1, and the ratio 64 : 1 six times of the ratio 2 : 1.

Consequently in the series (a) and (b) we have the rudiments of a logarithmic system to the base 2, wherein series (a) contains natural numbers and series (b) their corresponding logarithms.

The utility and extreme convenience of a complete system of logarithms is suggested by inspection of the incomplete table given above, and from this table we can deduce the four important rules stated below.

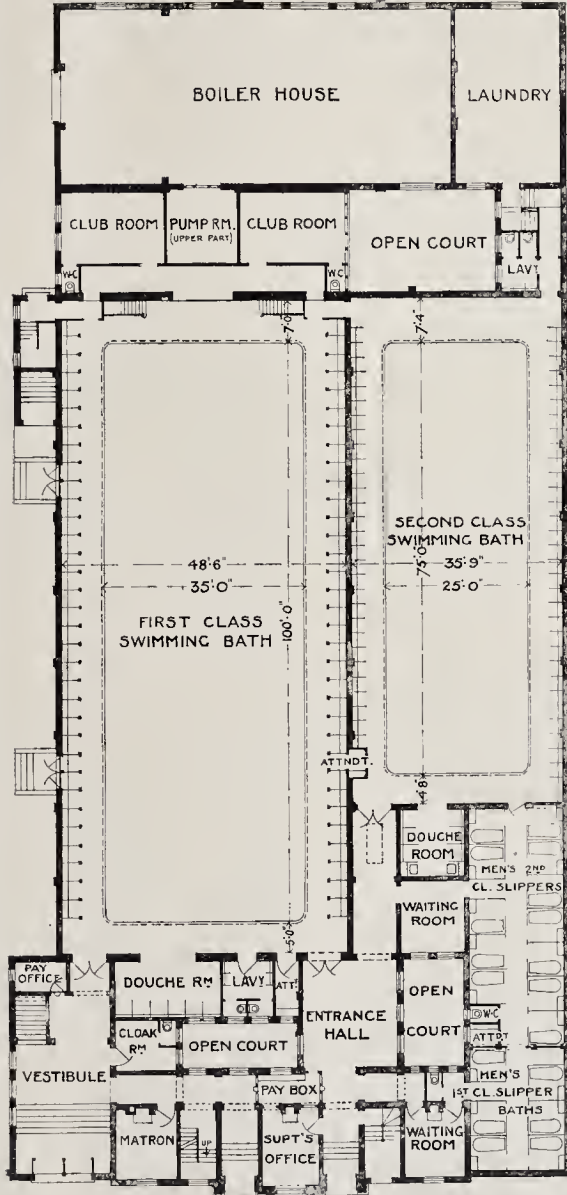
- (1) *Multiplication*.—The sum of the logarithms of two numbers is the logarithm of the product of those numbers.
- (2) *Division*.—The difference between the logarithms of two numbers is the logarithm of the quotient obtained by dividing one number into the other number.
- (3) *Involution*.—The product of the logarithm of a number by the index of any power of the number is the logarithm of the same power of that number.
- (4) *Evolution*.—The quotient obtained by dividing the logarithm of a number by the index of any root of the number is the logarithm of the same root of that number.

The following examples will serve to demonstrate the manner in which the four rules can be applied by the aid of our simple table of logarithms to the base 2.

The usual abbreviation *log* is used hereafter to denote "logarithm."

Example (1): Multiply 32 by 8.
By the table *log* 32 = 5, and *log* 8 = 3.
Therefore, by rule (1) the *log* of the product = (5 + 3) = 8.
Above 8 in the table we find 256, which is the required product.

Example (2): Divide 256 by 64.
By the table *log* 256 = 8, and *log* 64 = 6.
Therefore, by rule (2) the *log* of the quotient = (8 - 6) = 2.



10 5 0 10 20 30 40 50 SCALE OF FEET.
New Baths, Tottenham. Plan. (See page 410.)

Above 2 in the table we find 4, which is the required quotient.

Example (3): Find the 7th power of 2. By the table log 2 = 1. Therefore by rule (3) the log of the power = (1 x 7) = 7.

Above 7 in the table we find 128, which is the required power. Example (4): Find the cube root of 64. By the table log 64 = 6. Therefore by rule (4) the log of the root = (6 ÷ 3) = 2.

Above 2 in the table we find 4, which is the required root. Of course, to make the logarithmic table complete it would be necessary to include in series (a) the intermediate numbers: 3, 5, 6, 7, and so on, together with the corresponding numbers or logarithms in series (b).

However, we need not devote more attention to this experimental system, which is merely intended to make clear the general idea of logarithms and the immense saving of time that can be effected by a complete system established upon a suitable base.

The employment of artificial numbers in the manner indicated appears to have suggested itself to Archimedes and Euclid, but no practical scheme was evolved until after the end of the XVIIth century when trigonometrical calculations had become so complex that mathematicians began to seek for some ready means of reducing the labour thereby involved.

For the invention of logarithms the world is indebted to John Napier, of Merchiston, who published in 1614 a treatise containing a table giving logarithms to seven or eight figures of sines, cosines, and other functions of angles. Napier's logarithms are not quite the same as those now described as Napierian or hyperbolic logarithms, and they possess the disadvantages of being sometimes positive and sometimes negative, and of decreasing as the corresponding natural numbers increase. These defects were remedied in 1619 by John Speidell, who published amended tables in which the logarithms were all positive, and increased with the corresponding natural numbers. Further, they had for their base or radix the number, now denoted by the symbol e, which is the sum of the series

1 + 1/2 + 1/4 + 1/8 + 1/16 + ...

This sum is usually taken at 2.71828, its more precise value being e = 2.7182818284590452353602874 + ...

Speidell's numbers are often termed Napierian logarithms, but are more correctly described as hyperbolic or natural logarithms. They are extensively employed in the higher branches of mathematics, and in some practical calculations.

A still greater improvement upon Napier's logarithms was effected by Henry Briggs, professor of geometry at Gresham College, who published in 1617 a table of logarithms to the base 10 for numbers from 1 to 1,000 to 14 places of decimals.

These numbers are termed alternatively Bryggian, common, and decimal logarithms, but being almost universally employed for ordinary work they are more usually termed simply logarithms or, shortly, logs.

Seven years later Briggs published a book containing logarithms of numbers from 1 to 20,000 and from 90,000 to 100,000 to 14 places of decimals. Four years afterwards Adrian Vlacq, of Gouda, produced a table giving the logarithms of numbers from 1 to 100,000 to 10 places of decimals, 30,000 of the logarithms having been taken from Briggs's tables. The table prepared by Vlacq is the model from which all but one of the subsequent tables of logarithms of numbers have been derived, the solitary exception being the seven-figure table by Mr. Sang, published in 1871. Other computers have devoted themselves to the task of correcting the original and revised tables already calculated.

The inconvenience of the base e = 2.71828 in hyperbolic logarithms is that each movement of the decimal point in a line of figures involves an alteration in both the integral and the decimal portions of the logarithm, while on the other hand the decimal portion of an ordinary logarithm of any number serves equally for any decimal part or multiple of that number.

Table with 3 columns: Number, Hyp. Log., Dec. Log. Values include 0.38, 3.8, 38, 380, 3800.

In the first decimal logarithm above only the integer 1 is negative, the fraction 0.5797836 being positive. Inspection of the figures will show that for each change in the position of the decimal point the value of the hyperbolic logarithm is increased by 2.30258509+.

It will also be found that if any of the hyperbolic logarithms be multiplied by 2.30258509+ the product will be the decimal logarithm for the corresponding natural number.

Conversely, if any of the decimal logarithms be divided by 2.30258509+ the quotient will be the hyperbolic logarithm of the corresponding natural number.

The reciprocal of 2.30258509+ = 1/log 10 is 0.434294+, a quantity which is termed the modulus of the decimal system of logarithms. This modulus has been calculated by Professor J. C. Adams to 282 places of decimals, but for ordinary use the approximation 0.4343 is sufficiently close, and, similarly, its reciprocal may be taken at 1/2.3026.

At the beginning of this article we gave a simple illustration showing the general idea embodied in logarithms. Let us now turn to the consideration of the decimal system of such numbers.

Nothing could be more simple, for the entire theory is founded on the principle that every multiple or sub-multiple of the base 10 is represented by the index of the power to which that base must be raised to equal the given number.

Hence, decimal logarithms are simply the indices designating certain powers of the base 10.

The following is a skeleton of the decimal logarithmic scale from 0.00001 to 100,000.

Table with 3 columns: Number, Power of Base, Log. Values range from 0.00001 to 100000.

Here the index of each power makes clear the value of the log corresponding to the natural number, and it will be seen that any of the numbers can be multiplied or divided into each other simply by addition or subtraction of their logarithms.

To multiply 0.01 by 1,000 we add the logarithms in accordance with rule (1).

Thus log 0.01 = -2, log 1000 = 3, and -2 + 3 = 1.

Opposite log 1 we find 10, which is the required product.

Again, to divide 100,000 by 1,000 we subtract the logarithm of one number from the logarithm of the other.

Thus log 100,000 = 5, log 1,000 = 3, and 5 - 3 = 2.

Opposite log 2 we find 100, which is the required quotient.

In order to complete the table for practical use, fractional logarithms have to be inserted between the positive and negative integral logarithms.

The integral portion of a logarithm is termed the characteristic, and the fractional portion the mantissa, terms which can be abbreviated to char and mant. The characteristic is sometimes called alternatively the index, but this may lead to confusion, for while the characteristic may be regarded as the index of the logarithm, the logarithm itself is the index of the natural number.

The calculation of fractional logarithms has involved a prodigious amount of labour; but having once been calculated their use is just as simple as the use of the integral logarithms given above.

Briggs explains in the preface to his treatise Arithmetica Logarithmica the methods employed for the construction of his tables.

In performing this task Briggs extracted the square root of 10 fifty-four times to about thirty places of decimals, finding thus that log 1.00000 00000 00000 12781 61843 20032 35 = 0.00000 00000 00000 65551 11512 31257 82702, and that, for numbers commencing with 1 followed by fifteen ciphers, and then by seventeen, or a less number of significant figures, the logarithms were proportional to these significant figures.

Then by proportion he found the logarithm of 1.00000 00000 00000 1 to be 0.00000 00000 00000 0434294481+, and that the logarithm of 1.00000 00000 00000 x would be obtained by multiplying x into 0.00000 00000 00000 0434294481+.

The logarithm of 2 was found by raising this number to the tenth power (2^10 = 1024) and extracting the square root of 1.024 forty-seven times, thus obtaining the result 1.00000 00000 00000 16851+. Then multiplying the significant figures by 43429 and by 2^13, Briggs obtained 0.01029+ as the logarithm of 1.024. Adding the characteristic 3, and (as 2 = 10^2/10) dividing by 10, he obtained log 2 = 3.01029+ ÷ 10 = 0.301029+.

In a similar way log 6 was found to be 0.7781513 and log 3 was deduced

Thus As 6 ÷ 2 = 3, so log 6 - log 2 = 3. Therefore log 3 = 0.7781513 - 0.3010300 = 0.4771213.

Briggs also employed a method of obtaining the mean proportionals by continually computing geometric and arithmetic means between two numbers, one greater and the other less than the number required, until the geometric mean and its corresponding arithmetic mean, or logarithm, were found to a sufficient degree of accuracy.

To obtain log 5 in this way take the geometric mean between 1 and 10 = 3.162+; then, the arithmetic mean between log 10 and log 1 being (1 + 0) ÷ 2 = 0.5, the geometric mean between 3.162+ and 10 = 5.623+ corresponds to the arithmetic mean (0.5 + 1) ÷ 2 = 0.75; the geometric mean between 5.623+ and 10 = 7.746+, corresponds to the arithmetic mean (0.75 + 1) ÷ 2 = 0.875.

After twenty-two operations of the kind the arithmetic mean 5.000000 and the corresponding logarithmic mean 0.6989700 are obtained, the latter being log 5.

By laborious methods of this nature Briggs and Vlacq produced the first of those tables which have saved an incredible amount of time, and which, in conjunction with logarithmic tables of trigonometrical functions, have rendered possible researches that otherwise would have involved calculations of such magnitude as to be entirely beyond human capacity.

As originally conceived, a logarithm was regarded as an expression indicating a number of compounded ratios, hence the name was derived from logon arithmos—literally "the number of the ratios." If, according to this theory, the ratio 10:1 be considered as compounded of 1,000,000 small ratios, then the ratio 2:1 is approximately equal to a ratio made up of 301,030 of these small ratios. Similarly, the ratio 3:1 is equal to a ratio compounded of 477,121, the ratio 4:1 to a ratio compounded of 602,060, and the ratio 5:1 to a ratio compounded of 698,970 of the same small ratios, and so on.

The actual nature of a logarithm is more clearly indicated by the statement that it is an index or power of the base.

Then 10^0 = 1, 10^0.301030 = 2, 10^0.477121 = 3, 10^0.602060 = 4, and so on.

By looking at the matter in this way we are able to realise clearly the true meaning of the figures contained in a table of logarithms, as in the subjoined statement.

Table with 3 columns: Number, Power of Base, Log. Values range from 1 to 50.

With the object of saving space only the mantissae or decimal portions of logarithms are

There is also a low-level pumping-station at Angel-road which receives the sewage from the factories and what few cottages have been built on the east side of the railway; the sewage is pumped by means of two Crossley's gas engines and centrifugal pumps through a stoneware rising main on to the land. The effluent enters Salmon's brook near Angel-road, and reaches the River Lea below Tottenham Lock. With regard to the irrigation of the land with sewage, until recently about 15 acres were used for watercess beds, but although the water was clarified before it was sent to the beds, on the advice of the medical officer and in deference to public opinion, the Council declined to let any land for watercess beds. The Council has also grown osiers and rye grass, but the former were difficult to keep clean and the latter not in such demand as to warrant any large quantity grown; the Council are, therefore, driven to growing green crops of different kinds and roots, such as mangolds, swedes, and turnips, which are all fairly saleable. The level of the water over the whole area of the sewage farm was, some thirty years ago, within a foot or two of the surface of the land, but by straightening the watercesses and widening and deepening them considerably with fat falls of only about 2 ft. in a mile, the level of the water has been lowered considerably and at the present time it is further lowered artificially to a very great extent by a portable engine and pump used for the purpose of getting gravel of which there is a considerable depth. The question of clarifying the sewage effluent and purifying to a greater extent than can be done by broad irrigation, is now under consideration, and it is probable that this will be effected by means of septic tanks and contact beds. The land has been levelled with fairly uniform slopes from north to south and generally also from west to east with falls of about 1 in 600.

Appointments.

UNIVERSITY OF LONDON.—The following appointments have been made: Professor F. Brown to the Slade Chair of Fine Art; and to lectureships for the session, 1906-7, Mr. A. T. Walmisley in waterways, docks, and maritime engineering, Mr. W. M. Blair in roads, street-paving, and tramways, Mr. H. Deans in railway engineering, and Mr. N. T. Ormsley in surveying.

STANDARDS DEPARTMENT, BOARD OF TRADE.—Major P. A. McMahon has been appointed to succeed the late Mr. Chaney as superintendent of the Standards Department, of which he had been practically in charge during some months past in Mr. Chaney's absence through illness.

EDINBURGH.—The Streets and Buildings Committee of Edinburgh Town Council agreed, on the 6th inst., to recommend that Mr. James Sim, Deputy City Road Surveyor, be appointed Surveyor, in room of Mr. D. C. Proudfoot, whose retirement is to date from May 15 next.

Obituary.

SIR WYKE BAYLISS.—We regret to announce the death, on April 5, at 7, North-road, Clapham-park, S.W., of Sir Wyke Bayliss, K.B., F.S.A., aged seventy years. During the past eighteen years Sir Wyke Bayliss was President of the Royal Society of British Artists. Of his architectural paintings we may mention those of the interiors of cathedrals and churches in the United Kingdom, France, Belgium, Germany, and Italy. His literary works comprise "Rex Regum: A Painter's Study of the Likeness of Christ from the Time of the Apostles to the Present Day," 1905, and "Seven Angels of the Renaissance: the Story of Art from Cimabue to Claude," 1905, the "Angels" or "Messengers" being Cimabue, Leonardo, Michelangelo, Titian, Raphael, Correggio, and Claude. Sir Wyke Bayliss was the author of several theses and papers, the more recent of which were lectures to the Society for the Encouragement of the Fine Arts on "The Bogy in the Studio," March 26, 1903, and "The House of Her Friends," upon art in relation to the social condition of our great cities, April 21, 1904. He was a native of Madeley, co. Salop, became a member of the Royal Society of British Artists forty years ago, and was knighted in 1897.

MR. FRANKLIN.—The death, on March 26, is announced of Mr. J. E. Franklin, of Regent-street, Rugby, architect and surveyor. Mr. Franklin was senior member of the firm of Messrs. Franklin & Newman, having taken into partnership Mr. C. J. Newman, his former pupil. During the past fifteen years or so Mr. Franklin was architect of store buildings at New Bilton, at Rugby, and in the neighbourhood for the Rugby Co-operative Society; the enlargement, with improvements, of the Congregational church at Rugby, adding two new transepts and vestries, lengthening the choir, and making four new entrances: the St. Matthew's infants' school, Pennington-street, Rugby; and a block of shops, with assembly-hall, educational rooms, etc., in

Chapel-street, as an extension of their premises, for the Co-operative Society. He recently laid out some property on the Naseby's estate for the Rugby Benefit Building Society, and acted in a similar capacity in respect of the erection of many houses and business premises in the district, and was lately a member of the Urban District Council. Mr. Newman, we understand, will carry on the practice of the firm.

General Building News.

HOLY TRINITY CHURCH, BROMPTON.—At a sitting of the Consistory Court of London on March 28, Dr. Tristram, K.C., Chancellor of the diocese, agreed that a faculty should issue for the erection of a vestry, 20 ft. square in plan, on the south-east side of Holy Trinity Church, Brompton-road, with a lobby and porch to communicate with the avenue leading from the church to the main road, and for additional exits from the church through the new vestry, and also at the east end, and from the south gallery to the lobby. At present the chief exits are one on Francis's design, at the west end, and one on the south side, whilst there are only two small exits from the galleries, which hold 500 persons. For these and some minor improvements, estimated to cost 1,300l., the plans and designs have been prepared by Mr. Arthur Blomfield. Holy Trinity Church was built in 1825-9, by Professor Donaldson, after the Early English style, for 1,500 sittings. Sir A. W. Blomfield restored the fabric in 1880.

CHURCH OF ST. MARY, ACTON.—The Consistory Court of London will issue a faculty for the enlargement and improvement of the church after designs prepared by Messrs. Edward Monson & Sons, of Acton. It is intended to extend the present vestry on to a portion of the churchyard, which has been practically disused during some while past, and to make a third exit by opening out a doorway on the south side of the east end. The church accommodates a congregation of 950, but has only two doors, both at the west end, facing the west and north respectively. It was originally built from Francis's design, and enlarged in 1866; the tower was rebuilt thirty years ago.

NEW CHURCH, EDMONTON.—The Bishop of London recently consecrated the new church of St. John the Evangelist, Upper Edmonton. The church, which has been built to the plans of Mr. G. B. Wrenell, of Westminster, has sittings for 800 people.

WORK ON WINCHESTER CATHEDRAL.—The work of underpinning the east end of Winchester Cathedral is proceeding satisfactorily, and two divers are occupied in four-hour shifts in taking out the peat under the building and putting bags of cement in its place.

CHURCH RESTORATION, NORTH MUSKHAM.—The restoration of the church of St. Wilfrid, North Muskharn, three and a half miles north of Newark station, has just been begun, the contractors being Messrs. A. Wood & Sons, of Alford. An outlay of 1,700l. is necessary. The architect is Mr. C. Hodson Fowler, of Durham.

BAPTIST CHAPEL, BARGOE.—The laying of the foundation-stones for the extension of the English Baptist Chapel at Bargoe took place recently. The building has been erected on the walls of the chapel built in 1896. When completed, it will provide seating accommodation for about 1,500. The cost of the extension work will be about 3,500l. Mr. R. T. Burns, Bargoe, has the contract, which is being carried out from plans prepared by Messrs. James & Morgan, architects, Cardiff. The seating accommodation and fittings will be of pitch-pine. The exterior will be of Forest stone and red bricks.

WESLEYAN REFORM CHAPEL, HUCKNALL TORKARD.—The foundation-stones of the new chapel of the Hucknall Torkard Wesleyan Reformers were laid recently. The church is designed in the Gothic style, the Annisley-road front being executed in red Istock bricks and Pilongh stone. The building will cover an area of 112 ft. by 43 ft. The architect for the work is Mr. Harry Spencer, Hucknall, and the contract has been let to Mr. J. A. Munks for 2,660l.

SCHOOL CHAPEL, TAUNTON.—The foundation-stones of the new chapel at Taunton School, to be laid shortly. The design, which was prepared by Mr. Frank Wills, architect, will cost about 10,000l. to carry into effect, and its execution has been entrusted to Messrs. W. Cowlin & Sons, of Bristol. The chapel is cruciform in plan, and in the Early English style. The nave will be 64 ft. in length by 25 ft. in width, and the pews will run parallel to the central aisle. The chancel adds another 36 ft. to the length. The design provides for rubble walling with Guiting stone dressings. Broseley tiles are to be used as the roof covering, and the windows will have leaded lights. Among the features of the interior treatment will be the broad barrel roof, a west-end gallery, and a gallery over the vestry.

PARK INSTITUTE AND ADULT SCHOOL, HARROGATE.—Ald. Jas. Chippindale recently opened the New Park Institute and Adult School, The

new building occupies a site facing on the main road, and comprises a lecture-hall, billiard-room, with two tables, reading-room, bath-rooms, etc. The total cost, including land, is about 1,300l. The accommodation of the new institute includes, on the ground floor, an entrance porch and lobby, with stone staircase to first floor, billiard-room, two bath-rooms, etc. On the first floor is a meeting-room, 36 ft. 6 in. by 24 ft. A caretaker's house is attached to the institute. The architects are Messrs. Bland & Bown, and Mr. J. Allen was the contractor.

IMPROVEMENT OF THE COUNTY COURT, SHEFFIELD.—The county court buildings in Bank-street, Sheffield, are at present undergoing alterations. The scheme provides for a new public office on the ground floor, quarters for the High Bailiff and his staff in the basement, and a Registrar's court on the first floor. In order to carry out these improvements, extensions have been made on the low side of the present building. The new premises will face Scarfhill Croft, and New-street. The plans were drawn by Mr. H. N. Hawks, of H.M. Office of Works, and the alterations have been entrusted to Messrs. Ash, Son, & Biggin, contractors, Sheffield.

COTTAGE HOMES, MORPETH.—Cottage homes have been opened by the Morpeth Board of Guardians for the purpose of providing a home for workhouse children. The building, which was originally a villa, comprises two homes, each of which is an exact duplicate of the other, forming one block. The contractors for the alterations were Messrs. R. Carse & Son, Morpeth and Ambie; Messrs. Swinney, Morpeth, for the wrought-iron gate designed by the architect; and the entrance-road was made under the direction of Mr. J. M. Macgregor, Surveyor to the Rural District Council. The whole has been carried out to the designs and under the supervision of the Board's architect, Mr. L. A. Loades, Morpeth.

NEW DEPARTMENT, ROYAL ORTHOPEDIC HOSPITAL, BIRMINGHAM.—The foundation-stone of the new out-patient department of the Birmingham Royal Orthopedic and Spinal Hospital was laid on the 2nd inst. by the Lord Mayor (Councillor A. J. Reynolds). The new department is being built in Great Charles-street on the west side of the garden of the old hospital. A larger scheme is on foot for the rebuilding of the old hospital, and a space to be left between the two structures will be laid out as a garden. The site is part of the Colmore estate. The new building has a frontage of 22 ft. to Great Charles-street, and extends backwards 85 ft., with various rooms looking into the open garden. The front is in the Elizabethan style, with mullioned windows, and is being faced with slightly glazed gray bricks and terra-cotta. The plans were prepared by Mr. F. B. Osborn, and the contractor is Mr. Harvey Gibbs, King's Heath. There will be a vestibule entrance in Great Charles-street, leading to the hall, with staircase and lift, and on the ground floor will be the dispensary, the out-patients' waiting-hall for eighty-five, surgeon's room, dressing-rooms, etc. On the first floor will be two exercising-rooms, two massage-rooms for men, women, and children, and spare rooms. On the second floor will be provided two isolation wards, two nurses'-rooms, and bath-room, and in the basement accommodation will be made for perambulators.

WESLEYAN MISSION, BOLTON.—The memorial-stone has just been laid of the King's Hall, the new mission building which is being erected in Bradshawgate. The new building has been designed by Messrs. Bradshaw & Cass, architects, and the contract has been let to Messrs. J. C. & F. Woods. At the corner of Bradshawgate and Brightmet-street the entrance is dominated by a tower 75 ft. high, over which will be a glazed verandah. On the front and side shops are arranged, and the verandah is taken along the whole frontage. The vestibule leads to the reception and crush hall. Directly from the hall is the entrance to the mission hall. In addition to the corner entrance near the hall level, a new entrance will be formed at the south side, giving access to both the lower and upper floors. The main staircases and the entrance-halls are all of fireproof construction. On the first and second floors are assembly-rooms, lecture-rooms, club and class rooms.

ASYLUM, YORK.—The new asylum for the City of York, which has been erected at a cost, with the site, of about 130,000l., was formally opened on the 4th inst. The buildings are situated in the parishes of Water Fulford and Naburn. The main aspect is southerly, and the buildings cover between 2 and 3 acres. They are built from the designs of Mr. Alf. Creech, A.M.I.C.E. Accommodation will be provided for 151 males and 211 females. There are extensive grounds and a farm attached, while a chapel, medical officer's residence, a lodge, and cottages are situated in the vicinity of the front entrance, which occupies the centre of the administrative block. The contractors are Messrs. G. Longden & Sons, Ltd., Sheffield.

TOWN HALL, LANCASTER.—The new Town Hall at Lancaster will be situated in Dalton-square,

where some old private houses will be demolished to make room for it. The choice of this site involves the closing up of a public road, and the making of a new one further back, as well as the removal of the tramway car shed. All this work has already been done. The architect is Mr. E. W. Mountford, of London, and the contractors are Messrs. Waring & Gillow, of Lancaster, and London. The new building will accommodate the staffs of the Town Clerk, the Borough Accountant, the Borough Surveyor, the police and tramways departments, and sanitary and other officials. In addition there will be a Court House and a public hall for meetings, with a large organ at the rear of the stage. The main entrance is to be through a pillared portico fronting Dalton-square, and surmounted by a clock-tower of a total height of 146 ft. The Town Hall will stand by itself, with frontages to four streets. It will be built of local stone.

PLEASLEY HILL FREE LIBRARY.—The plan submitted by Mr. J. E. Goodacre, architect, of Mansfield, for the Carnegie Library at Pleasley Hill has been accepted. The leading library will have a reading room, and accommodation for 3,000 volumes, and the reading-room will be 32 ft. by 22 ft., to accommodate forty-eight readers. The main front will be designed in brick with stone dressing, and it will have a central stone arch, with pediment and inscription over. The site is in Bagshaw-street.

NEW BEDFORD MARKET EXTENSION.—The Kew Bridge Wholesale Market for the sale of fruit and vegetables has just been extended and opened. The market is approached by a main entrance from the Chiswick High-road, which entrance is 25 ft. in width, and covered with glass; on each side are four shops, and offices over and cellars under. The market is fitted with covered over and below aprons, and is lighted from the top on the north side only, and it is divided into three ways or avenues. Along the main walls on the north and south sides are constructed thirty-three shops, with 15 ft. frontages and a depth of 13 ft., with an office over, and selling spaces 15 ft. by 10 ft. in front, and cellars constructed under the entire length, 23 ft. by 15 ft. The old potato warehouses are added to by constructing an office over and an entrance into the new market. A refreshment-room is provided for the use of the market. A new buyers' standing has been made. Seventy-five new horse stalls are provided. Mr. Novell Parr was the architect, and Messrs. Dorcy & Co., the builders.

LIBRARY, MOTHERWELL.—On the 5th inst., the new public library at Motherwell was opened. The library, which has been erected at a cost of 12,000l., is situated in Clyde-street, opposite the Town Hall. The architects are Messrs. Greig, Fairbairn, & Niven, Edinburgh.

HALL, CARDIFF.—The memorial-stones of the new hall of the Cardiff Forward Movement, in Whitechurch-road, were laid on the 4th inst. It will, with its vestries, accommodate 1,200 people, and is costing 3,600l. It has a frontage to Whitechurch-road of 56 ft., and is ornamented by two towers, which rise one on either side of the entrance-hall. It is built of rubble stone with Bath stone dressing. Its depth is 94 ft. The architect are Messrs. Veall & Sant, and the builders Messrs. Knox & Wells.

HIPPODROME, PUTNEY.—A Hippodrome is in course of erection at Putney. It is to be built of white stone and red brick, with a frontage of about 110 ft. The height of the parapet will be nearly 40 ft. above the pavement, while at the corner, next to the High-street, a tower will rise to a height of over 70 ft., surmounted by an open work metal globe. The house will accommodate an audience of about 1,500. The Hippodrome has been designed by Mr. Frederick W. Kingston, and the building is being carried out by Messrs. Kinglerlee & Sons, of Oxford.

POST OFFICE, WARRINGTON.—A new Post Office is to be erected at the corner of Springfield-street and Egypt-street, Warrington. The tender of Messrs. J. Parkinson & Sons, Ltd., of Blackpool, has been accepted for the building, and the total cost of the work, including the fittings, will be about 16,000l.

CONVALESCENT HOME, BODNOR.—On the 4th inst. Princess Alexandra, of Teck opened a Children's Convalescent Home for Surrey at Bodnor. The new institution, which is situated in Clarence-road, will provide accommodation for fifteen children and eight women with their infants. The work was carried out under the supervision of Mr. H. G. Sawyer, Petersham.

The new Tollard Royal Hotel in Southampton-row, for which Messrs. Bradshaw & Gass specified the valve closed called "The Only," by the Sanitary Appliances Syndicate, but the builders were informed that this could not be used, "as the New River District had no official knowledge thereof." That it was in an early stage they have "no official knowledge" of a fitting before they condemned it does not seem to have occurred to the authorities. However, the Syndicate took the matter up, with the result that the Board's Inspector visited their show rooms and reported that the closest in question complied with the regulations and that there was no objection to its use. One would have thought that the Board might have taken the trouble to ascertain this in the first instance before condemning it wholesale.

HULL JOINT DOCK.—It is announced that Messrs. S. Pearson & Son have undertaken the contract for the Joint Dock of the North-Eastern and Hull and Barnsley Railway Companies. The estimated cost is 850,000l. The dock, 3,000,000 cubic yards will be excavated; the works are to be finished in the summer of 1910.

NEW WORKS FOR MESSRS. YARROW & CO.—This well-known firm of engineers and ship-builders have decided to migrate from Poplar to a site of 12 acres, with a frontage of nearly 800 ft. to the river Clyde, at Scotford, near Glasgow. We gather that the new works will be built by Sir William Arrol & Co., and that the construction of the fitting-out basin, which will be roofed in and equipped with overhead cranes, together with the building of the engine and boiler shops, berths, etc., is to be sub-let to Messrs. Morrison & Mason, of Glasgow.

SEWERAGE SCHEME, MORECAMBE.—Colonel W. R. Slacke, R.E., at Morecambe on the 4th inst., conducted an inquiry into the application of the Corporation to borrow a further sum of 7,200l., with the sanction of the Local Government Board, for works of sewerage and sewage disposal. The Town Clerk (Mr. Wm. Eilly) stated that the total cost of the works to date was 83,480l., and of the 7,200l. it was now proposed to raise, 3,390l. represented money overpent and 3,800l. for additional works. Mr. H. B. Nichols, C.E., the engineer to the scheme, explained in detail the nature of the application.

THE LONDON COUNTY COUNCIL DRAINAGE BY-LAWS.—The London County Council are taking steps to obtain the opinion of the Metropolitan borough councils upon the advisability of repealing the drainage by-laws requiring an intercepting-trap to be fixed in every main or other drain.

COMBINED DRAINAGE.—The Town Clerk of Fulham has been instructed to convene a conference of Metropolitan borough Councils with a view to approaching the Local Government Board for the purpose of asking for an amendment of the existing law dealing with combined drainage.

WATER SCHEME, NEWTONWARDS.—Mr. P. C. Cowan, M.Inst.C.E., Chief Engineer in Charge to the Local Government Board, held an inquiry on the 4th inst., in the Board Room of the Urban Council, Newtownwards, with regard to the application of the council for sanction to a loan of 18,500 for the purpose of providing a water supply to the town. Mr. J. H. Swiney, engineer for the scheme, gave details in regard to the supply, and the probable capacity of the storage reservoir which is to be constructed, also to the specification. The object of the scheme is to provide a supply was estimated at two million gallons, and the supply was estimated at 20 gallons per head per day on the present population. If the town increased in population, additional storage accommodation could be made. The cost of the entire work was 215,470 12s. 5d., to which he added 20 per cent. for land, law, engineering, and supervision expenses, which would amount to 23,094 7s. 7d., making together 218,565. Mr. John Ernest Crossadale, engineer, gave evidence as to the way in which the reservoir was to be constructed.

Foreign.

FRANCE.—M. Allouard, the sculptor, has just completed a monument to Carnelle, which a subscription committee proposes to erect at Paris. The monument is to be erected on the Place de Pantheon, alongside of the St. Genevieve Library, so as to form a pendant to the monument to Rousseau at the other side of the Place. The Municipal Council of Paris have decided not to allow the erection of any further statues in the Parc Monceau, the Cours la Reine, or the Champs Elysees. The jury of the Ecole des Beaux-Arts commissioned to the first competition of architectural students of M. C. Simardesco, pupil of M. Paulin; the subject being "Une Maison Hospitaliere Ouvriere." The following architects have been selected to take part in a limited competition for the proposed tower hall at Lyons: MM. Blanchard and new Town Hall at Lyons: MM. Blanchard and Tabourier (Versailles), Horneker (Nancy), Huguet (Lyons), Patoullard (Paris), and Perrin (Lyons).

—Since 1873 the Académie des Sciences et Belles Lettres of Lyons awards every year the prize founded by M. Dupasquier, which goes alternatively to architects, painters, engravers, and sculptors, natives of Lyons. This year the prize has been awarded to an architect. The Municipality of Avignon have voted a sum of 3,000,000 francs for various works to be undertaken for the better sanitation of the town. A new public Casino is to be built by the Corporation of Mentone. The Municipality of Nantes have voted 770,000 francs for expenditure in street improvements. The Municipality of Boulogne-sur-Mer propose to transfer the public library to another position, and to build a circus on the site. A new Bourse is to be erected at Lille. M. Injalbert, the eminent sculptor, has just completed a large monument to be placed in the Pantheon at Paris, which forms a kind of apotheosis of Mirabeau. He is represented standing on the Tribune, above him a winged genius accompanied by a lion as an emblem of Force. The group will stand on a pedestal having at the four corners figures symbolising respectively Royalty, Revolution, History, and Sorrow; the latter as lamenting the loss of the great orator. As in former years, the Chantilly Museum will remain open from April 15 to October 15, at an entrance charge of one franc. The Château de Breussieu, in the Department of Isère, one of the finest mediæval ruins in France, has been scheduled among the "Monuments Historiques." M. Boutterin, architect, has been commissioned to carry out a new school of clock making to be erected at Besançon, at a cost of 25,000 francs. The Municipal Council of Toulouse have decided on the construction of a hospital intended to replace the old Hôtel Dieu. The cost is estimated at a million and a half of francs. The Under-Secretary for Fine Arts has under consideration a scheme for restoring or replacing the frescoes by Girardet which decorate the ceiling of the Hôtel de Ville at Nancy, which are in a very dilapidated condition.

Miscellaneous.

GOVERNMENT BUILDINGS.—Sir Wm. Bull has asked the First Commissioner of Works if there are any Government buildings in Whitehall for which towers were originally designed but which have been abandoned by his predecessors. Mr. Harcourt replies that towers formed part of the design for the buildings now occupied by the Home Office and the Local Government Board, but they have never been completed.

ROADS IN HYDE PARK.—Answering Mr. Verney, Mr. Harcourt, in the Parliamentary Papers, states that approximately 22,000l. has been expended in the last five years on the roads in Hyde Park, and the average expenditure per mile per annum is 1,000l. The roads are first scarified, then retailed with Guernsey granite, machine broken to a 2-in. gauge, rolled with 15-ton rollers, and finally dressed with gravel.

THE FURTHER STRAND IMPROVEMENT.—The Clerk of the London County Council has informed the Further Strand Improvement Committee that the Improvements Committee will receive a deputational report in support of the memorial on Wednesday, May 2. The memorial may be signed at the Royal Academy of Arts, Burlington House; the Surveyors' Institution, 12, Great George-street; or at the office of the honorary secretary, 7, Pall-mall.

ST. MICHAEL'S CHURCH, BURELICH-STREET.—The site and materials of the church, of which we recently printed a description, were sold at the Mart, by order of the Ecclesiastical Commissioners on March 28. The site covers 4,450 ft. superficial; the bidings advanced from 10,000l. to 20,500l., at which sum the property, which is frechold, was sold.

GLADSTONE'S MEMORIAL, HAWARDEN.—It is stated that the centaph which Sir W. B. Richmond, R.A., has sculptured for Mr. Henry Neville Gladstone will be inaugurated in the side chapel of Hawarden parish church in the course of next month. The memorial, which presents a remarkable and original example of monumental design, embraces recumbent effigies of the late Mr. and Mrs. Gladstone; the former wearing the gown of an L.L.D., with an owl at his feet, a winged Angel of Watchfulness supports the pillow, and bends over the figures, each of which lays a hand upon a large cross which lies between them. The yellow marble pilasters of the base alternate with silver plaques in bas-relief to symbolise love and the plaques in bas-relief to symbolise love and the plaques in bas-relief to symbolise love and the plaques in bas-relief to symbolise love and the plaques in bas-relief to symbolise love.

THE BRITISH ASSOCIATION.—The seventy-sixth meeting will be opened at York on August 1. Professor Ray Lankester is being the President-elect. The Council have appointed the sectional presidents and vice-presidents; those for Engineering (section G) are Mr. J. A. Ewing, president, and Sir Colin Scott Moncreff and Mr. W. Cudworth, vice-presidents. The Association held its

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THE METROPOLITAN WATER BOARD AND FITTINGS.—Both the old water companies and the new Metropolitan Water Board have been too much disposed to condemn sanitary fittings, taps, etc., on the mere fact that such fittings were new to or unknown to them. A case of this kind seems to have occurred in connexion with

inaugural meeting at York in 1891, and met there again in 1844, and in 1881 under the presidency of Sir John Lubbock, now Lord Avebury. A sum of nearly 1,600*l.*, including subscriptions of over 700*l.*, is available for purposes of the medal fund to commemorate the recent visit to South Africa, and finished sketches of obverse and reverse designs, to be executed in bronze, have been made by Mr. F. Boucher. The medal is intended to signalise achievement and promise in scientific research in South Africa, and the balance of the income of the fund will be awarded, by the South African Association for the Advancement of Science, in respect of the same objects.

CASTLE OF SANT' ANGELO, ROME.—The mausoleum of Hadrian and of at least three of his successors, which has been used as a fortress, prison, and barrack in turn, has recently been converted into a historical museum to illustrate the engineering side of the Italian military service. Amongst the exhibits are some interesting plans of celebrated fortresses in Italy as in the XVth and following centuries, and it is anticipated that these will be supplemented by some models of the older fortifications.

GROSVENOR-SQUARE.—For clearing the site the materials of the two handsomely-fitted houses Nos. 22-3 have been sold. The houses stand on the west side, near the end of North Audley-street. Before the renumbering of the houses in the square in 1888—an episode of its history which is commonly overlooked—the two houses we mention were numbered 19a and 20, respectively.

THE "POTTERIES" DISTRICT, NOTTING HILL.—We lately republished from our number of November 10, 1895, a notice of the late G. Godwin's lecture upon "The Homes of the People," with a summary of the chairman's remarks, in which particular mention was made of the disgraceful condition of the Potteries. That reproach has endured to our own time. We may, therefore, mention that the Council of the Royal Borough of Kensington have taken steps for the erection of six blocks of working-men's flats upon the site of Nos. 33-49, Kenley-street, Notting Dale; each block will contain six suites of two rooms apiece.

SANITARY OFFICERS.—The Local Government Board has sanctioned increases in the salaries of Mr. G. O. Pavitt and Mr. E. T. Crook, sanitary inspectors in the Metropolitan Borough of Stepney, as from 31st January.

HOUSING SCHEME, LINTON.—On the 5th inst. at the Linton Workhouse Mr. E. A. Sandford Fawcett, M. Inst. C.E., Local Government Board Inspector, and Mr. B. T. Ritchie, F.R.I.B.A., Architect to the Local Government Board, held an inquiry into the application of the Linton Rural District Council to borrow 1,600*l.* for the purposes of a scheme under Part III. of the Housing of the Working Classes Act, 1890, for the provision of cottages for persons of the working classes in the parish of Linton. Mr. F. W. Chappell, the Sanitary Inspector, said it was proposed to charge 2s. 6d. per week rent, which would be remunerative. The buildings were to be constructed in groups of five, and were to have 9-in. party walls.

EXCAVATIONS AT HOLME CULTRAM, CUMBERLAND.—Aided by a grant from the Cumberland and Westmorland Archaeological Society, excavations have just been completed in the Holme Cultram churchyard, a few miles from Wigton, amongst the ruins of the ancient Cistercian Abbey, which was founded between 1100 and 1150. The excavations have been made to the east of the present structure, where once stood the chancel and transepts of the Abbey. The floor of the old chancel, laid with tessellated tiles, was reached, and also that of the northern transept, from the floor of which some four dozen square clay tiles with glazed upper surface of a floral design have been unearthed. The excavations were superintended by the Rev. W. Baxter.

Legal.

ACTION BY BUILDERS' MERCHANTS.

The case of Hooper & Ashby v. Willis came before the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Romer and Cozens-Hardy, on the 10th inst., on the appeal of the plaintiff from a judgment of Mr. Justice Kekewich in the Chancery Division. (The case was reported in the *Builder* of July 29, 1905.)

This was an action by the plaintiffs, a firm of builders' merchants, carrying on business at Southampton, with branch offices at Bournemouth, Poole, Portsmouth, and other places, for an injunction to restrain the defendant from carrying on such business at Broadstone in alleged breach of an agreement of service. The facts were these:—The defendant entered the service of the plaintiffs in September, 1898, when he was aged nineteen. The plaintiffs, by an agreement of service dated September 29, 1898, agreed to take the defendant into their employment, and in that agreement it was provided that defendant

should not for the space of fourteen years after the termination of his employment with the plaintiffs, whether the employment should be terminated by the plaintiffs or the defendant, at any place within a radius of thirty miles from the Town Hall at Bournemouth or the Bargate at Southampton, carry on directly or indirectly as principal clerk, agent, manager, or traveller, in any other capacity, the business of a builders' merchant or manufacturer of or a dealer in cement, lime, bricks, plaster, lathe, whitening, and any other building materials which at any time during his employment should be manufactured by or dealt in or sold on commission by the plaintiffs. The agreement was executed by the defendant, but not by any member of the plaintiff firm. The defendant was employed first as a clerk and afterwards as a traveller at the plaintiffs' Bournemouth office, but discharged himself from their employment in August, 1903. The plaintiffs subsequently discovered that the defendant was carrying on business at Broadstone, which was within seven miles of Bournemouth, and accordingly brought the present action, claiming the before-mentioned relief.

Mr. Justice Kekewich held that the area covered by the agreement was larger than was reasonably required for the protection of the plaintiffs' trade, and dismissed the action with costs. Hence the present appeal of the plaintiffs. Mr. Stewart Smith, K.C., and Mr. Mark Romer appeared for the appellants; and Mr. P. Ogden Lawrence, K.C., and Mr. Hohler for the respondent.

During the course of Mr. Stewart Smith's argument Lord Justice Romer pointed out that he could not see how it was made out that the agreement was beneficial to the defendant, who was an infant when he entered into it. There was no contract by the plaintiffs to employ him for any time or to give him fixed wages. Mr. Smith said it gave the defendant employment.

Lord Justice Romer: I do not know that it does except for the moment.

Mr. Smith said that the defendant had been going on in the plaintiffs' employment for several years, getting successive rises of wages, and he recognised the existence of the contract when he had the opportunity of leaving the trade, and not become a formidable competitor of those who had taught him.

Lord Justice Cozens-Hardy thought the practice of exacting these restraining covenants a pernicious one.

Mr. Smith said it was one of the conditions of entering the employment that the covenant should be entered into, and it was insisted on in the case of every employee. It was necessary to protect the interest of the employer. If the employee was to go away with the information he had acquired, and use it for his own benefit, he was taking part of his master's property.

Lord Justice Romer pointed out that, while the defendant had entered plaintiffs' employment as a clerk, he had afterwards been employed as a traveller, and suggested that the agreement thereupon came to an end.

Mr. Smith thought not because the covenant did not depend upon the nature of the employment.

Mr. Mark Romer having followed on the same side, the Master of the Rolls, without calling upon counsel for the respondent, in giving judgment, said Mr. Justice Kekewich had decided against the plaintiffs on the ground that the area was too wide for the reasonable protection of the employers and that the agreement could not be enforced. On that ground the learned judge was, he thought, right, and the appeal ought to be dismissed. There were, however, other difficulties in the plaintiffs' way. He was not satisfied, for instance, that the agreement, being made with an infant, and containing the clauses it did, was in itself a valid agreement, and if invalid there was no evidence of a fresh contract in writing on the defendant attaining the age of twenty-one. It was not necessary to decide these points, but he was not satisfied that the plaintiffs' position could be maintained on these grounds.

The Lords Justices concurred, and the appeal was accordingly dismissed with costs.

POINT UNDER THE PUBLIC HEALTH (LONDON) ACT, 1891.

In a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Darling and Bray, on the 6th inst., judgment was given in the case of the Mayor, etc., of Westminster v. the Gordon Hotels, on the appeal of the Westminster Corporation from a decision of the Bow-street stipendiary, the case raising an important point under sect. 30 of the Public Health (London) Act, 1891.

It appeared from the special case stated that the appellants, as the sanitary authority, were summoned by the Hotel Company on April 8, 1905, for an offence falling without reasonable cause to comply with sect. 30 of the Public Health (London) Act, 1891, in not having re-

moved from the Hotel Metropole at the ordinary period the house refuse in accordance with a notice served by the respondents. The magistrates, on June 23, 1905, convicted the appellants and imposed a fine of 10*l.* with 15*l.* costs. The facts were as follows:—On February 27, 1905, the appellants had been in the habit of removing daily all refuse from the hotel. On February 27, 1905, acting on legal advice, appellants gave notice in writing to the respondents that on and after April 1, 1905, they would not remove "trade refuse" from the hotel except in pursuance of sect. 33 of the Public Health (London) Act, 1891—that was to say, upon being required to do so by the respondents—and that they would make a charge of 10*l.* a load, or portions of a load, of trade refuse removed by them. The refuse which the appellants refused to remove consisted of ashes, sawdust, empty bottles, and tins, straw, sea leaves, waste paper, etc. The magistrate found as a fact that the appellants had failed to remove from the hotel within forty-eight hours after service upon them by the respondents of a written notice requiring its removal the refuse in question, and that such refuse was refuse of the same character and description as that which was removed by the sanitary authority from every large dwelling-house, and that it was ordinary domestic refuse resulting from, and incidental to, the supply of warmth, food, and other refreshment to the guests who had come to the hotel. He further found as a fact that the refuse was in the main not such as should be allowed to remain at the hotel, and that the refuse which the appellants had failed to remove was "house refuse" within the meaning of sect. 30 of the Public Health (London) Act, 1891, and that the appellants had not shown reasonable cause for their failure to comply with the respondents' notice requiring the removal of the refuse. The question for the Court to determine was whether, on the facts of the case, the conviction was right in law.

Mr. Macmorran, K.C., and Mr. Courthorpe-Munroe appeared for the appellants; and Mr. Danckwerts, K.C., and Mr. Cunningham Glen for the respondents.

Their lordships decided that the refuse was house refuse, and affirmed the decision of the magistrate.

ACTION AGAINST THE CHORLEY CORPORATION.

The hearing of the case of the Chorley Bleaching Company, Ltd., v. the Mayor and Corporation of Chorley and Townley Parker concluded before Mr. Justice Joyce in the Chancery Division on the 9th inst.

It appeared that under a 999 years' lease granted by the Corporation in 1803, the Company erected bleaching works, costing over 3,000*l.*, on a portion of the Common Bank farm, and the question for decision was whether the Company had the right to use the road leading to their works from the Southport-road. When a mere foot and bridle path the road in question was conveyed in 1887 by Mr. Townley Parker to the Corporation, who required access to their sewage farm at Common Bank, and vended it as to make a cart road. They gave the plaintiff Company the right to use it "so far as they could lawfully do so," but Mr. Townley Parker now claimed that on the true construction of the conveyance the Corporation and their assigns were only entitled to use the road for agricultural purposes, and could not do so for bleaching works. He therefore called on the Corporation to stop the plaintiffs using the road, and they had done so. It was stated that there were other roads giving the plaintiffs access to their works.

In the result, his lordship held that the plaintiffs were entitled to use the road in the manner they contended for, and made a declaration to that effect. He gave costs against both defendants with liberty to apply if they differed as to how they should be divided between them.

Order accordingly.

Capital and Labour.

BUILDING TRADE ARBITRATION, COVENTRY.—Under appointment from the Board of Trade, Mr. A. Hudson sat at St. Mary's Hall, Coventry, on the 4th inst., to arbitrate a dispute between the Coventry Master Builders' Association and the carpenters and joiners. The former had given notice to the latter of a proposed alteration of rules regarding overtime. The practice hitherto has been for time and a quarter pay to be made for hour done after the ordinary working hours, but this payment has been according to the employers, only after given in other branches of the trade after eight o'clock, the masters sought to bring the carpenters and joiners into line with other departments. On their part, the carpenters and joiners put in notices demanding an advance of wages from 8*h.* to 9*h.* per hour. Mr. Hudson promised to give his decision at an early date.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this list, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. viii. x.; Public Appointments, —; Auction Sales, xviii.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

Competition.

NO DATE.—BREAKFAST—EXHIBITION OF HOUSES.
 ***Nov. 18.**—The Belfast Garden Estates Company offer 700l. in prizes for the best designed and most economically built houses. The awards will be made by the assessor, Mr. Maurice B. Adams, F.R.I.B.A. Full particulars at office on the estate, Cliftonville-circuit; or from the agents, Messrs. R. J. McConnell & Co., 37, Royal-avenue, Belfast.

Contracts.

BUILDING.

APRIL 15.—CARLISLE.—HOUSES.—Carpenters and joiners, plumbers, glaziers, painters and glaziers, and slaters work required to be done in the erection of eight houses, Dalson-road, for William Johnstone, Esq. Specifications can be obtained, and plans can be seen, at the office of J. Dunstone Brothers, architects and surveyors, 75, Lower-lisburn, Carlisle. Names to be sent in on or before April 16.

APRIL 16.—CHURCH STREETION.—COTTAGE.—Church Streetion U.D.C. invite tenders for the erection of a cottage, and the necessary works, Little Streetion. Plans, specifications, and particulars can be obtained by application to Mr. E. Marsh, surveyor, Church Streetion. Tenders to be endorsed "Tenders for Cottage," and sent to Mr. S. M. Morris, College Green, Carlisle, on or before April 16.

APRIL 16.—STANLEY.—STEAM LAUNDRY.—The Stanley Steam Laundry Company, Ltd., invite tenders for the building only of a steam laundry. Plans and specifications may be inspected between 10 a.m. and 4 p.m. at the office of Messrs. Ridley and Reay-Smith, solicitors, Stanley, S.S.O., to whom tenders must be sent not later than the 16th inst.

APRIL 17.—COCKTON HILL.—SCHOOL.—Durham County Education Authority invite tenders for the erection of Cockton Hill School. Plans etc. can be seen, and bills of quantities obtained, at the office of the architect, Mr. C. G. Hoskins, Darlington. Sealed tenders, endorsed "Cockton Hill Council School Tender," to be sent on or before April 17, addressed to the Secretary, Elementary Education Department, Shire Hall, Durham.

APRIL 17.—TREDEGAR.—HOUSES.—Twenty-two houses at Charles street, Tredegar. Application to view plans and specification must be made, with deposit of one guinea, to Mr. Thomas Banks, Oakfield-road, Tredegar, on or before the 17th inst. Sealed tenders, endorsed "Tender for Houses, Charles-street," must be received by J. Porteous Bell, Secretary, Hawthorn Villa, Tredegar, on or before the 17th inst.

APRIL 18.—CERRAL.—VERANDAS AND ROOF.—Llandaff U.D.C. invite tenders for (a) cast-iron verandahs and (b) wrought-iron roof for laundry, in accordance with specifications, which may be obtained on application to Messrs. H. H. James, architects, 18, Quay-street, Cardiff. Tenders, sealed and endorsed, to be sent to Mr. W. Warren, Clerk, Park House, Cardiff, not later than noon on April 18.

APRIL 18.—MOLD.—ALTERATIONS TO CHAPEL.—Alterations to Bethesda C.M. Chapel, Mold. Plans, etc., may be seen on application to Mr. Jesse Roberts, Brynhyll, Mold, to whom tenders must be sent by April 18. Richard Davies & Son, architects, Bangor.

APRIL 18.—SHOOTON BRIDGE.—CHURCH HOUSE.—For building a church house at Shooton Bridge, Co. Durham, for Rev. E. Fenton. Apply to the architect on or before April 18. The architects reserve the right of selecting the builders to tender. Plans and specifications may be seen and all particulars obtained after April 18, by appointment with Stephen Wilkinson & Crowley, A.R.I.B.A., 30, Mosley-street, Newcastle-on-Tyne.

APRIL 18.—SHOOTON BRIDGE.—PARISH ROOM.—For building a parish room at Shooton Bridge, Co. Durham, for Rev. E. Fenton. Apply to the architect on or before April 18. The architects reserve the right of selecting the builders to tender. Plans and specifications may be seen and all particulars obtained after April 18, by appointment with Stephen Wilkinson & Crowley, A.R.I.B.A., 30, Mosley-chambers, Newcastle-on-Tyne.

APRIL 18.—TAMWORTH.—FURNISHS.—Tamworth Industrial Co-operative Society, Ltd., invite tenders for certain new buildings and alterations to their premises in Orchard-street, The Leys, Tamworth, including the erection of butcher's and grocers' shops and sundry other works. Copies of the bills of quantities may be obtained from the society's architect, Mr. Francis B. Andrews, A.R.I.B.A., 95, Colmore-row, Birmingham, on payment of 1l. 15s. E. Ford, S. Wharton, Colehill, Tamworth, on or before April 18.

APRIL 20.—COTHAL.—HOUSE AND SHOP.—Mason, carpenter, slater, and glazier works of new dwelling-house and shop to be erected at Cothal. Also for the mason and carpenter works of repairs and concrete floor at the Old Mill, Cothal. Plans etc., may

be seen in the hands of Alexander Stronach, Jun., and Son, advocates, 20, Belmont-street, Aberdeen. Offers must be lodged with Messrs. Stronach on or before April 20.

APRIL 20.—HALIFAX.—RESIDENCE.—The several tenders received in the erection of a detached residence at Wheatley, Halifax. Plans etc., may be seen, and quantities obtained, at offices of Mr. Lister Coates, A.R.I.B.A., architect, Central Chambers, 10, Central-street, Halifax, from Thursday, April 12, to Friday, April 20.

APRIL 21.—FORRES.—RESIDENCE.—For the mason, carpenter, slater, plaster, plumber, painter, and glazier, bell-hanger, and blacksmith work of residence to be built at Trafalgar Park, Forres. Plans and specifications may be seen with Messrs. R. & R. Urquhart, solicitors, Forres. Bills of quantities and bills of materials may be obtained from the architects, Messrs. Ross & Macchell, Inverness; and tenders to be lodged with Messrs. Urquhart, on or before April 21.

APRIL 21.—LANHILHETH.—HOUSE.—Building a new house at Lanhilth for Mrs. Davies, Lanhilth House. Plans and specification may be seen at the office of the architect, Mr. C. Telford Evans, Cardiff, to whom tenders are to be sent on or before 22nd inst.

APRIL 21.—LWYNYDDIA.—ALTERATIONS.—Alterations to Salem Chapel, Lwynyddia. Plans, etc., to be seen with Mr. Jacob Rees, architect, Penre, and tenders to be addressed to M. D. Jones, assistant surveyor, Lwynyddia, on or before 12 noon, April 21.

APRIL 21.—NEWMACHAR.—HOUSE.—Mason, carpenter, slater, and plaster work of reconstruction of dwelling-house at Muirfyold, Elrick, Newmachar. Plans, etc., may be seen with Messrs. Burnett and Reid, 12, Golden-square, Aberdeen, by whom offers will be received up to April 21.

APRIL 21.—YSTRADGYNLIS.—VESTRY.—Vestry for the Tabernaclc Calvinistic Methodist Chapel, Ystradgynlais. Plans and specifications may be seen at Mr. Williams, 21, Gore, Ystradgynlais. Sealed tenders to be sent to the Secretary, Mr. Thomas Evans, Maes Cynlais, Ystradgynlais, on or before April 21.

APRIL 22.—ABERYDAR.—CHURCH.—New Wesleyan church and alterations to present chapel at Aber-tilery. Plans and specifications may be inspected at 1, Commercial-street, Aberllyry, and at the office of the architect, Messrs. Havelock Fawcett, 4, 4, High-street, Newport, from whom also copies of the quantities may be obtained. Tenders are to be sent to the Secretary, Mr. G. D. Gales, Commercial-street, Aberllyry, on or before April 23.

APRIL 23.—CWMDARE.—HOUSES.—Fifty-five houses (more or less) on the Gwynniford Estate, Cwmdare, for the trustees of the Cwmdare Building Club, etc. Plans and specification may be seen at offices of Mr. J. Llewellyn Smith, architect, Aberdare. Sealed endorsed tenders to be sent to the Secretary, Mr. D. R. Griffin, Printing, Aberdare, on or before 7 p.m., the 23rd inst.

APRIL 23.—GLAMORGAN.—SCHOOLWORKS.—Glamorgan C.C. invite tenders for (1) New covered playshed and other works to the playground, etc., at the Gray's Goth Coed School; (2) alterations and additions at the Gwellogerth Council School; (3) erection of a new mixed department at the Onllwyn Council School, near Neath; (4) erection of a new school at Newtown, Gelligaer; (5) asphaltting the playgrounds of the following Council schools, viz. Llanwit Major Infants, Caerphilly (Tonyfelin), Barroed Infants, (wacodyrhan (part only), Llancafan (part only), Miskin, Llanharan (part only), Tonyfrell (part only), Brynfan (part only), Cowbridge, Gorseionn (part only), Pontardulais Boys' and Girls, Pontardulais Infants (part only), Penryhol, Three Crosses, Herbert road, Neath (part only), Tonna, Neath Altwyn Infants' (part only), Pantlog and Ynyslawe (part only). Specification, etc. of work No. 1 may be obtained at the Gilfach Goch Police Station. Plans, etc., for work No. 3 at the Neath County Police Station. Form of tender for work No. 5 may be obtained at offices of Mr. T. Mansel Franklin, Clerk of the County Council, Glamorgan County Offices, Westgate-street, Cardiff. Plans, etc., for works No. 2 at Tal's Well Police Station. Plans, etc., of work No. 4 and form of tender obtained at the Pantlog Police Station. Plans, specifications, etc., of all the works may be seen at offices of the clerk, together tenders are to be delivered to the Clerk, together with the full names and addresses of two substantial sureties, not later than April 23, marked outside "Tender for Gilfach Goch Council School" or "Tender for New School at Onllwyn," etc., etc., as the case may be.

APRIL 23.—SHEFFIELD.—COMMISSIONERS OF H.M. Office of Works invite tenders for the erection of a sorting office at 12, Colville, Sheffield. Drawings, specifications, copy of conditions, and forms of contract may be seen on application to the Postmaster, Head Post-office, Sheffield, between 10 a.m. and 4 o'clock on or before April 18. Tenders to be sent to H.M. Office of Works, Storey's Gate, S.W., to whom sealed tenders must be delivered, endorsed "Tenders for Sorting Office, Attercliffe, Sheffield," before 12 on April 23.

APRIL 23.—TRURO.—ALTERATIONS AND ADDITIONS TO "TRUVAUNANCE" Truro (now known as Comprigney House), for Mr. E. L. Carlyn, Plans, etc., may be seen at the office of Mr. A. J. Corneius, architect, Truro. Sealed tenders to be sent to Mr. E. L. Carlyn, Truro, on or before April 23.

APRIL 23.—TRURO.—DETACHED RESIDENCE. Short-Lames-end, Truro, for Mr. Thomas Powell. Plans, etc., may be seen at the office of Mr. A. J. Corneius, architect, Truro. Sealed tenders to be sent to Mr. Thomas Powell, Treyrow-road, Truro, on or before April 23.

APRIL 23.—DOVERCOURT.—RESIDENCES. Two blocks of semi-detached residences on the Stour View Estate, Dovercourt. Plans, etc., at the offices of the architect, Mr. H. Steward Walling, F.S.A., Kingsway House, Dovercourt. Tenders to be delivered on the 24th inst.

APRIL 24.—HALIFAX.—WORKSHOP, ETC.—Engineer's workshop and pattern store, at Clarence Iron-works, Halifax, for Mr. George Swift. Plans, etc., seen, and bills of quantities obtained, on application to Mr. Arthur George Dalzell, architect and surveyor, 15, Commercial-street, Halifax, from Wednesday, April 18, to Tuesday, April 23.

APRIL 25.—BRIMINGTON.—SCHOOL.—Derbyshire Education Committee invite tenders for alterations and additions to the Central School, Brimington, near Chesterfield. Plans, etc., and bills of quantities, at the offices of Mr. W. C. Jackson, architect and surveyor, 29, Kuffessmill Gate, Chesterfield, upon payment of one guinea. Sealed tenders, endorsed "Brimington School," may be sent to Mr. C. Kerslake, Clerk, Education Office, Fallowfield-road, Chesterfield, not later than April 25.

APRIL 25.—TROTHERY.—ALTERATIONS, ETC.—Certain alterations and additions to 127, Dale-street, TROTHERY, for Messrs. D. M. Williams & Co. Plans and specification may be seen at office of Mr. W. D. Moran, M.S.A., architect, Victoria-chambers, TROTHERY. Sealed and endorsed tenders to be delivered to the proprietors on or before noon of April 25 next.

APRIL 27.—NELSON (GLAM.).—HOUSES.—Erection of twenty (more or less) houses at Nelson. Plans and specifications may be seen at the office of Messrs. Osborne and Rees, Nelson. Sealed tenders, endorsed "Tender for Houses," to be sent to Mr. T. H. Doudeswell, Fairford, Nelson, on or before April 27.

APRIL 27.—ROVINGTR.—INSTRUMENTS.—ESSEX (C.) Highways, Bridges, and Buildings Committee invite tenders for the brick and concrete abutments, etc., for a small bridge at Radwinter, near Saffron Walden, in the county of Essex. Plans, etc., at offices of Mr. Percy J. Sheldon, M.Inst.C.E., Chief Surveyor to the Council, County offices, Chelmsford. Tenders must be delivered on or before the 27th inst.

APRIL 27.—WATERLOO.—LIBRARY AND MUSEUM.—The U.D.C. of Waterloo-by-Saforth invite tenders for the erection of public library and museum buildings adjoining the Town Hall, Waterloo, near Liverpool. Bills of quantities from Mr. John I. Thompson, Clerk to the Council, Town Hall, Waterloo, near Liverpool, upon payment of a deposit of two guineas. Drawings and specifications may be seen at the office of Messrs. O. D. Black & A. F. Milligan, architects, Central-chambers, South Castle-street, Liverpool. Sealed tenders, endorsed "Tender for Public Library and Museum," must be delivered to the Clerk not later than 12 noon on April 27.

*** MAY 1.—LEEK.—EXTENSIONS.**—The Leek U.D.C. invite tenders for extensions to the refreshment house at their gasworks, Newcastle-road, Leek. Plans, sections, stipulations, and specifications may be seen, and bills of quantities and form of tender obtained of Mr. W. E. Bechan, Council's Surveyor, Town Hall, Leek, on payment of 1l. is. Sealed tenders, endorsed "Retort House Extension," and addressed to the Chairman of the Gas Committee, to be delivered to the above mentioned before noon, May 1.

*** MAY 1.—NORTH WALSHAM.—ERECTOR OF CLASSROOM, ART-ROOM, AND OFFICES FOR THE PASTOR GRAMMAR SCHOOL, NORTH WALSHAM.** Names to be sent by April 19, with a deposit of 1l. for bill of quantities, to Messrs. Olley & Howard, Queen-street, Great Yarmouth. Endorsed tenders to be delivered to the Clerk to the Governors, North Walsham, by noon, May 1.

*** MAY 1.—SOUTHEND-ON-SEA.—NEW SCHOOL, BOKERMOOR PARK-ROAD, FOR THE EDUCATION COMMITTEE.**—Bills of quantities may be obtained, and plans inspected, at offices of architects, Messrs. Greenhalgh and Broadbent, Bank-chambers, Southend-on-Sea, on payment of 2l. 2s. deposit. Tenders addressed Mr. Robt. Langton, Southend-on-Sea, by May 1.

*** MAY 2.—WOOD GREEN.—LIBRARY.**—Erection of new library at corner of High-road and Station-road for the I.D.C. of Wood Green. Builders wishing to tender to forward names and addresses to Mr. C. J. Gwynon, architect, Town Hall, Wood Green, by 5 p.m. on April 18, accompanied by a deposit of 2l. 2s. for the form of tender and bills of quantities. Tenders on form supplied only, not later than 5 p.m., May 2.

*** MAY 3.—GLASGOW.—SHEED.**—The directors of the Caledonian Railway Company invite tenders for constructing a point shed and warehouse on the site of the old City Roomhouse to the east of Buchanan-street Goods Station, and of a portion of a bridge to carry Dobbie's Loan. Drawings may be seen at the office of the company's engineer,

Buchanan-street Station, Glasgow, where copies of the specification and schedule may be obtained on payment of two guineas. An assistant engineer will be at the main entrance to the old Poorhouse in Parliamentary road on Tuesday the 17th inst. at 11 a.m. to accompany contractors over, and point out the sites of the works. Sealed tenders, endorsed "Tender for Buchanan-street Station Refractory Sided Warehouse and Relative Works," to be lodged with Mr. J. Blackburn, Secretary, Caldonian Railway Company's office, 303, Buchanan-street, Glasgow, on or before May 3.

* **MAY 5.—RAMMAGE-SCHOOL.**—The Kent Education Committee invite tenders for new Council school to accommodate 250 children at Rainham, Kent. Drawings and specifications may be inspected at the office of architect, Mr. G. E. Bond, High-street, Rochester. Persons desirous of tendering must send their names to the architect, together with deposit of 1*l.*, by noon, April 20. Tenders on the forms supplied to be delivered to Mr. Ernest C. Harris, 76, High-street, Sittingbourne, by noon, May 5.

No Date.—**APPELLEY BRIDGE-SCHOOL.**—Additional wings and other work at Woodhouse Grove Schools, Appleby Bridge. Names to Messrs. W. J. Morley, F.R.I.B.A. & Son, architects, 269, Swan-arcade, Bradford.

No Date.—**BRADFORD-WAREHOUSE.**—The various works required in the erection of warehouse, Sidney Works, Fairweather Green, for Messrs. Woolcombers, Ltd. Quantities at office of Mr. Percy Turner, F.R.I.B.A., architect and civil engineer, 23, Bank-street, Bradford.

No Date.—**HORSFORTH.—CONVALESCENT HOME.**—The various works required in connection with the extension to Springfield Convalescent Home, Horsforth. Send in names to Messrs. Walter A. Hobson & Co., architects, 2, Basinghall-square, Leeds. A deposit of 10*s.* will be required for each set of quantities.

No Date.—**ROCHDALE-SCHOOL.**—Rochdale Education Committee invite tenders for alterations and additions to Milkstone Council School. Names to the Secretary, Education Committee, Bailiestreet.

No Date.—**SALISBURY-HOUSE.**—Building a house upon the New-road, Britford-road, Salisbury, plans and specification of which can be inspected at the offices of Messrs. John Harding & Son, architects and surveyors, 58, High-street, Salisbury.

No Date.—**TUPSEY-VILLAS.**—Tenders are invited from Hereford builders for the erection of a pair of semi-detached villas on the High-street, Tupseley, for Mr. Alfred Precoe. Forms, etc., obtained at the offices of Messrs. Groome & Bettinson, architects and surveyors, Palace-chambers, King-street, Hereford. Tenders must be upon the form supplied.

No Date.—**WHITWORTH-WAREHOUSE.**—The separate branches of works required for the erection of three-story warehouse at Whitworth for the Brookside Mill Company, Ltd. Send names to the architects, Messrs. S. Butterworth & Duncan, F.R.I.B.A., South Parade, Rochdale.

No Date.—**WYSEBURY-SCHOOL.**—The Breconshire Education Committee invite tenders for the erection of new mixed school, for 300, central hall, etc., Wysebury. Plans may be inspected at the office of the Surveyor to the Education Committee, County Hall, Brecon.

ENGINEERING, IRON, AND STEEL.

APRIL 17.—**AULDHOUSE-BRIDGE.**—The First or Upper District Committee of the County of Renfrew invite tenders for removing the present bridge, and erecting a new stone and concrete bridge on Thornliebank road, over Auldhouse Burn, and diverting the roadway there. Drawings may be seen at the office of Mr. George B. Walker, measurer, 65, Bath-street, Glasgow, from whom form of tender, etc., may be obtained on payment of one guinea. Sealed tenders, marked outside "Tender for Auldhouse Bridge," must be lodged with Mr. William H. Hill, District Clerk, 154, Ingram-street, Glasgow, not later than 10 a.m. on Tuesday, April 17.

APRIL 17.—**SURESBURY—HOT AND COLD WATER SUPPLY.**—The Baths Committee invite tenders from plumbers willing to supply and fix eleven slipper-baths, with hot and cold water, supply pipes, and valves, showers, waste pipes, etc. Forms, etc., obtained at the office of Mr. W. Chapple Edgewood, Borough Surveyor, Borough Surveyor's Office, The Square, on payment of 1*l.* Sealed tenders, endorsed "Slipper-baths," to be sent to the Surveyor, on or before 10 on the morning of April 17.

APRIL 18.—**LONDON—RAILS.**—The Secretary of State for India in Council invites tenders for the supply of rails and fishplates, fishbolts, spikes. The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office by 2 o'clock p.m. on April 18.

APRIL 18.—**NELSON—IRON PIPES.**—Borough of Nelson Water Committee invite tenders for (1) about 24 tons of 15-in. iron pipes, in 12 ft. lengths; (2) the driving of a tunnel and trench, about 200 yds. long, at Pasture Head, to convey their water main from the Pindle to the springs, and specifications, quantities and quantities obtained, at the office of the engineers, Messrs. John Newton, Son, & Bailey, 19, Cooper-street, Manchester, or at the Water Manager's office, Town Hall, Nelson. Sealed tenders, endorsed "Pipes," or "Tunnel," to be sent to Mr. J. H. Baldwin, Town Clerk, Town Hall, Nelson, not later than April 18.

APRIL 19.—**RYNOSTROUW-HULL-SENT.**—The Electric Lighting Committee of the Hull Corporation invite tenders for the following plant required at their Sulcoates-lane generating station:—Contract 25—Coal-handling plant, etc. in connection with eight Lancashire boilers, contract 56—condensers, pumps, pipework, etc., in connection with six Lancashire boilers and two high-speed engines. Forms for either contract may be obtained on depositing the sum of one guinea with the City Treasurer, Mr. T. G. Milner, Town Hall, Hull, for each copy required. Tenders, in separate sealed envelopes, endorsed respectively "Coal-handling plant" and "Pipework," etc., are to be addressed to the Chairman of the Electric Lighting Committee, Town Hall, Hull, before noon on April 19. Further information from Mr. H. Bell, City Electrical Engineer, Sulcoates-lane.

APRIL 19.—**WIMBLEDON-GALLERY.**—The Corporation of Wimbledon invite tenders for the supply, delivery, and erection complete of constructional steel and wrought-iron work in connexion with the erection of a gallery, 5 ft. 6 in. wide, and enclosed 100 ft. long, around engine-room at electricity works extensions, situate at Durnsford-road, Wimbledon, consisting of cast-iron columns, rolled steel joists, plates, and bolts, enclosed plates on floor, and turned steel standards, and railings. Form, etc., may be obtained on application to the Borough Engineer and Surveyor's office, Town Hall, Wimbledon. Sealed tenders, endorsed "Tender for Steelwork, Electricity Works, Engine-room Extensions," and addressed to the Chairman of the Electric Lighting Committee, to be delivered at the Town Hall on or before noon on April 19.

APRIL 23.—**BELFAST—STEEL RAILS.**—Belfast Harbour Commissioners invite tenders for about 100 tons of best rolled steel girder tramway rails, with fish-plates and bolts to suit. The sealed tenders may be obtained from the Harbour Engineer, Mr. W. Redfern Kelly. The rails, etc., must be weighed on one of the Harbour Commissioners' weighbridges, and the contractors' expense, and delivered on the County Antrim side of the harbour where pointed out. Sealed tenders, stating time of delivery, to be addressed to Mr. W. A. Currie, Secretary, Harbour Office, Belfast, enclosed "Tender for Rails, etc.," and sent in on or before April 23.

APRIL 23.—**GLASGOW—CAST-IRON BOXES.**—The Corporation of Glasgow invite tenders for the supply of joint boxes. Plans and specifications, with form of tender, may be obtained on application to Mr. W. W. Lackie, Engineer, 75, Waterloo-street, Glasgow, or to the Borough Engineer and Surveyor, Town Hall, Glasgow. Sealed tenders, marked "Electricity Department; Tender for Cast-iron Joint Boxes," and addressed to Mr. A. W. Myles, Town Clerk, City-chambers, Glasgow, must be lodged with him on or before April 23.

APRIL 23.—**LEENS—PAPER, ETC.**—Leeds Corporation Gas Committee invite tenders for the supply of cast-iron pipes, roller castings, etc. Samples may be seen on application at the Stores Department, 21, Dewsbury-terrace, Leeds. Forms, etc., obtained on application to Mr. R. H. Townsley, General Manager, Gas Offices, East-parade, Leeds. Endorsed tenders, to be delivered not later than April 23, addressed to the Town Clerk, Town Hall, Leeds.

APRIL 23.—**WIMBLEDON-TROLLEY.**—The Corporation of Wimbledon invite tenders for the supply of a mechanically-driven trolley to take a water-van or body for materials. Full particulars can be obtained on application to Mr. C. H. Cooper, F.R.C.E. Borough Engineer and Surveyor, Town Hall, Wimbledon. Sealed tenders, marked "Trolley Tender," to be delivered, addressed to the Chairman, Highways and Sewerage Committee, at the Town Hall, on or before noon, April 23.

APRIL 24.—**BRISTOL.—PUBLIC CONVENIENCES.**—The Sanitary Committee of the Corporation invite tenders for the construction of five public conveniences in various parts of the city. Drawings and specifications may be seen at the office of Mr. H. Yabbicom, M.Inst.C.E., City Engineer, 65, Queen-square, Bristol, and bills of quantities obtained on deposit of a cheque valid for 10*s.* Sealed tenders to be delivered before 5 p.m. on April 24.

APRIL 24.—**LONDON.—MACHINES.**—The Secretary of State for India in Council invites tenders for workshop machines. The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office by 2 o'clock p.m. on April 24.

APRIL 24.—**MIDDLEWICH—WATER PUMPING PLANT.**—Middlewich P.D.C. invite tenders for a pumping plant in duplicate, consisting of a deep-well pump, driving gear, gas engine, and gas-producer plant with accessories, etc. Specifications, etc., may be obtained on application by letter to Mr. Frederick W. Stocks, Engineer, Town Hall, Middlewich. Sealed tenders, endorsed "Pumping Plant," to be delivered to Mr. G. Lawrence, Clerk of the Council, Town Hall, Middlewich, on or before April 24.

APRIL 25.—**LONDON.—DECK SPANS.**—The East Indian Railway Company invite tenders for the supply and delivery of deck spans (from 6 ft. to 33 ft. in the clear) as per specification to be seen at the Company's office. Tenders are to be sent to Mr. C. W. Young, Secretary, Nicholas-lane, London, E.C., marked "Tender for Deck Spans," not later than 12 o'clock noon on April 25. For each specification a fee of 1*l.* 1*s.* is charged, which cannot be returned.

APRIL 30.—**DARLINGTON—PLANT.**—The Electricity Committee invite tenders for a cooler current jet condensing plant, complete with piping and cooling tower. Form of tender may be obtained from the Borough Electrical Engineer, Electric Works, Haughton-road, Darlington, on payment of a deposit of 1*l.* 1*s.* Sealed tenders, endorsed "Condensing Plant," to be delivered to Mr. H. G. Stevenson, Town Clerk, Haughton-road, Darlington, on or before April 30.

MAY 11.—**FLEMBRODTON—WATERWORKS.**—Bridlington R.D.C. invite tenders for the construction of waterworks at Flembrodtown, Yorkshire, including supplying and laying 25 miles of 3 in. cast-iron pipes with all appurtenances, the construction of three reservoirs, each of 50,000 gallons, and the erection of an engine room. Plans can be seen at the office of Mr. George Hankinson, Clerk to the said Bridlington R.D.C., Long-lane, Bridlington, and at the office of Messrs. Ellis, Biddell, and Co., Engineers, Barton-buildings, Parliament-street, Nottingham, from whom copies of the specification and bills of quantities and form of tender can be obtained on deposit of 1*l.* 1*s.* Sealed tenders to be delivered to the Clerk on or before May 11.

MAY 23.—**BRISTOL.—PUMPS.**—The Docks Committee of Bristol invite tenders for the construction, delivery, and erection in the existing engine-house, Underfall-yard, testing, and maintenance for twelve months after completion, of two sets of electrically-driven hydraulic-dresser pumps. Each set is to consist of ten pumps to be delivered to the Clerk on or before May 23.

an accumulator pressure of 750 lb. per square inch. The contract includes the pumping machinery, and also the electro-motors and accessories and gearing for driving the pumps. Forms of tender, etc., from Mr. W. Turner, Engineer, Government Office, Cumberland-road, Bristol. Production of a receipt from the Secretary of the Docks' Committee, showing that 5*l.* has been paid as deposit. Tenders must be in separate sealed envelopes, endorsed "Tender for Electrically-driven Hydraulic Pressure Pumps," and addressed to the Secretary of the Docks' Committee, 19, Queen-square, Bristol, and must be delivered before 10 a.m. on May 23.

MISCELLANEOUS.

APRIL 17.—**ARMAGH.—ROLLER.**—The C.U. invite tenders for the supply of a 6-ton roller. Tender, form, etc., on application to Mr. Joseph Atkinson, Secretary, Court House, Armagh. Sealed tenders, addressed to the Secretary, Armagh County Council, to be delivered not later than the 16th inst.

APRIL 16.—**PONTILIAS.—REMOVING EARTH, ETC.**—Removing earth, about 200 yds., and filling up a landslip on the roadside near Pentwyn Farm, Llango, Pontilias, for Abergevy R.D.C. For particulars apply to Mr. W. Marsh Gwillim, surveyor, 15, Gosport-road, Abergevy. Tenders, marked "Pentwyn Landslip," to reach Mr. James H. Farquhar, Clerk for Highway Purposes, Market-street, Abergevy, not later than April 16.

APRIL 16.—**WALTHAM CROSS.—SLOP CARRS.**—Waltham Cross U.D.C. invite tenders for the supply and delivery of four slop carts. Those tendering are invited to send designs and specifications. Tenders, to be enclosed in envelopes supplied by Mr. W. Turner, Engineer, Armagh, Sealed tenders, to the Council, Town Hall, Waltham Abbey, are to reach the office of Mr. F. C. E. Jessop, by 12 noon on the 16th inst.

APRIL 16.—**FURNITURE.**—The Library and Technical Instruction Committee of the Belfast Corporation invite tenders for the supply of reading stands, tables, chairs, and counter, also some cork carpet for Oldpark Road Branch Library. Plans and specifications to be sent to Mr. Robert Wilson, Clerk to the Guardians, Union Offices, Chipping Sodbury, marked "Tenders for Furnishing," on or before 10 o'clock on April 16.

* APRIL 16.—**BERMONDSEY.—SUPPLY OF FLETON BRICKS FOR THE BOROUGH COUNCIL OF BERMONDSEY.**—The Corporation of Bermondsey invite tenders for the supply of 100,000 bricks. Plans and specifications can be obtained on application to the Town Clerk, Town Hall, Spa-road, S.E. Tenders, addressed to Town Clerk, and endorsed "Tender for Bricks," not later than 10 o'clock on April 16.

APRIL 18.—**CHIPPING SODBURY.—FURNITURE.**—The Guardians invite tenders for the supply of furniture, etc., for their board room and offices at Yale. Specifications may be inspected at the Board Room. Sealed tenders to be sent to Mr. Robert Wilson, Clerk to the Guardians, Union Offices, Chipping Sodbury, marked "Tenders for Furnishing," on or before 10 o'clock on April 18.

APRIL 18.—**ORSETT.—FENCE.**—Orsett R.D.C. invite tenders for removing a bank and putting up a close oak park fencing, partly on a dwarf brick wall, at Mullins Corner, Little Thurrock. Plans and specifications can be seen on application to Mr. F. T. Johnson, 2, Orsett-road, Grays. Tenders, marked "Fencing," to be sent to Mr. James Beck, 2, Orsett-road, Grays, on or before April 18.

APRIL 19.—**GLASGOW.—TIMBER, ETC.**—ARRANGEMENTS.—Glasgow Corporation invite tenders for the several works required in the erection of (1) timber gymnasium, and (2) swimming tank, with iron swimming within Elmwood-street, Finnieston-street, and James's School playgrounds. Specifications and forms of tender may be had at the Office of Public Works, City Chambers. Sealed tenders, marked outside "Tenders for the Gymnasium and Swimming Tank," to be lodged with Mr. A. W. Myles, Town Clerk, City-chambers, Glasgow, on or before April 19.

APRIL 21.—**MANCHESTER.—TERRA COTTA.**—Manchester Education Committee invite tenders for the supply of terra cotta for the Queen-street Municipal School, Bradford. Forms and specifications may be seen and copy of the bill of quantities (including specification) may be obtained at the offices in Deansgate, Manchester, on a deposit of 4*l.* 1*s.* Tenders, on the forms and in the envelopes provided, must be delivered at the Deansgate offices of the Education Committee not later than April 21.

APRIL 21.—**SWINTON.—SCHOOL FURNITURE.**—Swinton and Pendlebury Education Committee invite tenders for 750 dual desks of various heights, and about 50 assistant teachers or pupil teachers' desks. The desks to be delivered carriage paid at any school in the district. Specifications and bills of quantities to be delivered to Mr. W. T. Postlethwaite, Secretary to the Education Committee, Council Offices, Swinton, Manchester, endorsed "Tender for School Furniture," not later than April 21.

APRIL 25.—**HAYWARDS HEATH.—STONE STEPS.**—The Visiting Committee of Brighton County Borough Asylum, Haywards Heath, invite tenders for new stone steps at the principal entrance of the asylum. Copy of specification and bills of quantities at the office of Surveyor to the Asylum, Mr. J. G. Gibbins, F.R.I.B.A., 3, Palace-place, Brighton, on April 17, between 10 and 4 p.m. No. 5, Bolto-road, Haywards Heath. Sealed tenders, endorsed "Tenders for new Entrance Steps," by 10 o'clock on April 25, addressed to the Medical Superintendent, at the Asylum.

APRIL 28.—**EAST HAM.—IRON DUST BINS.**—East Ham Corporation invite tenders for the supply of 200 portable galvanised iron dust bins. Form, etc., to be obtained on application to the Public Health Department, Town Hall, East Ham. Tenders, to be delivered, addressed to "The Chairman, Public Health Committee, Town Hall, East Ham," and endorsed "Tenders for Iron Dust Bins," on or before 12 o'clock noon, of April 28.

PAINTING, etc.

APRIL 18.—DARLINGTON.—PAINTING, etc.—Darlington Corporation invite tenders for painting, etc., the outside and part of the inside of the public buildings, and quantities obtained on application at the office of Mr. George Winter, Borough Surveyor, Town Hall, Darlington, for painting of the walls of the public buildings, to be sent to H. G. Stevenson, Town Clerk, on or before the 18th inst.

APRIL 18.—MACEFLESH.—PAINTING.—Outside painting to the north front of the main asylum buildings, Parkside Asylum, Macefield. Specifications and forms of tender (with copy of fair wage clause annexed) on application to Mr. H. Beswick, 4, Court Avenue, Chester, and tenders must be sent to Mr. A. C. Procter, Clerk to the Committee of Visitors, 23, King Edward-street, Macefield, by April 25, endorsed "Tender for Outside Painting."

APRIL 21.—BLADON.—PAINTING.—Durham County Education Committee invite tenders for painting and colouring the following schools during the mid-summer recess:—Durham Council, Swatwell Council, Marley Hill Colliery Council, Hylton Council (boys and girls' department), High Spoken Council. Specifications and forms of tender to be returned to Mr. I. George Maguire, 7, Wallace-terrace, Ryton-on-Tyne.

APRIL 24.—CONWAY.—PAINTING, etc.—Conway Suspension Bridge Commissioners invite tenders for the cleaning, scraping, and painting of Conway Suspension Bridge, according to specifications, etc., their Engineer and Surveyor, Mr. F. Delanotte, Town Hall, Conway, at whose office form of tender, etc., may be obtained on payment of one shilling. Tenders, endorsed "Bridge Painting," to be forwarded to Mr. T. E. Parry, Town Clerk, Conway, on or before April 24.

APRIL 25.—HAYWARDS HEATH.—PAINTING, etc.—Haywards County Asylum, Haywards Heath, Visiting Committee invite tenders for painting and decorating the corridors in the basement of the main building and the head attendant's room, etc. Copies of the specifications can be seen and bills of quantities obtained at the office of the Surveyor to the Asylum, Mr. J. G. Gibbins, 5, White-church-lane, Brighton, on April 17, between 10.30 and 11.30, at 5, Botolph-road, Haywards Heath, Sussex. Sealed tenders, endorsed "Tender for Painting Corridor," to be sent by 10 o'clock on April 25, addressed to the Medical Superintendent, the Asylum, Haywards Heath, Sussex.

APRIL 30.—LONDON, W.—PAINTING, COLOURING, CLEANING, REPAIRS, AND ALTERATIONS OF SCHOOLS AT SOUTHALL REQUIRED BY THE GUARDIANS OF POOR OF ST. MARYLEBONE.—Specifications and forms of tender to be sent to the Clerk to the Board of Guardians, 27th inst. Tenders, endorsed "Tender for Painting, etc., Schools," to be delivered at Guardians' office, Northumberland-street, W., by 10 o'clock a.m. on April 30.

NO DATE.—ECCLESHELL.—PAINTING, etc.—The inside painting, colouring, varnishing, etc., of the Peccles and Ecclesshell Schools, For particulars, see page 418. Tenders apply, between 10 and 12 a.m., to Mr. Henry Vint, Victoria Mill, Ecclesshell, Bradford.

ROADS, SANITARY AND WATER WORKS.

APRIL 16.—HOLY CROSS.—ROADS.—Waltham Holy Cross U.D.C. invite tenders for making up Fairmead-road, High Beech. Specifications and forms of tender from Mr. W. Turner Strickland, Engineer and Surveyor to the Council, Town Hall, Waltham Abbey. Tenders (in envelopes supplied) are to reach the office of Mr. F. C. E. Jessopp, Clerk to the Council, not later than 4 p.m. on April 16.

APRIL 16.—AGBERVEY.—ASPHALTING LIMESTONE CONCRETE PAVING (about 1,600 sq. yd.) for the Monmouthshire Asylum Committee, Abergevy. Specifications will be supplied on application at the clerk's office at the asylum. Tenders to the Clerk of the Asylum by April 18.

APRIL 18.—DEVON.—ROADS, etc.—Forming, sewerage, drainage, banking, kerbing, and other work required in the extension of Acres-street, Denton Plains, etc., at the office of Mr. Edward Garside, A.M.I.C.E., 7, York-street, Hull-chambers, Ashton-under-Lyne, on payment of a deposit of 10s. Sealed tenders, endorsed "Tender for Acres-street," to be delivered on or before April 18.

APRIL 18.—ENFIELD.—U.D.C. of Enfield invite tenders for the making up of the following private streets in their district, viz., Birkbeck-road (part of), Enfield; Mowley-hill, Enfield; and Seaford-road, Enfield. Bills of quantities can be seen and forms of tender and all information obtained, on application to Mr. Richard Collins, the Council's Surveyor. Separate tenders for each road are invited to Mr. F. W. Scott, Clerk to the Council, Public Offices, Enfield, not later than noon on Wednesday, April 18, endorsed "Tender for—"

APRIL 18.—WATFORD.—Wokefield Rural District Council invite tenders for the construction of main pipe sewers, together with the necessary manholes, and other appurtenant work, and also the construction of a sewer, etc., at Walton. Forms, etc., at the office of Mr. Frank Massie, M.I.C.E., on payment of the sum of two guineas. Tenders, endorsed "Tender for Walton Sewer," to be delivered to Mr. H. Bechmont, Clerk to the said Council, Tetley House, 47, Kirk-gate, Wakefield, not later than April 18, at 10 a.m.

APRIL 25.—WATFORD.—Wokefield Rural District Council invite tenders for the following works:—(1) The construction of a sewer, 9 in. in diameter and about 430 yds. in length, together with other appurtenant works; (2) the laying of water mains (including

the provision of the pipe), 5 in. in diameter and about 1,200 yds. in length, with valves and other fittings and sections may be seen at 85, Lane-street, Preston, the office of the engineer, Mr. F. E. Dixon, C.E., and a copy of the specification and bills of quantities may be obtained on payment of a sum of 1l. in respect of each or either contract. Tenders, duly endorsed, to be delivered to Mr. A. S. Woodcock, Clerk of the Council, Council offices, Colburn Bridge, not later than 9 o'clock a.m. on April 18.

APRIL 19.—BROMLEY.—PAR PAVING.—The Town Council invite tenders for par paving about 1,650 yds. super, breaking-up and re-topping about 3,169 yds. super, and re-laying about 2,824 yds. super, in accordance with the specification prepared by the Borough Engineer. Materials to consist of Kentish flintstone, and to be manufactured within twenty-five miles of Bromley. Forms, etc., may be obtained on payment of half a guinea at office of Mr. Fred. H. Norman, Town Clerk, Bromley, Kent. Tenders, endorsed "Par Paving," must be delivered not later than 5 o'clock on April 19.

APRIL 20.—TALGHAM MOORS.—DRAINS.—Surface drains, and make footpaths through the Talgham Moors. Offers will be received by Mr. John Cruick-shank, Tulsham Lodge, who will show intending offerors over the Moors, and upon receiving two clear days' notice (except Saturdays), up to and including Friday, April 20.

APRIL 21.—JERSEY.—PAVING, etc.—The Parish Council invite tenders for the laying of about 2,500 yds. of creosote deal wood paving and granite sets in Halkett-place and York-street, St. Heliers. Plans and specifications can be obtained from the Town Surveyor, Town Hall, Jersey, on payment of one guinea. Tenders, sealed and enclosed in envelopes, are to be delivered at the Town Hall before five o'clock on April 21.

APRIL 23.—HENSON.—SEWERAGE, DRAINAGE, etc.—The Henson U.D.C. invite tenders for (1) 400 lin. yds. 12-in. pipe sewer and surface water drain in Finchley-road, near the Hill, etc.; (2) 925 lin. yds. 9-in. pipe sewer, with manholes, flushing chamber, ventilators, etc.; (3) sewerage, levelling, kerbing, channelling, and paving, etc., in connection with making up of concrete road and new Mr. Child's Hill. Drawings and specifications may be seen, and form of tender obtained, of Mr. S. Slater Grimey, Council's Engineer, Council Offices, Henson, on deposit of 10s. Sealed tenders, endorsed "Finchley-road Sewerage," are to be addressed to Chairman of Council, to be sent to Mr. H. Humphris, Clerk to the Council, Council Offices, Henson, N.W., by 5 p.m. on April 23.

APRIL 23.—STANLEY.—ROADS.—Stanley Urban District Council invite tenders, by schedule of prices, for the execution of the works to be carried out in the formation of several private streets at South Moor. Forms, etc., from Mr. Jos. Kettlewell, Surveyor, Council offices, Stanley, on the 16th inst. and between 10 a.m. and 3 p.m. Sealed tenders, endorsed "Street Works," to be sent to Mr. John Geo. Ridley, Clerk to the said Council, Stanley, R.S.O., on or before April 23.

APRIL 24.—NEWTON HEATH.—EXCAVATION, etc.—Lancashire and Yorkshire Railway Directors invite tenders for excavation, etc., for marshalling sidings and other works at Newton Heath. Plans and specifications obtained on application at the Engineer's office, Hunt's Bank, Manchester. Tenders, endorsed "Tender for Excavation, etc., at Marshalling Sidings between Newton Heath and Mosley," to be in the hands of Mr. R. C. Irwin, Secretary, Hunt's Bank, Manchester, not later than 10 o'clock on the morning of April 24.

APRIL 24.—PONTARDAWNE.—PIPE LAYING, etc.—Pontardawe R.D.C. invite tenders for the following works:—Contract No. 1, for 1,100 yds. of cast-iron pipes of 4 in. diameter, and about 170 yds. of cast-iron pipes of 3 in. diameter, delivered at Stalystra (Midland Railway); also for about 1,200 yds. of cast-iron pipes of 4 in. diameter, delivered at Pontardawe (Midland Railway). Contract No. 2, for cast-iron sluice valves, stop valves, air valves, and hydrant valves, etc., for the laying of about 3,700 yds. of 5 in. steel tubes; and about 3,545 yds. of 4 in. steel tubes; also for laying and jointing about 3,774 yds. of 4 in. cast-iron pipes, and about 170 yds. of 3 in. cast-iron pipes. Plans, forms, etc., at the Engineer's office, Herbert Chambers, Pontardawe. Sealed tenders should be endorsed "Contract No. 1 and 2," and delivered at office of Mr. Chas. Bevan Jenkins, Clerk, Herbert Chambers, Pontardawe, R.S.O., Glam., not later than 4 o'clock in the afternoon of April 24. The engineer will meet intending contractors on April 17 at Stalystra Station, at 11.45 a.m., to walk the pipe track.

APRIL 24.—SOUTHALL.—SEWERAGE WORKS.—Southall-Norwood U.D.C. invite tenders for sewage and drainage water drain, Rectory-road. Forms, etc., at office of Mr. Reginald Brown, A.M.I.C.E., etc., Engineer and Surveyor to the Council, Public Offices, Southall, on the hours of 10 a.m. and 4 p.m., and on Saturdays, between 10 a.m. and 1 p.m. Sealed tenders, in the envelopes supplied, and endorsed "Sewerage Works," must be delivered to the Clerk of the Council not later than 4 p.m. on April 24.

APRIL 30.—HAYVAT.—SEWERAGE WORKS.—Hayvatt U.D.C. invite tenders for constructing and maintaining stoneware and iron pipe sewers, manholes, ventilating shafts, pump wells, pumps and machinery, septic tank, outlet leads, outfall sewer, and other work, in accordance with plans, etc., prepared by Mr. A. E. Stallard, F.S.I., Hayvatt, Hants (Engineer to the Council), and Messrs. G. and J. Bilzard, M.I.C.E., 1, Lansdowne House, Castle-lane, Southampton, and 11, Victoria-street, Westminster (consulting engineers). Plans and specifications at offices of the District Council, West-street, Hayvatt, and copies of bills of quantities, etc., on payment of the sum of 5s. Tenders, to be sent to Mr. E. R. Longford, Clerk to the Council, West-street, Hayvatt, on or before 12 noon on April 30.

APRIL 4.—PENRITH.—SEWERAGE WORKS.—Penrith U.D.C. invite tenders for the construction of about

2,500 yds. of 21-in. stoneware main outfall sewer and continent works within the district of Penrith, and to be after Monday the 16th inst., general conditions, specifications, bills of quantities, and forms of tender may be obtained, and drawings inspected, at the Town Hall, Penrith, upon receipt of a deposit of two guineas. Full information may be obtained from the engineers, Messrs. Brierley, Holt, & Co., of Blackburn and Blackpool, or from the Resident Engineer, Mr. J. J. Knewstubb, Town Hall, Penrith. Sealed tenders, endorsed "Penrith Sewerage—contract No. 1," must be delivered to Mr. George Wainwright, Clerk to the Council, Town Hall, Penrith, not later than May 5.

STONE, MATERIALS, AND STORES.

APRIL 16.—WALTHAM CROSS.—STONES.—Waltham Holy Cross U.D.C. invite tenders for the supply of the following for the year ending March 31, 1907:—(1) Tar slag macadam; (2) Portland cement; (3) forage; (4) stoneware pipes; (5) broken stone; (6) coals for boilers, etc.; (7) disinfectants; (8) oil; (9) kerosene; (10) timber; (11) tools for highways, etc.; (12) team labour for haulage of stone, ash collection, etc.; (13) chimney sweeping; (14) road gravel; (15) lime slag. Forms from Mr. W. Turner Streather, Engineer and Surveyor to the Council, Town Hall, Waltham Abbey. Tenders (in envelopes provided) are to reach the office of Messrs. F. C. E. Jessopp, Clerk to the Council, not later than 12 noon on April 16.

APRIL 17.—BLACKROCK.—SAND, etc.—U.D.C. of Blackrock invite tenders for the supply of pit sand and ballins, delivered free at Town Hall, Blackrock, for the year ending March 31, 1907. Forms of tender can be obtained on application to Mr. J. Finlayson Heron, Town Clerk, Town Hall, Blackrock, Co. Dublin. Tenders, in sealed envelopes, and marked "Tender for Pit Sand," and addressed to the Chairman of the Council, must be delivered before 4 p.m. on April 17.

APRIL 17.—CHELMSFORD.—GRANITE.—The T.C. of Chelmsford invite tenders for the supply of 1,500 tons of granite (more or less, as the Council may require) uniformly broken to a 2½-in. gauge, to be delivered either at the Chelmsford Station of the Great Eastern Railway, or on to the wharf of the Chairman and Blackwater Navigation Company, Springfield, near Chelmsford. Tenders to state prices for contracts for periods of one, two, and three years. Further information may be obtained from Mr. Guthrie Brown, Borough Surveyor, 16, London-road, Chelmsford. Tenders, endorsed "Tender for Granite" (with samples of granite), to reach the Town Clerk's office at office of Mr. Thomas Dixon, Town Clerk, 16, London-road, Chelmsford.

APRIL 17.—CHORLEY.—MATERIALS.—Chorley Corporation invite tenders for the following:—(1) Supply of lumpy lime, small lime, or lime ashes: 600 tons; or thereabouts; (2) supply of limestone acid: 100 tons; or thereabouts; (3) supply of prills acid: 100 tons; or thereabouts, for twelve months, commencing July 1, 1906. Form of tender for acid, or any other information may be obtained on application to Mr. J. W. Allen, gas engineer, Chorley. Tenders, duly endorsed, to be sent to Mr. Jno. Mills, Town Clerk, Town Hall, Chorley, on or before April 17.

APRIL 18.—ROCHESTER.—SEWERS.—The Justices and Commissioners of Sewers for the limits extending from Gravesend Bridge to Sheerness, and thence along the River Medway to Penshurst, in Kent, will, at their Court at the Bull Hotel, Rochester, on April 18, at 11 o'clock, receive tenders for supplying the several levels within the Commission, viz.:—Cliffe level, Chalk and Denton level, Higham Abbey level, High Halslow and St. Mary's level, Stone and Abhalons level, and north-west and south-west levels, in the Isle of Grain, with good rag stone, free from lussack, and the north-west level in Grain, and Cliffe level with large black stones of 2 and 3 ft. across each. Mr. E. L. Baker, Clerk to the Commission, The Precinct, Rochester.

APRIL 20.—GLASGOW.—STONES.—Glasgow P.C. and Glasgow District Board invite tenders for the supply of goods to Barnhill Poorhouse, Storchill, Eastern and Western District Hospitals, Woolfele and Gartloch Asylums, laboratory, and offices for twelve months, commencing May 16 next. Forms, etc., from Mr. Jas. R. Motion Inspector and Clerk, 256, George-street, Glasgow. Goods must be according to samples or patterns, which may be seen at the Chambers from Friday, the 6th inst. to Wednesday, the 18th inst., between the hours of 10 a.m. and 1 p.m., and 2 p.m., and 3 p.m. Sealed offers not later than 10 o'clock, April 20.

APRIL 21.—OKHAM.—GRANITE.—The R.D.C. of Okham invite tenders for the supply of broken granite and slag, to be delivered in the following quantities and to be delivered in the undermentioned railway stations, viz.:—Ashwell, 680 tons granite, 30 tons slag; Kettleton, 500 tons granite, 40 tons slag; Marston, 420 tons granite, 40 tons slag; Marston, 420 tons granite, 30 tons slag; Okham, 2,500 tons granite, 500 tons slag; Stamford, 175 tons granite; South Witham, 800 tons granite. Specifications, forms, etc., at offices of Mr. William Batts, Clerk to the R.D.C., Calmsore-street, Okham. Samples, addressed to the same, may be seen at the offices of the District Council, not later than Saturday, April 21. Sealed tenders, marked "Materials," are to be delivered at the Clerk's office not later than 4 o'clock p.m. on April 21.

APRIL 25.—DUBLIN.—STONES.—Dublin, Wicklow and Wexford Railway Directors invite tenders for the supply of the undermentioned stones for twelve months, from May 1, 1906. Specifications, with form of tender price 6d. each, on application to Mr. M. P. Keogh, Secretary, Secretary's Office, Westland-row, Dublin. Tenders, sealed, marked "Tender for Stones," are to be sent to Mr. J. J. Keogh, Secretary, Westland-row, Dublin, by 12 noon on April 25. (1) Iron castings; (2) varnishes; (3) steel files; (4) nails; (5) bolts; (6) cylinder oil; (7) chandlery; (8) tallow; (9) burning oil; (10) petroleum; (11) ropes, cables, etc.; (12) waggons covered; (13) brushes; (14) mats, etc.

(14) cotton waste and wicking; (15) carriage trimmings; (16) carriage furniture; (17) carriage bolts; (18) ironmongery; (19) glass; (20) leather; (21) native timber; (22) foreign timber; (23) slates, tiles, etc.; (24) cement; (25) permanent way fastenings; (26) India rubber; (27) plumbing and gas fitting.

April 25.—Glasgow.—Stones.—The Corporation invite tenders for the supply of the unmeted materials, and also for the carting required for the twelve months, from 31st prox., viz. (1) Splint coal and snailly chert; (2) paints and oils, including paraffin and naphtha; (3) M. I. gas and steam tubes and fittings; (4) Portland cement; (5) Caithness pavement; (6) timber (pine woods); (7) timber (hard woods); (8) ropes; (9) cotton waste; (10) hammer handles; (11) wooden troughing; (12) carting (street mains department); and (13) carting (generating department). Furnish may be obtained on application to Mr. W. W. Lenkie, engineer, 75, Waterloo street, Glasgow. Sealed offers, marked "Electricity Department." Offer for — and addressed to Mr. A. W. Myles, Town Clerk, City Chambers, Glasgow, must be lodged with him on or before the 23rd inst.

April 24.—Aldershot.—Kraning, etc.—Aldershot I.D.C. invite tenders for the supply, free on rail at

either the London and South-Western Railway or South-Eastern and Chatham Railway Stations, Aldershot, of 1,300 ft. run of 12-in. dressed, flat, granite kerling, and 1,500 of 12-in. by 6-in. Kerling or blue penant channelling, all in lengths of not less than 33 in. by 6 in. Tenders, endorsed "Kerling and Channelling" stating the price per foot of each material to be sent to Mr. Fred. C. Green, District Surveyor, on or before 24th inst.

April 27.—Rawdon.—Road Metal.—Rawdon I.D.C. invite tenders for the supply of the following road metal, broken and unbroken, during the year ending March 31, 1907, to be delivered at Yeardon Railway Station, as and when required by the Council:—(1) Whinstone macadam; (2) granite macadam; (3) dark blue limestone macadam; (4) dark blue unbroken. Sealed tenders, marked outside "Road Metal," must be delivered on or before April 27 to Mr. John H. Pratt, Royal Bank, Rawdon.

April 27.—Thursk.—Winstone, etc.—Thursk R.D.C. invite tenders for the supply of about 4,000 tons of whinstone and 6,000 tons of slag, to be delivered, carting free on rail, at the following stations:—Baldersby, Boroughbridge, Brafferton, Coxwold, Humberton Sidings, Newby Wiske, Otter-

ton, Pilmoor, Sessay, Sinderby, Thursk, Thirsk Town Station, and Topcliffe. Forms of tender can be obtained from Mr. William Swarbrick, Clerk to the Council, Thursk, or the Council's surveyor, on receipt of stamped addressed envelope. Duplicate samples of stone are to be sent in to the Surveyor of Highways, Thursk, R.D.C., 28th inst. or before Friday, April 27. Tenders are to reach the Clerk by twelve o'clock at noon on April 28.

April 28.—Teddington.—Mazrulis.—Teddington I.D.C. invite tenders for the crushing year for the supply and delivery of the following:—1,000 yds. of broken granite and 2,000 yds. of blints, to be delivered as required, either by barge alongside the Teddington public landing wharf on the River Thames, or by rail at the London and South Western Railway Station, Teddington. Also for the execution of all sashery, smith's work, and team labour, the supply of tools and implements, oil, waste, and engine-house goods, household sundries, pipes, gullies, etc. Forms, etc., may be obtained on application to Mr. Marshall Hainsworth, Surveyor, Council offices, Teddington. Sealed tenders to be delivered to Mr. G. H. Salmon, Clerk, Council offices, Teddington, at the Council's offices, not later than April 28.

Auction Sales.

Nature and Place of Sale.	By whom Offered	Date of Sale.
*BUILDING SITE, COPPHALL AVENUE, E.C.—At the Mart	Thills & Son	May 4
*BUILDING ESTATE, HEATFORD—Hertford	Norris & Dayall	May 4
*BUILDING LAND AND THE OSBORNE BUILDINGS, POPPER'S CROSS—At the Mart	Mills, Son, & Co.	May 11
*FREEHOLD RESIDENTIAL AND BUILDING ESTATE, SOUTHAMPTON—At the Mart	Edwin Fox & Bousfield	May 16
*FREEHOLD BUILDING SITE, KING'S CROSS—At the Mart	Edwin Fox & Bousfield	May 23
*FREEHOLD, SHAFTESBURY AVENUE, W.C.—At the Mart	Edwin Fox & Bousfield	do.

Patents of the Week.

APPLICATIONS PUBLISHED.*

5,167 of 1905.—H. C. CLEAVER: Domestic Fireplaces.

This relates to a domestic fireplace, wherein fuel is continuously fed from a hopper to the top of a forwardly inclined grate at the lower extremity of which a curb is provided, and consists in the provision of a door giving access to the space beneath the grate for the removal of the ashes.

5,569 of 1905.—A. E. HARRIS: Apparatus for Heating Water.

This relates to a water heating apparatus wherein two vessels are connected by a zigzag or tortuous passage upon the surface of which heat is applied, and the sectional area of which is relatively small, so that heat from it will be rapidly imparted to the water flowing through the said passage.

6,604 of 1905.—J. YARDLEY: Fireplaces, Steam Boiler Furnaces, and the like, to Facilitate the Consumption of Smoke.

This relates to fireplaces, steam boiler furnaces, and the like, having a main and secondary fire grate, the latter of which acts as a combustion chamber to the products of the former, and is characterised by dividing the main fire grate from the secondary one by means of fire bars and a swing door, whereby the smoke from the main fire is caused to pass over or through the secondary fire, and the smoke from the secondary fire is drawn down through its own fire for the purpose of being thoroughly consumed.

9,421 of 1905.—E. RUDD: Jackets or Casings for Water Heaters.

This invention relates to jackets or casings for water heaters of the kind in which the water to be heated passes through pipes of a heating coil in the interior of the heater, and is heated by hot gases in the space surrounding such pipes or coil within the jacket or casing, and consists of a door or doors in the casing, and means for automatically closing such door or doors, which at the same time permit them to open under the increase of pressure within. These doors are also convenient for giving access to the interior of the casing for inspection or cleaning purposes.

10,323 of 1905.—E. HURLEY: Chimney Cowl and Ventilating Cowl.

This relates to a chimney cowl or ventilating cowl, and consists in the combination of an upright air or smoke shaft, a vertical spindle fixed thereto, and projecting through the back or inward side of the hood, which revolves on said spindle and is made with a top wall and an inclined sided depression in its rounded side, terminating in a slot in the hood above the smoke shaft or air shaft, and provided with a bracket made with a depression on its underside to receive the top end of the vertical spindle, and also having a lower eye hinge through which passes the spindle, and means to prevent the hood from rising.

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

10,921 of 1905.—F. M. PROCKTER and H. C. HOWORTH: Apparatus for Supplying Humidified Air to Rooms or Enclosed Spaces.

This relates to an apparatus for supplying humidified air, and consists of a rotary drum having radiated openings through its periphery mounted in position to come into contact with water contained by a vessel beneath, while shields and grilling parts are situated upon it relatively with said drum, so that a fan mounted in the position described may induce air to flow to be humidified by the several parts employed.

13,732 of 1905.—J. H. CARLAND: Door Springs and Checks.

This relates to door springs and checks, and consists in the combination with a cylinder connected to a box or frame, and having a piston and spring enclosed therein, of a connecting rod having studs and spindle suitably carried in said box or frame, and claw-like arms, said spindle having further provision for connecting it to the moving door.

21,666 of 1905.—R. HUDSON: Gates and Doors.

This relates to a gate or door wherein shanks formed integral with or secured to the two hinges extend across the frame of the gate or door to the free end thereof, each end of the gate or door frame being secured to the shanks by nuts or cotters in suchwise that the frame can be adjusted upon said shanks towards or from the hinge post.

25,919 of 1905.—F. G. MANSFIELD and E. H. CUTFORTH: Water-closets.

This relates to a water-closet having a combined "wash-out" and "wash-down" shelf extending from the front of the pan towards the back to the same extent as the seat-opening; the trap and back part of the closet being closed.

26,117 of 1905.—G. C. DOUGLAS (W.) ROBERTSON: Ventilating Cowls.

This relates to a ventilating cowl without fixed wind vanes, and consists in the combination of an internal and an external fan mounted on a spindle carried by a rotatory cowl for the purpose of assisting in the extraction of smoke or foul air, the extending fan also acting as a wind vane.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

March 30.—By THOMPSON & WOOD (at Gimsly).

Tetney, Lincs.—Farm house and 112 a. 3 r. 29 p. f. and c. £3,050

By C. B. HILLIARD & SON (at Chelmsford).

Springfield, Essex.—"Stacey's Farm House" and 2 a. 2 r. 4 p. £75

April 2.—By VENTMOT, BILL & COOPER.

City.—Garlick-hill, l.g.r. 84, reversion in 45½ yrs. 2,520

Chease—16 and 17, Walpole-st., u.t. 34 yrs. g.r. 6, r. 13s. 1,680

11, Cheltenham-ter., u.t. 34 yrs. g.r. 6, r. 13s. 800

Bow—10, Campbell-st., (s.), u.t. 50½ yrs. g.r. 3, r. 6s. 8d., r. 38s. £1,195

April 8.—By BATE & CO.

Bayswater.—78, Queen's-rd. (s.), u.t. 42½ yrs. g.r. 104, r. 120s. 2,150

By BARNES & CO.

Poplar.—21 and 22, Stratford-st., u.t. 35½ yrs. g.r. 104, r. 62s. 8d. 225

By WALLEN & CLUNN.

Poplar.—11 and 12, Montague-pl., l. yr. 804. £1,050

175, High-st. (s.), l. w.r. 23s. 8s. 250

9 and 10, Cottage-st., e. w.r. 83s. 10s. 265

Paris-ter., l.g. rents 114, reversion in 42 yrs. 1,344

Paris-ter., l.g. rents 114, reversion in 42 yrs. 271

By FLEBERT, SONS, & ADAMS (at Masons' Hall Tavern).

Ramsgate, Kent.—Harbour Parade, "The Admiral Harvey" p.h., and shop adjoining, u.t. 17 yrs. r. 200s., with goodwill 500

5, Kent-ter., l. r. 40s. 530

By LOUD & DODD (at Masons' Hall Tavern).

Twickenham.—King-st., "The George" p.h., with forge and stabling adjoining, u.t. 5½ yrs. r. 65s., with goodwill 1,250

By A. DODD (at Edinburgh).

Killean, etc., Argyllshire.—The estate of Olencreggan, 1,000 acres 6,500

April 4.—By A. G. BONSOR.

Kingston, Surrey.—57, Thames-st. ("Golden Bell Dining Room"), l. r. 84s. 900

By JOHN BOTT & SONS.

Herc Hill.—9 and 10, Deerbrook-rd., u.t. 52 yrs. g.r. 164, 168, r. 80s. 500

69, Fawcett-st., l. r. 68½ yrs. g.r. 74, 10s. p. 462

By CHESTERTON & SONS.

Fulham.—Munster-rd., l.g.r. 254, reversion in 91 yrs. 625

By FOSTER & CRANFIELD.

Hoxton.—22, 24 and 26, Ivewick, l. r. 101½ s. 650

Hackney.—St. Thomas' pl., l.g.r. 364, reversion in 79 yrs. 900

St. Thomas' sq., l.g. r. 214, reversion in 80 yrs. 930

Sussex, l.g. rents 544, reversion in 84 yrs. 610

By FULLER & RUDDOCK.

Hammersmith.—214, Blythe-rd. (s.), u.t. 75½ yrs. g.r. 124, 128, r. 50s. 380

Hackney.—21, Victoria Park-st., u.t. 30½ yrs. g.r. 74, r. 40s. 400

By HAXELL & SON.

Gray's Inn-road.—No. 312 (s.), l. r. 1104. 1,525

By W. HOLLIS.

Hendon.—Station-rd., "Fry Thorn" and "Stannore," u.t. 92½ yrs. g.r. 144, r. 131s. 1,860

Station-rd., a building site, u.t. 92½ yrs. g.r. 74, 8s. 600

Edgeware-rd., five freehold shop sites 500

Finchley.—Dale-gr., "Lucerne" and "Knowsley," u.t. 98 yrs. g.r. 104, 108, r. 544, 12s. 550

Hutton-gr., two freehold building plots 160

By MORETON RICHES.

Battersea.—24, 26, and 28, Yelverton-rd., u.t. 71 yrs. g.r. 154, w.r. 104s. 6s. 500

Wandsworth.—83, St. Ann's-hill (s.), u.t. 84 yrs. g.r. 6, r. 18s. r. 45s. 420

121 and 123, Aslet-st., u.t. 90½ yrs. g.r. 114, w.r. 78s. 490

51, Alma-rd. (s.), u.t. 72 yrs. g.r. 54, 12s. r. 30s. 300

15, Haldon-rd., u.t. 64 yrs. g.r. 64, 16s. e.r. 38s. 250

By PHILIP STOKER.

Balham.—68, Galsford-st., 85 yrs. g.r. 64, 10s., r. 32s. 290

April 5.—By PERCY H. CLARKE.

Whitechapel.—78, Wentworth-st. (s.), l. r. 634. 955

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MEETINGS.
WEDNESDAY, APRIL 18.
Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.
Edinburgh Architectural Association.—Annual business meeting and President's volucratory address. 8 p.m.
Royal Meteorological Society.—Mr. Alfred Hands, F.R.Met.Soc., on "Some So-called Vagaries of Lightning Reproduced Experimentally." 7.30 p.m.
FRIDAY, APRIL 20.
Junior Institution of Engineers.—Mr. F. J. Maddox on "The Internal Combustion Engine as Applied to Marine Purposes." 8 p.m.
The Junior Institution of Engineers (Westminster Palace Hotel).—Paper on "Recent Developments in the Construction of Suction Producer Gas Plants," by Mr. William A. Tookay. 8 p.m.
SATURDAY, APRIL 21.
Edinburgh Architectural Association.—Visits (1) to the Pinkie House, Musselburgh; (2) Church and Presbytery of Our Lady of Loreto, Musselburgh.

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Valley tiles..... 3 8 "
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Hip tiles..... 4 0 per doz.
Valley tiles..... 3 8 "
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Do pressed..... 47 6 "
Do. Ornamental do..... 50 0 "
Hip tiles..... 4 0 per doz.
Valley tiles..... 3 6 " "

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Deals: best 3 by 9 " " " " " 13 0 0 ... 14 0 0
Battens: best 2 1/2 in. by 7 in. and 3 in. by 7 in. and 3 in. by 7 in. and 3 in. by 7 in. 11 0 0 ... 12 0 0
Battens: best 2 1/2 by 6 and 3 by 6 " " " " " 10 0 0 ... 11 0 0
Deals: second..... 1 0 0 less than best.
Battens: second..... 0 10 0 " "
2 in. by 4 in. and 2 in. by 6 in. 8 10 0 ... 9 10 0
2 in. by 4 1/2 in. and 2 in. by 5 in. 8 10 0 ... 9 10 0
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3 in. 1 0 0 " "
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Seconds..... 4 0 0 ... 4 10 0
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Small timber (6 in. to 8 in.)... 3 0 0 ... 3 10 0
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3 in. by 9 in. 22 0 0 ... 23 0 0
Battens, 3 1/2 in. and 3 in. by 11 in. 16 10 0 ... 18 0 0
Second yellow deals, 3 in. by 11 in. 17 10 0 ... 20 0 0
3 in. by 9 in. 18 0 0 ... 19 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 13 10 0 ... 14 10 0
Third yellow deals, 3 in. by 11 in. 13 10 0 ... 15 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 11 0 0 ... 12 0 0
Petersburg: first yellow deals, 3 in. by 11 in. 21 0 0 ... 22 10 0
Do. 3 in. by 9 in. 18 0 0 ... 19 10 0
Battens..... 13 10 0 ... 15 0 0
Second yellow deals, 3 in. by 11 in. 16 0 0 ... 17 0 0
Do. 3 in. by 9 in. 12 10 0 ... 13 10 0
Battens..... 11 0 0 ... 12 10 0
Third yellow deals, 3 in. by 11 in. 13 0 0 ... 14 0 0
Do. 3 in. by 9 in. 12 10 0 ... 13 0 0
Battens..... 10 0 0 ... 11 0 0
White Sea and Petersburg.—
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3 in. by 9 in. 13 10 0 ... 14 10 0
Battens..... 11 0 0 ... 12 0 0
Second white deals, 3 in. by 11 in. 13 10 0 ... 14 10 0
" " " 3 in. by 9 in. 12 10 0 ... 13 0 0
Battens..... 10 0 0 ... 11 0 0
Pitch-pine: deals..... 18 0 0 ... 21 0 0
Under 2 in. thick extra..... 0 10 0 ... 1 0 0 "

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2 in. to 2 1/2 in. sawn one side slabs (random sizes)..... 0 7 1/2 " "
1 1/2 in. to 2 in. ditto, ditto..... 0 6 " " "

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6 in. rubbed two sides ditto..... 3 0 " "
3 in. sawn two sides slabs (random sizes)..... 1 2 " "
in. self-faced random slabs..... 0 5 " "
Hoyton Wood (Hard Bed) in blocks 2 0 per ft. cube, del'd. rly. depôt.
" " " 6 in. sawn both sides landings 2 7 per ft. super. del'd. rly. depôt.
" " " 3 in. sawn both sides random slabs..... 1 0 " "
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Table listing contractors and their fees for furnishing Kenhale-street house.

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Table listing contractors and their fees for erecting a Council school in Ravenstone.

TADCASTER.—For drainage works, Allerton Bywater, for the Rural District Council. Mr. J. Simmons, engineer, Bank-chambers, Doncaster:—

Table listing contractors and their fees for drainage works in Tadcaster.

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ILLUSTRATIONS.

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Royal Horticultural Society's Exhibition Hall and Offices.....	Mr. Edwin J. Stubbs, Architect.
Ballumbie House, N.B., as Remodelled (Two Views).....	Mr. James Findlay, Architect.
"Redheugh," Sutton Valence, Kent.....	The Hon. A. McGarel Hogg, Architect.

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In the Abruzzi.



NTIL within the last ten years the mountains of the Abruzzi were amongst the most inaccessible regions of Italy. But now the entire district is opened up by a new railway, the construction of which was commenced about 1895. This railway forms a curiously exact cross on the map, of which the four extremities are Cittaducale on the north, Isernia on the south, and on the east and west Chieti and Avezzano. Solmona happens to be in the exact centre of this cross as a railway junction. The Abruzzi (formerly divided into Abruzzi Ultra and Citra) forms the northern frontier district of the mediæval kingdom of Naples, where the Apequines seem to circle round the flat country of the Roman Campagna on its eastern side. These Abruzzi Apennines form two main ridges, with a string of deep valleys in between, running from north to south. The high alpine range of the "Gran Sasso" rises to over 10,000 ft. above sea level, and now that a direct railway runs from Rome to Solmona these mountains have become a special summer resort for dwellers in the Eternal City, who can here enjoy an almost Swiss climate at the end of a small railway journey.

The northern visitor to the Abruzzi naturally enters the province by way of

a branch from the main line between Florence and Rome either by Perugia or by Orte; in any case he finds himself at the fine old walled city of Rieti, a city which has many characteristics to remind him of mediæval Rome, its huge palace walls inlaid, with the doors and windows of varying styles, lining narrow lanes paved with cobblestones—the Rome which is so rapidly passing away at the present day. Here and there a fine Gothic church tower, square and covered with flat tile roof, and also a few venerable Gothic churches remain. The town walls of Rieti are also of the Roman kind, low curtains with square towers and square-towered gates, and in places these seem to have been "restored" of recent years.

From Rieti junction and its wealth of surrounding vineyards and woodland the Abruzzi railway enters a narrow defile to the first Abruzzi town—Cittaducale. Here, in the days before Garibaldi, the unhappy traveller was subjected to all the inconveniences of the old passport regulations, which in the Neapolitan kingdom seem to have been exceedingly annoying. Cittaducale was built in 1308, and there are a few mediæval traces, notably a fountain in the principal piazza, but the town wears a dilapidated appearance, and looks as if it had been repeatedly rebuilt after suffering the fortunes of frontier war and earthquakes. Its ancient walls have, to a great extent, been demolished.

The narrow pass through which the road to Aquila—one of the capitals of the Abruzzi—proceeds is remarkable for the

number of ruined castles of different ages visible on either hand. Evidently this must have been a hotly-contested part of the world in former ages. Some of these mountain forts date back perhaps to Rome for their origin, but it is singular that so very few Roman monuments of any first-class importance now exist in the Abruzzi. On the contrary, the long chain of valleys between Cittaducale and Castel di Sangro may be said to breathe forth an atmosphere purely of the Middle Ages. All that preceded or followed the XIIIth—XIVth centuries is of little importance, and attracts no attention.

Aquila is about 2,350 ft. above sea-level. As a consequence, the architecture, although Neapolitan in character, is much modified by the requirements of almost a northern climate. Here the flat terrace roofs of Naples have to be replaced by the usual heavy tiles and projecting eaves of the north, and the wider spacing and smaller size of the windows marks the rigorous nature of winter weather. Even in July the glaciers visible from Aquila on the neighbouring "Gran Sasso" suggest the necessity for thick walls and capacious fireplaces during the greater part of the year. The older buildings of Aquila arrest the attention of the architectural student at once. He feels that he has crossed the frontier of a new artistic province. The Tuscan-Umbrian Gothic of Assisi and Perugia, with its rather meagre decoration and severity of un moulded arch or simple column construction, gives place to a style suggestive of the French

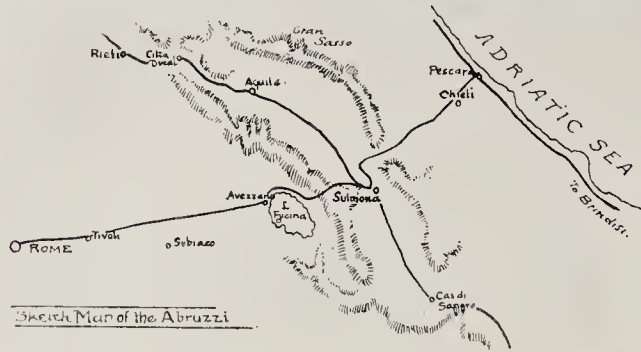


Fig. 1.

flamboyant," and even more of the Spanish and Portuguese work of the same kind. This peculiar style, specimens of which may be found on almost every northern shore of the Mediterranean from Gibraltar to Cyprus, appears like a very early development of what we call the "last Gothic style." The ogee arch and square-headed window with dripstone, the dying off of arch mouldings into splays, and many peculiarities which we associate with the later XVth century in Europe, appear as immediate developments from a primitive style of Gothic which is little more than a pointed Romanesque. In other words, there are few traces in Mediterranean lands of that intermediate "geometrical" or "decorated" type which we are familiar with in England, France, and Germany.

The ecclesiastical buildings of Aquila are not so interesting as those of a domestic kind. This is due, perhaps, to their having suffered more from earthquake—that force which, even more than man's destructiveness, has ruined so many monuments within Neapolitan territory. The Duomo, or Cathedral, has been entirely rebuilt in a heavy classical style, and not a vestige of the mediæval building remains. The great church of S. Bernard of Siena—in most Italian towns of the Middle Ages there is a "great church" independent of the cathedral—is an ugly and uninteresting XVth century building enclosing a poor specimen of the XVth century style of shrine, one of those over-elaborated masses of white marble, like the outside of the "Santa Casa" of Loretto. There are traces of an older and mediæval structure about the building. The smaller churches of Aquila have all been more or less modernised, and one or two are being "restored" at the present time. Outside the city walls the enormous Celestine monastery of S. Maria di Collemaggio attracts attention. The monastic buildings are now an impenetrable penal settlement, but the church, which internally reminds one of S. Giov. Laterano in Rome, is open to the public. Of its mediæval character nothing remains but the singular west front in coloured marble and stone, with three deeply-recessed doorways, the centre one of which is round arched. This church was ruined by an earthquake in 1703, and thus a monument of the greatest interest, to judge by the

surviving front, was lost to art. On the south side of the singular west front is what appears to be a machicolated tower suggestive of fortification.

Several of the small mediæval houses mentioned in Murray for 1855 no longer exist. To judge by others which still survive in different parts of the town, which are presumably of less importance than those mentioned fifty years ago, the aspect of Aquila must have been at one time very remarkable. In the quiet narrow back streets of the town many of these little houses, or traces of them, may be noticed; their number tends, of course, to diminish year by year, as modern life and business penetrate the Abruzzi in the wake of the railway and the mania for creating new streets through old cities spreads amongst the people. Amongst the most interesting objects of art destroyed during the past fifty years is probably the great fountain of Aquila described by Ricci in *Storia dell' Architettura in Italia*, 1858.

One of the most singular features about the small house architecture of S. Italy in a large number of cases is that the accommodation of two, or at most three, rooms on an upper floor—*primo piano*—seems to have remained sufficient for the use of a family throughout three or four centuries, and that these small houses with such limited accommodation were originally built by persons sufficiently well-to-do to be able to cultivate a taste in architecture. As



Fig. 2. At Aquila.

will be seen in Figs. 2 [and 3] these houses were designed for the shopkeepers who probably occupied the shops below them, but the entrances are always quite distinct from the shops. In Fig. 3 it will be noticed that the entrance to the *primo piano*, which pierces the quaint line of arched shops, probably leads to a larger house more like a palace—the residence of some more important merchant, perhaps. In the case of this larger house there is a singular mode of suggesting a plinth to the building by a heavy *boutell* moulding which follows in a stepped-up line the rise of the street. It is a peculiar and effective treatment of a wall in a very narrow street; it must also have been intended to keep the wall clean in days before the advent of carriages.

In all the little towns of the Abruzzi mediæval street architecture may still be studied chiefly in the form of small houses, with occasional palaces, as at Popoli, where the Palazzo Cantelmi is one of the finest examples. As the traveller proceeds along the new railway towards Sulmona he notices from the carriage window many churches and ancient houses in ruins; these features



Fig. 3. At Aquila.

of the landscape naturally suggest the frequency of earthquake, and, indeed, as has recently been exemplified in Calabria, this terrible force has been the chief destroyer of historical landmarks in the Neapolitan kingdom, as well as in the older Magna Græcia. Such colossal fortresses as that of Aquila, or another on the way to Sulmona called Fossa, have, however, remained proof against the devastation.

Solmona is a large town which has been on the increase during the last few decades. It is situated at some distance from the railway-station, to which a road leads through a kind of public garden. There are many most interesting mediæval buildings in this capital of the Abruzzi. The most important, and one which is first seen by the visitor on entering the town, is the very interesting façade of the Annunziata (Fig. 4), an institution for the maintenance of the Abruzzi foundlings, or at least the administrative office for the purpose. The richly decorated façade of this building suggests to northern eyes the idea of a town-hall, but in the "kingdom," as the Neapolitan territory was called in the Middle Ages, to distinguish it from the Papal State and the northern Republics, town-halls



Fig. 4. The Annunziata, Solmona.

the homes of countless generations, whose descendants still survive. Of such houses Figs. 5 and 6 are characteristic. The houses of Solmona are somewhat larger in scale compared with those of Aquila; they approximate more to the palace type. Fig. 5 shows the entrance to the little palace of the Tabazzi family, and is, perhaps, one of the most elaborate examples of such a design in the town. The delicately-carved double window is the only piece of ornamentation on the street front; the other windows of the same story are mere square holes, and must always have been so. The same idea of an entrance with the double window above occurs in Fig. 6. This treatment was evidently a very common local one during the XVth century, and may often be noticed elsewhere in Neapolitan towns. In Naples itself the doorway is usually the only portion specially elaborated, the windows



Fig. 5. At Solmona.

of a façade in the narrow mediæval streets evidently being considered too much out of sight to be worth decorating.

At the side of the doorway of the Palazzo Tabazzi is a curious little tablet, on which is engraved "Mastro Petri da Como fece questa Porta, A.D. 1448." Here we have, therefore, an interesting dated example of Neapolitan architecture, and at the same time a curious evidence of how little the peculiar characteristics of local style were carried into foreign parts during the later Middle Ages. If this inscription means that Master Peter really came from Como in the middle of the XVth century as a wandering mason, it is evident that he did not bring with him any of the Comacine peculiarities of masoncraft. There is nothing in this work, with its flat surface ornament and, horizontal lines, to suggest affinity with the half-German style of the north of Lombardy. The high stilted

arch is also somewhat peculiar to the south of Europe.

Not far from Solmona is the immense monastery and the adjacent hermitage of S. Pietro da Morrone, or, as he is more commonly known, Celestin V., a Pope whose memory is associated with politics as much as religion of the XIIIth century. Owing to this historical association the enormous buildings which have been erected both at Aquila (S. Maria di Collemaggio, where he was crowned Pope, and which seems to have been intended to take the place of S. Peter's, Rome, at that period) and here at Solmona would have an interest as most important monuments of the Middle Ages, but, unfortunately, there is very little mediæval left about them. S. Pietro da Morrone is even more completely transformed than the church at Aquila, and the only record of the mediæval building is a canopied tomb in a side chapel, with the recumbent figure of a youthful knight in the style of so many such monuments in Naples.

The Cathedral of Solmona is an interesting building of Romanesque style, with raised choir and *confessio* beneath. It seems to occupy a site which must have always been at some distance outside the town limits. Like the neighbouring S. Pietro da Morrone and the curious church of Pellino, it appears to have been built out of the ruins of an ancient Roman town of Corfinium. Many of the parish churches of Solmona retain Gothic doorways and details; the once splendid and interesting church of S. Maria della Tomba (described in "Murray" of 1855 as having an almost English interior) has been rebuilt, excepting the ancient west front, in a mean classic style: Everywhere the terrible earthquakes of the "Kingdom" have perhaps been a sufficient reason for the disappearance of so much that was still visible even in the middle of the last century.

The old consular road of the Abruzzi continues past Solmona in a direction due

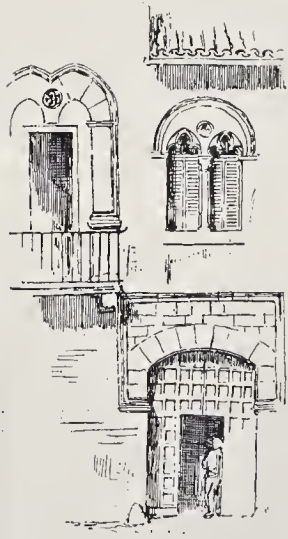


Fig. 6. At Solmona.

do not seem to have been much *en évidence*. A founding hospital was evidently thought more of importance by a paternal government. The Annunziata exhibits that very peculiar characteristic of the early Italian Renaissance, the building by fragments of different styles, possibly by the same master mason, or at least at about the same period. It seems as if, owing to the change in task as to architectural detail in the XVth century, such a committee as must have existed for the building of this chief civic monument was unable to carry on the work in any particular style. In this curious example we see a gradual change in architectural forms from the ordinary Gothic detail of the clustered columns intended to support an arcaded street front of the XIVth century, through the last development of the pointed style, into distinctly Renaissance pilasters and decorative cornices, which take the place of the earlier mouldings and string courses. All these curiously jumbled details have an appearance of being coeval in workmanship, and in all probability they date from a special foundation of this charity by Alfonso I., King of Naples, in 1442. The Gothic details represent probably the lingering masoncraft of the district; the early Renaissance in art had become popular before the building was completed. At the present day it would perhaps be difficult to carry out a large public building in such a manner, although some of our more eclectic designers have made attempts in the same direction. In the later Middle Ages such a combination was natural, owing to the lingering traditions of an older style.

Solmona is the second capital of the Abruzzi, or at least of that portion which lies between the two great mountain ranges. Although now becoming the principal capital of the district in consequence of its position at the junction of the railways, it betrays no particular sign of changing its character from a small centre of agricultural industry. For long to come the visitor will be able to appreciate its air of mediæval quiet; its grass-grown streets and absolute absence of all modernism. Much more than Aquila it shows traces of past earthquakes, where mediæval houses still stand shattered and roofless. No new streets have yet been cut through the century-old lanes, with their old houses,

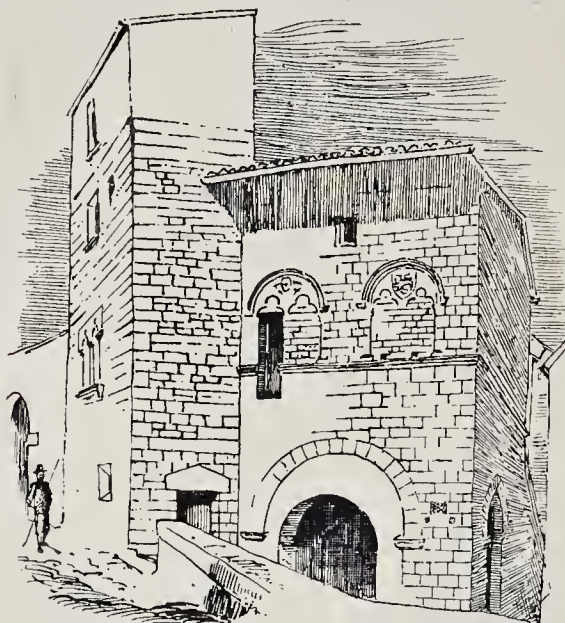


Fig. 7. Casa del Leone, Castel di Sangro.

south over a plain or upper valley about 4,300 ft. above the sea. Here in former days the road was always stopped in winter time by snow, but the railway has done away with such an interruption to traffic. At Introdacqua the train passes in a loop round one of the most picturesque villages in existence, standing on a steep rocky ridge round which the railway and the river wind through deep gorges. The country becomes then bleak and uninhabited, and is used by the shepherds of Apulia as a summer camping-ground for the flocks which make this annual migration. At Roccasecca is the highest inhabited village in S. Italy—4,370 ft. above the sea—from hence begins the descent towards Capua and Naples, and following the river Sangro the road leads to Castel di Sangro, a rather dirty village clustering round the base of a hill on which the castle of the Marsi, from which the village takes its name, is built.

Castel di Sangro possesses several old houses of the interesting XIIIth and XIVth century style. The one represented in Fig. 7 is perhaps the most important in the little town. It is still in a delightfully untouched condition, with merely the accretions of six centuries added to its venerable walls. This house is known as the "Casa del Leone," on account of the shield with that emblem on it carved between the trefoils of a window. As has already been remarked, it is somewhat surprising to note how very limited the accommodation seems to have been in the mediæval Italian house, and yet a family of apparently knightly pretensions would have need for more rooms than appear in such a house as the present. Are we, perhaps, to suppose that this little "Casa del Leone" was merely a small town house or factor's office for some noble family, whose feudal home

may have been in the vicinity of Castel di Sangro?

In the town, or, more properly speaking, village of Castel di Sangro are several traces of mediæval shops with living rooms or houses above them, precisely similar to those of Aquila already noticed. The same characteristic wide opening, which may form either a blacksmith's forge, a butcher's, or any other kind of shop or workshop on the level of the street, affords to the passer-by a glimpse of some craft or industry still carried on in the little Italian *bottegas* in a primitive manner which seems almost forgotten in our modern cities of more northern climes. Here no plate-glass windows intercept the view, and instead of the "manufactures" being made by machinery in mills far away from the place where they are sold, they are clearly enough made by hand on the premises.

The little town of Castel di Sangro is at the most southerly point of the Abruzzi; from it one descends into the lower plains of the Neapolitan kingdom, where the architecture, losing all the restraint to some extent imposed by the presence of snow—the "white pilgrim," as Italians call it in picturesque language—becomes thoroughly Levantine or Spanish "flamboyant" in character, and the Gothic gable develops into a mere decorative moulding, straight or curved, as the case may be, against a flat-topped wall.

It must be admitted that the mediæval art of Italy affords but little to the student in search of models for imitation in northern lands. In countries with climatic conditions similar to those of the 40° parallel—countries which of late years the British race manifests an inclination to colonise—the southern mediæval style has certain qualities

which seem certainly more appropriate to warmth and sunshine than the national styles of England, France, or Germany. The wide arched doorway, the open arcade of court and terrace, and, above all, the windows fitted with wide opening wooden shutters, not to mention the perhaps doubtful advantage of a flat roof, all indicate the necessary adaptation of the pointed style to a southern climate, and it is certainly quite as foolish to introduce the English "perpendicular" or other northern styles into a country south of the Alps (as is actually being done in Florence at the present moment) as for the Albert Memorial to have been built in the "Giottesque" taste.

However, whether the mediæval architecture of Italy be of any interest to the practical designer of modern buildings or not, there is no doubt about its extraordinary value to the artist and archaeological student of Italian history. A trip in the far south of the Peninsula (rendered easy by modern means of communication) is always delightful, and the only regret one can feel is that the terrible forces of Nature have destroyed so many beautiful buildings—apparently without much of the usual human assistance—during the past five hundred years.

WINCHESTER CATHEDRAL.

TO the casual visitor there are not many evidences of the peril which in a measure still threatens Winchester Cathedral, partly because the effects of the settlement of the foundations are practically confined to the presbytery and other portions of the building to the east of the transept, and partly because the height of the vaulting above the floor level tones down irregularities and makes it difficult to detect new and old cracks. Moreover, the reredos hides much of the eastern portion of the cathedral, and partitions erected across the aisles shut out the general public from the parts most affected.

On ascending the scaffolding which has been erected for the purpose of centring the vaults of the north and south aisles many serious defects are revealed, some obviously of old standing, and showing signs of repairs executed during past years, and some of recent date. Not only is much of the vaulting in a dangerous state, and in parts only held up by being bolted to timbering in the roof space above, but many of the ribs are seriously distorted, so that in some cases tensile stress developed on the under side has splintered the stone. This state of things, serious as it is, does not involve quite so much danger as might be assumed from a first perusal of the foregoing lines. The fact is that settlement of the foundations has been going on for a long period of time, during which the vaulting has been continually accommodating itself to the slowly altering conditions, and as far as possible attempting to maintain a state of equilibrium—up to within quite a recent date with a considerable share of success. But we are perfectly satisfied, as the result of careful examination made this week, that the Dean and Chapter have been well advised in taking measures

with the object of arresting the movement which has caused the vaulting to crack, and which, if not arrested in time would certainly have led to serious disaster. At the present time the threatened parts of the vaulting are being securely centred, an operation which is nearly completed.

The cause of the trouble is twofold. In the first place, the north and south walls to the east of the transept have slowly rotated about their foundations in an outward direction until the distance between the two walls at the top is some 15 in. greater than the distance between them at foundation level. In the second place, the eastern end of the building has moved perceptibly towards the east. Both of these movements are due to sinking of the earth, and the outward tilting of the walls has naturally been effected by the outward thrust of the vaulting. However good the walls may have been, they were bound to suffer under the stresses developed, and they undoubtedly did suffer, but, fortunately, only to so comparatively small an extent as to make their satisfactory repair no insuperable task. Any efforts made to repair the vaulting and the walls would evidently have produced no lasting good so long as the foundations remained insecure, and to place these upon a sound footing has been the first care of the authorities, acting under the advice of Mr. Jackson. As a precautionary measure, instructions were given in August last for shoring the greater part of the south wall, and for bonding across the cracks in the same wall, and we were able to see on the occasion of our visit that this work had been satisfactorily accomplished from ground level up to window level—a height of about 15 ft. As Mr. Jackson states in his recent report to the Dean, repairs below ground level await the execution of the underpinning, and above window level the application of tie-bars, which will be carried transversely across the cathedral to prevent further spread of the walls.

The insecurity of the stones in the vaulting was brought forcibly to attention in February last by the falling of one stone almost above the Waynflete Chantry, this fall being very reasonably attributed by Mr. Jackson to the jarring caused by the cutting of holes for the passage of the ties. Consequently, the piercing operations were stopped, the adjoining stones were securely wedged, and instructions were given for the erection of centring under the vaults, and of shoring outside the north wall similar to that on the south side. There is now nothing to prevent the fixing of the tie-bars, and when these are grouted in and screwed up it will be possible to proceed with greater confidence with the underpinning works, and at the same time to push on with the repair of the walls and the vaulting. The ties will pass horizontally between the springings of all the arches in the width of the cathedral, and though it is a pity that such a remedy should be necessary, the only alternative would be the equally undesirable one of erecting perfectly new buttresses on the exterior. When all cracks in the north and south walls have been bonded in the admirable manner already evidenced by the work so far accomplished, we have no doubt what-

ever that these portions of the structure will be perfectly safe for centuries to come, providing their foundations are made secure. And, given secure foundations and sound walls, we are equally satisfied that Mr. Jackson's proposal to reset some parts, and to grout and pin up the whole of the defective vaulting, will be attended with satisfactory results.

Turning now to the most important matter of all, the underpinning of the main walls, we ought to say at the outset that this vital question has been the subject of most careful consideration and inquiry from the very first. Actual operations have not been advanced very rapidly, for a certain amount of experimental work has necessarily to be done, and because elements of insecurity in the superstructure demanded prior attention. While endeavouring to avoid delays, which might prove very dangerous, Mr. Jackson appears to have acted with much caution and good judgment in dealing with a fabric of which some portions were in a rather nicely-balanced condition, and whose equilibrium might have been upset very easily by hasty action or injudicious treatment. That the critical stage may now be looked upon as a thing of the past is certainly a reason for congratulation.

From the architect's report it appears that the whole eastern end of the building was originally supported by a grillage formed of two layers of tree-trunks laid crosswise to each other on the soft soil. Many of the trunks remain sound, but others, as we have seen for ourselves, are so decayed that portions may be crumbled to powder between the fingers. Even if the timber had remained sound there would still have been settlement, for the trunks have been pressed down into the soft earth by the weight of the masonry above. The last-mentioned difficulty seems to have been recognised by the builders who extended the Lady Chapel in the XVth century, for the timber grillage then employed was made of proportionately greater area, so as to distribute the weight more effectually. Bearing in mind the fact that the nature of the earth becomes worse the further it goes eastward, Mr. Jackson decided to commence underpinning at the east end of the building. Accordingly, a trench has been dug along the east wall of the Langdon Chapel, and the greater portion of the foundations below this wall now rests upon concrete, cement, and brickwork, carried about 9 ft. inwards, and built up from the solid gravel formation, encountered 21 ft. below ground level and 14 ft. below the present level of the water. The programme laid down for the underpinning operations is a good one, the intention being to arrest any further movement of the foundations by a solid substructure at the east, and then to work in a westward direction along the south wall of the presbytery, and probably along the north wall also. Some difficulty was occasioned by the flow of water from the gravel into the excavation. As the water proved to be perfectly clear, and experimental pumping showed that no sand or other material was removed thereby, a steam-driven centrifugal pump was installed, which cleared the way for the laying of concrete and brickwork. On the second section of underpinning

undertaken a fresh difficulty arose from the fact that a thin layer of chalky material was found above the gravel, and as pumping would have brought away some of this it became necessary to employ divers to deposit a layer of concrete sufficient to seal the spring, and thus to permit the water remaining to be removed by pumping. Good progress is now being made with the underpinning works, and there is reason for hoping that before very long the threatened portion of the cathedral will rest upon a permanently secure foundation, which with the works of reparation previously described should finally remove all cause for future anxiety.

NOTES.

Two Reports issued by the British Fire Prevention Committee give the results of tests conducted upon two floors consisting of broad flanged steel beams and light steel joists with a filling of concrete, the aggregate being gravel in one case and furnace clinker and coke breeze in the other. Examination of the Reports shows that the results were very different, as the clinker and breeze concrete afforded far better protection than the gravel concrete, and, so far as concerns resistance to fire, it appears to be clear that the former aggregates are distinctly superior. It should not be inferred, however, that cinder concrete is generally more suitable than gravel or stone concrete, for the question of strength and the protection of metal from corrosion have also to be taken into account. Clinker and coke are light but relatively weak, and, owing to their capacity for the absorption of moisture, often cause voids, which account for the quantities of steel that have been rusted when encased in concrete mixed with these materials as aggregate. Sometimes, also, they contain oxide of iron, which facilitates corrosion. The remedies for these disadvantages are to be found in the use of sufficient water and cement to guard against voids and to cover the aggregate. With proper attention to these points clinker and coke concrete may be used with entirely satisfactory results in floors of construction akin to those forming the subject of the present Reports. It would be very unwise, however, to draw the hasty conclusion that, for different forms of design and for other purposes, cinder concrete should be substituted for concrete made with gravel and other stone.

ANALYSIS of the figures contained in the recent return made by the London Fire

Brigade shows that of the 3,511 fires which occurred in the metropolis last year nearly two-thirds were due to general carelessness and the lack of proper precautions in handling materials and apparatus for the provision of heat and light. Nearly a thousand fires were caused by children playing with matches and fire, and by grown-up children throwing lights carelessly aside or dropping lighted tobacco. Nearly a thousand fires also were caused by carelessness and accidents in connexion with

gas-fittings, lamps, candles, and electric light installations. In this category gas-fittings easily head the list, probably because the use of gas has extended so largely within recent years. The use of swinging gas-brackets in places where such fittings are convenient for igniting curtains and other combustible hangings ought certainly to be discouraged, and so also should the natural but fatuous habit of looking for escapes of gas by the aid of naked lights. If people would be more sensible in these two respects the number of fires might be considerably reduced. Fires resulting from the employment of electricity represent only a small proportion of the total number, but might be almost entirely obviated if architects, electrical engineers, and property owners would set their faces against the use of wood casings and other conduits which are not able to prevent moisture and water from gaining access to cables and wires. The remaining fires reported last year were due to various causes, among which we only notice two of special interest to our readers—improperly fitted stoves and the slaking of lime by rain, these being responsible for sixty-seven and five fires respectively.

In a Note, December 2, 1905, The Factory Act. we had occasion to draw attention to the difficulties introduced by the wording of the Factory and Workshop Act in determining what is a factory and what is a workshop. By sect. 149 of the Factory Act a workshop is defined as a place not being a factory in which "any manual labour is exercised by way of trade or for purpose of gain in or incidental to the altering, repairing, ornamenting, or finishing any article." A fisherman had a boat store over which was a chamber to which fishermen and their wives resorted for the purpose of mending the nets; the owner was summoned for not complying with the Factory and Workshop Act by exhibiting an abstract of the Act as in a workshop. The Divisional Court held that this was not a workshop, and following the case of *Nash v. Hollingshead* (1901) laid it down that the article must be manufactured, or the work expended for the purpose of direct gain. In argument the illustration was given of a railway company making its own railway rolling stock, and it was argued such workshops would be excluded by the reasoning in this case. The Court intimated that such workshops would be within the Act, but was not prepared to say how the distinction would arise. This method of slipshod definition in Acts of Parliament gives rise to much litigation, and its difficulties and absurdities are well illustrated by these cases. In *Nash v. Hollingshead* the real reason of the decision was that the Court could not bring itself to hold a farm to constitute "a non-textile factory."

ALTHOUGH we cannot approve the attempt made last week by a daily paper to create a scare with regard to the character of the metropolitan water supplies, it certainly is the case that considerable difficulty is experienced in dealing with public authorities who persist in contaminating the rivers

Thames and Lea with sewage effluents. At the last meeting of the Thames Conservancy Board the pollution caused by the War Office was again the subject of discussion, and while the belief was expressed by the chairman of the Rivers Purification Committee that the Department were endeavouring to comply with the requirements of the Conservators, it is the fact that no effective measures have yet been adopted. The condition of the Lea, again, is so unsatisfactory that the Metropolitan Water Board have decided to establish an intake higher up the river for the purpose of safeguarding the interests of the public. Moreover, in the south-eastern district, the Darenth pumping-station is within about 1,000 yds. of the Metropolitan Imbecile Asylum, whence a large proportion of the untreated sewage is distributed upon a layer of porous gravel and sand, overlying a stratum of fissured chalk. The Medical Officer of Health for the district reported in 1904 that twenty-six cases of enteric fever and five deaths from this cause were directly traceable to polluted soil carried into the hospital on the feet of workmen engaged in repairing some defective drains, and as the Metropolitan Water Board's pumping-station is situated at a lower level than the asylum there is urgent need for prompt action with the object of compelling the Metropolitan Asylums Board to place their drainage system upon a footing more worthy of the XXth century, and less likely to endanger the health of the public.

TWO QUESTIONS CONCERNING CONCRETE-STEEL. IN the course of the discussion that followed the paper on "Ferro-concrete," read by Mr. S. Bylander at the last joint meeting of the Architectural Association and the Junior Institution of Engineers, Mr. Max Clarke raised two questions which may have occurred to other architects who are interested in concrete-steel, and feel inclined to adopt it in practice. Admitting the valuable properties of the new material if applied in accordance with correct designs and under efficient supervision, Mr. Clarke first asked how architects could best secure the attainment of that standard of workmanship which is necessary to give an adequate guarantee of strength and durability, and next, whether under existing conditions it would be possible to erect ordinary buildings in concrete steel comparing favourably as to cost with similar buildings in brick. These two questions are certainly most pertinent, and unless they can be answered satisfactorily in any given case, the practical advantage of adopting reinforced concrete cannot be particularly striking. Until building contractors generally have acquired the necessary knowledge and experience, it appears to us that architects must rely chiefly upon the aid of firms who are accustomed to deal with concrete and steel in the exceptionally careful manner demanded by the new method of construction. As for the second question, we believe that, in places where building regulations are of reasonable character, ordinary buildings can be erected in concrete-steel at prices which compare favourably with brick construction. This, however, cau-

not be taken as an invariable rule, and data bearing upon the question would certainly be welcomed by the profession.

IN the latest issue of the *Journal of the Franklin Institute* will be found a copy of the paper read by Mr. H. W. Spangler on the heating installation of the dormitories of Pennsylvania University. The dormitories comprise at the present time a group of twenty-one buildings disposed partly around an interior quadrangle, and having a total frontage of about 1,325 ft. The buildings are heated by steam supplied from a central station situated at a distance of 1,200 ft., and conveyed through underground mains. The group of dormitories first erected, accommodating 361 students, is heated by means of indirect radiators fixed in the basement, but as each battery of radiators supplies several rooms the method of heat control has not proved entirely satisfactory. Therefore, in equipping the second group of dormitories it was decided to employ direct radiation. The data presented in Mr. Spangler's paper relate to one of the new buildings, known as the Edgar F. Smith house, of which plans and sections are given showing the disposition of the heating apparatus, and particulars of the various rooms and the radiator surface provided for each. After the heating apparatus had been planned a proposal was made that some of the radiators should be fitted with thermograde automatic control, and as the building was one in which such an installation could be tested conveniently, this system was applied to eighteen rooms, while in other rooms the ordinary hand control was adopted. Separate meters were applied so that the quantity of condense water from each group of radiators could be accurately measured, and after comparison of the results obtained during the winter of 1904-5, it was found that a saving of from 38 per cent. to 47 per cent. could be effected by means of the automatic control. The paper contains a full record of this practical test, and will repay perusal by all who are concerned in the heating of buildings.

A PRACTICAL difficulty which has hampered the progress of electric lighting is the want of a rapid, simple, and economical method of testing the efficiency of glow lamps. The old method of taking a few sample lamps and making a thousand hours' life test is expensive and unsatisfactory. What is wanted is a simple piece of apparatus which will enable the consumer to find rapidly the light efficiency of his lamps. In many cases this knowledge will enable him to effect considerable economies even although the illumination is increased. In the *Electrician* for last week Dr. Torda describes a portable selenium photometer for glow lamps which seems to solve the problem of measuring the efficiencies in a very satisfactory manner. It has been known for many years that the resistance which selenium offers to a flow of electric current through it is much greater in the dark than in the light. Unfortunately, however, after being exposed to

the light it takes some time to recover its normal condition. Dr. Torda gets over this difficulty by arranging by means of clockwork that the selenium cell is only exposed to the light of the lamp under test for two seconds, and the shutter of the box is then automatically locked for forty seconds. It is found that this time is amply sufficient to allow the cell to recover. On pressing a push-button on the photometer box a current produced by a few dry cells, similar to those used in electric bell systems, passes through the selenium, and an ammeter in the circuit gives a reading. By pressing a lever a shutter is opened for two seconds, and the increase of the ammeter reading due to the light rays diminishing the resistance of the selenium measures the intensity of these rays. It will be seen that anyone can use an instrument of this nature, and inferior lamps which consume too much current for the light they produce can easily be detected. Dr. Torda's photometer is sufficiently accurate to show the great fluctuations in the light given out by glow lamps due to fluctuations in the pressure of the supply mains. In conjunction with a standardised lamp, therefore, it can be used as a voltmeter to measure the pressure.

Egyptian Gallery, British Museum. The statues, sarkhets, sarcophagi, and other massive sculptured objects in the gallery (ground floor) of the west wing are being re-arranged, and two or three fresh statues are set up at the remote end of the gallery. A large portion of the more familiar objects were deposited in the Museum about one hundred years ago, having been taken from Napoléon's army, as spoils of war, after the capture of Alexandria. An illustrated catalogue of the exhibits, as re-classified and newly-grouped, will shortly be prepared, to supplement the catalogues now issued of the smaller Egyptian antiquities.

Exhibition of German Art. We learn that it is proposed to hold an Exhibition of German art, or at all events of Munich art, at the Grafton Gallery, to open on May 2. It is promised that all the artists belonging to the different Munich schools will contribute. It is to be hoped that the exhibition will be such as to raise our estimate of modern German art, but we surmise that there will be some curious things to be seen there.

Craig's-court, Charing Cross. THE demolition now in progress in Craig's, or rather Cragg's, court (1702) includes two or three of the original houses, one of them, at the corner by the entrance from Charing Cross, being that wherein by name of the Elvaston Fruit Stores the Earl of Harrington during many years kept a fruit and flower shop for the sale of his own garden produce. The freeholds of Nos. 8, 9, 9A, and 10, in the court, together with No. 21, Charing Cross, the fruit-shop, covering an aggregate of more than 2,500 ft. superficial, were placed in the market last June. At the same time was offered for sale No. 4, occupying the entire east side of Craig's-court, a fine old Early XVIIIth-

century mansion belonging to Elizabeth Still, Dowager Countess of Harrington. The house, however, had remained many years uninhabited; with the garden, which once overlooked the river, it extends over an area of nearly 7,000 square ft., and it is being placed in repair for occupation. The premises in the corner of the court, now a department of the War Office, were formerly the Royal Alms-houses, removed thither sixteen years ago from Spring-gardens after the demolition of the old Queen's Treasury. Whitehall. The house was adapted in 1840 for the collection, made at Sir H. de la Beche's instance, of specimens gathered during the geological survey of the United Kingdom, which became the nucleus of the Royal Geological Museum; it then served as the Census Office, 1850-63. In November, 1888, Messrs. Cox & Co., successors to Cox & Greenwood, army agents and bankers, migrated from Nos. 1-2, Craig's-court to Nos. 16-7, Charing Cross, built for them by Ewan Christian. The court was built, or rebuilt, in, it appears, 1702, so the tradition that claims No. 2 as a home of Nell Gwynne (*obit* 1687) lacks confirmation. At No. 9 were the offices of S. S. Teulon, architect. The Sun Fire Office was established in 1726 in the court, so named, some say, after the father of Secretary Cragg. The fruit shop was, it is said, the offices of Woodfall, the printer; on first coming to London, in 1762, Romney lodged in Craig's-court.

Croyland Abbey. THE Rector of Croyland writes a letter to the *Times* of Saturday which we are sure would be read with sympathy by all who are interested in the preservation of our national architectural monuments. Mr. Le Beuf has for many years given proof of the interest he takes in the ancient church which is under his care, and in order to assist in bringing his appeal under the notice of our readers we have gone somewhat out of our usual course in reprinting his letter in its entirety (see page 436). We hope those of our readers who are able to give any assistance towards this good work will do so.

THE CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.

EVEN in this non-decimal country we have the habit of reckoning some things by tens and hundreds, and our readers will probably agree with us in considering as a noteworthy event the hundredth distribution of certificates at the close of the hundredth term of the Crystal Palace School of Practical Engineering. Founded thirty-four years ago, this institution is comparatively little known among the general public, but, owing to the eminently useful nature of the instruction imparted, and the successful career of many old students, the school has secured a reputation in engineering circles which suffices to bring more pupils than can be dealt with comfortably within the premises at present available.

The difficulty of securing just the right sort of engineering training has been recognised for many years past. The pupil who enters the office of a purely professional engineer has little or no opportunity of becoming acquainted in a practical way with the operations involved in the designs which he assists to prepare, or the work he helps to carry out. Similarly, the pupil in an engineering workshop does not come across much that tends to throw light upon the theoretical principles underlying the types of constructive work upon which his attention is engaged.

Before the Crystal Palace School of Practical Engineering was founded, Mr. J. W. Wilson, the father of Mr. J. W. Wilson, the present principal of the school, established, in connexion with his drawing office in Westminster, pattern and fitting shops for the training of his pupils, and, realising the benefits conferred by this method of instruction, he suggested the foundation of the present engineering school to the directors of the Crystal Palace, an idea which was adopted in 1872. Since that year the original purpose of the founder has been kept steadily in view, the main object of the school being to provide students of civil or mechanical engineering with thoroughly practical tuition in the rudiments of their future profession, and so to prepare students by a system of combined practical and theoretical instruction that, on entering an engineer's office or works, they might at once become useful and be the better enabled to increase their knowledge by experience and observation.

The course of instruction extends over about two years, during which period the student passes through seven departments. In the first year one term is occupied with the study of mechanical drawing, one term to pattern-making and foundry work, and the third term to fitting and smith's work. In the second year the student has the choice of taking up the civil engineering or the electrical engineering course. The first of these comprises three terms—one devoted to practical surveying and the preparation of plans for some imaginary public work to be executed on a site surveyed in the Palace grounds; another devoted to the preparation of working drawings, estimates, and specifications relative to a public work such as that outlined during the preceding term; and the last term is devoted to original design, the preparation of stress diagrams, the preparation of reports, and to the general application of scientific principles to practical work. The electrical engineering course covers two terms, during which the student receives theoretical instruction, and gains practical experience by working under competent direction on the electrical installation in the Crystal Palace and its grounds.

The foregoing brief outline will serve to give a general notion of the educational methods practised at this engineering school, and, as a proof of the advantages offered thereby, we may mention the fact that, out of some 1,750 old students, no fewer than 900 are known to be occupying, or to have occupied, responsible positions in their profession.

On the occasion of the hundredth award of certificates by Sir Alexander Binnie on Wednesday, April 11, we had an opportunity of inspecting the various departments of the school, and some of the work finished during last term. While finding ample evidence of the useful work that is being conducted, we could not help being struck with the need that evidently exists for more suitable and larger premises, and, in some departments at least, for more modern tools and appliances. Although about 120 students are now on the books, there really is not comfortable room for more than 100, and we think the directors of the Crystal Palace would do well to consider the advisability of erecting and equipping new buildings upon an adequate scale, so as to support more fully this valuable institution and to render possible an extension of its sphere of usefulness.

MAGAZINES AND REVIEWS.

THE *Art Journal* this month is very largely occupied with the subject of designs for posters, of which a number of examples by English artists are given, and a few French and German examples, with an article on the subject by Mr. Lewis F. Day. The humorous element is prominent in most of these, sometimes accompanied by a good deal of force of drawing and effect, but not such as to add to the beauty of the hoardings much. There is, however, as Mr. Day remarks, a wholesome tone of fun about these, very different from the style we constantly meet in French poster designs, such as the one by Grün given as one of the illustrations, which are vulgarly suggestive of the *Armi-monde*. There are some fine designs among the more serious examples, two of the best of them German—"Der Kunstschatz" by Herr Koloman Moser, and

the "Concours des Canots Automobiles" at Monaco by Herr Hohenstein. This is designed for the same purpose as the French one by Grün just referred to, and it is worth while to compare the spirit of them—the pleasant figure of the young girl at a steering wheel in the German example and the highly objectionable female figured in the French example. Herr Stuck's poster for the "Internationale Kunst Ausstellung," with the head of Minerva in a hexagonal panel, is a fine one; and among the English examples we may mention Mr. Buechel's fine poster for the play of Ulysses (he bears a German name, too, but the design is obviously not "made in Germany"); the same artist's drawing of "The Last of the Dandies"; Miss Brodie's procession of oxen for the Lambeth School of Art (the pertinence of which to the subject is not, however, very obvious); Mr. Morrow's "The Exile"; Miss Houghton's "Arts and Crafts"; and Mr. E. Bertram's familiar one for Bovril ("I hear they want more," an exceedingly clever piece of brute expression. It is interesting, too, to find the names of such artists as Mr. Wylie and Mr. Brangwyn attached to two posters of steamboat companies, which are really fine pieces of marine painting. We entirely agree with the protest which Mr. Day makes in favour of advertisers who require posters going direct to artists, and not to firms who supply them commercially, and from whom they will not get the best art.

In the *Darlington Magazine* an editorial article on "The Purpose and Policy of National Museums" suggests that there are three classes of museums, which must be considered on separate grounds—(1) great national museums such as the Louvre and British Museum; (2) provincial museums; (3) museums having a special scientific or educational purpose. The article is partly in reference to what seems to be a new department in the Boston Museum, of exhibiting a certain proportion only of the most remarkable works for the general public, and reserving the remainder for special study by students. We entirely agree with the writer that, even if this system may for any special reasons be best suited to the Americans, it would be an entirely mistaken one for adoption in such museums as the Louvre or the British. These are for the housing and display of great representative collections, for enjoyment and for comparative study; and the argument that the majority of visitors do not care for or attempt comparative study is no justification for removing the opportunity for it out of their reach. We cannot tell how far the sense of comparative criticism may be aroused in the popular mind, or a portion of it, by continued opportunity; and it is far more delectable for the studious few to see their material all before them instead of having to apply for special permission to see things. In a national museum the rule should be—show everything publicly that you can. We do not know that it is quite a fair criticism against the management of the South Kensington Museum, to say that while this museum is really a collection which in splendour and importance is in its way comparable to the Louvre or the National Gallery, it is managed "as if it were merely the *annexe* to an art school." But that is what it originally was; it had its first beginnings in the idea of reviving applied art in England, and furnishing models for study. Probably its originators did not foresee what a future was before it, but it was certainly established for educational purposes, and it is difficult to see how and when this tradition could have been broken with. When the collection comes to be definitely arranged in the new building, that may afford an opportunity for organising a different policy. The point that there is not only a moral and intellectual but a material profit from keeping up great national museums, is well put and is worth enforcing, since it will appeal to some persons to whom the higher considerations may not appeal. There is no doubt that there would be fewer visitors to this country and less foreign money spent in it if our great art museums were suffered to decline; and there is the consideration of national prestige, too, which is also worth something both in a material and a moral sense. In connexion with a short article on "The Most Magnificent Book in the World," by Mr. Yates Thompson (the fortunate possessor of the book), we are given full-page

reproductions from two pages from the Latin Aristotle produced in 1483 by Andrea dei Torresani. The text is quite a subordinate element of the page, which is crowded with fantastic figures and ornament in Renaissance taste not of the purest kind, but fascinating from its very richness and multitudinous character; at the top of the first page, in the foreground of a landscape, a mediæval-looking Aristotle is instructing Averroes, whose comment forms part of the text. "Silver Plate at Belvoir," by Mr. Starkie Gardner, is illustrated by some splendid examples. A short article on Menzel, one of the idols of contemporary art-critics, by Mr. C. Ricketts, is refreshing from its same and moderately expressed criticism; Mr. Ricketts can see (what most contemporary critics cannot) that Menzel was little more than a supremely clever realist, and that he had little sense of beauty; he "never attempted that ordering of his perception and emotion which makes for style, nor had he that sense of crisis which also makes for beauty." And yet one is told over and over again in print now that Menzel was one of the greatest of artists. It is just a fashion.

The *Architectural Record* (New York) contains an article on and illustrations of "Two New Armories" in New York which exhibit a very clever and interesting attempt to give a specially warlike or fortress-like character to these buildings, partly by suggestions from mediæval castle architecture, partly by specially designed modern features. One could wish that something of the same kind had been attempted for our War Office, instead of a building on stately classical lines which might be any other class of Government building. Surely a War Office should look threatening in its architecture, "Examples of Georgian Work in Charleston" are very interesting and in some cases remarkably English; in looking at the view of "The Market, Charleston," we might almost fancy ourselves in an English country town, but for the tramlines and the web of telegraph wires. The interiors of rooms in two houses designed by Mr. Robert Spencer are worth attention for their refined and yet unostentatious treatment. In "Notes and Comments" there are some amusing details as to the work at rebuilding the Venice Campanile, and the manner of work of the Italian labourer, by "K. G. H." *Blackwood* contains an article by Mr. H. W. Lucy on "A New House for the Commons," which, after rather exaggerating the supposed inconveniences of the building, we are glad to see supports the late Mr. Charles Barry's scheme for enlarging the House, the republication of which in the *Nineteenth Century* we have already referred to. Mr. Lucy seems to think, as we do, that it is surprising that this perfectly feasible and effectual, and comparatively economic scheme, has not been already taken in hand. To the same magazine Mr. Edward Hutton contributes an exceedingly picturesque article on the architectural glories of old Salamanca.

In the *Westminster Review* Mrs. Bidulph's article on "The History, Use, and Abuse of Trade Unions" is one of the most impartial and sensible articles on the subject that we have seen, and we would recommend its perusal to those who think that Trade Unions are an unmixing good and a kind of divine institution, if we could hope that anything would induce them to consider any point of view but their own.

In *Scribner* Mr. Charles Pepper, the United States and Pan-American railway commissioner, gives an account of what is termed "The Pan-American Railway," the five thousand miles track of which, when completed, will bring New York into direct connexion with Buenos Aires and Alaska, and Hudson's Bay with Patagonia. It is evidently an immense scheme, which has required the co-operation of fifteen republics. Great portions of this vast scheme are completed, though much remains to be done; and the illustrations which accompany the article give a vivid idea of the various difficulties to be encountered and of the sensational scenery of the line, now zig-zagging along the sides of a vast mountain, now carried by a bridge across a narrow gorge between immense precipices. We gather that the gauge even of the trunk line is a comparatively narrow one, one metre (3 ft. 3½ in.), probably in order to facilitate the passage

over some of the more difficult portions of the route; and some of the branch lines are even narrower; that from Antofagasta to Oruro, crossing the volcanic ranges known as the Occidental Cordilleras, will be 575 miles in length when completed, and is of 2 ft. 6 in. gauge; probably, as the author says, the narrowest railway for its length in the world. The number includes an article (rather over enthusiastic) on Sir F. Seymour Haden and his etchings, which we cannot agree in accepting as the *ut plus ultra* of etching, though he has produced some very fine things. Among the anecdotes is a good one of Sir Seymour seeing in a print shop window in New York a palpable forgery after his "Breaking up of the Agamemnon"; he entered the shop, asked to look at the print, and coolly tore it in four pieces, handing them back to the shopkeeper with his card and the name of his hotel. Nothing more was heard of the matter. Under "The Field of Art" Mr. W. Walton has some remarks on "Some Un-ecclesiastical Religious Art"—the realistic scenes from the life of Christ by von Ude, for instance, and the sensational pictures by M. Jean Déraud in which the figure of the Saviour is contrasted with personages of modern Parisian life. We agree with him in the opinion that there is no earnestness of feeling or conviction behind these pictures, which are only an artistic pose, arresting the attention on first acquaintance from the novelty of the idea, but soon losing their hold. Von Ude is a painter of much more serious intention, but his attempt to bring realism into the scenes of the Life of Christ, though well meant, results, as in his picture of "Suffer Little Children to Come Unto Me," in a sense of anachronism; the children are those of a modern Sunday School, and the result is entirely unconvincing. Still von Ude's pictures are marked by a spirit of reverence, of which there is nothing in those of Déraud.

Under the title "A Sculptor of the Labourer" the *Century* publishes a rather over-wrought article on the work of Constantin Meunier, the Millet of sculpture, as he may be called, but who was not really a great sculptor, though a very gifted and earnest one in the restricted path he followed. The closing sentence, "His art seems to palpitate with the benediction of a divine pity," is a specimen of the whole and of the kind of sentimental exaggeration which so often passes for art-criticism nowadays. "Public Squares in City and Village," by Mr. Sylvester Baxter, is an excellent article on making the most of opportunities afforded by open spaces, either regular squares or spaces formed at the meeting of roads. An illustration of a small park in New York formed by filling in an old dock on the East River front is a good example of an opportunity made the most of. The illustrations are excellently drawn by Mr. Guérin. No. IV. of "Historic Palaces of Paris" illustrates and describes the Hôtel de la Rochefoucauld-Dondeauville.

In *Harper* an article under the title "A Glimpse of the English Washington Country," viz.: the part of the country in which George Washington's progenitors lived, by Mr. W. D. Howells, gives a pleasant description of Northampton and its neighbourhood, and the scenery of the Nene valley, as seen with the eyes of an American visitor, and is illustrated by some beautiful sketches by Mr. Vernon Bailey. An article on "The American Nile," by Mr. Gordon Copp, takes us back to the new world; the American Nile being the Colorado River, which appears to have its season of high rise, its delta, and the same capacity for bringing rich fertilising soil which distinguishes the historic African river.

The *Antiquary* contains a long and full article, by Mr. Alfred C. Fryer, under the title "A Pilgrimage to St. David's Cathedral," going in detail into the history and characteristics of the building, with some illustrations. It is to be continued in future issues, and will be useful as calling fresh attention to a cathedral which is less visited than it would be if it were not so inconvenient of access. The history of all that has been done at the Egyptian Hall, Piccadilly, is continued by Mr. Aleck Abrahams from a previous number; it forms a remarkably interesting record of the varying tastes of the London public in amusements during the time that the Hall existed.

In *School* Mr. Sydney F. Walker continues his series of articles on "The Engineering of School Buildings," the present one being devoted to short descriptions of the methods and advantages of various systems of heating rooms, on which we have no remark to make except that the subject is much larger than can be adequately treated in a short paper like this, which can only be regarded as a general suggestion, but as such may be useful to headmasters and others. But we put in a caveat against the suggestion that "an ascending flue in the middle of the room may be used to cause an ascending draught of air in addition to that created by the fire." Theoretically, and in our belief practically, this would only result in the stronger exit current cancelling the other, and making it temporarily an inlet. In other words, in ventilation you may have any number of inlets, but you can only have one extract.

In these days of class journalism almost every profession and industry has its special organ, and many branches of general professions and industries are similarly represented. The *Engineer-in-Charge* is the latest publication of the kind, being addressed to an indispensable and most useful class, the members of which occupy the position once held by the engine-driver or mechanic placed in charge of machinery and plant in public institutions and industrial works. Owing to the greatly increased adoption of mechanical, electrical, and other engineering plant in such establishments, the responsibilities of the engineer-in-charge have gradually become more onerous, and the standard of technical knowledge necessary for the satisfactory performance of his duties has been raised in corresponding measure. Hence at the present time the engineer-in-charge may fairly claim to be regarded as a member of the great engineering profession. The main objects of the new journal are to discuss practical points connected with the selection, installation, and management of engineering plant, and to afford a medium for the interchange of ideas upon matters of professional interest and difficulty. So far as can be judged by the first number, these objects are likely to be fulfilled in a satisfactory manner. The principal articles are "Some Notes on the Design and Management of Waterworks Pumping Machinery," by Mr. Percy Griffith, M.Inst.C.E.; "The Truth about Producer-Gas Plants," by M. W. A. Tooke; "Systematic Stores Keeping," by Mr. W. R. Pettit, A.M.I.Mech.E.; and "Modern Methods of Heating and Ventilating," by Mr. Kenneth Gray; and besides these there are short articles and notes devoted to the management and repairs of machinery.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION: FERRO-CONCRETE.

Mr. W. Wonnacott presided on Wednesday evening in last week over the last meeting of the session of the Discussion Section of the Architectural Association. The meeting was a combined one with the Junior Institution of Engineers, and during the evening Mr. Sven Bylander (member of the Junior Institution of Engineers) read a paper on "Ferro-Concrete."

The Chairman reported that Messrs. Belcher and Trant Brown had retired from the Committee, and Messrs. S. H. Hamp and S. Towse had been nominated to fill the vacancies, while they had been fortunate in getting Mr. A. H. Belcher to act as Hon. Secretary.

There being no further nominations, the Chairman declared the following officers elected:—Chairman—Mr. F. Lishman; Vice-Chairman—Mr. K. Gammell; Hon. Secretaries—Messrs. M. G. Pechell and A. H. Belcher; Committee—Messrs. H. Passmore, R. J. Turner, S. H. Hamp, and S. Towse.

Mr. A. H. Belcher proposed a vote of thanks to the retiring Chairman, and said that Mr. Wonnacott had had a record session. At one meeting they had had eighty-four members present, which was a thing to be proud of. Mr. Wonnacott's encouragement to young members to speak had been a great help to them all.

Mr. S. Hamp seconded the motion, and it was carried.

The Chairman briefly expressed his appreciation of the compliment paid him. He

trusted that his successor would have a pleasant year.

Ferro-Concrete.

The Chairman, in calling on Mr. Bylander to read his paper, said that the use of ferro-concrete was of the greatest importance both to engineers and architects. Without going into the matter dealt with in the paper, he felt there was one point on which engineers could not help architects. He meant that unless architects stood shoulder to shoulder, and pushed their material as an up-to-date material, they would never get the by-laws and Building Acts amended so that they could be up to date in the material they employed.

Mr. Bylander said that ferro-concrete was a building material composed of concrete and steel. As concrete had a low co-efficiency to tensile stresses steel was placed in it to resist tension. The method of construction and the disposition of the steel was the secret of the work. Many engineers had tried to discover the most effective and economical methods of combining the two materials, and different systems, each having its own advantages, had been patented. Such systems were the Monier, Hennebique, Coignet, De Valier, Ransome, Kahn, etc. He proposed in his paper, however, to take a broad view of the term, "ferro-concrete," but, for the purposes of illustrating his remarks, he would take the Hennebique system, as it was well known in this country. Explaining diagrams thrown upon the screen, the lecturer said that the arrangement of the stirrups was a special feature of the Hennebique system. In a beam constructed with four rods in its lower part, two of the rods were bent upwards from the lower part of the beam to its upper part, near the supports, the object being two-fold—to make the longitudinal reinforcement at the centre of the beam greater than at the ends, and partly to take up the shear, and to form a reinforcement at the upper part of the beam at the support in order to take the tensile stresses which occurred there. The stirrups were placed closer together near the support, and if the support was a pillar, a bracket or seat, properly reinforced, was formed on the pillar underneath the beam to take up and transmit the shear. The main reinforcement consisted of round rolled bars, used as they came from the mills. Vertical reinforcing members, or stirrups, should be placed far apart at the centre of the beam, and close together, or made of greater cross-section, nearer to the supports. It was of the greatest importance in the construction of a ferro-concrete beam that the shearing forces should be properly taken care of. Most of the full-size tests which had been made showed that beams were more liable to fail owing to insufficient resistance to shear than to bending. The determination of the strength of a ferro-concrete member was a problem which puzzled many engineers and scientists, and even the specialists in ferro-concrete construction. The reason was that no satisfactory theory for the stresses which occurred in ferro-concrete members had yet been found. However, on the basis of many and important experiments, sufficient facts had been ascertained to enable the ferro-concrete designer to set up simple empirical formulas, giving results which practically satisfied the actual conditions. Mr. Bylander then showed a diagram illustrating the determination of the internal stresses in a beam subjected to an outer bending moment. He said that the resistance of the concrete on the tensile side of the neutral axis was considered equal to nil, all the tensile stresses being taken up by the steel rods. The concrete of the other sides of the neutral axis would, without reinforcing, take up all compressive stresses. Bars with diameters of $\frac{3}{8}$ in. to 1½ in. were largely used. The cohesion between the steel and the concrete was relied upon for transmitting the stresses between the concrete and the steel, no mechanical bond between the bars, or stirrups, being provided. Beams, the lecturer continued, were generally subjected to a load uniformly distributed over the entire length, and in ferro-concrete construction they were generally made continuous, and it was claimed that thereby the structure was made more rigid, and the stresses were less than if the beams were freely supported at the ends. Ferro-concrete beams so constructed were considered semi-fixed at both ends. These claims were, of course, true if

all the parts of the structure were loaded exactly as assumed in the calculations, and if no settlement of foundations took place, but, as those assumptions were generally not true in practice, he believed that the stresses in a monolithic construction were sometimes greater than if the construction was not monolithic. However, the additional stresses due to unequal loading were generally taken care of by using a large factor of safety, and it was more practical and simpler to make all the members in one continuous mass or monolithic. The lecturer then showed a number of diagrams illustrating the foregoing points, and said that the steel reinforcement was generally known as being of two kinds—horizontal and vertical; and the section and strengths of the reinforcing members should be made in proportion to the intensity of stresses in the different parts of the beam—greatest at the centre of the beam from the neutral axis was D_c and D_s , the moment of the internal stresses of the moment of the stresses was as follows:— $M_b = R_c \times D_c + R_s \times D_s$,—which moment was equal to the external bending moment. R_c and R_s must be equal and act in opposite directions. The diameter of the steel reinforcing rods was generally small compared with the distance D_s , and the fibre stress could, therefore, with sufficient accuracy, be said to be

R_s .
The location of the area of the rods = J_s . The location of the neutral axis was not the same as for steel, viz., passing through the centre of gravity of the cross-section, or located at a distance of half the depth of the beam from the bottom. It was generally placed somewhat higher, but opinion as to its exact position differed greatly. Generally, however, it was calculated from the proportion between the modulus of elasticity for the two materials in a somewhat similar way as the position of the neutral axis was ascertained for a cross-section of cast-iron. That which complicated the accurate calculation still more was the irregular deformation of the concrete, and because the intensity of stresses did not increase directly in proportion to the distance of the fibres from the neutral axis, particularly when the stresses were high. Compression members, such as pillars, might be calculated as follows:—Assume that the proportion between the modulus of elasticity of steel to that of concrete was 15, and that A_c = area of concrete and A_s = area of steel in square inches, and the load P in pounds, the stress on the concrete per square in.

would be:— $J_c = \frac{Ac + As}{P}$, and for the steel, $J_s = 15 J_c$. Mr. Bylander, having shown diagrams illustrative of these calculations, continued, that when concrete and steel in one and the same member were placed together to resist compression only the deformation must, of course, be the same for the two materials. If the diameter, or width, of the pillar was sufficiently large compared with the length, the lateral flexure might be neglected in the calculations, and the pillar might be calculated for compression only. In case of eccentric loading the stresses due to bending must, however, be always ascertained. The author's opinion was that simplicity was of the greatest importance in actual practice, and the engineer was less liable to make mistakes when he was using simple formulas and short calculations, and the results obtained were generally more satisfactory than if apparently more accurate formulas were used, providing that he used proper judgment in applying the formulae. For greater and more important structures, such as bridges and heavy girders, more accurate methods and formulas must be used in the calculations. Simple formulae, such as he had explained, should be used for simple members, such as ordinary beams, floors, and pillars. He considered that no one should attempt to design or calculate ferro-concrete construction but such men as had complete knowledge and a practical experience of that material. Many assumptions had been made in setting up formulas, so that the greatest care must be exercised by the designer when applying them, or otherwise dangerous mistakes could easily be made. The location of the reinforcement was of great importance, and must be distinctly shown on the drawings. It must not be left to the foreman to determine. For buildings which had to be erected very

rapidly, and where the drawings had to be made in a relatively short time, it was advisable to have all working drawings made to standards or to adopt a certain system which could be easily understood by anyone either in the office or on the site. The different methods of employing the two materials, concrete and steel, in building construction might be placed under three headings:—(1) Ferro-concrete construction where the entire structure was made of a monolithic mass of reinforced concrete; (2) construction where steel was used for the skeleton or frame; and (3) combination of these two methods. This last system was represented in buildings where steel columns and steel girders carried the principal loads. The floor slabs, and sometimes also the secondary beams, were constructed in reinforced concrete, this being more generally used in America than in Europe. The author said that he did not claim that ferro-concrete was the right material for all constructions, for each kind of material should be used to its greatest advantage, cost, safety, and duration being considered. The compressive strength of concrete was more than ten times as great as the tensile resistance, while in the case of steel the compressive and tensile resistance was practically the same. Speaking of the Hennebique system, the lecturer said that the vertical steel rods for the pillars were first placed in position and tied together with wire at intervals. The shuttering around the pillars was then erected on three sides only, the fourth side being left open in order to permit access. The concrete was filled in sufficient small layers, and was properly tamped in order that no voids should occur. The fourth side of the shuttering was carried up as the concrete was filled in. The vertical rods in the pillar were extended above the concrete, and the shuttering for the next floor put up. Reinforced rods for the girders were first put in place, the concrete filled in; then reinforcing rods for the floor-plate were laid, and the centring for the entire floor slab and the finishing of the girders proceeded with. Thus the floor-plate, girders, and pillars were moulded at practically the same time, and the whole construction was monolithic. The influence of the hooping of a pillar was very remarkable, it having been proved by Mr. Considere in his experiments that a hooped pillar could resist a load three or four times as great as a pillar without hooping or lateral reinforcing. Another method of combining steel and concrete was in foundation works; in fact, the author thought that foundations could with greater advantage than perhaps any other part of a building be so constructed. Such foundations, being thinner, could be made at less cost than foundations of solid concrete. But consideration should always be given to local conditions. Ferro-concrete had been used with great success for bridges, culverts, conduits, water-tanks, reservoirs, and retaining walls and dams. In the case of conduits and similar works care should be taken that the steel was well protected. Another interesting use for the material was for the construction of piles, which were usually fitted with a wrought or cast iron shoe. In conclusion, Mr. Bylander said that the materials for the concrete or ferro-concrete must be of much better quality than for ordinary concrete. The aggregate must be of smaller size, crushed to pass through a 3/4-in. mesh. Coke breeze or cinder was not satisfactory, and there must be no voids in the finished concrete. The concrete should be put in a wet state and in thin layers, and should be properly tamped to cover and embed the steel. One important point which occurred in testing members was that cracks in concrete were not visible, the introduction of steel producing this phenomenon. Reinforced concrete deserved to be recommended if properly designed and constructed, but it was dangerous if the work was not carried out well.

Mr. P. J. Waldram, in proposing a vote of thanks to the reader of the paper, said that one particular point not mentioned was as to the legal difference, so to speak, between these various systems of reinforced concrete. Were they patented, or were they interchangeable? This was important, because the architect had to be very careful in adopting any system which had any patent rights attached unless he went to the patentees and paid their price, which

was a thing architects should avoid, if possible, in the interests of their clients. It was one thing to adopt a patent bearing a very small proportion to the total cost of the building, but it was a very serious thing where the greater part of the construction of the building would be placed in the hands of any particular firm. He did not say that with the slightest disparagement to the Hennebique or any other system, but it was a serious thing for architects to go in for any particular system without any competition at all. With reference to that, he noticed that very few of the systems published any indication of how they were to calculate the system, and, as an engineer was not afraid to put his formulae in such a way that people could understand them, so personally he would be more inclined to trust the manufacturer who was not afraid to put his system before the professional public in such a way that they could calculate it for themselves, than the manufacturer who absolutely kept all his formulae and data to himself. The architect, and especially the engineer-architect, should be in a position to say not only that the manufacturer said this was sound, but to say, "This is sound because I know it and have calculated it myself." There was also a considerable misapprehension about the question of shear, and it was often as difficult to explain to an architect or engineer what shear was as it was for a sanitary inspector to explain what a drain was. He was inclined to suggest that any system which did away with the complicated question of shear was a better system than one in which shear was to be taken out as a separate factor. The question of the position of the neutral axis was certainly a difficult one, and in that connexion they were greatly indebted to Mr. Bylander, who, instead of quoting oceans of data calculated by different engineers, told them that it was about two-thirds. That endorsed a rather curious point which should not be forgotten, viz., that the elasticity of concrete was greater than that of steel. Most people said that steel was the more elastic material, but that was not so. The importance of superintendence had been touched upon, but he thought hardly sufficiently. It was absolutely necessary to have drawings showing precisely where the reinforcement should be, but it was a very different thing to get the reinforcement put in as shown in the drawings. It must be remembered that the concrete was filled in with the shovel often without skilled superintendence, and if the bars got displaced it was a very important thing indeed. The ordinary navy knocked a bar and put it out of place, and no one probably knew anything about it, but the reinforcement of the beam was in an entirely different place to that in which the engineer thought it was. There was nothing to be gained by overlooking things of this description. In ferro-concrete they had a new material, and it had the disadvantage, like all other new materials, of being put to all sorts of improper uses, and nothing was to be gained by overlooking the disadvantages. When once the disadvantages were realised then it could be used in its proper place. They must take care that the reinforcement was kept in place, and that there were no voids. It was an easy thing when concrete was being filled in to find when the case was knocked away at the bottom a great big gap, and when it came to a thin floor gaps became a serious matter. Then, again, it was very necessary to have proper superintendence at the mixing of the concrete; there must be no superabundance of large material and no insufficiency of sand, and especially must they be careful where the reinforced concrete was to be exposed to damp. The concrete must be solid, and the materials known to the designer, and the materials must be mixed in the proper proportion. Another disadvantage was the difficulty of cutting the material after it had been fixed—it was almost impossible when the reinforcement was very large. The advantage of the material was that it enabled bold things to be done which could not otherwise be done, but that was no part of ordinary everyday architectural practice. They did not often want to construct a building to project over a road, but they did often have to build ordinary walls and retaining walls, and those were the lines on which architects should mainly look

for assistance for the use of reinforced concrete. Much material put into foundations at the present day was absolutely wasted, and if by the use of reinforced concrete they could make savings in the foundations and retaining walls and floor construction and beams, then such savings might be used on other parts of the building. Freak buildings were no part and parcel of the everyday business of the architect. So far as he could see, the designer was not tied down to any particular system of armoured concrete, and he saw no reason why a man who could design an ordinary steel work should not be able to thoroughly grasp the principles of the design of concrete steel, and by careful attention to the work be able to produce a wholly satisfactory drawing. A difficulty one found in designing brickwork was the unreliability of large brick piers, and the known tests of brick piers did not carry them very far. It was often necessary to put very heavy weights on ordinary brick piers, and he had been endeavouring to collect information with regard to the employment of Hennebique reinforcement in brickwork. The difficulty was that they could not reinforce it without destroying the bond, but he had not been able to make a practical test yet. He felt, however, that it was not impossible to reinforce brick piers without giving trouble.

Mr. A. T. Walmisley, seconding the motion, said that reinforcement, to his mind, consisted of concrete and steel in which the steel was part and parcel of the whole construction—the rods which the author described became part and parcel of the whole construction. Of course, every inventor tried to bring out something which somebody else had not brought out, whether it was good or not—and the architect or engineer had to consider what was the best kind to adopt. Reinforced concrete for floors and columns and foundations concerned the architect as much as the engineer, and the architect often adopted a system, and then said to the contractor, "You must take the whole responsibility of the construction, and you must submit drawings to an engineer whom I will name, for him to approve of them." He will not think that was the right thing. The architect should have the engineer under his control, and the engineer ought not to be the servant of the contractor. The author had shown them the rod system, but a system he had not shown was that in which expanded metal was employed. With rods it was very evident, and especially in piles, that they must have lateral bracing, or otherwise they would have the rods bulging out and destroying the concrete. He had seen at Messrs Armstrong's works at Newcastle a floor of a workshop which carried very heavy machinery connected with the manufacture of guns, and that floor was constructed with expanded metal. The expanded metal system, to his mind, prevented the anxiety of having to watch the exact position of the rods. An enormous amount of superintendence was needed with the rod system, and there was the tying together of the rods, whereas with expanded metal it was all prepared for them, and they had only to lay it down in a proper position.

Mr. E. O. Sachs said the question of patent rights of concrete systems was very important. In his opinion reinforced concrete, taken as a whole, was not subject to patent rights, but many patents had cropped up which were true patents on special points, and both architect and engineer should be very careful not to infringe these patents on special points. So far as he could make out, there were thirty-six German and Austrian systems, twenty in the United States, fifteen in France, and two or three absolutely English systems. As an architect, he was astounded at the ugliness of the reinforced buildings presented on the screen. The only beautiful thing shown was the Luxembourg Bridge, and that was not entirely reinforced concrete. He felt that the material was one merely for use for business premises. He did not think it a material which lent itself at present to domestic and town architecture, for where it was used it required a great deal of clothing and artificiality. He was glad to hear the warning about accepting the guarantees of firms and what had been said as to the secrecy of the formulae, and he was glad to say that the United States firms were now showing formulae on which

the work was calculated. Supervision was absolutely essential, both in respect of the materials and the putting together of the work. He recently came across a piece of reinforced concrete in the North in which natural Belgium cement had been used. The contractor said it was cheaper, and why should they not use it? One point which had not been mentioned was as to the fire-resistance of reinforced concrete. He would like to know what happened to the rod with half an inch protection of concrete.

Mr. A. G. Green remarked that, in regard to the formulae of different systems being open to inspection, they had also to consider whether they were capable of judging the value of the formulae. If they studied the subject and mastered it, then they had only to invite competition to carry out the work, and it would not be a competition of different systems, but a competition of contractors to carry out a given system. Mr. Green proceeded to give details of various works he had been connected with. They had to underpin a hospital at the Albert Docks and construct a new foundation as, owing to the action of a grub, the timber piles had been eaten away. They used reinforced concrete piles and beams, which had given great satisfaction. In the case of a warehouse building for a tinsmith printer at Bermondsey where the soil was soft, reinforced concrete was used for the foundation, and the floor was now bearing a weight of tinsmiths of 3 tons per superficial foot. They made some tests in connexion with that building. Four beams were tested. One was concrete only, the second was reinforced in the bottom only, the third was reinforced with four bars, and the fourth was reinforced on the Hennebique system. Boxes of tinsmiths were piled on the beams. The concrete beam broke off short with 3 tons upon it, but the others were loaded up to 29 tons and did not break. The beams were crippled beyond use, but they did not break. They had also used reinforced concrete for a water-tower, the tank being 70 ft. in diameter, and the walls 5 in. thick at the top and 6 in. at the bottom. That was standing well.

The Chairman said he would draw the attention of the members to the representative committee which had been appointed by the Royal Institute of British Architects in consultation with other bodies to consider the subject of ferro-concrete under all aspects, and also the fact that the Congress of Architects were calling for papers on the subject from two aspects.

Mr. Max Clarke (the Special Visitor) said that he had asked Mr. C. Marsh, whom they knew as one who knew something about ferro-concrete, to come there that evening. Unfortunately, he was unable to do so, but Mr. Marsh had sent him some written remarks, which he proposed to read to them. Mr. Marsh said:—"The paper is a valuable contribution in that it brings reinforced concrete to the notice of the members. There are, however, one or two statements to which exception may be taken, and some that it is essential to notice."

Mr. Bylander says that in the lower part of a beam it is advisable to use as few bars as possible in order to simplify the construction. This is true, so long as the bars are not too large. It should be borne in mind that a small number of large diameter rods have not so large a perimeter as a greater number of smaller rods, and the aggregate perimeter of the rods in a beam should be as large as possible in order that the shearing stresses may be resisted in the concrete surrounding the rods. For example, it is not good practice to use one large rod in a beam where two or four smaller ones could be employed, but it may be better, taking all the points into consideration, to use, say, four larger rods in place of six smaller. In slabs it is always advisable to use small diameter bars spaced fairly close together in preference to large diameter bars far apart. One of the objects to be aimed at in all reinforced concrete design is to divide up the reinforcement so that the stresses on the concrete in contact with the bars may be distributed as much as possible throughout the whole layer in which the reinforcements are placed. A further point to which it is necessary to refer is the nature of the formulae recommended in the paper. Although simplicity is of importance in practice, still the simple formulae used should be based on

true principles. The author of the paper in his beam formula assumes that the internal moments of the tensile and compressive resistance about the neutral axis are equal to one another. It is curious how this error is so frequently made. The resisting forces in tension and compression are equal to one another since the resisting moment is the couple composed of the tensile and compressive resistances, the arm of the couple being the distance between their centres of action. It follows in a reinforced concrete beam, where the neutral axis is always considerably nearer the centre of action of the compressive forces than the axis of the reinforcements, that the moments of the respective resistances about the neutral axis cannot equal one another. The author remarks that the draughtsman is less liable to make mistakes when he is using simple empirical formulae and short calculations, and the results obtained are more satisfactory than if more accurate formulae were used. A far better view to take is that the designer should first be thoroughly conversant with the true principles, and no design should be undertaken unless these principles are thoroughly understood. The designer can then make intelligent use of simple formulae or diagrams based on the true principles, of which there are a great number by various authorities. There is danger in the employment of reinforced concrete when the design is left in the hands of anyone who does not understand the true principles involved, even if he has had practical experience, and more especially so if he uses formulae which are based upon fallacies. I would say to any young engineer who is interested in reinforced concrete, first study the theoretical aspect, and thoroughly master the true principles involved. You will then be in a position to select formulae and constants suited to the work you may have to design. Empirical formulae may give results of sufficient exactitude when used by those who understand their limitations, but are certain to be dangerous when employed by those who have not taken the trouble to study the subject in a proper manner." Proceeding, Mr. Max Clarke said that with regard to brickwork he was told that brick pillars reinforced had been used at the Imperial Institute. One thing he would like to know was how the cost of building an ordinary warehouse with ferro-concrete compared with brickwork and steelwork in the ordinary way, for no man departed from that which he knew to something of which he knew nothing, and he took it that in this case they would not depart unless they got something cheaper. He noticed from the report of a paper in the *Builder* of March 24 that the cost per cube foot of ferro-concrete was stated to be 1.625d. per foot, and that the rate of insurance was reduced to 1s. 5d. per 100l., and if they could only be sure of building at 1 1/2d. per foot cube they would all use it at once. On the other hand, he saw the regulations of the National Board of Underwriters as to by-laws for the construction of buildings in America, and if a man had to carry out such regulations in this country he certainly would not build for 1 1/2d. a cube foot. He would like to know what effect rust would have on the rods, for they could not always get them as they came from the mills. It was also said that when the building was guaranteed the contractor used a high factor of safety. Of course that was so, and the client had to pay for it. Then he had a strong impression that if the bars were placed very near the surface, whether they were round or twisted, the building would not be even fire-resisting. Then it was said that beams were more liable to fail from insufficient resistance to shear than to bend. He had seen some experiments at Messrs. Cubitt's where concrete beams were tested, and they were practically split in the centre at the bottom, and there were no cracks at the end. He took it that the rods must have been sufficiently numerous or thick to prevent any shearing. Then he was told that one of the essentials in making a ferro-concrete beam was to put the concrete in dry, and that was in direct opposition to what Mr. Bylander said. It was said that men of complete knowledge and experience only should be employed, but the difficulty was to find the men. The vote of thanks having been passed,

Mr. Bylander made a very brief reply, and said that the reason he did not refer to expanded metal was that he had to cut out the portion of his paper which dealt with a number of other systems. He did not mean that special rolled bars were not as good, but that the advantage of them was not very great. He certainly agreed that rust had not a good effect on the bars. As to the failure of the beams from shear, he had noticed that where a beam was loaded with a uniformly-distributed load it had more tendency to fail from shear than from tension.

SCULPTURE PANEL: "MUSIC."

This is an illustration of a panel by Miss E. M. Rope which was exhibited in coloured plaster at the Arts and Crafts, and had also been exhibited in bronzed plaster at the Royal Academy, as one of a pair illustrating the



Sculpture Panel: "Music."

words "Sing we merrily unto God our strength, make a cheerful noise unto the God of Jacob"; but as the companion panel did not lend itself well to colour and this one did, the marginal text was cut off and it was entitled simply "Music."

FIRE STATION, HAMPTON HILL.—The new fire station which has been erected near the railway bridge in Windmill-road for the accommodation of No. 2 section of the Hampton Brigade, was opened on the 11th inst. The building is of red Leicestershire bricks with Portland stone dressings. Beside accommodation for the manual engine, escape ladder, hose reel, and other appliances, there is a men's room and other offices at the rear. The premises are paved with Victoria stone, and are electrically lighted, and heated by gas radiators. The building was designed by Mr. S. H. Chambers, Surveyor to the Council, and the builder was Mr. Budd.

CROYLAND ABBEY.

The following letter from the Rector of Croyland Abbey appeared in the *Times* of Saturday, the 14th inst. We reprint it here for the reason given in our "Note" on page 431.—

"Sir.—For more than twenty years I have endeavoured to raise sufficient money to simply preserve the historic remains of this once glorious Benedictine nunnery, but, being situated in the Lincolnshire Fens, remote from the general thoroughfares of the nation, we seem to attract little attention and little response to my fifteen appeals. I am now too ill to issue another appeal on behalf of the serious rents in the inside wall of the north aisle, on that portion still used as the parish church. Since January 1, 1906, four surveys have been made of the abbey fabric. Large rents from the roof to the foundations, buckling of the north wall and window jambs, caused by vaults weakening the foundations, which were laid on a peat bed 2 ft. in thickness, compelled me to give the order to immediately underpin that portion inside the church, and rebuild the west portion of the north window. The funds required for that work and the roof section X are £3,000. I have written 17,910 letters since 1882, when I became rector of Croyland, otherwise Crowland. Unfortunately, the labour and anxiety have told seriously upon my health. Four times I have collapsed during Divine Service, and am now (in advanced age) compelled to employ extra clerical help, and that on an income less than I had as curate of Croyland in 1880. This is the reason, Mr. Editor, why I trespass once more on your valuable space, so that by the *Times'* world-wide circulation, some of your generous readers may be led to help us. The work is most urgent.

Croyland Abbey is a nation's memorial, and as such I feel I have a claim upon the nation in endeavouring to preserve this land-mark of the bold religion had in the ages long gone by.

The history of Croyland Abbey goes back to a period long anterior to the establishment of the English kingdom. The abbey was founded nearly 100 years before the supremacy of Wessex under Ebert was formerly recognised, and it shared the varied fortunes of the great religious houses in the ten centuries, during the three centuries which preceded the Norman Conquest. Cambridge University was founded by monks from Croyland Abbey.

I trust, Mr. Editor, through your kindness, this letter may meet with sympathetic response from all those who are interested in architectural memorials.

Surely those whom God has blessed with this world's wealth will not turn a deaf ear to its appeal, as the work is most urgent, but come forward and help to preserve to our children's children this noble land-mark of the faith and hold religion had in a great age.

Reader, pray help us by sending a donation according to God has prospered you.

I remain, Sir, yours faithfully,
T. H. LE ROY, Rector of Croyland Abbey,
otherwise Crowland, near Peterborough, and
Surrey, in the Diocese of Lincoln.
Croyland Rectory, near Peterborough, April 9."

Architectural Societies.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—The annual meeting of the members of the Devon and Exeter Architectural Society was held at Tiverton on the 7th inst. The Hon. Secretary presented the nineteenth annual Report, from which it appears that there is an increase of membership by eight, the total numbers being now ninety-four. The Hon. Treasurer presented the balance-sheet, which, with the Report, was adopted. The retiring President (Mr. B. Priestly Shires) then delivered his address. He said that the history of the XIXth century would be a history of associations, the extent of whose influence it would be impossible to over-estimate; social life had been intensified and improved by associations; scientific research had been accelerated by it; it had given an unparalleled impetus to civilisation; and had made the last sixty or seventy years the most important period in the history of the world. Architecture, however, did not possess the same power of imparting an impetus to the progress of civilisation as science; it acted more as a record, and formed a monument of the various stages of advancement amongst mankind. Architecture, like other fine arts, is more passive in character than the sciences; but of all fine arts architecture is the most allied to science. It made the sciences minister to its requirements; it clothed them with beauty; it is the art of making the useful pleasing, and the connecting link of science with art, and numberless buildings have been erected testifying to the increased knowledge and taste of modern architects. But in addition to having architects possessed of taste and knowledge, it was almost as necessary that there should be clients possessed of the same qualifications. When we look upon a successful piece of architecture

a considerable amount of praise was due to the client who had had sufficient taste to appreciate the architect's efforts as well as to the architect. Good architecture was contagious, for, however plain a client wishes a house building, nowadays, he would look aghast if his architect built him one as bald as those of fifty years ago. Everyone who built was bound to make some small concession to the public and do his part in improving the character of the vicinity in which he built; he was not compelled to build extravagantly but tastefully, as though he was not wrapt up entirely in himself, but had given some consideration to others. He believed that one of the principal objects of the founding of the Devon and Exeter Society was to afford facilities for the study of architecture. Apart from any pecuniary gain architecture was a study, entertaining to both professional and non-professional men, and no man would ever succeed as an architect unless he lifted himself above the level of mere sordid interest in the level of enthusiasm for his art, and in this sense he would welcome to their lectures those who cared to come. So long as the public were uneducated in architectural taste architects would not have the opportunity of producing buildings commensurate with their skill. Since Ruskin first drew attention to the unarchitecturalness, if he might use the term, of our buildings, architectural practice had been revolutionised. It was important that architects should be thoroughly equipped for the responsible work they had to undertake, and he welcomed and appreciated the work that was being done in London and in some of the provincial centres for the architectural student, and hoped it would be still possible to carry out a curriculum of study for those who desired to enter the profession of an architect in the province of Devon and Cornwall. A general impression seemed to be abroad that if a youth was fond of drawing his parents at once concluded he ought to be an architect, but the mere liking of drawing was not always capacity for the architectural profession. Drawing was but the means whereby the architect expressed himself; it was the creative genius which was necessary to make an architect. No one would deny that the architects of mediæval times were true architects, yet they were not draughtsmen; joiners made better drawings now. He did not underrate draughtsmanship, far from it; it was one of the principal accomplishments of an architect, but it was well to remember, as there was such a danger to think it so in these days, that draughtsmanship was not all in all. Drawing each line had, or should have, a meaning; each line represented an idea and an expression of the architect's mind, and by these multitudinous lines he imparted his instruction to others.—After the conclusion of his address, Mr. Shires proposed Mr. Harbottle Reed (Exeter) as President for the ensuing year, and this was seconded by Mr. A. S. Parker, and supported by Mr. C. J. Tait, and carried. Mr. Reed, in returning thanks, said he would endeavour to advance the interests of the Society as his predecessor and those members present who had been President had done before him. Mr. M. A. Bazeley (Plymouth) was elected Vice-President; Mr. Allan J. Pinn, Hon. Secretary; Mr. O. Baling, Hon. Treasurer; and Messrs. P. Morris, W. A. May, and C. J. Tait were chosen to fill the vacancies on the Council.—The meeting was followed by a luncheon at the Palmerston Hotel, after which the new President, Mr. Harbottle Reed, remarked that, in suggesting Tiverton as the place of meeting, he was afraid it might possibly deter some of the three towns' members from coming, but he was assured that many were prepared to go as far as Bideford. They had come to what on the face seemed a more prosaic town, but some future Kingsley might expand the interest aroused by Blackmore in the old borough, for there was no lack of material. We had the Saxon town belonging to the Lady Cyther, as did Exeter, afterwards over-awed in the time of Henry I. by the castle built by Richard de Redvers, the Earl of Devon (1106). The castle was the residence of the Redvers and the Courtenays after them, until 1540, when the Marquis of Exeter lost his estates, and his head. Here the Princess Katherine, daughter of Edward IV., was wife of Courtenay, and her presence

conjures up stately scenes of pomp and pageantry, of which her funeral was not the least impressive. Edmund, second son of Henry III., married the last heiress of the Redvers. From Tiverton Castle went three brothers of the Courtenays to fall by the axe or in battle during the Wars of the Roses; one early at Tewkesbury. The old castle had its part in the Civil War; was taken in assault by Parliamentarians, under Massey, in 1645, and afterwards dismantled. Hard by is the Church of St. Peter, most picturesquely situated, especially when viewed from the river; it possesses many features of interest, although the restorers, (?) in 1830, did their best to restore them to oblivion. Except the tower and Greenway aisle it has been almost entirely rebuilt. Some traces of Norman work exist, and the red tower is very pleasing; but the south porch and aisle, with its chapel of St. Christopher, St. Blaize, and St. Anne would claim most attention. The chapel was founded after 1517 by John Greenway, a Tiverton wool merchant, who died in 1529. On the exterior are elaborate sculptures of Scripture scenes, arms, ships, cyphers, trade emblems, and inscriptions, as "Whilist we think well, and think to amend, time passeth away and death's end." A panelled and pendentive ceiling remains, but the frescoes, screens, and tabernacle work have vanished. It was for its woollen trade, begun as far back as the XIVth century, that Tiverton was famed, and Dr. Leisching had consented to the party viewing his house, which was at one time the wool market, built in 1611; it had much interesting work. But, of course, the most famous name was Peter Blundell's, who died in 1601, leaving his fortune to found the school, begun in 1604. His nephew, Robert Chilcot, who succeeded to his business (dying in 1609), was founder of Chilcot's School, erected in 1611. Following the lead of his bachelor uncle, he ruled that no married man should be a master of the school, and no maids or girls should be taught therein, but men children only. Not only to educational purposes, however, did the wealthy old clothiers leave their money, but they remembered their less fortunate brethren and employees, for John Greenway, who built the south aisle of the church, erected a set of almshouses in 1517, which, despite its being largely rebuilt in 1732 after the fire, still presents much of interest in its little chapel, with lowly porch and pious inscriptions, "Have grace, ye men, and ever pray for the soul of John and Jane Greenway," niches with figures of the apostles, and armorial bearings. Another successful wool merchant, John Waldron, who died in 1597, built another block, with a somewhat similar chapel and porch. The four doorways of the houses is carved, "Deposit thy goods whyl thou hast time, after thy death they are not thine. God save Queen Elizabeth." While the cornice bears the advice—

If that upon the Poor doth spende,
The goods that he hath here,
To God agen that same doth send,
And paye the same with great increase.

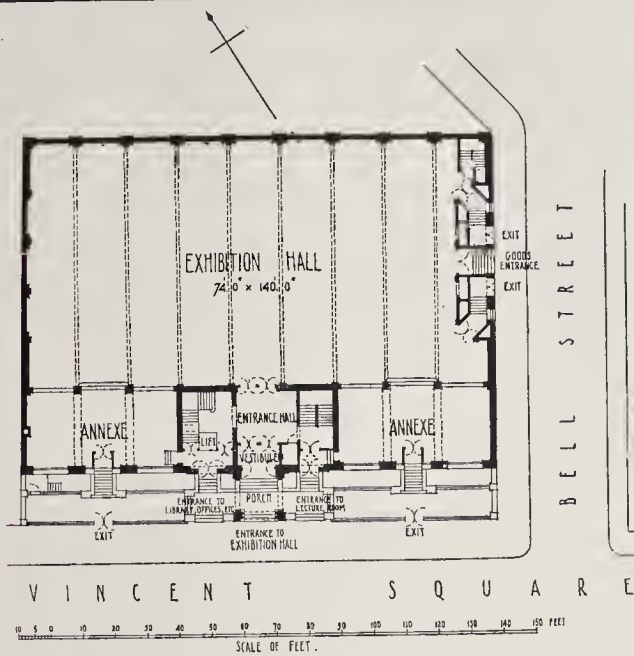
On the porch are the royal and founder's arms. At the conclusion of the visit thanks were expressed to the Rector, Prebendary Scott, and Mr. Churchwarden Deeks, Mr. Featherstonhaugh, and Mr. Brown for their courtesy.

Fifty Years Ago.

From *The Builder* of APRIL 19, 1856.

THE REIGN OF UGLINESS.

We will take one example, and that shall be the huge building of iron and glass which is being erected at this moment for the *Royal Commissioners of 1851* on the Kensington Gore estate, and is intended for the exhibition of the Marlborough House collections—the Trade Collection, presented to the Royal Commission by various exhibitors, at the close of the Great Exhibition of 1851; the Patent Museum; the Educational Museum; and the Museum of Animal Produce, formed at the Society of Arts, in conjunction with the Royal Commission. It is 266 ft. long, 126 ft. wide, and is in three equal spans, covered by three elliptical roofs, all at the same height from the ground, like three huge boilers placed side by side. The shell, is formed of flat iron uprights, filled in with



Royal Horticultural Society's Hall. Plan.

boarding. Messrs. Young & Co., who are the contractors for the works, claim in the newspapers the exclusive credit of the design; Sir William Cubitt overlooks them, and there is a resident engineer acting on behalf of the Commissioners. Of the construction we say nothing, we shall give our readers some sections and a plan in another number; nor of the effect of the interior just now, and the probable want of light in great part of it; our immediate object is to direct the attention of the Commissioners, before it be too late, to the exterior, which, if carried out in accordance with the drawing, will discredit all who are concerned in it, and be an eyesore and injury, so long as it remains. Its ugliness is unmitigated; never was a beautiful sward, where the daisies blossom and trees and shrubs put forth their leaves and branches in forms of beauty

unapproachable by man, so vilely disfigured. We know nothing with which to compare it. Railway sheds and locomotive depôts have often some little bit of art or taste about them, but here there is nothing; up one side and down the other, all is blank and offensive. No squatter in the Back-woods, no New Zealand savage, would erect a structure so utterly and indefensibly ugly. If the Marlborough House authorities retain their Chamber of Horrors—their examples of "what to avoid," when they get into their new quarters—Mr. Cole's first act must be to have a model made of this Museum itself. Seriously and earnestly, we do hope that the Royal Commissioners will call in some artist to their aid, and endeavour to improve the appearance of this ugly result of the '51 Exhibition, whether it is to be called temporary or not.

Illustrations.

FOUNTAIN, VITERBO.

FHIS fountain in the courtyard of Viterbo Municipal Buildings is one of the finest to be seen in this town, famous for its public fountains (there are nearly one hundred) and the Villa Lante, about two miles distant.

The fountain, constructed of dark rich brown sandstone, is attributed to Vignola, although the screen is of later date. The court also contains the "six fine Etruscan sarcophagus lids shown on the plan.

The municipal buildings date from 1264, with a beautiful portico of XVth century date. The doorway shown on Section AA. is very typical of the charmingly simple Early Renaissance work to be found at Viterbo.

LIONEL U. GRACE.

THE ROYAL HORTICULTURAL HALL, WESTMINSTER.

Built by the Royal Horticultural Society to celebrate the centenary of the Society, this building was opened by the King in July, 1904.

The whole of the ground floor, except the portion occupied by the entrances and staircases to the upper floors, is appropriated to the exhibition hall and its two annexes, thus affording the maximum area for the Society's fruit and flower shows.

The exhibition hall, decorated with ornamental plaster and Austrian oakwork, is covered with a single-span roof of steel and glass.

The basement is utilised for storage and cloak-rooms; on the first floor are a lecture-room and committee-rooms; on the second floor the council chamber, library, secretary's room and offices; on the third floor the hall-keeper's quarters.

The building is faced with sand-faced red bricks, with dressings of Portland stone above a basement of Withnell pressed red bricks.

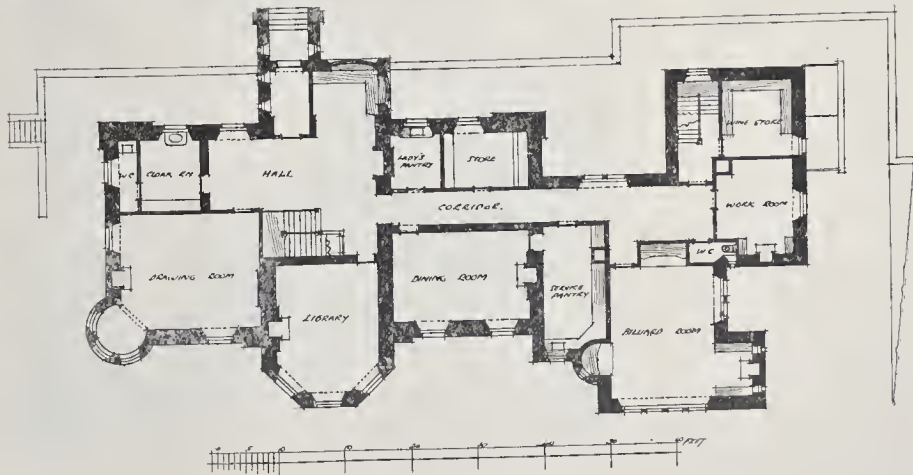
The contractors for the buildings were Messrs. G. E. Wallis & Sons, of Maidstone, and for the concrete foundations, Messrs. John Mowlem & Co.

The architect was Mr. Edwin J. Stubbs.

BALLUMBIE HOUSE, N.B.

THIS house is situated about four miles from Dundee; the original house was of a severe classic design, but this style was departed from in favour of a more picturesque treatment, and the house, as now completed in cement rough-cast, with Caithness stone slates and crow steps in roughly-hewn stone, leaves little trace of the original design. The inside finishings have been executed largely in fumed oak and pitch-pine.

The architect is Mr. James Findlay, of



Ballumbie House, Forfarshire. Plan.



Ballumbie House, Forfarshire. Sketch of House before Alterations.

Dundee. The general contractor was Mr. John Howie (Alyth); joiners—Messrs. Paton & Fairweather (Broughty Ferry); plumbers—Messrs. Jas. Fyffe & Son (Dundee); plasterer—Mr. Alex. McRitchie (Dundee); slaters—Messrs. Robt. Brand & Son (Arbroath); painter—Mr. Jas. C. Bruce (Broughty Ferry); heating—Messrs. H. Walker & Son (Newcastle-on-Tyne); and electric lighting—Messrs. Lowdon Bros. & Co. (Dundee).

"REDHEUGH," SUTTON VALENCE, KENT.

"REDHEUGH" Sutton Valence, stands on the southern slope of a hill, with brick-walled terraces below, one bearing the date 1645 in cut brick. In its older portions, on the north side, "Redheugh" was constructed entirely of timber, chiefly of oak, though this had been concealed latterly by lath and plaster work. On the southern front were various minor outbuildings of recent date.

The scheme of reconstruction involved the demolition of these latter to make way for the erection of a new wing, and the entire remodelling of the interior. The half-timber work of the north front has been exposed to view where possible, and new oak casement windows inserted.

The builders were Messrs. James Wood & Sons, of Boughton Monchelsea; and the architect the Hon. A. McGarel Hogg, of London.

Engineering Societies.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting on Tuesday, the 10th inst., Sir Alexander R. Binnie, President, in the chair, the paper read was "On the Resistance of Iron and Steel to Reversals of Direct Stress," by Mr. T. E. Stanton, D.Sc., M.Inst.C.E., and Mr. L. Bairstow, A.R.C.S. The following is an abstract of the paper:—

While recognising the valuable work which has been done by previous observers in the study of the fatigue of metals, the authors call attention to the fact that further experimental work on the subject is much needed for the following reasons:—

1. Practically all the previous work, with the exception of Reynolds' and Smith's experiments, has been done by subjecting the materials to transverse stresses, the intensity of which has, therefore, to be calculated by the ordinary theory of bending.
2. The resistance of the materials in common use by engineers at the present day when subject to reversals of stress is imperfectly known, and there exists considerable difference of opinion as to the materials best suited for stresses of this kind.
3. Although it appears from Reynolds' and Smith's experiments that the resistance of iron and steel is seriously diminished when the alternations are very rapid (i.e., 1,500 to 2,000 per minute), it is not known if this reduction in resistance is considerable at those speeds which are common in

high speed reciprocating motors (i.e., in the neighbourhood of 800 reversals per minute), since the majority of experiments have been made at approximately sixty reversals per minute.

4. Although it is generally recognised that the effect of moderately rapid or sudden changes in section of materials subject to reversals of stress is to diminish their resistance, the amount of this reduction in strength for the various materials commonly used is not known.

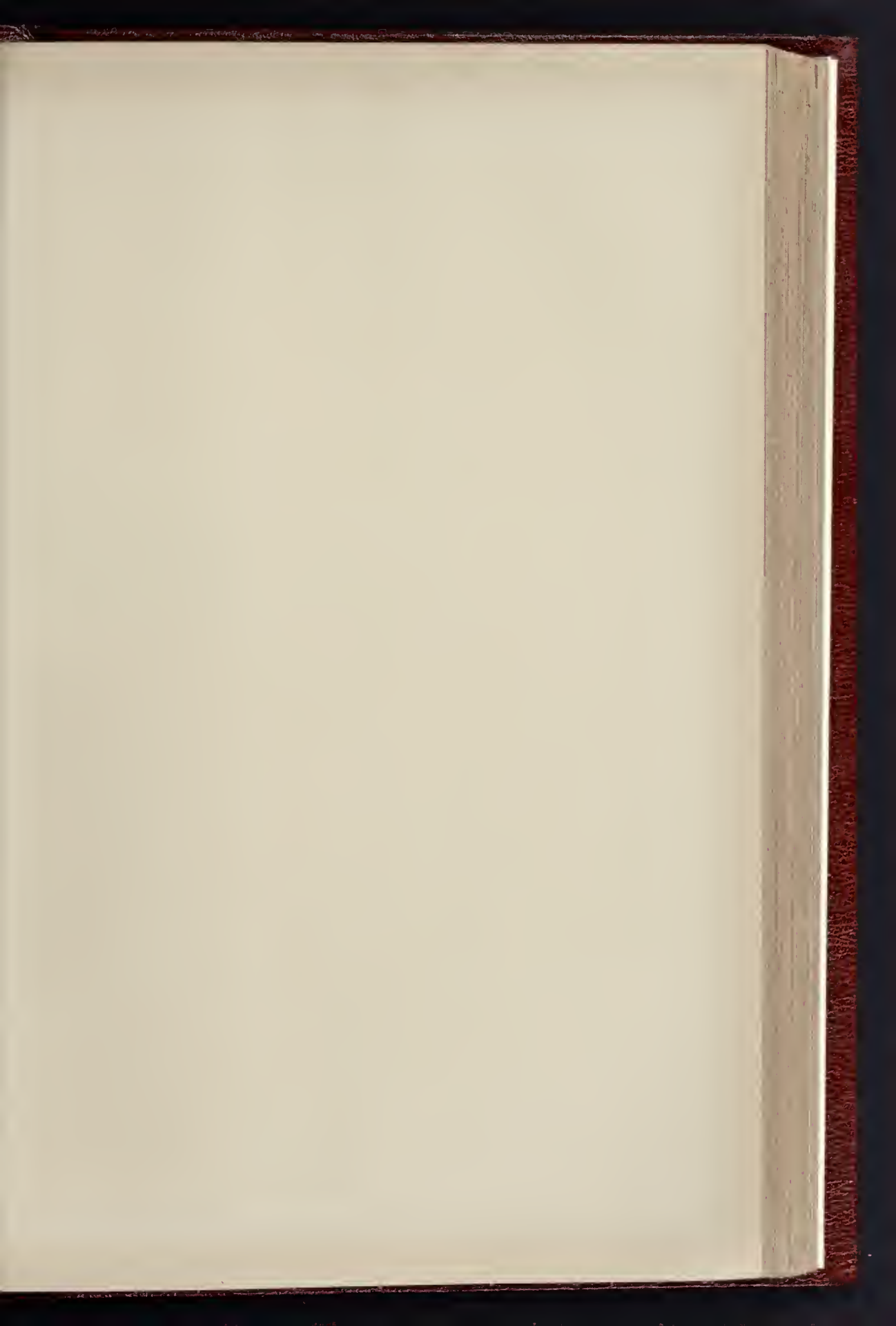
5. The common assumption that, in cases in which the stress varies from tension to compression, but between unequal limits, the resistance depends solely on the range of stress and not on the actual values of these limits, has not been experimentally verified.

From these considerations it was decided to undertake a research, the object of which should be the experimental determination of the resistance of certain kinds of iron and steel, under the special conditions mentioned in the above paragraphs, when subject to reversals of direct stress. The experiments were made on the alternating stress-testing machine which has been designed and constructed at the National Physical Laboratory, and which has been fully described in *Engineering* (February 17, 1905). Jointly with this work, a microscopical investigation has been made of the changes which take place in the crystalline structure of materials under reversals of stress as the test proceeds, to determine, if possible, the manner in which ultimate failure occurs. The materials upon which the tests have been made may be conveniently divided into three groups:—

1. Three samples of Swedish Bessemer steel and one sample of Swedish charcoal iron presented by Mr. R. A. Hadfield for the purpose. The carbon content of the steels was approximately 0.17, 0.44, and 0.64 per cent.
2. Four samples of steel presented by Messrs. Belliss & Morcom for the purpose. Of these, two were mild-steel bars, one was a bar of harder steel used for piston-rods, and the fourth consisted of specimens which had been cut from a large steel forging.



"Redheugh," Sutton Valence, Kent: Before Alterations.



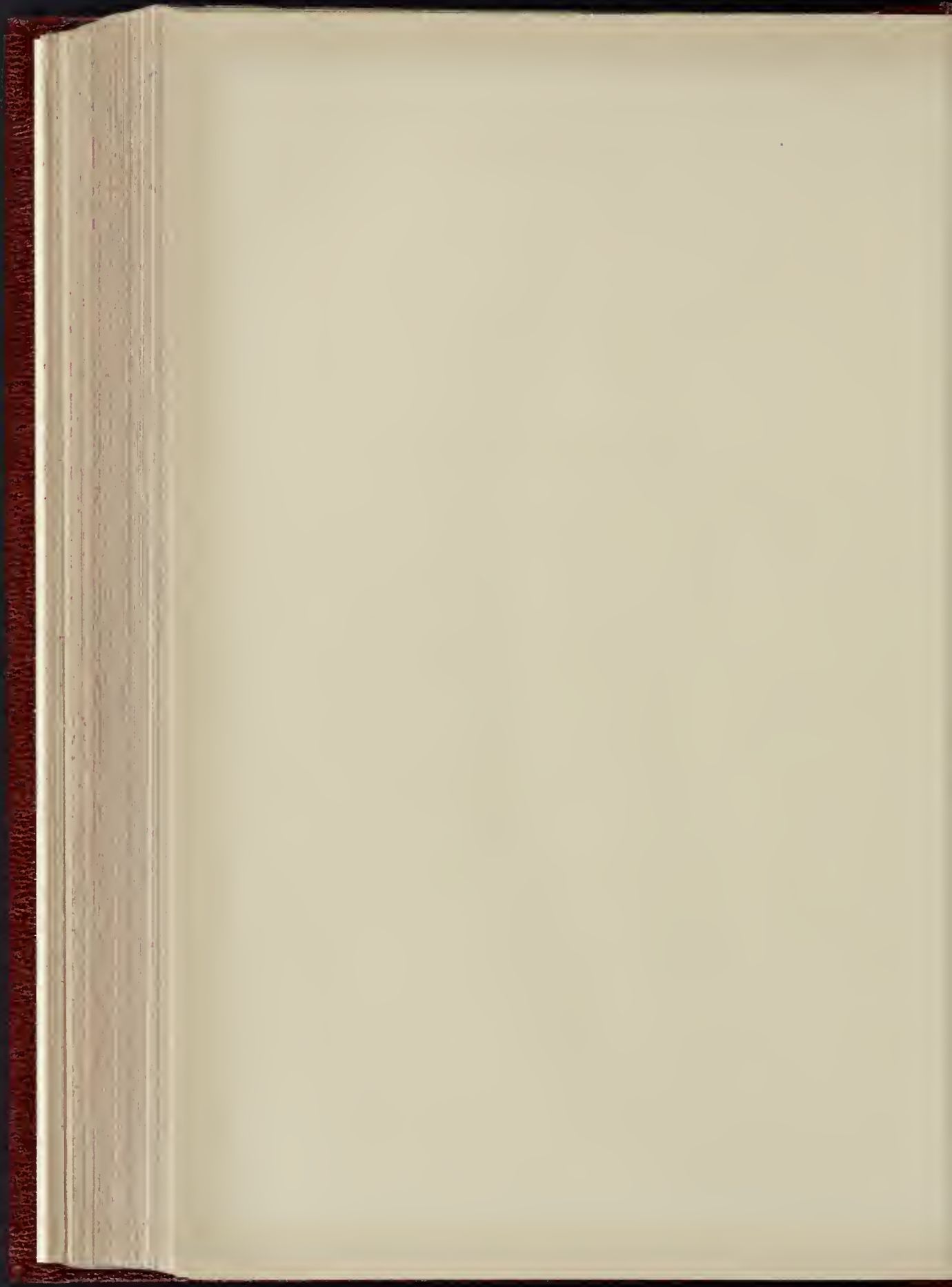


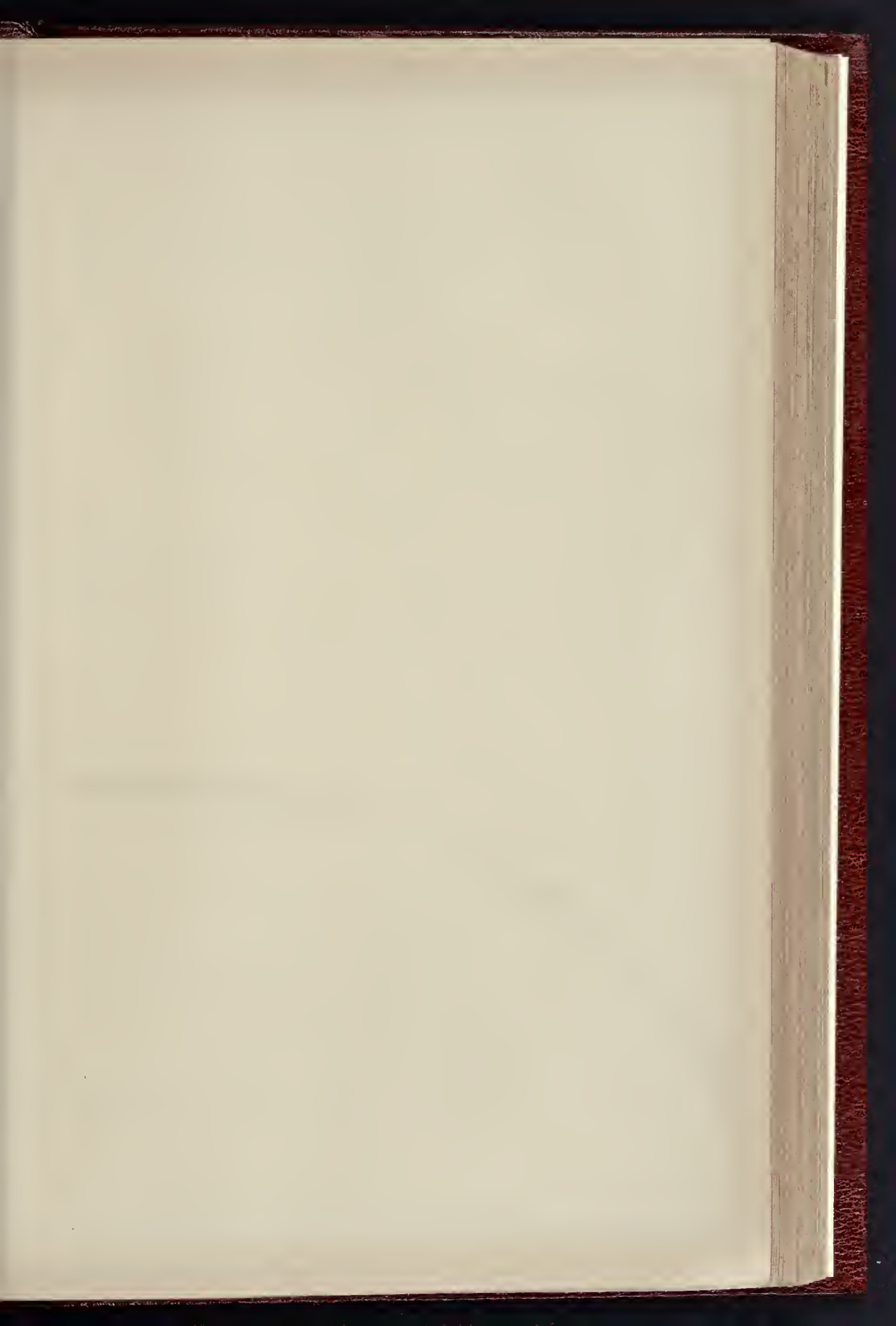
ROYAL HORTICULTURAL SOCIETY'S EXHIBITION



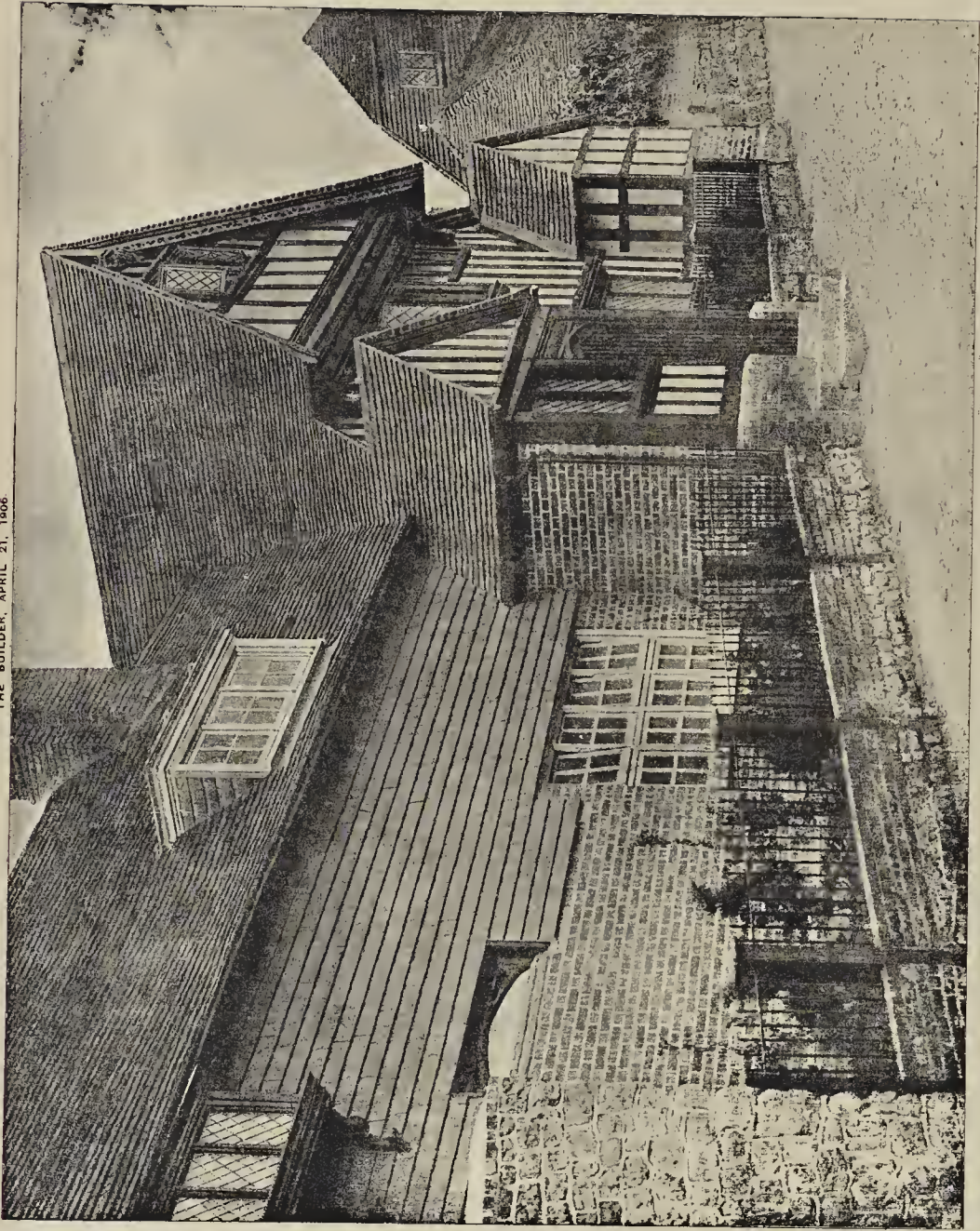
INK-PHOTO SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE E.C.

AND OFFICES.—MR EDWIN JAS. STUBBS, ARCHITECT.



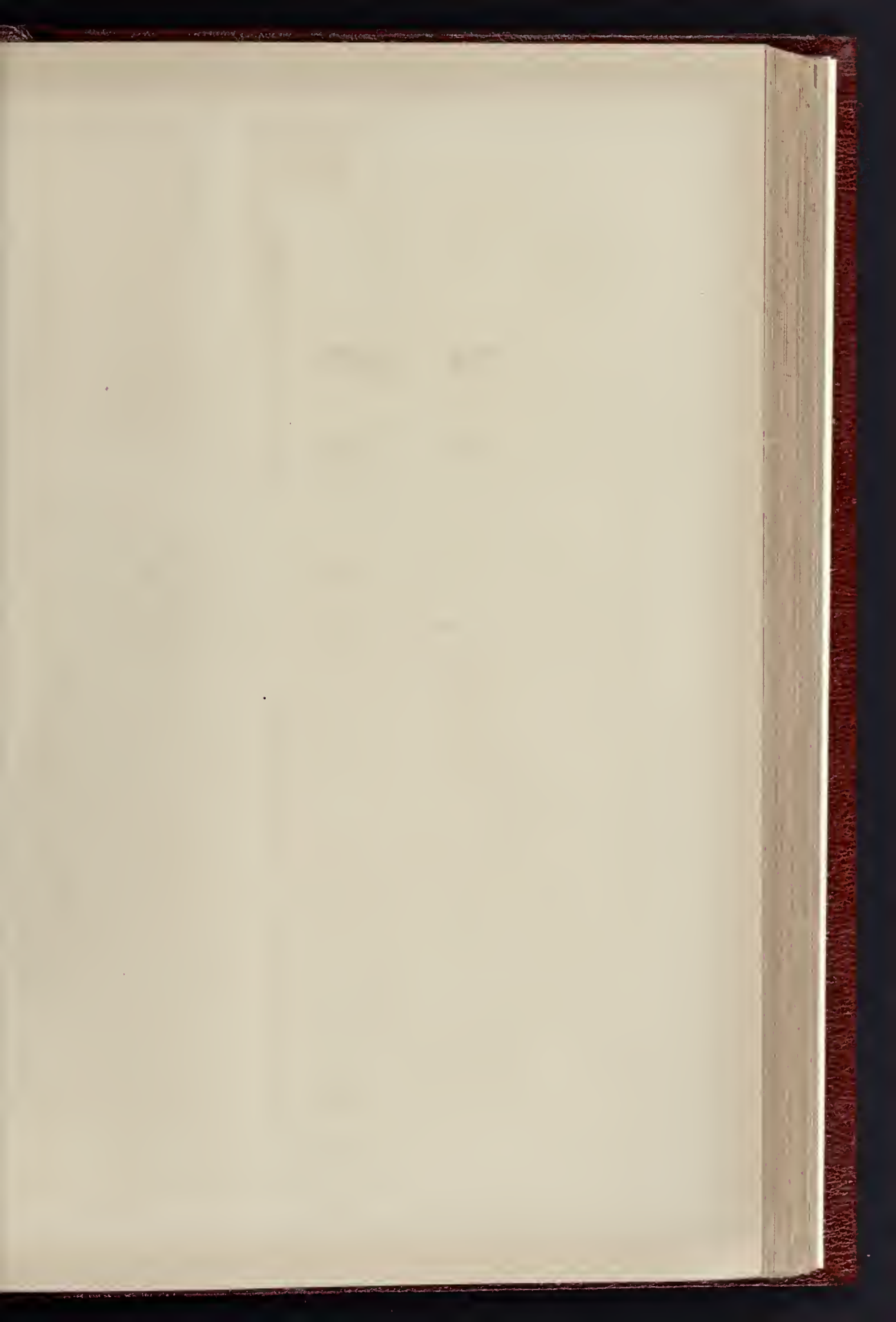


THE BUILDER, APRIL 21, 1906



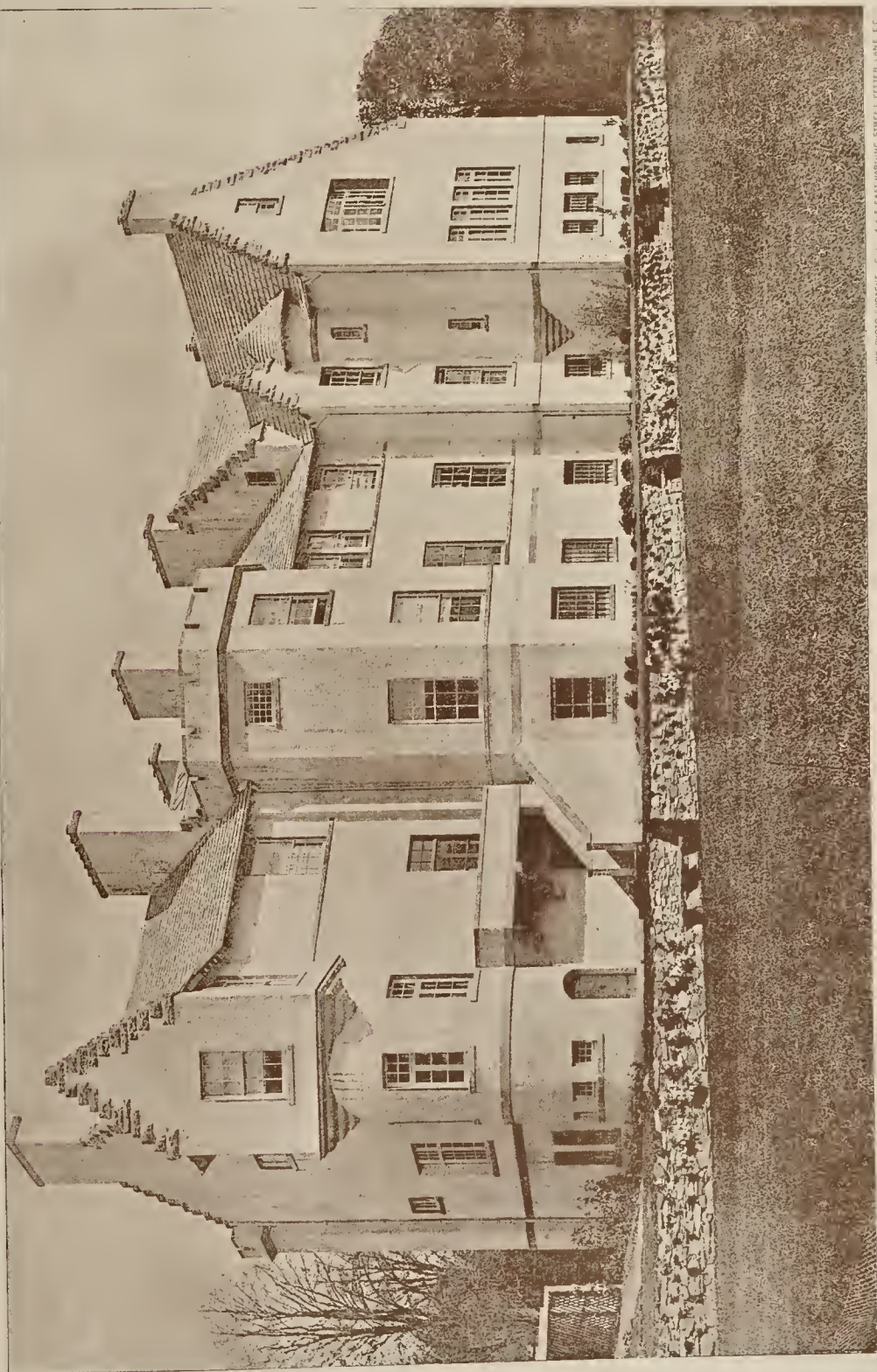
INK PHOTO, SPRAGUE & C. 179 & 5 EAST WINDING STREET, FETTER LANE, E.

"REDHEUGH," SUTTON VALENCE, KENT. NORTH-FRONT AS RESTORED.



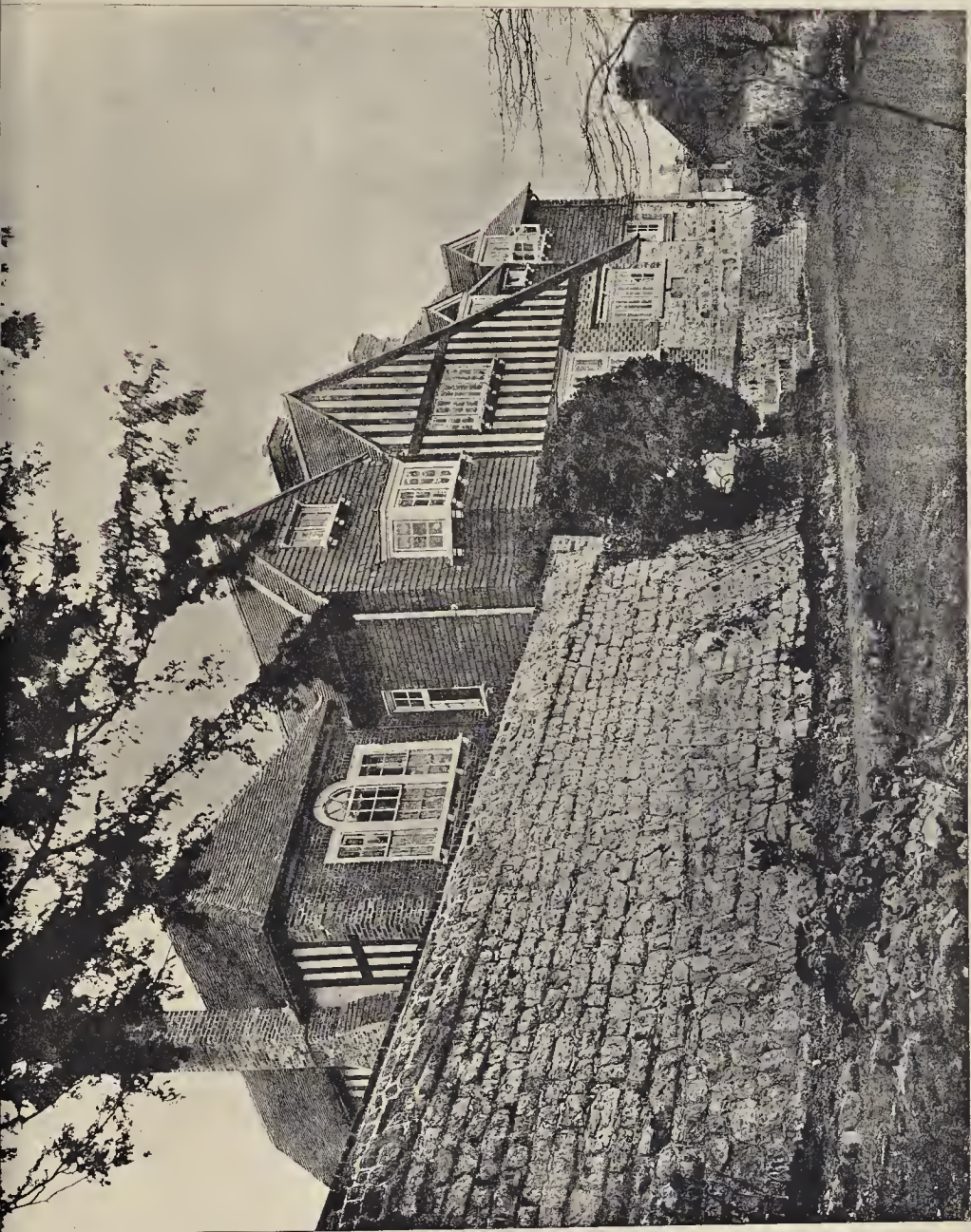
THE BUILDER, APRIL 21, 1906.





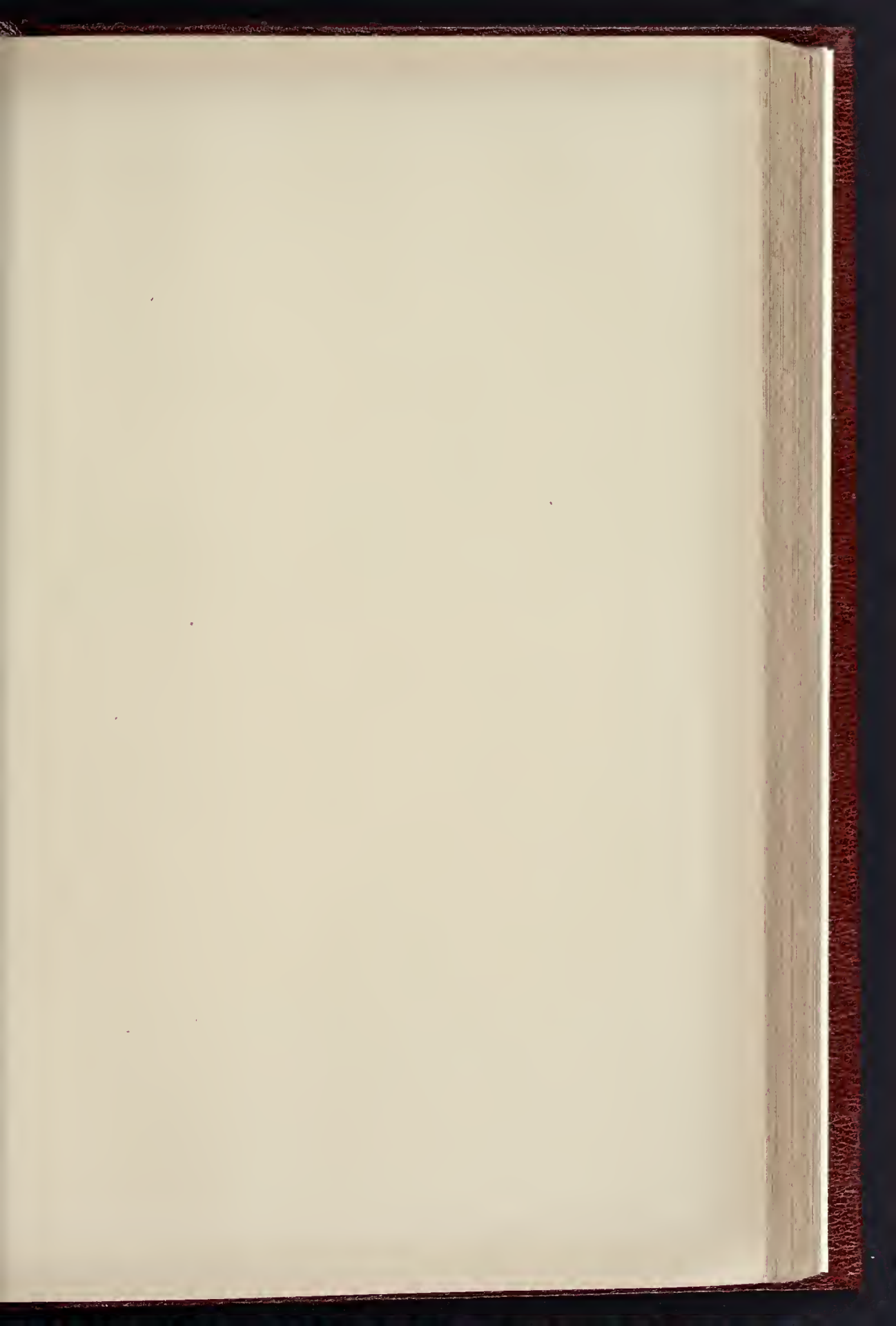
18K PHOTO SPRAGUE & CO. 4 & 5 EAST WINDING STREET, PETER LANE, E.C.

BALLUMBIE HOUSE, N.B., AS REMODELLED.—MR. JAMES FINDLAY, ARCHITECT



IN A PHOTO-GRAPH OF E. C. L. & S. EASTBROOK STREET, PETER LANGE, E.C.

"REDHEUGH," SUTTON VALENCE, KENT; SOUTH FRONT, SHOWING NEW WING—THE HON. A. MCGABEL HOGG, ARCHITECT.





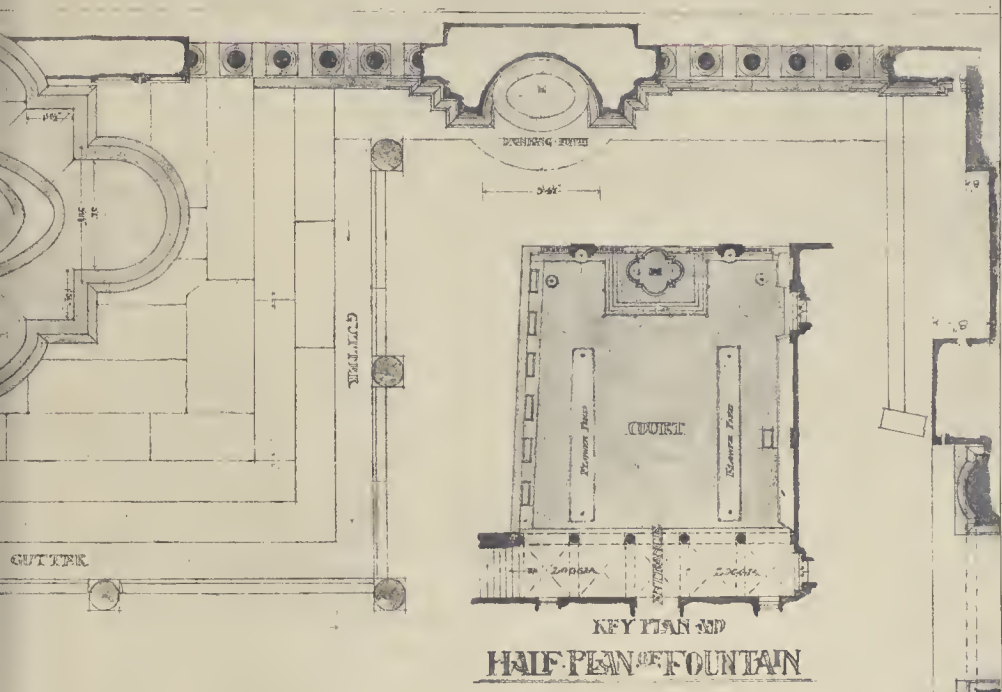
HALF-ELLYN HALF-SECTION ON LINE A-A

VIERBO MUNICIPAL BUILDINGS

By the architect and the painter on the appearance of Vierbo.

BY THE ARCHITECT

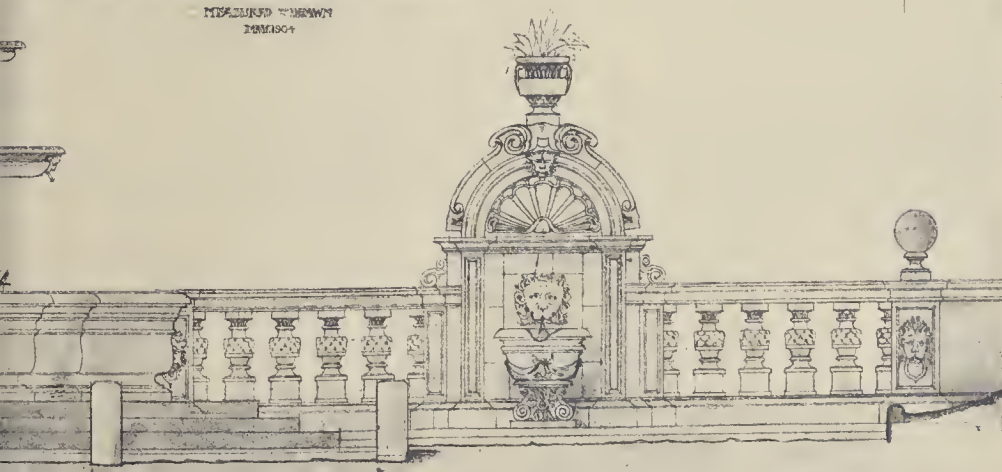
Scale bar and other technical markings.



KEY PLAN AND
HALF-PLAN OF FOUNTAIN

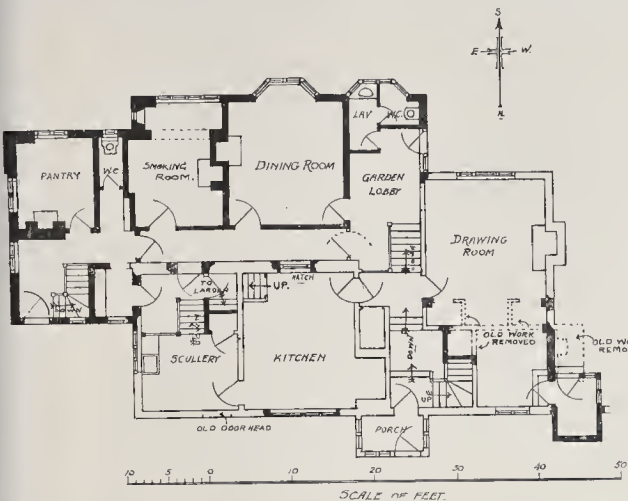
FOUNTAIN IN THE COURT YARD

MEASURED & DRAWN
1904



Louis C. Grace, 1904.

INA PHOTO 1 - ACUE - C. L. 4 & 5 EAST HARDING STREET FETTER LATE E.C.



"Reithugh," Sutton Valence, Kent: Plan as Remodelled.

3. Two samples of wrought-iron of British manufacture, bought for the purpose of the tests.

Although more uniformity in the results of the tests would no doubt have been obtained by subjecting all the specimens cut from any given material to an annealing process, it was felt that this would detract from the value of the tests owing to the well known effect of heat treatment on the resistance of steel. For this reason the tests were made on the bars as received; and in cases in which there were several bars of the same material, the specimens in any group of tests were not always cut from the same bar. This does not apply to the case of the specimens whose structure was examined microscopically, in which the actual resistance was of secondary importance. The results of the experiments may be stated briefly as follows:—

1. The superiority, in resistance to reversals of stress, of moderately high-carbon steels over low-carbon steels and wrought irons, which was discovered by Wöhler to exist when the rate of reversals was six per minute, still holds when this rate is increased to 800 per minute, although, according to Reynolds' and Smith's experiments, this superiority no longer exists when the rate of reversals is in the neighbourhood of 2,000 per minute.
2. As far as comparisons can be made between the results of the present experiments and those of Wöhler and Sir Benjamin Baker, there is no marked reduction in resistance due to raising the rate of reversals to 800 per minute.
3. Experiments in which the ratio of tension to compression varied from 1.4 to 0.72 indicated that between these limits the value of the maximum range of stress was practically independent of the actual values of the limiting stresses in tension and compression.
4. The resistance of the materials in three typical cases of rapid reduction of area of the specimens has been determined.
5. The failure of iron specimens due to the development of the slip-lines of Ewing and Rosenhain into cracks has been determined for the case of direct stress; and the failure of moderately high-carbon steel, due to the development of cracks in the ferritic areas of the structure has also been established.

STATUE TO GENERAL JOHN NICHOLSON, DELHI.—Lord Minto recently unveiled a statue of General John Nicholson at Delhi. The statue is the work of Mr. Brock. It represents General Nicholson with his head inclined towards the Kashmir Gate and his sword unsheathed.

Competition.

LIBRARY, BANGOR.—The award in the competition for the proposed Free Library at Bangor has been secured by Mr. Albert E. Dixon, of Messrs. Dixon & Potter, King-street, Manchester. The competitive plans numbered 119.

Books.

The Roman Forum: Its History and its Monuments. By CHARLES HUELSEN. Translated from the second German edition by J. B. CARTER. Rome: Loescher & Co. 1906.

AS WITH the widow's curse, so with the Roman forum; every visit produces a fresh supply of treasure. Its yield is no sooner thought to be exhausted than the thrust of a pick and the turn of a spade reveal some vestige which as likely as not overthrows theories held for centuries. That the Press can hardly keep pace with these discoveries is shown by the short history of this, the newest of handbooks on the subject. In June, 1904, Professor Huelsen, of the German School at Rome, brought it out for the use of those who, though not wishing on the spot to go deeply into the subject, are still anxious for more information than is conveyed by the curt statements of guide-books. Such was the reception given this little book that in less than a year a second edition was called for. This was supplied by Professor Huelsen, who enriched it with further illustrative material and brought it up to date in the way of the newest discoveries and investigations. The value of such a book to English visitors was the excuse for the present excellent translation, which, although based in general upon the second German edition, has been revised, altered, and brought still further up to date by Professor Huelsen himself, so that it may be considered the third edition of the work in eighteen months.

The methodical, practical treatment of the subject is what one would expect of its author. The history of the forum is minutely traced as the burial-place, the market-place, the centre of social life, the arena of political events, the site of memorial monuments, and, finally, the scene of destruction and ruin. The different periods of exploration are then dealt with, and the section plentifully illustrated with representations of the state of the forum from 1490 onwards. The greater part of the book is devoted to the monuments. They are taken topographically, not chronologically, and their life's history traced with

a confidence and precision which can only come of intimate knowledge.

The London Building Acts, 1894 to 1905. With Introductions and Notes, and the By-laws, Regulations, and Standing Orders of the Council, etc. By E. ARAKIE COHEN, M.A., of Lincoln's-inn, Barrister-at-Law. London: Stevens & Sons, 1906.

THIS work, which is an exhaustive commentary on the building law of London, is addressed not only to experts, but, being provided with introductions to the more important parts, will also enable those who are not conversant with the subject to get a succinct view of the London Building Acts. To have stated with clearness and precision in language which is intelligible to laymen the law in regard to so complex a subject is no inconsiderable achievement; and, so far as we can judge, Mr. Cohen has successfully accomplished that task. It is not to be expected that a first edition constructed on so ambitious a scale should nowhere present some inequalities; for example, to define one of four kinds of buildings which sect. 6, subsect. 5, of the Act of 1905 makes to be new buildings as "a building which has been altered in height so that the under (sic) surface of the floor of any story of which (sic) is more than 50 ft. above the level of the footway" (p. 238) is to make a statement which is at once ungrammatical and inaccurate; though it is only fair to say that in the course of a careful examination we have lighted on no other serious slip of this sort. We would also suggest that the expression "twenty-person" building, uncouth though it be, is to be preferred before "sleeping accommodation or employment" building, which Mr. Cohen uses "in the absence of one to serve the purpose better" although it is true he is "sensible of the clumsiness" of the latter expression.

These which we have called inequalities ought not to be allowed to obtrude so as to spoil the clear impression which we have formed of the finished work as a whole. The illustrative cases are really as illuminating, the notes are fully and accurately set out, the effect of judicial interpretations and the principles of decided cases are clearly expressed, and what will be of especial service to the practitioner, the by-laws and regulations of the Council under the Acts are fully cited, and the rules of procedure drawn up by the Tribunal of Appeal are given, together with the Council's requirements as to the provision of means of escape in case of fire in factories under the Factory and Workshop Act, 1901. We will close this review with a quotation, which may be taken as a typical example of the lucidity of Mr. Cohen's style, where, in commenting on the law relating to (a) "high" buildings and (b) "twenty-person" buildings, he says:—
"The law relating to existing buildings of both class (a) and class (b) differs from the law relating to new buildings, not only in that it comes into operation a year later than the latter, but also in that the burden of saving what the means of escape should be is transferred from the owner to the Council. The Council are required to serve notice on the owner (not vice versa as in the case of new buildings) of the building which they think is not provided with sufficient means of escape, and to specify in detail in such notice what they require the owner to do to provide such means of escape."

Baku: An Eventful History. By J. D. HENRY. London: Archibald Constable & Co., Ltd.; price 12s. 6d. net.

AS AN interesting and well-written account of the Russian oil fields this book is certainly worth reading. Some years ago Mr. Charles Marvin dealt with the same subject in a technical manner, and Mr. Henry, having recently returned from Baku impressed with the magnitude and importance of the work there conducted, now describes in popular style the origin, progress, and present position of the Russian oil industry. The neighbourhood of Baku, where the "eternal fires" were once regarded as the manifestation of a deity, has become the scene of most remarkable activity, and since hand-dug wells were superseded by deep borings the yield of the oil fields has increased immensely. After the first attempt made by Mr. Novossiltzev to drill with the aid of machinery about 1865 had resulted in the opening of the first "spouter," the hand-dug well soon became a thing of the past. Mr. Henry, like other visitors to Baku, was much struck with the spouters, and he devotes two

chapters of his work to some highly interesting and sensational details concerning famous wells of the kind. Perhaps the most striking and regrettable feature recorded in connexion with these is the enormous quantities of oil that have run to waste owing to the past lack of means for controlling the flow and of collecting the oil yielded during the first violence of the outburst. In the case of one well alone the waste was estimated at between 220,000 tons and 500,000 tons, Mr. Henry saying that "Thousands of tons were burned outside the district to get rid of it; thousands more were diverted into the Caspian; huge lakes of oil were formed near the well."

Nobel Brothers undertook the improvement of well drilling in the early seventies; in 1877 they laid the first pipe line for the transport of oil, and in 1879 built the first tank steamer for transport across the Caspian Sea. During the past quarter of a century this firm has drilled some 500 wells, from which about twenty million tons of oil have been raised. In 1904 they paid more than 1,000,000*l.* in railway and steamship freights, and 1,100,000*l.* in excise duties. These figures serve to give some idea of the oil industry, whose growth is fully discussed in Part I. of Mr. Henry's book. Part II. is entirely historical, and deals in a most graphic manner with the terrible features of the recent rising in the Caucasus. Part III. is chiefly concerned with the shipping trade of Batoum, the greatest oil port in the world. In spite of all precautions, fire is still the dreaded foe of the oil well sinker. As a general rule the oil bursts forth without warning, and a single spark is sufficient to start a fire, which extends to the oil-soaked ground, to reservoirs, tanks, derricks, and buildings. As the author says, "the belching forth of these fountains of liquid fire—the terrible roar of escaping gas, the short, sharp reports, the fierce flashes of blinding light, and the thick clouds of smoke, which roll upwards, fold upon fold, and shut out the sky—is a thrilling and appalling sight." Some of the most noteworthy fires which have occurred in the Russian oil fields—and probably the most appalling the world has ever known—are described in this book, which possesses much literary merit and commercial interest, although in no way to be described as a technical work.

Technical Dictionary in Six Languages.
Vol. I.: The Machine Elements and Tools for Working in Metal and Wood (825 illustrations). Edited by P. STREPNAGEL.
London: Archibald Constable & Co. 1906.

This dictionary is the first volume of a series intended to give, in English, French, German, Italian, Spanish, and Russian, the technical terms employed in connexion with all departments of engineering and architectural practice. Each volume will be devoted to one particular branch of work, the terms being classified according as they are of general, theoretical, or practical application, and to enable the user to find any term, an alphabetical index of words is given at the end of the book, together with a separate index in Russian. Vol. I. is of convenient size for use as a pocket dictionary, and, in addition to terms frequently used in metal and wood, working, it gives a large number of terms relating to the drawing office and employed generally in constructive work. With one or two exceptions the English terms are admirably stated—a feature not always to be found in dictionaries of the kind—and the utility of the work is much increased by the numerous diagrams and symbols printed in the middle of each page.

BOOK RECEIVED.

FIRE TESTS WITH FLOORS; Nos. 107 and 108 of British Fire Prevention Committee's publications.

INSTITUTE PREMISES, HARROGATE.—The New Park Institute and Adult School at Harrogate were opened a short time ago. The new building comprises a lecture hall, billiard room with two tables, reading room, bath rooms, etc. The total cost, including land, is about 1,300*l.* Mr. J. Allen was the contractor for the work, Mr. Brown, of Messrs. Bland & Bown, being the architect.

Trade Catalogues.

From the Carron Company, Carron, N.B., we have received a well-produced catalogue of cast-iron baths, lavatory-stands, and sinks, fully illustrated by half-tone blocks, some of which are also coloured. It is somewhat strange that, although fifty illustrations of baths are given, there is not one which shows fully the waste and overflow fittings in position. Two pages contain separate illustrations of taps, traps, standing wastes, etc., but sections of the baths showing the wastes and overflow fittings would have added very much to the value of the catalogue. Some of the lavatory stands are of a better type of design than usual, but even greater simplicity might have been studied with advantage, and it is surely high time that the "ornamental" supports for baths should be discarded in favour of something simpler and more appropriate.

The London Warming and Ventilating Company have published a catalogue containing illustrations of various adaptations of the "Senior" fire (Florence patent). One of the most important features of the firegrate is the firelump back, in which a flue is formed, commencing a little above the bottom grate and communicating at the top with the main flue; by means of a damper the back flue can be opened and the front flue closed, or *vice versa*. When the back flue only is open a quick draught is obtained, and the smoke from the surface of the coal is drawn through the body of the fire, and is partly consumed. After the fire has "burnt up," the main flue can be opened, and the grate is converted into a slow-combustion grate with a normal draught. The grates are made either with or without front bars, and with metal or glazed-brick surrounds. Nearly all the designs are simple, but not without character, and architects will certainly find the catalogue useful.

A supplementary catalogue has also been received from Messrs. E. H. Shorland & Brother, Manchester, and contains the latest designs of Shorland's patent "Manchester" grates and stoves and exhaust roof-ventilators. The grates and stoves are of the ventilating type, and are adapted for use in houses, schools, hospitals, and other buildings. The new designs are of simple character, tiles and glazed-bricks being freely used. The single and double open-fire stoves, with ascending or descending flues, deserve a special word of praise for their freedom from dust-collecting ornament; the sides and top are of tiles in an angle-iron framework, the top moulding being a small ogee around the top.

Messrs. Twyford's, Hanley, sent us some time ago a copy of their supplementary catalogue, Section A, which contains illustrations of sanitary appliances for schools, reformatories, and other institutions. There are some very good ranges of enamelled fireclay ("Adamant") lavatory ranges, with simple supports of cast-iron. The waste arrangements have been carefully considered. Among the other fittings are laboratory sinks, slop-sinks, wash-tubs, urinals, water-closets, and latrines, and foot, shower, and plunge baths.

The Nautilus Fire and Heating Company have sent us their 1906 catalogue, which contains a number of new designs of their well-known "Nautilus" grate and also of other heating and sanitary appliances now manufactured by the company. Attention may be drawn to the varied selection of fire-grates with and without front bars, of which the "Hearth" fire may be specially mentioned, and to the wood and iron mantels, some of which are of excellent design. Various kinds of stove are also shown, together with a number of kitcheners, fitted with the "Mermaid" boiler, which is an improvement on the ordinary types of domestic boiler. Some sanitary fittings are included, and an illustration is given of the "Simplex" water-softening apparatus. The catalogue contains a full index, and is much more comprehensive than the previous catalogues issued by the firm.

From the Phoenix Engineering Company, Chard, we have received a catalogue of the contractors' plant and municipal appliances manufactured by the firm. These include boilers, tanks, buckets, etc., for tar and asphalt, asphalted tools, mechanical mixers for tar macadam and concrete, road-sweeping

and scraping machines, gully-emptiers, watering and orderly carts, and other appliances for the making and maintenance of roads; pumps of various kinds, crabs, derricks, etc. The catalogue is fully priced and illustrated, and contains a complete index.

Messrs. Mellows & Co., Sheffield, have sent us their new catalogue containing complete illustrations of the patent "Eclipse" roof-glazing. This is adapted for either wood or steel bars, the upper surface of the wood and the whole of the steel being protected by a covering of "tin-lead." The catalogue contains illustrations of many large railway-stations and other buildings where this method of roof-glazing has been adopted, and a folding-plate is inserted giving details of the purlins, plates, etc., required in wood and steel roofs glazed on this system.

The Cydesdale Iron Foundry Company have sent us a copy of their new catalogue, consisting of about fifty separate plates, bound together by means of two screws and nuts. The advantages claimed for this method of binding are that sheets can easily be taken out to show to clients, and that new sheets issued by the firm can be inserted, thus keeping the catalogue up to date. On the other hand, the sheets are not paged, and an index is, therefore, impossible. The illustrations include inexpensive firegrates of various kinds, cast-iron and wood mantels, etc. Most of the designs are of a class more desired by the speculating builder than by the architect, but there are two or three exceptions, such as the hob-grate No. 394, even in this, however, the trail of the "New Art" is too conspicuous.

Messrs. John Bolding & Sons, in their "Supplementary Catalogue of Sanitary Appliances," show a number of "Commode" arm-chairs, valve and wash-down closets, stall urinals, lavatories, baths, etc. Special mention may be made of the fireclay plunge bath, sunk in the floor and fitted with a marble curb, and of the various spray and shower baths. The ingeniously-hinged "arm-chair" seat for a pedestal water-closet is also worthy of notice.

The Safety Tread Syndicate have sent us their new catalogue of Mason's patent non-slipping treads, which consist of ribbed plates of iron, steel, or bronze, having the alternate corrugations of dovetail section and filled with lead. The new pattern has deeper corrugations than the original design, and, therefore, wears longer. Mason's treads can be fixed on steps of wood, stone, or concrete, but "constructional treads" are now made, which are self-supporting, and can be built up to form straight or circular staircases. The same "non-slipping" surface is also adopted for area-gratings, man-hole-covers, coal-plates, etc.

Messrs. Millars' Karri and Jarrah Company have sent us a small illustrated catalogue of their karri and jarrah fencing and gates. The designs include post-and-rail fencing of various kinds, open and close park-pale fencing with sawn palings, military or pallisade fencing, and gates to match. The "ornamental" gates are not very pleasing, but, of course, other designs will be made to order. Karri and jarrah have obtained a good reputation for durability, and there does not appear to be any reason why they should not be extensively used for gates and fencing in this country.

The Richardson Electrical Company send us a book of numerous illustrations of their electric-light fittings, not all of equal merit; but some of them show good simple lines of metal design; the simple dies are the best. The "flounced" designs, as one may call them, with silk draperies, we do not like, but we suppose ladies will have them.

GOLF CLUB PREMISES, BOURNEMOUTH.—The new club-house and pavilion erected at Queen's Park, Bournemouth, by the Meyrick and Queen's Park Golf Club, Ltd., was opened recently. The architects were Messrs. Creek, Gifford, & Oakley, the builder being Mr. G. W. Meadus.

CHURCH RESTORATION, SANDBY, NOTTINGHAMSHIRE.—The western tower of the church of St. Botolph, at Sandby, is seriously dilapidated, Mr. C. Hodgson Fowler, F.S.A., of Durham, who has been consulted, proposes to shore up the tower and build two buttresses at the north-east angle. It will then be possible to take out the east wall and reconstruct the nave arch. Such other repairs as are required will then be done piece by piece. The total cost will be 1,200*l.*

Correspondence.

MUCH ADO ABOUT NOTHING.

Sir,—The members of the Institute's Registration Committee deserve credit and the thanks of the Profession generally for devoting so much valuable time and trouble to the work intrusted to them, but the result of it all is rather disappointing. The labour has been painful and prolonged, and the handling is such a very little one, that it is even with some difficulty that we are able to see it! For, after all, what do the recommendations of the Committee amount to but that the Institute should continue to act to what has done for many years, and as it does at present, as a learned society willing to give its diploma or certificate of efficiency to all who apply for it and prove their fitness by passing certain examinations? Then, it is proposed that the Institute should undertake the duty of declining architects to be competent to give no evidence of this by passing an examination. These would not become thereby members of the Institute, and if that body chooses to take the responsibility of giving such certificates there seems to be nothing in the Charter to hinder it doing so. In short, there is nothing to prevent these two methods of registration being thrown away.

Why should this prestige be thrown away? Why, above all things, should such a misnomer as "College" be proposed? The Institute never was a college, and never can be. The Royal College of Physicians probably was a college to begin with, although latterly only retaining one of its functions: that of examining. The idea of a rivalry between the two professions has been greatly exaggerated. There is practically none. I shall not waste time by saying more on this point, but will only ask, in passing, whether the greatest architectural works throughout the country have been designed by men who have passed the Institute's examinations, or by men who never did so—the majority of whom could not have done so had they tried.

But even if the majority day should ever come when the art of architecture shall be interfered with by statutory qualifications it may be safely asserted that the Institute will not be the only body empowered to conduct the necessary examinations, whether it changes its name or not, any more than the Royal College of Physicians is the only body retaining a degree of B.S. Degrees elsewhere, indeed, are much more highly esteemed in the profession, and in the event of registration being made compulsory, other centres for examination must be created in the provinces and in Scotland. Why not in Birmingham, Liverpool, Edinburgh and Glasgow, for instance? And even now, there is a flourishing architectural school, originated by Sir Rowand Anderson, and in Glasgow there is a school of architecture under the direction of Professor Bourdon of Paris, the diploma of which requires qualifications higher than those of the intermediate examination of the Institute. But a still lower standard of examination must suffice

for universal registration, or consequences will ensue which any thoughtful architect can foresee. What, then, has been gained by the Institute's intervention in this matter? Absolutely nothing. We are exactly in the old satisfactory position of having a door wide open for the admission of all who wish to obtain a certificate of fitness which is recognised by the public both at home and abroad. Recent discussion may serve to create interest and induce young men to seek admission, but no great accession to the number of Associates can be expected, I think, till two obstacles which at present stand in the way are removed. There can be no doubt that the payment of two guineas annually is a difficulty in the way of young men in the provinces at least.

Architecture is not a lucrative profession generally, and beginners—it may be for years—are frequently so situated that a contribution is apt to be burdensome, especially when they think that they get no equivalent for it compared with their fellows in London. It therefore seems advisable that the annual payment of Associates should, say, forty miles outside of London, be reduced by one-half, or better still, that annual payments should be compounded for by a single payment at first. Many young men would prefer this, as parents or guardians would probably pay this entrance-fee, especially if relieved of the heavy premiums for nothing, the continued exaction of which means an altered educational condition so scandalous. Although the time has fully come when this relic of the old system should be abolished, the Institute appears to lack courage to grapple with it—as it appears also to lack zeal to deal with the whole question of systematic education in a business-like way.

It is deplorable that the good work of the Educational Board should be shelved to give time for the discussion of such a comparatively frivolous subject as Compulsory Registration.

AN OLD FELLOW.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XV.

HYPERBOLIC LOGARITHMS: TABLES AND THEIR APPLICATION.

HAVING now before us a general review of the history and derivations of logarithms, it will be convenient to inquire into the manner in which logarithmic tables are presented for use and to compare some of the most generally published tables with the view of ascertaining their relative suitability for practical work.

The extracts given below have been selected so as to facilitate comparison, and to make intelligible the explanation of the manner in which the hyperbolic logarithm of any given number and the number corresponding to any given hyperbolic logarithm can be found.

Table VIII. is extracted from an eight-figure table of hyperbolic logarithms of numbers from 1 to 9,999, the extracts comprising the first eleven and the last ten lines.

The hyperbolic logarithm of 10,000, not given in this table, is $\log_e 10,000 = 9.21034038$. The value is easily calculated by the rule given last week that for each change in the position of the decimal point the value of the hyperbolic logarithm is increased by 2.30258509.

Hence we can compute the value of $\log_e 10,000$ from that of 1, 10, 100, and 1,000. Thus $\log_e 10,000 = 9.21034038$

$\log_e 10,000 = 9.21034038$
 $\log_e 100 = 4.60517019$
 $\log_e 10 = 2.30258509$
 $\log_e 1 = 0$

The slight inaccuracy of the first two results is due, of course, to the omission of decimal places in the hyperbolic logarithms of the lower numbers.

To Find the Hyperbolic Logarithm of any Number.

Rule (1).—The hyperbolic logarithm of any integral under 10,000 can be found by inspection of a table such as that illustrated in Table VIII.

Rule (2).—If the number be decimal or partly decimal, but including not more than four figures, the hyperbolic logarithm may be found thus:—

Find the logarithm of the figures as if they were integrals, subtract from it the logarithm of that power of 10 which contains one more figure than there are figures in the decimal part of the given number, and the remainder will be the required logarithm. If the logarithm of the power of 10 in question be greater in value than the logarithm of the four figures the positions of the numbers must be reversed in subtraction, and the remainder will be the required logarithm, but its value will be negative.

Example (1): Find the hyperbolic logarithm of 8.2.

Here $8.2 = \frac{82}{10}$

Therefore we have
 $\log_e 82 = 4.40671925$
 $\log_e 10 = 2.30258509$
and the required $\log_e 8.2 = 2.10413416$

Example (2): Find the hyperbolic logarithm of 0.82.

Here $0.82 = \frac{82}{100}$

Therefore we have
 $\log_e 100 = 4.60517019$
 $\log_e 82 = 4.40671925$
and the required $\log_e 0.82 = -0.19845094$

Rule (3).—If the number contains more than four figures the hyperbolic logarithm may be found thus:—

Multiply or divide it by such a power of 10 as will separate it into four integers and a decimal fraction. Then multiply the difference between the logarithm of the integral part and the logarithm of the next higher number by the logarithm of the next higher number: to the product add the logarithm of the integral part of the given number and the logarithm of the decimal part of the reduced number; finally, add to or subtract from the sum so obtained the logarithm of that power of 10 first employed, and the sum or remainder will be the required logarithm.

Example (3): Find the hyperbolic logarithm of 995682.

Here $995682 \div 100 = 9956.82$

TABLE VIII.—HYPERBOLIC LOGARITHMS FOR ALL NUMBERS FROM 1 TO 9,999. (Extract.)

Table with 10 columns (0-9) and multiple rows of hyperbolic logarithm values for numbers 1-9999.

Therefore we have
hyp. log. 9957 = 9-20603110 -
hyp. log. 9956 = 9-20593066
 0-00010044 ×
 0-82
hyp. log. 9956 = 0-0000823608 +
 9-20593066
hyp. log. 100 = 9-20601302 +
 4-60517019
 and the required *hyp. log.* = 13-81118321
 Example (4): Find the hyperbolic logarithm
 of 99-5682.
 Here
 99-5682 × 100 = 9956-82
 and we obtain, as in example (3), the value
 9-20601302, which in this case is the logarithm
 of the increased number.
 Therefore instead of adding we subtract
hyp. log. 100, obtaining
 9-20601302 -
hyp. log. 100 = 4-60517019
 and the required *hyp. log.* = 4-60084283

Although the logarithms found by the above
 method are not always correct in the last
 decimal place they are sufficiently accurate for
 all ordinary purposes.

To Find the Number Corresponding to any
 given Hyperbolic Logarithm.

Rule (4).—If the given logarithm be beyond
 the limits of the table add to or subtract from
 it the logarithm of such a power of 10 as will
 bring the given logarithm within those limits.
 Take from the table the number next below
 that indicated by the reduced logarithm; find
 the difference between the logarithm of that
 number and the reduced logarithm, also
 between the logarithm of the same number and
 the next higher logarithm, and divide the
 former difference by the latter difference.
 Append the quotient so obtained to the number
 first found, thus obtaining the number cor-
 responding to the reduced logarithm; divide or
 multiply it is number by that power of 10 first
 employed, and the result will be the required
 number.

The following examples show that this rule is
 really the converse of Rule (3).

Example (5): Find the number corresponding
 to the hyperbolic logarithm 13-81118321.
 Here we have

13-81118321 -
hyp. log. 100 = 4-60517019
 9-20601302 (a)
hyp. log. 9956 = 9-20593066 (b)
hyp. log. 9957 = 9-20603110 (c)
 Difference (a-b) = 0-00008236
 " (c-b) = 0-00010044
 Then as 8236 = 0-82 nearly
 10000

9956-82 × 100 = 995682 the required number.
 Example (6): Find the number corresponding
 to the hyperbolic logarithm 4-60084283.

(a) As this *hyp. log.* is within the limits of
 the table we take the number next below that
 indicated by the given logarithm and start
 by finding the differences as explained in
 Rule (4).

Thus
 4-60084283 (a)
hyp. log. 99 = 4-59511985 (b)
hyp. log. 100 = 4-60517019 (c)
 Difference (a-b) = 0-00572298
 " (c-b) = 0-01005034
 Then as 572298 = 0-5694
 100-034

∴ 99-5694 = the required number,
 but, as comparison with example (4) will show,
 the result is correct only to two places of
 decimals.

The result can be obtained more correctly
 by adding the logarithm of a multiple of 10 so
 as to conduct the working towards the end of
 the table where similar numbers are involved
 but containing more decimal places, and con-
 sequently where the differences between the
 logarithms are considerably smaller.

Thus by adding *hyp. log.* 100 we get
 4-60084283 +
hyp. log. 100 = 4-60517019
 9-20-01302 (a)
 Then *hyp. log.* 9956 = 9-20593066 (b)
hyp. log. 9957 = 9-20-03110 (c)
 Difference a-b = 0-00008236
 " c-b = 0-00010044 = 0-82 nearly
 ∴ 9956-82 + 100 = 99-5682 the required
 number.

Hyperbolic logarithms are employed in the

manner stated in the four fundamental rules
 given last week, as shown in the following
 simple example within the range of the extracts
 in Table VIII.

Example (7): Multiply 25 by 3-6.

Here
hyp. log. 25 = 3-21887582
hyp. log. 3-6 = 1-2803385
 4-49901437

By Table VIII, we find *hyp. log.* 4-49901437
 = 90, which is the required product.

It is unnecessary to give further examples
 as division, involution, and evolution can be
 performed with equal facility by following the
 other fundamental rules given last week.

Tables IX. and X. contain hyperbolic
 logarithms in the form usually given in
 engineering pocket-books.

TABLE IX.—HYPERBOLIC LOGARITHMS
 1-01 TO 10.

No.	Hyp. Log.	No.	Hyp. Log.	No.	Hyp. Log.	No.	Hyp. Log.
1-01	0-009	1-26	0-231	1-51	0-412	1-76	0-5653
1-02	0-0198	1-27	0-2390	1-52	0-423	1-77	0-5710
1-03	0-0266	1-28	0-2469	1-53	0-433	1-78	0-5766
1-04	0-0322	1-29	0-2546	1-54	0-438	1-79	0-5822
1-05	0-038	1-30	0-2624	1-55	0-443	1-80	0-5878
1-06	0-0583	1-31	0-2700	1-56	0-447	1-81	0-5933
1-07	0-0677	1-32	0-2776	1-57	0-451	1-82	0-5988
1-08	0-0770	1-33	0-2852	1-58	0-457	1-83	0-6043
1-09	0-0862	1-34	0-2927	1-59	0-463	1-84	0-6098
1-10	0-0853	1-35	0-3001	1-60	0-470	1-85	0-6153

9-16	2-2148	9-41	2-2417	9-66	2-2679	9-91	2-2935
9-17	2-2159	9-42	2-2428	9-67	2-2690	9-92	2-2945
9-18	2-2170	9-43	2-2438	9-68	2-2700	9-93	2-2955
9-19	2-2181	9-44	2-2449	9-69	2-2710	9-94	2-2965
9-20	2-2192	9-45	2-2460	9-70	2-2721	9-95	2-2975
9-21	2-2203	9-46	2-2471	9-71	2-2732	9-96	2-2985
9-22	2-2214	9-47	2-2481	9-72	2-2742	9-97	2-2995
9-23	2-2225	9-48	2-2492	9-73	2-2752	9-98	2-3005
9-24	2-2235	9-49	2-2502	9-74	2-2762	9-99	2-3015
9-25	2-2246	9-50	2-2513	9-75	2-2773	10-00	2-3025

TABLE X.—HYPERBOLIC LOGARITHMS
 1-10 TO 30-00.

No.	Hyp. Log.	No.	Hyp. Log.	No.	Hyp. Log.	No.	Hyp. Log.
1-10	0-0953	4-15	1-4231	7-20	1-9741	11-00	2-3979
1-15	0-1898	4-20	1-4351	7-25	1-9840	11-25	2-4201
1-20	0-2823	4-25	1-4469	7-30	1-9929	11-50	2-4430
1-25	0-3723	4-30	1-4586	7-35	1-9947	11-75	2-4636
1-30	0-4624	4-35	1-4702	7-40	2-0015	12-00	2-4849
1-35	0-5501	4-40	1-4816	7-50	2-0149	12-25	2-5052
1-40	0-6355	4-50	1-5041	7-60	2-0281	11-50	2-5252
1-50	0-8065	4-60	1-5261	7-75	2-0477	12-75	2-5455

3-50	1-2528	6-60	1-8871	9-75	2-2773	13-00	3-2189
3-60	1-2819	6-75	1-9085	9-90	2-2925	13-25	3-2581
3-75	1-3218	6-90	1-9315	10-00	2-3026	27-00	3-2958
3-80	1-3610	7-00	1-9459	10-25	2-3279	28-00	3-3322
4-00	1-3883	7-10	1-9601	10-50	2-3513	29-00	3-3673
4-10	1-4110	7-15	1-9671	10-75	2-3749	30-00	3-4012

An illustration of one useful purpose to which
 hyperbolic logarithms are applied in practice is
 given by the following formula for calculating
 the theoretical mean pressure of steam in an
 engine cylinder, where hyperbolic expansion of
 the steam is generally assumed

$$p_m = p_1 \left(\frac{1 + \text{hyp. log. } r}{r} \right)$$

where p_1 = initial absolute pressure of steam
 per sq. in., r = ratio of expansion.

Substituting values as below for a hypotheti-
 cal case we have

$$p_m = 80 \frac{1 + \text{hyp. log. } 4.3}{4.3}$$

$$= 80 \frac{1 + 1.4586}{4.3}$$

$$= 45.74 \text{ lb. per sq. in.}$$

UNBREAKABLE TIE-BARS AND AXLES.—The
 Farman Automobile Company, who are the
 patent proprietors of Col. Fox's unbreakable axle,
 mentioned on page 356 ante, point out that the
 wording in our paragraph "a steel bar surrounded
 by a series of other bars," conveys a wrong im-
 pression, the structure being a centre bar sur-
 rounded by tubes one within another which are
 welded by heat until they become one solid bar.
 The point of the invention, as we implied, is
 that faults are not likely to be found in the same
 position in any two of the tubes before welding.

Obituary.

MR. W. FRAME.—We regret to record the death
 of Mr. W. Frame, of Cardiff, architect to the
 Marquis of Bute. He was a native of Trowbridge,
 and received his professional education in the
 office of Mr. Pritchard, diocesan architect of
 Llandaff. In 1873 he obtained the Soanemedallion
 of the Institute of Architects, and subsequently
 the gold medal in architecture of the Royal
 Academy. When Burges undertook the restora-
 tion and partial rebuilding of Cardiff Castle
 for the Marquis of Bute he engaged Mr. Frame
 as his assistant, and on Burges's death he was
 engaged as architect to continue the work.
 Among his other works were the restoration of
 Falkland House, also for the Marquis of Bute;
 the restoration of Castell Coch in the Taff Valley;
 and the Cardiff Railway Company's offices at
 the Bute Docks.

MR. R. A. BRYDEN.—We have to record also
 the death, at the age of 64, of Mr. R. A. Bryden,
 of Glasgow, of which he was a native. He had
 carried on a considerable practice in Glasgow,
 latterly in partnership with his son, Mr. Andrew
 Bryden. Among the buildings which he carried
 out in Glasgow were the building containing
 the Christian Institute, the Bible Training
 Institute and the Young Men's Christian
 Association Club, and the new Maternity Hospital;
 he also made the plans for a hospital in course
 of erection in the Isle of Man. He was a member
 of the Wrights Incorporation of the Trades'
 Hall, and some twenty years ago served the
 office of Deacon. Mr. Bryden was elected a
 Fellow of the Institution of Architects in 1878.

MR. W. H. HOPKINSON.—The death took place
 on the 9th inst. of Mr. William Henry Hopkinson,
 Engineer, Surveyor of Highways, and Inspector
 of Buildings to the Keighley Corporation. The
 deceased, after completing his education at West
 Gower Academy, entered the office of the Borough
 Engineer and Surveyor of Halifax, where he
 remained for thirteen years, occupying the posi-
 tion of district or assistant surveyor. In 1883
 he was appointed Surveyor of Keighley, and in
 1892 the Corporation, having numerous important
 engineering works to carry out, appointed him
 to the position of Borough Engineer. His
 principal works under the Keighley Corporation
 were the construction of the Marley sewage
 disposal works, at a cost of about 30,000l., the
 construction of the filter-beds in connexion with
 the waterworks at Oldfield, at a cost of about
 10,000l.; and latterly the laying of the permanent
 way for the electric tramways. Mr. Hopkinson
 was an Associate Member of the Institution of Civil
 Engineers and a member of the Association of
 Municipal and County Engineers.

MR. GOLDSMITH.—The death, on April 14, at
 the Manor House, Pinner, Middlesex, is announced
 of Mr. William Goldsmith, aged 49 years,
 No. 40, Old Broad-street, E.C. Mr. Goldsmith
 was a Fellow of the Surveyors' Institution, and
 was elected an Associate of the Royal Institute
 of British Architects in 1882.

General Building News.

METHODIST SCHOOLS, BALLYNAFEIGH.—The
 new national schools in connexion with Ballynafeigh
 Methodist Church were opened recently. The
 buildings are of red brick, with artificial
 stone dressings. They provide accommodation
 for 300 pupils. The central hall with adjoining
 classrooms is the leading feature of the school.
 This hall is 30 ft. by 27 ft. wide, by 21 ft. high,
 and it can be enlarged to 45 ft. by 36 ft. by
 opening sliding partitions. Separate entrances
 are provided for boys and girls, with cloak-room
 accommodation adjoining each. The builder was
 Mr. Wm. Oliver, who has carried out the plans
 and specifications of the architect, Mr. James St. J.
 Phillips. The hardware, including the sprout-
 ing, patent fanlight operns, etc., was supplied
 by Messrs. A. & D. Wright; while the special
 glazed sewer pipes and sanitary appliances were
 supplied by Messrs. Jones Bros. The plumbing
 was done by Mr. Thomas Campbell, and the heat-
 ing by Messrs. Hayes & Rudkin. The cost has
 been about 21,000l.

BOARD SCHOOL, ABERDEEN.—A new school
 is to be erected by the Aberdeen School Board
 at Ruthrieston. The site has a frontage to
 Holburn-street and Riverside-road of about 240 ft.,
 and its total area is about 1½ acres. The building,
 which will be a three-story one, will have a total
 length of 150 ft. and a breadth of about 80 ft.,
 measuring 45 ft. by about 30 ft. There are the
 usual rooms for the staff near to the entrance.
 Also on the ground floor at the opposite end
 of the building is the boys' entrance, with

headmaster's-room and assistant masters'-room. On the south front is the girls' entrance with lobby leading to the staircase. There are two staircases, one for boys and the other for girls, leading to the upper floors. There are six classrooms on the first floor, providing accommodation for 364 pupils. A cloak room and teachers'-room are also provided, and also a combined hall and gymnasium for junior and senior pupils, of the same size as that in the infants' department. On the floor above are eight classrooms, with accommodation for 468 pupils. At one end of this floor is provided a cookery and laundry-room, with scullery accommodation, while at the opposite end is a manual instruction room with wood store. The staircases will be fireproof. The building is to be ventilated mechanically, and it will be heated by steam, generated by a Lancashire boiler in the basement. A house for the janitor, entering from Holburn-street, is to be provided. Playsheds will be erected in the playgrounds, and latrines provided for boys and girls and infants respectively. The architect's estimate of the total cost of the building, including the laying out of the site, the playsheds, furniture, etc., is 15,788. The contract for the excavations was secured by Mr. James Gauld, and the mason work by Mr. Edgar Gault. The school has been designed by Mr. J. A. Ogg Allan, the School Board Architect.

TWEKESBURY GRAMMAR SCHOOL.—The foundation stones of new buildings at the Grammar School, Twickenham, were laid recently. The new buildings, which are in Tudor style, were designed by Mr. W. Ridler, and are being erected by Messrs. Collins & Godfrey, at a cost of about 2,700. The ground floor will contain an entrance hall, chemical and physical laboratory, balance-room, classroom with laboratories and cloak-room. On the first floor will be a master's room, an art classroom, and a general classroom.

SECONDARY SCHOOL, URBIDGE.—A new secondary school is to be erected at Urbidge. The building will be situated at the end of the Greenway, near the Hilington-road. It will consist of class-room accommodation for 150 children, with science rooms, a large central hall—so arranged that for the present it can be used as an art room, and also as a dining hall—cloak-rooms and changing-rooms for the principal and secretary, and common room for the teachers. In order to reduce the expenditure, only one laboratory, with balance-room, has been provided, leaving as a future extension a second laboratory, a dining hall, and art room. In addition to the main school building, centres for instruction in cookery and woodwork are to be built as a separate block. The buildings will be constructed with red brick and stone. The roof will be covered with tiles. The plans for the work have been prepared by Mr. H. G. Crodhall.

Y.M.C.A. PREMISES, LEEDS.—New premises are being erected by the Leeds Young Men's Christian Association at the corner of Albion-street and Albion-place. The two principal fronts will be of dressed stone. In the basement there will be a gymnasium and various store-rooms and offices. On the ground floor, besides an entrance-hall, lounge, and staircases, five shops and several offices will be constructed. On the first floor a lecture hall, gallery, able to accommodate about 450 persons, will be the principal feature, and other apartments will be refreshment-room and buffet, reading-room, secretary's and clerk's offices, etc. On the second and third floors a meeting-room, library, writing-room, committee-room, classrooms, photographic and work rooms will be provided. The total cost is expected to reach 49,000. Mr. W. H. Thorp, architect, prepared the plans for the work.

ISOLATION HOSPITAL, BURSLEM.—A new infectious diseases hospital has been erected at Stanfield by the Corporation of Burslem. The main entrance is on the south side of the site, and is approached by way of the Havill-street and in immediate conjunction with this entrance. The blocks for the treatment of patients are grouped in the rear of the lodge. The general contractors for the erection of the hospital are Messrs. J. H. Broadbent & Sons, Burslem. Messrs. Douglas & Co. have executed the hot-air stoves, and Messrs. G. G. & Sons, Staffordshire Potteries Waterworks Co. have laid the water mains, and Mr. S. Barlow, of Burslem, has provided all water tanks and water supplies throughout the institution. The wall-fires and bedroom grates have been supplied by Messrs. Shaw & Adams, and the sanitary fittings by Messrs. Burslem, Messrs. G. Geet & Sons, of Stoke-on-Trent, have been entrusted with the furnishing of the hospital, which has been carried out to the satisfaction of the architect. Mr. W. Williams, of Ettrick, has carried out the levelling and road-making on the site. Messrs. Austin & Co., of Burslem, the boundary fences and gates, and the general laying-out of the grounds has been executed under the supervision of Mr. McPhail, the park superintendent. It is expected that

the total cost of the hospital, inclusive of the cost of the land, will be between 10,000, and 11,000. The whole has been erected from the designs and under the supervision of the architect, Mr. Reginald T. Longden, of Burslem. The clerk of works was Mr. Mark Simpson, building inspector to the Corporation.

GLASGOW POST OFFICE EXTENSION.—Additions from time to time have been made to the General Post Office in George-square, but these remedies for the congestion of traffic proved only temporary, and it was decided to remove the parcel-post work from the George-square building to a new building on a site in Waterloo-street, about half a mile westward. The new parcel-post office is situated on the north side of Waterloo-street, between Wellington and West Campbell streets, having architecturally-treated façades to all the three streets. The site, which is an island one, covers an area of 2,926 yds., and is entirely built over. Although the building is nominally only a three-story one, it rises to a general level of 90 ft. above the street pavement, this unusual height being the natural outcome of the large areas of the sorting halls, which necessitate ceilings 25 ft. high. The whole of the street floor, excepting a small portion at the Wellington-street end, where the Waterloo-street branch post office is to be housed, is occupied by one of these large sorting halls, together with a loading platform and covered wayway 180 ft. long, entering from Waterloo-street by several archedways. On the first floor, and immediately over this sorting hall, loading platform, etc., is another large sorting hall, with a floor area of 18,715 super. ft. The second floor is at present unoccupied. The walls are of local iron, floor to ceiling with ivory-white glazed bricks. The floors are of wood blocks. The street floor of the Wellington-street building will be used as an ordinary branch post office for general work, and the public entrance and the posting boxes are situate in Wellington-street. The walls of the main entrance porch will be lined with marble, and the floor will be of mosaic. Passing from thence through a pair of swing doors the public office will be entered—a chamber treated architecturally in fumed oak, a counter 54 ft. long, telegram writing tables, high wall-linings, screens, etc., with a panelled plaster ceiling and mosaic floor. Entering immediately off this room is a public telephone call office. A staff entrance and staircase at the north end of the Wellington-street front gives access to the five upper floors of this block, which are mainly occupied by the postal engineers' and other departmental offices, together with cloakroom and lavatory accommodation for the whole of the block, and staff, which are used for special occasions and combined with the dining-room is provided, with the necessary kitchen and servery adjuncts. A basement extends under the whole building, and is divided up for the various departmental stores, and the electric lifts run down to same.

The heating is to be on the low-pressure system, and the illumination on electric light. The three street fronts and the returns at the back lane are faced with a cream-coloured freestone from Northumberland on a high granite base, and the stonework is being treated with preservative solution to withstand the effect of the Glasgow atmosphere. The main front is divided into five large arches, each 32 ft. wide, and 22 ft. high, and supported at one end by a solid pedimented pavilion. The other fronts are on a similar scale. The building has been erected from plans prepared in H.M. Office of Works, Edinburgh, under the direction of Mr. W. W. Robertson, H.M. late Principal Architect for Scotland, and Mr. W. T. Oldrieve, H.M. present Principal Architect for Scotland, and it is under the supervision of the latter gentleman that the work is being carried out. The general contractors are Messrs. P. & W. Anderson, Glasgow, and the clerk of works is Mr. James Hislop. The cost will amount to about 80,000.

COUNCIL OFFICES, PONTYFRIDDE.—The new public offices erected in Gellwastad-road, Pontyfridd, by the Urban District Council, were opened on the 11th inst. by Sir Alfred Thomas, M.P. The new buildings, which are from plans by Mr. Henry T. Hare, accepted in competition, provide accommodation for the various departments, besides a council room, and ante-rooms, committee room, and chairman's parlour. The main entrance facing Gellwastad-road. The frontages are faced with local stone, with Forest of Dean dressings, and the roofs are covered with slates. The whole of the construction is fireproof, and the windows are fitted with iron casements, glassed with leaded lights, those in the council chamber being of stained glass bearing various coats of arms. The stained glass bearing various coats of arms, the windows of the council chamber being provided by special radiators. Ventilation is provided by electric fans. Mr. C. Watkin Williams was contractor, the approximate cost being 16,000.

PUBLIC LIBRARY, TEDDINGTON.—A new public free library has been opened at Teddington. The building was erected from designs prepared by Mr. H. A. Cheers, architect.

NEW STANDS, CATERBRICK BRIDGE RACE-COURSE.—The new county and grand stands (which are to replace the old structure) have just been completed. The architects are Messrs. Mangnall & Littlewoods, of Manchester, the contractors being Messrs. R. Blackett & Son, of Greenocroft. The size of the county stand is 88 ft. by 35 ft., and it accommodates about 1,526 people. The grand stand is 65 ft. by 54 ft., and accommodates more than 936 people. Red-tiled roofs entirely cover the whole area of both stands. The walls are of local brickwork. Under the county stand are the new quarters for the jockeys and gentlemen jockeys, weighing-room, press-room, clerk of the course, and lavatory, etc. Sir John Lawson has a separate stand on the county stand, with a staircase leading from the paddock. This also leads to a roof stand for the use of trainers and the press. Under the grand stand is situated the luncheon-room, refreshment-room and kitchen. A new paddock, much larger than the old one, has been laid with new gravelled walks. The old building, in which was situated the jockeys' quarters and stewards, is to be converted into police quarters, telegraph-office, and lavatories, etc.

BUILDING IN BOURNEMOUTH.—Since 1899 there have been 2,156 new houses put up in the borough of Bournemouth, and in addition 742 large additions made to stables, workshops, etc., a total of 2,936. In new houses alone the yearly totals are in 1899, 150, then in succeeding years 174, 200, 294, 436, 440, and 479 in 1905.

Stained Glass & Decoration.

PRESENTATION COMMUNION-TABLE.—A new communion-table has just been given to the parish church of St. Paul, Leith, by a member of the congregation. The design of the table is Renaissance in character. Upon a plinth and caps supporting a moulded table-top of marble 6 ft. long by 3 ft. 3 in. in height. In the front, between the plasters, a panel is formed which contains the sculptured representation of Leonardo Da Vinci's picture of the Last Supper, and on the treze above, in gilt letters, are the words, "This do in remembrance of Me." The material is English coloured alabaster, the sculpture being pure white, and the work was executed by Mr. W. Birnie Rhind, R.S.A., Edinburgh.

Foreign.

FRANCE.—The new Metropolitan line "No. 2 Sud" at Paris is to be opened at the end of this month. It is on a viaduct from Passy to Rue de Vaugirard, and there is a tunnel as far as Place St. Jacques. From that station it is a high level line to Rue Corvisart and the Seine. Industries is to be held from June to October in the conservatory on the Cours la Reine at Paris. The seventy-third session of the Congrès Archeologique de France will be held in May at Careassonne and Perpignan. A Departmental Committee has been formed at Chambéry to protect from injury the monuments and picturesque sites of La Savoie. The Municipal Council of Paris has voted a sum of 128,000 francs for various works in connexion with the Petit Palais, especially the construction of some large windows and skylights to give more light to the galleries of pictures. The Chamber of Deputies, before separating, voted the cession of the Caserne Napoleon to the City of Paris, in exchange for certain properties in the Rue Oudinot, where the Ministry of the Colonies is to be accommodated. The Caserne Napoleon will be made use of as an annex to the Hotel de Ville. The annual exhibition of Pastellistes has been opened in the Georges Petit Gallery at Paris. It includes works by MM. Bernard, Gaston La Touche, Vêler, Dagnan-Bouveret, and other well-known artists. The Institute of France has just decided on the distribution of the prize fund of 30,000 francs left by M. Debrousse. Among the beneficiaries are two architects, M. Bigot, who is in charge of the excavations in the Circus Maximus at Rome, and M. Prost, for his work of restoration at S. Sophia, Constantinople. A monument to Alphonse Karr was inaugurated last Sunday at Saint Raphaël. M. Maubert is the sculptor; and a monument to Jeanne d'Arc has been inaugurated at Mars-la-Tour, the work of M. Robertson as sculptor; the pedestal, in the blue stone of Belgium, has been designed by M. Nicolas. The death is announced, at the age of seventy-three, of M. Emile Gerspach, former Director of the Gobelins, and founder of a School of mosaic work. He was the author of numerous publications

on subjects connected with art, among others a work on Mosaic, and one on Coptic textiles. He had long been known as a contributor to artistic magazines. He had been created Chevalier of the Legion of Honour.

SOUTH AFRICA.—Rough sketch plans of a new market house next the Kazerne have been prepared. The estimated cost of the undertaking is 71,500*l.*—A new hotel for Messrs. Lewis & Marks, to cost 13,100*l.*, is to be erected in Pretoria.—The Harrismith municipality is about to raise a municipal loan of 30,000*l.* for the building of a town hall, a market hall, and half the cost of a bridge over the Wilge River.—In Cape Town the foundation stone has been laid of a new block of buildings for the Norwich Union Life Insurance Society, the architects of which are Messrs. MacGillivray & Grant, and the builders Messrs. Rochelle & Smith.—A conference of the Master Builders' Federation was opened in Pretoria on March 19 and was attended by delegates from all the principal towns of the British colonies in South Africa, with the exception of Bloemfontein and Kimberley.

Sanitary and Engineering News.

ENGINEERING STANDARDS COMMITTEE.—The Secretary of State for India in Council has nominated Mr. A. Beeston, C.S.I., to represent the India Office on the Sectional Committee on Locomotives (Chairman Sir Douglas Fox), in the place of Sir Frederick R. Upcott, Chairman of the Indian Railway Board. The Council of the Institution of Naval Architects have nominated Mr. Sydney W. Barnaby, of Messrs. John I. Thornycroft & Co., to represent that Institution on the Sectional Committee on Screw Threads and Bolt Gauges (Chairman Mr. H. P. Donnan, Chief Superintendent of the Ordnance Factories), in the place of Mr. McFarlane Gray, resigned.

ROYAL SANITARY INSTITUTE.—The following is the list of members and associates elected this month:—*Members:* J. E. Doré (City Sanitary Engineer, Montreal); J. E. Farmer, (Mitcham); S. S. Gettings (West Bromwich); Dr. Laberge (Bacteriologist to the City of Montreal); F. Longland (Swindon); E. Marceau (Principal, Ecole Polytechnique, Montreal); Lieut.-Col. Melville (Wokingham); E. M. Modi (Bombay); F. R. Ryman (Borough Surveyor, Stamford); W. C. Sillitoe (Ealing). *Associates:* T. Baker (Aldwyck, W.C.); J. P. C. Bowden (Bristol); T. M. Draper (Manchester); W. Heald (Blackburn); C. Killington (H.M. Naval Yard, Wei Hai Wei); C. A. N. Ludlam (W. Kensington); G. E. Marlow (Desborough); H. Montgomery (Cape Town); A. W. Potter (Bristol); C. M. Robinson (Finchley, N.); J. I. Smith (Hounslow); Alice Vickers (Sparbrook, Birmingham); S. Wallis (Kettering); W. Whatley (Kidderminster); S. Wilmot (Nottingham).

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. Thos. Moody, F.S.I., has removed his offices from 30, Cockspur-street, to 2, Haymarket, S.W.

"ETERMIT" ASBESTOS SLATE.—The material designated by this name is made by the Austro-Hungarian Asbestos Cement Company and supplied in Great Britain by Messrs. G. R. Speaker & Co. So far as can be judged from samples we have received, the tiles and sheets are identical in composition and in other respects with the asbestos cement tiles noticed in our issue of March 31st last, and the general remarks there made are equally applicable to the "Eternit" slate. Our readers may perhaps be interested in the following data taken from a report on the latter material by the director of the Austrian Royal Technical Institute:—

Tensile strength: 5,781 lb. per sq. in.
Crushing strength: 6,281 lb. per sq. in.
Coefficient of elasticity: 9,555,923 lb. per sq. in.
Specific gravity: 2.40.
Permeability: Impermeable to water at 15 lb. per sq. in. Duration of test, one and a half hours.
Porosity: 62% per cent., same as natural slate.
Heat conductivity: Cork = 0. Eternit = 13.9. Welsh slate 16.4.

GAS V. ELECTRICITY.—The preference recently given to gas as a material of illumination by public authorities and important companies clearly demonstrates that electricity has a very formidable opponent. It is stated that the London Brighton and South Coast Railway have saved more than 1,000*l.* a year at Victoria Station by the substitution of high-pressure gas lamps for inefficient arc lights, and that it is believed the extension of the same system to the enlarged station, involving an increase from 8,000 candle-power to 40,000 candle-power, will reduce the total cost of lighting to 200*l.* a year less than the amount formerly paid for electricity in the old part of the station. Encouraged by the

success attained at Victoria, the North London Railway have adopted high-pressure gas for the illumination of Broad-street Station, with most satisfactory results. These examples are only two out of many others showing that far from being in a state of decline, the gas lighting industries have taken a new lease of life, owing to the remarkable improvements that have been developed within the last few years.

A NEW TURBINE POWER-HOUSE.—In respect of mechanical equipment, the Williamsburg generating-station built for the Brooklyn Rapid Transit Company represents a radical departure from the practice followed in the great power-houses of New York. Instead of reciprocating engines, nine turbo-generators of the Parsons-Bullock type will be installed, the largest of these having a capacity of 9,000 h.p. An indication of the saving effected in the cost of the building is given by the statement that the floor space of the Williamsburg station represents less than two-thirds of the area that would have been required for reciprocating engines. The saving in the cost of the site must be even more considerable in a district like Brooklyn, where the value of land is extremely high.

AUTOMATIC TRAP-DOOR OPENER.—Messrs. J. H. Heathman & Co. have designed an automatic trap-door opener to comply with the London Building Act (Amendment Act), 1905. It consists of a lever pivoted (near the middle of its length) on a stud fixed to the frame under the trap-door; a counterweight is attached to one arm of the lever by an adjustable arrangement, which allows the counterweight to be fixed at the required distance from the pivot or fulcrum to counterbalance the weight of the door. The other end of the lever is pivoted to a second bar, the upper end of which works on a pivot attached to the trap-door itself. When the door is shut the two bars form an acute angle, but when the fastening of the door is released, by means of a chain and pull, the counterweight depresses the end of the lever, and raises the other end, by which in turn the second bar and the trap-door are raised. The sketch and description which have been sent to us do not explain how the door is closed again.

PRESTO COMBINED LADDER AND TRAP-DOOR.—As a convenient means of complying with the requirements of sect. 12, clause B, par. (b) of the London Building Acts (Amendment Act), 1905, the invention now being applied by the Presto Combined Ladder and Trap Company quite deserves the attention of architects. The apparatus consists of a hinged trap-door, suitable for covering an opening in a flat roof, an extensible ladder designed on the principle embodied in "lady ladders" and levers connecting the door with the ladder. The upper end of the ladder is hinged to the side of the trap framing opposite to that on which the door is hung, and the levers are arranged in such manner that when the free end of the ladder has been disengaged from a spring clip it swings downward and opens the trap-door upwards. The ladder begins to open as soon as the horizontal position is left, and as its lower extremity reaches the floor below by a gradual movement which is prevented from becoming too rapid by the fact that the trap-door acts as a counterpoise. As ceilings are usually too high to be reached by a person of ordinary stature, a "long arm" is provided for disengaging the end of the ladder from the spring clip, and the same instrument is employed for securing the ladder after it has been pushed up by hand as far as can be conveniently reached, the upward movement of the ladder having the effect of closing and securing the trap-door. The ladder is built of stamped steel, with steel bolts at the joints. There is therefore no reason to doubt its strength, and being light it can be very easily manipulated. When out of use the ladder occupies the space below the trap-door, and requires a depth of only 15 in. between the underside of the door and ceiling level. For the sake of appearance the trap-door can be fitted in the ceiling and worked automatically with the apparatus, and for the purpose of assisting women and children to step from the top tread of the ladder to the roof above, a pivoted hand-post can be fitted at the upper extremity of the ladder and automatically elevated or lowered as the ladder is drawn down or pushed up. Having inspected an installation of the apparatus at the makers' works, we are satisfied that it fully complies with the demands of the new Building Act, and represents a thoroughly practical idea. It ought to be mentioned that the trap-door cannot be opened from the outside, a point of some importance to tenants who would naturally look with disfavour upon any device likely to facilitate visits of unorthodox character to their premises.

VICTORIA AND ALBERT MUSEUM: RECENT ARCHITECTURAL ACQUISITIONS.—In the North Court have just been deposited Mr. J. H. Fitzhenry's gift of specimens of French architectural art consisting of a highly enriched Renaissance canopy from the church of St. Etienne du Mont, Paris; a fragment of an arch-soffit from Guillaume Admiral de Bonnavat's chateau, temp. Francis I.; part of a dormer-window bearing that monarch's

cognisance of a salamander in flames; and a whole dormer-window from Jehanne de Belzac's chateau de Montal near Saint Crés. The latter bears the motto "plus d'espoir" and two busts with the figure of a headless warrior on the pediment, the Belzac and Montal coat-arms are carved below, and there is a sculptured frieze of armorial torsos, and scroll work around a cartouche. Another fresh exhibit is a cast of Peter Visseher's bronze monument, 1497, for Archbishop Ernst of Magdeburg, executed in the prelate's lifetime; for the Art Library have been collected a large number of early illustrated books upon architecture.

CONSISTORY COURT OF LONDON.—Dr. Tristram, K.C., Chancellor of the Diocese, has agreed that faculties should issue in respect of the churches of St. James, Upper Edmonton, and St. Saviour in Eton-road, South Hampstead. In the latter case Messrs. Caröe & Passmore, architects to the Ecclesiastical Commissioners, have prepared plans for certain alterations and improvements at an estimated cost of 4,600*l.*, of which about 4,500*l.* are already subscribed. The new works comprise an extension of the foundations, 1497, for a strengthening of the chancel 10 ft. eastwards with a strengthening of the foundations at that end which is in a very dangerous condition and stands upon shifting soil; an enlargement of the vestries; a chamber for electrical organ-blowing apparatus beneath the clergy vestry; removal of the choir vestry west window to the south side of the south chancel aisle; a heating chamber under the two new windows in the chancel, etc. The church was built in 1856 for 750 sittings after E. M. Barry's designs in the Early English style, and Messrs. Clayton & Bell decorated the chancel twenty years afterwards. Large sums have been expended from time to time in strengthening various parts of the fabric, and Messrs. Caröe & Passmore consider that it is essentially necessary to strengthen the foundations to secure the safety of the east end.—St. James' Church, Upper Edmonton, built in 1849-1850 for 625 sittings, was designed by Ellis after the Early English style; the new works will be executed under Mr. Edward B. Ellis's direction, and superintendence. The faculty relates to repairs and improvements of the church, churchyard, and vicarage, and a rebuilding of the wall and piers and providing new gables for the frontage to Fore-street. The frontage of some 160 ft. is to be set back for a widening of the street for an authorised tramway line; the Edmonton Urban District Council will pay the sum of 500*l.* and costs in compensation, and 500*l.* of the money to be applied to the purposes we mention. The organ, by Bishop, was originally built for the London Tavern in Bishopsgate-street.

PETROL ELECTRIC SETS.—A difficulty is often experienced by the owners of motor-cars, especially in country districts, of getting their ignition accumulators charged. Occasionally the engineers who undertake motor-car repairs will do it at a reasonable cost, and so will a few electric supply stations. In many parts of the country, however, the want of facilities has to be taken seriously into account when considering the advisability of keeping a motor-car or bicycle. Messrs. R. J. Nicholson & Co., of Cannon-street, Manchester, have sent us a pamphlet describing their "ideal" petrol-electric sets, which are designed to meet this difficulty. They recognise the necessity of providing a simple petrol engine and dynamo which will stand the roughest usage and run for many hours without attention. In addition to charging the ignition accumulators, these sets can be used to light up the garage and workshop, as the smallest dynamo given in their list lights 16 eight-c.p. lamps. They also provide a larger combined engine and dynamo for house-lighting, but in this case accumulators are necessary and more skilled attendance is required.

THE LEGAL ASPECT OF BUILDING CONTRACTS.—Mr. James Cameron, solicitor, secretary of the Scottish Building Trades Federation, read a paper on the III inst. in the Building Trades' Exchange, George-street, Edinburgh, to a meeting of the Edinburgh Building Trades' Exchange, and the Edinburgh, Leith, and District Building Trades Association, of which two societies he is also secretary. Mr. Patrick Knox presided. The lecturer dealt with "The Legal Aspect of Building Contracts," and in the course of his paper he emphasised the points to be kept in view when tendering. He commented on the inconvenience to which builders were sometimes put when they could not get a certificate after the work was done, and when they had often to wait for six or twelve months, and sometimes more, before they got a final settlement. With regard to the arbitration clause in a building contract, he said that an architect acting as arbitrator must honestly and impartially exercise the quasi-judicial functions entrusted to him. The almost autocratic power put into his hands under the usual terms of a building contract had often given rise to complaints on the part of builders. The speaker's suggestion that justice would be done, a better feeling promoted, and more satisfaction given to builder and architect alike if the architect were a neutral party mutually agreed upon.

otes of thanks to the lecturer and the chairman terminated the meeting.

PAVING DISPUTE, SOUTH SHIELDS.—A Local Improvement Board inquiry was conducted by Mr. Boulnois in the Town Hall, South Shields, on the 19th inst., relative to a dispute which has arisen in connexion with certain street paving in the borough. The appellants were Mr. Thomas Banks, a builder, who was represented by Mr. Hope (Sunderland), and the Town Clerk (Mr. J. George Hayton) was present in the interests of the South Shields Corporation. Mr. Hope stated that the Corporation acquired the Fairles Estate for the purposes of public improvement, and the surplus land in connexion with this estate was bought from them by Mr. Banks. In preparing his plans for the streets, he took into consideration the cost of the making of them, so as to calculate the result of his investment. At that time he had no notice that the requirements for paving would be any other than the ordinary. After he had commenced building operations, Mr. Banks received certain notices from the Corporation re paving, which he considered to be according to the recognised method of the paving of private streets, which was by chip blocks. That was according to the specification served upon his client in November, 1903. The Corporation afterwards let the contract on specifications other than Mr. Banks had received notice of. His client complained, after he had been served with new notices, but the Corporation adhered to the amended specifications. His client estimated that the increased expense which would be incurred by reason of the change from chips to sets, would be 92s. or 2s. per square yard. The Corporation estimated it to be 67s. or 1s. 3d. per square yard. The Town Clerk spoke on behalf of the Corporation, contending that it was Mr. Banks' duty to inquire as to what was the scope and jurisdiction of the Corporation under the Public Health Acts, in the matter of paving. Had he done so he would have ascertained that sets were provided for. The Borough Surveyor had been serving the Council to do so for years, and it was no sudden inspiration on the part of the Committee. He did not agree that the Corporation should have issued notices publicly announcing the new departure. The inquiry afterwards concluded, and the inspector will make his report in due course.

IMPROVEMENTS, NEWCASTLE-ON-TYNE.—On the 9th inst. an inquiry was held at Newcastle Town Hall by Mr. H. Percy Boulnois, M.Inst.C.E., as Inspector of the Local Government Board, under an application by the City Council for leave to borrow 7,665*l.* for works of street improvement, and 535*l.* for the provision of a new boiler and fittings at the Northumberland Baths. The Town Clerk explained that the sum required for street improvements was made up as follows:—Neville-bridge, wood paving, 2,215*l.*; Stowell-street, granite sets, 1,000*l.*; portion of cost of new road at North Shields, one-half of which is to be paid by the North Eastern Railway Company, 865*l.*; Barrack-road, lowering of footpaths, etc., 3,740*l.* Mr. Kirkpatrick, City Engineer, gave the details of the various improvements.

NORTH STAFFORDSHIRE BUILDERS' ASSOCIATION.—The annual dinner of the North Staffordshire Builders' Association was held recently at the North Staffordshire Hotel, Stoke. The President (Mr. John Gallimore) presided, and the company included the Chief Bailiff of Tunstall (Alderman Heath), the Chief Bailiff of Newcastle (Mr. A. Cotton). Mr. Bennion proposed "The Local Governing Bodies," to which the Chief Bailiff of Tunstall replied, in proposing "Architects and Surveyors." Mr. Broadhurst said the building trade was in a critical condition. He thought the district was well served with architects. Mr. Scrivener, in reply, cited as proof of the disinterestedness of the men on local authorities the fact that so many bodies, by getting elected to these bodies, place themselves outside the possibility of doing a great deal of work. Mr. Scrivener deplored the slackness in the building trade. He knew of one town where not a single architect had got a job in his office. Messrs. Longden and Tindall also responded to the toast. "The North Staffordshire Builders' Association" was proposed by the Mayor of Newcastle. The building trade, he observed, was a very important one. A large amount of capital was invested in it, and the outcome of its exercise was the employment of a very large amount of labour. The building trade, he should imagine, was the first to feel any depression, but it was also the last to feel any improvement. He was glad to think that the pottery trade had very perceptibly improved during the last twelve months, and was still improving. As a natural outcome of other trades, including that of builders, should also improve. He said the building trade had passed through a period of five years' depression altogether unprecedented in its annals, and, unfortunately, he saw no immediate signs of revival. During the past twelve months they had had no labour

troubles. At the present moment they had the question of trades unionism in the forefront of practical politics. It was a lamentable fact, discussed by many builders' associations throughout the country, that during the last twenty years whilst the cost of labour had increased, efficiency in labour had not increased in the same ratio. It was singular that the trade unions in the building trade had been alone in not requiring efficiency from operatives. The building trade, unlike many other trades, was universal; it paid between one and two millions a week in wages, and it was a melancholy fact that it had no representation in the House.—Mr. H. Howlett proposed "The Visitors," which was acknowledged by Mr. H. Barrett Greene.—Mr. William Grant proposed the health of "The President," who, in reply, said Labour members and trade unions had come to stay, and the unions set builders an example of the results of combination. Touching on the Trade Disputes Bill, Mr. Gallimore said he thought it wrong that trade union funds should be entirely immune, and he thought the principle would never carry because it was wrong. The health of Mr. Harris was also drunk.

EUREKA GREEN SLATES.—Messrs. Roberts, Adlard, & Co. send us some specimens of this slate, which is of a fine green tone, and also an old specimen which had been for thirty years on the roof of St. Emanuel's Church, Ridgway, Wimbledon, and was taken off in the course of making some repairs to the roof timbers. Messrs. Roberts, Adlard, & Co. send this, we understand, in disproof of an assertion that their green slates change colour. We can hardly say that the specimen sent us has not changed colour to some extent, but it has kept its colour quite as well as could be expected after thirty years' exposure. The new specimens sent show an excellent slate, not too thin, and with a good sound metallic ring.

THE VAGARIES OF LIGHTNING.—At the monthly meeting of the Royal Meteorological Society on Wednesday evening, the 18th inst., at the Institution of Civil Engineers (Mr. R. Bentley, President, in the chair), Mr. Alfred Hands read a paper on "Some So-called Vagaries of Lightning Reproduced Experimentally." He said that lightning is an electric discharge, and as such it should act in accordance with the laws that are known to govern the subject. We have doubtless much to learn yet as regards electricity, but even though fresh facts and laws may be discovered, they can scarcely be in direct opposition to those already known, and therefore if an occurrence does not appear to accord with our knowledge, we should try and fathom the mystery, and not dismiss it as a vagary. The author, in the course of an extended investigation into the effects of lightning, has come across many cases that have been called vagaries, but which on a close inspection have proved to be but ordinary only in the erroneous way in which they were described, and had they been correctly reported would have appeared perfectly consistent with preconceived ideas—in fact, could have been foretold in every case if the conditions that led to those effects had been known before the events occurred. The author reproduced experimentally several so-called vagaries of lightning, showing by means of rough models the conditions under which they occurred.

Capital and Labour.

ABERDEEN PLUMBERS.—The operative plumbers of Aberdeen have submitted to the employers a proposed alteration of the by-laws affecting the trade. At present the hours are nine per day for eight months, and eight per day for the remaining four, or winter months. The suggestion is that the hours be eight per day all the year round, and the rate of pay 9*d.* per hour.

Patents of the Week.

APPLICATIONS PUBLISHED.*

2,003 of 1905.—R. LLOYD: *Hods as used in Building and like Apparatus.*

This relates to a metal connexion or frame for securing the shaft to the box of a hod, made out of sheet steel, the steel being first cut to a suitable shape so as to form a depending stem and arms and then bent or flanged round its edges so as to impart rigidity and strength.

7,280 of 1905.—M. WHITAKER and WHITAKER BROS., LTD.: *Excavating Apparatus.*

This relates to an excavating apparatus, consisting of a steam crane navy and a transporter,

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

combined, wherein the jib of the transporter is pivotally attached to the carriage of the navy and supported on a main pillar or frame adapted to run on a base rail.

16,319 of 1905.—H. McCANN: *Means for Moulding Concrete and like Walls or Parts of Buildings, Structures, or Foundations in situ.*

This relates to means for moulding concrete and like walls, or parts of buildings, structures, or foundations *in situ*, and consists of the arrangement of sets of box plates, each set comprising a plurality of plates connected together in alignment by connecting bolts or other fastenings, and means for holding the two sets together in parallel relation.

18,240 of 1905.—W. WARNER: *Machinery for the Manufacture of Paving Blocks, Slabs, and Tiles.* This relates to machinery for the manufacture of paving blocks, slabs, tiles, and any form of paving made from asphalt and town's refuse clinker, and consists in the use of hardened steel wearing plates riveted to the sides of the mould, and the use of ratchet gear and cooling trough in combination with the conveyor for cooling the blocks.

20,229 of 1905.—W. UWINS: *Drainage Gully and Interceptor.*

This relates to a gully or interceptor, comprising a trap of substantially U-shape and having an inlet adapted to be closed by a float in case of back flow, the arrangement of an enlarged chamber and well, whereby the float is guided and prevented from impeding the normal flow or from being washed into the outgo, while also minimising the risk of accumulation of soil behind the float.

20,237 of 1905.—F. MELLAUX: *Method for Imbedding Railway Rails in Concrete Asphalt Pavement or in any other Pavement Construction of Plastic Materials.*

This relates to a method of imbedding railway rails at the joints or other parts or in their entire length in asphalt pavement upon concrete or other pavement formed of plastic material, consisting in that recesses with smooth walls are formed on each side of the rails, and when filling the spaces under the rail head with wood blocks or the like, the said recesses are filled with blocks of concrete or the like, which reach up to the end side of the asphalt or other pavement which is then laid over such blocks up to the rail head.

5,872 of 1905.—L. A. DREYFUS: *A New Paint.*

This relates to a cold water paint composed of a basic material, binding or adhesive material, a non-volatile petroleum, and a volatile solvent of the petroleum, with or without colouring matter. These ingredients are placed in a mixer and thoroughly mixed into a homogeneous mass. They are then preferably brushed through a suitable sieve to produce a uniform and fine powdered product. This product, although not absolutely dry, is nevertheless such that it permanently maintains a substantially dry condition, so that it may be indefinitely stored, handled, and used, as well-known dry powdered paint compounds now are.

6,014 of 1905.—E. R. A. MATTHEWS: *Air Heating Arrangements for use in connexion with Domestic Fireplaces.*

This relates to a domestic fireplace, and consists in the combination with a "well" or "half-well" hearth, of an air heating box, arranged underneath the said hearth within the influence of the heat conducted therethrough, and having at its opposite ends an air inlet and an air outlet adapted to admit of the connexion thereto of air passages which are disposed outside the brick-work of the fireplace, so that both the box and its passages are isolated from direct contact with the fire, smoke, and products of combustion.

8,260 of 1905.—J. ECKERSLEY: *Window Sash Fastener and Lock.*

This relates to a window sash fastener and lock, wherein a locking arm pivoted to one sash is drawn across the sashes and passes over a catch plate attached to the other sash, and consists in the provision on the catch plate of a spring controlled tongue to engage with a notch in the locking arm and retain it until released by a key acting on the spring-controlled tongue, the locking arm having a slot across its width to engage the corresponding cross sectioned catch plate.

12,799 of 1905.—C. SNOWELL: *Sliding Bolts.*

This relates to a sliding bolt, and consists in the combination with a front plate, having guides and slot with recessed ends, of a bolt having at its rear end a central opening, slots or grooves formed therein, and a lever having crank pins formed thereon operating in said grooves.

13,419 of 1905.—E. T. HELME: *Doors of Chambers Employed for Hardening Bricks and the like.*

This relates to doors of chambers for hardening bricks and the like, and consists in the combination with the mouth of the chamber of a framework built up in parts, and consisting of two vertical plates at a suitable distance apart and

PATENTS.—Continued on page 449.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv, vi, viii, x.; Public Appointments, xvii.; Auction Sales, xxvi. Certain conditions, beyond those given in the following information, are imposed in some cases, such as; the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

Competition.

MAY 5.—SUNDERLAND.—LIBRARY.—Sunderland Corporation invite competitive designs from architects practicing in the borough for a proposed branch library in Kayll-road. Preriums of £20 and £10 are offered for first and second designs respectively. Plans, etc., from Mr. John W. Moncur, Assoc. M.Inst.C.E., Borough Engineer, Town Hall, Designs are to be delivered, free of cost, at the office of the Borough Engineer, Town Hall, before 12 o'clock on noon, May 5.

Contracts.

BUILDING.

APRIL 20.—HAXBY.—VILLAS.—Two semi-detached villas at Haxby. Names to Messrs. Felgate & Hepworth, architects and surveyors, 3 Stonegate, York, on or before April 20.

APRIL 21.—LINCOLN.—PAVILION.—Lincoln Corporation are prepared to receive names of persons willing to tender for the erection of a shelter in connection with the Infectious Diseases Hospital, Long Leys-road. Quantities will be supplied to those persons sending in their names to Mr. R. A. MacBinar, City Surveyor, Corporation Offices, Silver-street, Lincoln, on or before April 21.

APRIL 23.—ALDINGBOM.—BRIDGE WORK.—East Ashford R.D.C. invite tenders for repairing a bridge in Oxchess-road, Aldingbom, and building a parapet wall to same. Plan and specification may be seen at the office of the Surveyor to the Council, Mr. T. W. Pugh, Kemington. Sealed tenders, endorsed "Tender for Bridge," to be addressed to the chairman and delivered at the Workhouse, Willesborough, by 9 a.m. on April 23.

APRIL 23.—DARLINGTON.—SHELTER.—Darlington Corporation invite tenders for the erection of a shelter at North Lodge Park. Forms, etc., on application to Mr. George Winter, Borough Surveyor, Town Hall, Darlington, endorsed "Tender for Shelter," to be sent to Mr. H. G. Stevenson, Town Clerk, not later than April 23.

APRIL 23.—WALSLEND.—GREENHOUSE.—The Corporation of Walslend invite tenders for the erection of a greenhouse in the Richardson Bees Park, Walslend. Particulars may be had on application to the Borough Surveyor, Mr. George Hillings, Corporation Offices, High-street, Walslend. Tenders to be delivered to Mr. W. V. McCasler, Town Clerk, Walslend, 28, Sandhill, Newcastle-upon-Tyne, marked "Tender for Greenhouse," on or before April 23.

APRIL 23.—WALSLEND.—CONVENIENCES.—The Northumberland C.C. Education Committee invite tenders for erecting boys' and girls' conveniences, boundary fencing, etc., in connection with a temporary iron building proposed to be erected at Westerhope, near Newcastle-upon-Tyne. Forms may be obtained from Mr. C. Williams, Secretary to the Education Committee, Pearl Buildings, Newcastle-upon-Tyne, and plans of the work can be inspected at the office of the Committee. Tenders, properly sealed and endorsed, must be forwarded to the Secretary, not later than April 23.

APRIL 24.—EAGLESCLIFFE.—SCHOOL.—Durham County Education Authority invite sole tenders for new Council school at Eaglescliffe Junction. Plans, etc., at the office of the architect, Mr. J. Sanderson, 134, High-street, Stockton-on-Tees. Sealed tenders, endorsed "Eaglescliffe Junction Council School—Tender," to be sent on or before April 24, addressed to the Secretary, Elementary Education Department, Shire Hall, Durham.

APRIL 24.—NEWTON ABBOT.—DRIVING CLOSET.—Newton Abbot Guardians invite tenders for the erection of a driving closet, adjoining the laundry at the workhouse, in accordance with plans and specifications, which may be seen at the office of Mr. Samuel Scar, F.I.A.S., Newton Abbot. Tenders to be sent to Mr. F. Horner, Clerk, Newton Abbot, marked "Tender," not later than April 24.

APRIL 24.—NORTHWOLD.—SCHOOL.—The Primitive Methodists of Northwold invite tenders for erecting a Sunday-school at Northwold. Plans and specifications may be seen at Mr. John Dye's, machinist, Northwold, or at Mr. Charles E. Clark's, Tether, Frywell-road, Methwold, Norfolk, marked "Tender," by April 24.

APRIL 24.—PENDLETON.—LODGE.—Salford Museum, Libraries, and Parks Committee invite tenders for the erection of a lodge at the recreation ground, Irlams-o'-th'-Height, Pendleton. Form, etc., on application to Messrs. Brimfield & Smith, architects, 23, Bridge-street, Manchester, upon depositing a cheque for 11 s. Tenders, endorsed "Lodge, Irlams-o'-th'-Height," and addressed to the Chairman of the Museum, Libraries, and Parks Committee, Town Hall, Salford, must be delivered at the office of Mr. L. C. Evans, Town Clerk, Town Hall, Salford, not later than 12 noon, April 24.

APRIL 24.—STOCKPORT.—STALLS.—For the erection of three stalls in the covered market, and for weather screens to enclose same from the streets, for the Memorial Tolls Committee. Plans, etc., may be seen and forms of tender obtained, on application to Mr. John Atkinson, A.M.I.C.E., Borough Surveyor, Stockport. Tenders, addressed the Borough Surveyor, Stockport, sealed and endorsed "Tender for Stalls in Covered Market," to be left at his office by noon on above date.

APRIL 25.—ABBEYLEIX.—ADDITIONS TO CONVENT.—Additions to the Bridgine Convent, Abbeyleix. Plans and specifications can be seen at the Convent, Abbeyleix, or at office of Messrs. William H. Byrne & Son, architects, 20, Suffolk-street, Dublin.

APRIL 25.—BLON.—BUSINESS PREMISES.—Estimates wanted for mason, carpenter, plumber, slater, plaster, and painter work in the erection of business premises in High-street, Eigin. Plans and specifications to be seen with Mr. R. B. Pratt, A.R.I.B.A., architect, 20, York Hall, Eigin. Bank-buildings, who will receive estimates on April 25.

* APRIL 25.—LONDON, S.W.—ENGINE BED AND FLOOR, and floor for the Metropolitan Borough of Fulham. Specifications, drawings, and form of tender may be obtained from the Borough Electrical and Consulting Engineer, Mr. J. H. Buxton, 11, St. Paul's Church, Tenders, addressed to Town Hall, Fulham, and endorsed "Tender for Contract T," be delivered at the Town Hall not later than 12 noon on Wednesday, April 25.

APRIL 25.—MINSHULL.—SCHOOL.—Alterations and additions to the school buildings, Church Minshull, near Middlewich. Plans and specifications may be seen at the office of Mr. H. Beswick, County Architect, Newgate-street, Chester. Quantities obtained on deposit of 11. Tenders to be sent to Mr. C. E. Spinks, Town Clerk, Education Office, Crewe, on or before April 25, endorsed "Tender for Works at Church Minshull."

APRIL 25.—PLYMOUTH.—ALTERATIONS, ETC.—Alterations and additions to licensed premises, Whimbolds-street, Plymouth. Plans and specifications and quantities may be obtained from Mr. T. Rogers Kilsell, A.R.I.B.A., George Street-chambers, Plymouth, on payment of 31 s. Sealed tenders must be delivered before 12 o'clock noon on April 25.

APRIL 25.—PROSEY.—ADDITIONS.—Erection of additions to Priestley Mill, Pudsey, for Mr. Samuel Corbridge. Plans may be seen and quantities obtained at office of Mr. Wm. Rhodes Nunn, architect and engineer, Market-street, Bingley.

APRIL 25.—SAYON.—ADDITIONS, ETC.—Mason, carpenter, slater, and plaster work of additions and alterations to the parish church at Sayon. The architect will meet masons at the church on Saturday, April 22, at 11 o'clock. Plans and specifications may be seen with Mr. Pentre, architect, Haddo House; and sealed tenders to be lodged with him on or before April 25 at 10 a.m.

APRIL 25.—STONOROUGH.—CORRIDGES.—For the erection of a row of cottages at St. Leonard's. Plans, etc., at office of Mr. W. Cooke, architect, 10, North-street, Wareham. Tenders to be sent to architect, sealed and endorsed, not later than April 25.

APRIL 25.—SALISBURY.—A house on the new road, Britford-road, Salisbury. Plans etc., at the offices of Messrs. John Harding & Son, architects, 58, High-street, Salisbury. Estimates are to be sent in before 4 p.m. on April 25.

APRIL 27.—TROYNAY.—HORSES.—The erection of fifteen houses at Tynbydd-terrace, Trocyrch, Rhondda Valley, for Messrs. Davies & Morgan. Plans, etc., at office of Mr. W. D. Morgan, M.S.A., architect, Victoria-chambers, Cardiff. Sealed and endorsed tenders to be in before noon, April 27.

APRIL 28.—BINGLEY.—MILL.—Erection of a mill at Bingley. Contractors can obtain quantities and inspect the plans and specifications at the offices of Messrs. Samuel Jackson & Son, architects, valuers, and engineers, 11, Tanfield-chambers, Bradford, from April 21 to April 28.

APRIL 28.—HENGVED.—CHAPEL.—Erection of a new English Baptist chapel at Hengved. Plans and specifications can be seen at the office of Mr. Geo. Kenstole, architect and surveyor, 11, New-road, Bangor. Tenders to be sent to Mr. Arthur Morgan Brooklands, Maescywanmor, on or before April 28.

APRIL 28.—MAESTEC.—REBUILDING.—Rebuilding the following public-houses for Mr. E. Evans Bevan, Nenth:—(1) Traveller's Rest, with stables, Nantyllyn, Maestec; (2) Farmer's Arms, Commercial-street, Maestec; (3) Crown, 11, New-bridge-road, Maestec. Plans at the office of Mr. J. Cook Rees, architect, St. Thomas-chambers, Nenth, on payment of 11. Sealed tenders to be sent in not later than April 28, endorsed "Tender."

APRIL 28.—RABON.—REPAIRING TOWER.—Repairing and repainting of the tower, and for sundry repairs to the walls and roof of the church, specifications may be obtained from Mr. Stewart Dufosse, architect, Kington, Herefordshire. Tenders must be sent under cover, marked "Tender," addressed to the Rector, New Radnor.

APRIL 28.—TYOWELLOG.—SCHOOL, ETC.—For new Council school at Tyowellog, near Pwllheli. Conditions and alterations to Llidardun Council School; new master's house at Rhye Council School. Plans etc., to be seen at the office of Mr. How Lloyd Jones, County Architect, 7, New-street, Pwllheli. Sealed tenders (separately) endorsed "Tender for School" to Mr. E. R. Davies, Secretary of Education, Carmarvon, by 10 a.m. on April 28.

APRIL 30.—BERNSIDE.—CURB.—Arch.—Taking down and rebuilding a portion of existing arch of the Ladyburn at the foot of Bishopgate, Burnside, Curragh, Form, etc., from Messrs. Bruce, Prinflood. The tender to be delivered in a sealed cover to Mr. J. L. Anderson, Town Clerk, Town Clerk's Office, Curragh, and marked "Tender for Ladyburn Covering," by 11 o'clock on the morning of April 30.

APRIL 30.—LEEDS.—GREENHOUSES.—Four ranges of greenhouses and the hot-water heating to same, also bricklayers and concretors work to same at Leeds Union Workhouse, Beckett-street, Leeds. Names to the architects, Messrs. Thomas White & Sons, 34, Albion-street, Leeds, not later than 12 noon on above date. Quantities and particulars will be duly forwarded.

APRIL 30.—LIVERICK.—SCHOOLS.—For erection of the Gerald Griffin Memorial Schools at Bridge-street, Liverick, from plans and estimating the present Christian Brothers' Schools. Plans prepared by Mr. Joseph O'Malley, B.E., architect, may be seen with the Rev. Br. M. A. Nolan, Sexton-street Schools, at Mr. Francis Hooley, Town Clerk. Tenders to be lodged by 12 noon on April 30 with the Rev. Superior.

APRIL 30.—NEW SAREM.—DEPOT.—Town Council invite tenders for alterations to a highway depot in Friary-lane, Form, etc., at the office of Mr. W. J. Survery, Endless-street, Salisbury, on payment of 11. Sealed tenders, endorsed "Highway Depot," must be sent to Mr. Francis Hooley, Town Clerk, Municipal Offices, Salisbury, on or before April 30.

MAY 1.—KINGSBIE.—VILLA.—Mason, carpenter, slater, plaster, plumber, and glazier and painter works of villa to be erected at Kingsbie, near the offices of London. Plans and specifications to be seen with Messrs. D. & J. B. McMillan, architects, 105, Crown-street, Aberdeen. Plans and specifications also seen with Mr. Mackenzie, architect, Kingsbie. Offers to be lodged with Messrs. McMillan, not later than May 1.

* MAY 1.—LEEK.—EXTENSIONS.—The Leek U.D.C. invite tenders for extensions to the retort house at Leek, Leek, on payment of 11 s. Sealed tenders, to be delivered to the Chairman of Leek Extension, and addressed delivered to the above-mentioned before noon, May 1.

* MAY 1.—LEWIS.—CARSHEDS at Lea Bridge-road Dawson, Town Hall Lewes, etc., of Mr. William on depositing 21 s. Sealed tenders, in special sealed envelopes furnished with the form, to be sent to the above Council, Town Hall, Lewes, by May 1.

MAY 1.—TASPOOL.—ENNSKILLEN.—SCHOOL.—Tenders will be received by the Rev. C. Halahan, Rector, Restory, Ennskillen, on or before May 1, for the erection of the proposed Jones Memorial School, at Lisnole, according to drawings and specifications to be seen at the office of Mr. Thos. Elliott, architect, 37, Darvel-street, Banickhill.

* MAY 1.—LONDON, N.E.—SCHOOL.—Enlarging and improving Kingsland Secondary School, Colvestones and Sneinton, N.E., for the L.C.C. Draw quantities and forms of tender, on inspected, hills of Education Offices, Architects' Department, Victoria, on payment of 11 s. Tenders (with the provision) to be enclosed in envelopes marked "Tender," to be delivered at above offices (Room 149), not later than 11 a.m. on Tuesday, May 1.

MAY 2.—TOLNES.—POOR-HOUSE.—Tolnes Guardians invite tenders for the erection of a board-room and offices at Tolnes. Plans, etc., obtained on

payment of 2l. 2s. at the office of the architect, Mr. W. F. Tolth, 10, High-street, Totnes, between the hours of 10 a.m. and 4 p.m., except on Thursdays. Tenders to be sent to the architect, Clerk, 15, High-street, Totnes, on or before May 2.

MAY 3.—SUNDERLAND.—HOUSE.—Sunderland Corporation invite tenders for the erection of caretaker's house in connexion with Harrison Buildings, Station-roads, Sunderland. Plans, and form of contract, to be delivered at the Town Clerk's Office, Town Hall, before 12 o'clock noon on May 3.

MAY 3.—WETTERAL.—HOUSE.—Excavating, brick-laying, masonry, slating and plastering required in the erection of a house at Wetteral, for Mr. John Dalton. Plans, etc., at offices of Mr. J. H. Martindale, F.R.I.B.A., architect, Eaglesfield Abbey Rooms, Castle-street, Carlisle, during office hours from 12.30 to 2.30 p.m. 5. Tenders to be sent enclosed.

MAY 4.—SHELTON AND HARDWICK.—SCHOOL. ENLARGEMENT.—Enlargement of the Shelton and Hardwick School, for the Rev. G. B. Scott, architect, Castle Meadow, Norwich, where plans, etc., can be inspected and bills of quantities obtained on and after April 23. A deposit of 1l. will be required. Tenders received by 12 noon on May 4, addressed to the Secretary, Norfolk Education Committee, 57, London-street, Norwich, and endorsed "Tender for Shelton and Hardwick School."

MAY 4.—CHURCH.—REPAIRING FLOOR FOR THE GUARDIANS OF THE POOR, CHELSA. at their workhouse. Drawings, etc., to be seen between the hours of 10 and 4 (Saturdays till 4) between April 23 and 29 at the office of the Clerk, Guardians' Office, 250, King's-road, Chelsea, not later than 12 noon on Tuesday, May 8.

MAY 8.—WEST HAM.—WHARF WALL.—Construction of new wharf wall on the Channelsea river at Sewage Pumping Station, Abbey-road, West Ham. Plans and specification may be seen at the office of the Borough Engineer, Town Hall, West Ham, upon deposit of 1l. The contractor is required to enter into a bond with two sureties for due performance of contract, and must not underlet or make a sub-contract. Tenders, endorsed "Tender for New Wharf Wall, etc.," to be delivered at the office of the Engineer, West Ham, not later than 4 o'clock on Tuesday, May 8.

MAY 10.—ROXTON.—SCHOOL.—Lancashire Education Committee invite tenders for the erection of a new public elementary school at Roughton, near Oxley, near Oldham. The plans may be seen, and bills of quantities obtained, at the office of the County Architect, Mr. Henry Litter, 16, Ribblesdale-place, Preston, by payment of a deposit of 2l. Tenders must be delivered before 12 o'clock noon on May 10, sealed and endorsed, to Mr. J. W. Kiley, Town Hall, Roxton.

MAY 12.—HEADINGTON.—SCHOOL.—Oxfordshire Education Committee invite tenders for the erection of a new provided school at Headington, in accordance with drawings and specification prepared by the architect, Mr. G. B. Blalberwick, City Chambers, South Parade, Nottingham. Plans and specification may be seen at either the offices of the architect, or of Mr. Sidney Stallard, County Surveyor, 3, New-road, Oxford, and bills of quantities and form of tender obtained from the latter on payment of 1l. 1s. Tenders must be delivered before 12 o'clock noon on May 12, addressed to the Secretary, Education Committee, County Hall, Oxford, and endorsed "Tender for Headington School."

MAY 14.—LONDON, S.W.—BATHS.—Erection of baths at the Broadway. Tooting, for the Wandsworth Borough Council. Drawings, specification, and bill of quantities may be seen, form of tender and copy of bills of quantities obtained, at the Council House, East Hill, Wandsworth, between 10 and 4 o'clock on Monday, 12 and 19. Tenders, endorsed "Tooting Baths, Building," or "Tooting Baths, Engineering," as the case may be, with priced bills of quantities, in separate envelope, to be delivered at above address not later than 3 o'clock on Monday, May 14.

MAY 15.—BILBERRIE.—INFIRMARY.—Wigan Guardians invite tenders for the erecting and completion of proposed workhouse infirmary and other buildings and works, in the township of Billinge, near Wigan. Drawings may be inspected, and limited copies of bills of quantities and conditions of contract obtained, according to priority of application, from the architects, Messrs. Heaton, Ralph, & Heaton, Wigan, on payment of 1l. Tenders, endorsed "Wigan Infirmary," to be delivered to Mr. Henry Ackerley, Clerk, 9, Victoria-buildings, King-street, Wigan, not later than May 15.

MAY 15.—LIVERPOOL.—SCHOOL.—Lancashire Education Committee invite tenders for the erection of a new public elementary school at Beach-road, Litherland, near Liverpool. The plans may be seen at the office of the Architect, Mr. Henry Litter, 16, Ribblesdale-place, Preston, by payment of a deposit of 2l. Tenders must be delivered before 12 o'clock noon on May 15, sealed and endorsed, to Mr. Josiah Dean, 22, Lord-street, Liverpool.

NO DATE.—ALSTON.—HOSPITAL.—A new hospital at Alston, Cumberland. Name and address of the architect, Mr. T. W. Scott, F.R.I.B.A., architect, 43, Lowther-street, Carlisle after which copies of the specifications and quantities will be forwarded.

NO DATE.—ANDERTON.—FARM-HOUSE.—Whole or separate tenders invited for a farm-house and buildings in Anderton. Quantities, etc., obtained at the office of Messrs. Jolly & Buckley, architects, High-street, Chorley, to whom sealed and endorsed tenders must be sent.

NO DATE.—DONCASTER.—WORKS AND OFFICES.—Works and offices at Doncaster for the Rhodes

Electrical Manufacturing Company, Ltd. Quantities may be obtained from Mr. Percy Fox, architect, 14, Minchester-road, Bradford, on and after April 23.

NO DATE.—HUTTON MARE.—SCHOOL.—Rebuilding Hutton Mare Voluntary School. Names to the office of the architect, Mr. H. Higginson, 3, Lonsdale-street, Carlisle.

ENGINEERING, IRON, AND STEEL.

APRIL 24.—BELFAST.—PUMPING STATION.—Belfast Improvement Committee invite tenders for the erection of a pumping station near Shore-road. Drawings and specifications may be seen in the City Surveyor's office. Sealed tenders, endorsed "Tender for Pumping Station," to be lodged with Sir Samuel Black, Town Clerk, by 10 a.m. on Tuesday, April 24.

APRIL 24.—BURMA.—STEEL RAILS, ETC.—The Board of Directors of the Burma Railways Company, Ltd., invite tenders for the supply of—(a) 2 1/2 tons steel rails, 60 lb. per yd., and 425 tons fish-plates; (b) 21 tons fishbolts; (c) 275 tons wrought-iron spikes. Forms, etc., at the Company's Offices, 199, Greenway-house and Broad-street, E.C. For each specification (a), (b), and (c), a fee of 1l. will be charged, which will not be returned. Tenders, marked "Tender for Burma Railways," or as the case may be, must be delivered not later than noon on April 24.

APRIL 24.—LONDON.—SPRINGS.—The Secretary of State for India in Council proposes to receive tenders from such persons as may be willing to supply bearing springs. The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W. and tenders are to be delivered at that office by 2 o'clock p.m. on April 24.

APRIL 24.—MANCHESTER.—BRIDGE.—Manchester Improvement and Building Committee invite tenders for the reconstruction of Dawson-street bridge over the River Medlock, and Carruthers-street bridge over the Ashton Canal. Form of tender, etc., at Town Hall, Manchester, on payment to the City Treasurer of 2l. 2s. All cheques or postal orders are to be made payable to the order of "The Corporation of Manchester." Tenders, enclosed in the official envelope, and addressed to the Chairman of the Improvement, etc., Committee, to be delivered at the City Surveyor's office, not later than 10 a.m. on April 24.

APRIL 24.—STRELLAY.—WATER MAINS.—The R.D.C. of Basford invite tenders for providing and laying about 2 miles of 30-in. and 2-in. cast-iron water mains, with all necessary valves, etc., in the parish of Strelley, near Nottingham. Plans to be seen by appointment. Forms, etc., from Mr. S. Maylam, Director of Public Offices, Basford, Nottingham, on deposit of 2l. 2s. Sealed tenders, endorsed "Tenders for Strelley Water," to the Clerk to the R.D.C., at the Public Offices, Basford, Nottingham, by 9 o'clock a.m. on April 24.

APRIL 25.—GREENWICH.—REPAIR OF WHEELS.—The Council of the Metropolitan Borough of Greenwich invite tenders for the repair of wheels and pipes of coach ironwork for the period extending from May 5, 1906, to March 31, 1907. Schedules, specifications, and other particulars can be obtained at the Borough Engineer and Surveyor's Office, Town Hall, Greenwich, S.E., between the hours of 10 and 4 (Saturdays between 10 and 12). Tenders, which must be made on the forms to be supplied at the Town Hall as above, must be sealed up and endorsed "Tender for Wheelwright's Work," and must reach Mr. Francis Robinson, Town Clerk, Town Hall, Greenwich-road, S.E., before 12 o'clock noon on April 25.

APRIL 25.—LEDS.—STEEL FRAMEWORK.—Leeds Waterworks Committee invite tenders for the supplying and erecting of steel framework at Moorfoot Reservoir, Harrogate-road, Leeds, and at the existing boiler house from the Headingly Pumping Station, North-lane, Headingly, and fixing on the aforementioned framework at Moorfoot. Plans and specifications may be seen at the office of Mr. Charles C. Heuzell, M.C.E., Waterworks Engineer, Municipal Buildings, Leeds. Tenders, endorsed "Steel Framework, Waterworks," to be at the Town Clerk's Office, Leeds, not later than April 25.

APRIL 25.—MANCHESTER.—PIPES.—Manchester Corporation Gas Committee invite tenders for the supply of about 650 tons of 30-in. cast-iron pipe. Specification and form of tender may be obtained on application, in writing, to Mr. C. Nickson, superintendent, Gas Department, Town Hall. Sealed tenders, addressed to the Chairman of the Gas Committee, must be delivered at the Gas Office, Town Hall, Manchester, not later than 10 a.m. on April 25.

APRIL 25.—MILFORD HAVEN.—WATER MAINS.—Milford Haven Harbour Board propose to receive tenders for the undermentioned cast-iron S. and P. water mains (coated, viz., 1,302 yds. 6 ft. by 9 in., 1,020 yds. 6 ft. by 9 in., 255 yds. 3 ft. by 9 in., weight not more than 1 cwt. 1 lb. 28 lb.; 4 ft. by 9 in., weight not more than 1 cwt. 3 lb. 3 r. 21 lb., and tested to stand 300 lb. water pressure. Price per ton delivered, at Old Milford Station, G.W.R., not to exceed on May 17. Sealed tenders, endorsed "Pipes," addressed to the Chairman Gas and Water Works Committee, to be in not later than April 25.

APRIL 27.—SOUTH SHIELDS.—MACHINERY AND TOOLS.—Sally & Shields Corporation invite tenders for the supply of machinery and tools required at the electric tramway sheds. Particulars can be obtained on application to Mr. John Wilson, General Manager, Franway Depot, Dean-road, South Shields. Tenders to be delivered to Mr. J. Moore Haxton, Town Clerk, Court-buildings, South Shields, not later than noon on April 27, endorsed "Tender for Machinery and Tools."

APRIL 30.—SKIPTON.—WATER MAINS.—Skipton U.D.C. invite tenders for the supplying and delivery free at Skipton of about 19 tons of 6 in. diameter, and 35 tons of 3 in. diameter cast-iron water mains. Specification and form of tender may be obtained on application to Mr. John Mallinson, Waterworks Engineer, Town Hall, Skipton, and sealed tenders,

endorsed "Water Mains," are to be delivered to him not later than April 30.

MAY 1.—BASINGSTOKE.—WATER SUPPLY.—For the construction of a circular concrete high-level service reservoir, holding about 22,000 gallons, and also for the erection of a wind engine and pump for the Corporation. Plans may be seen and specifications and quantities obtained at the office of Mr. F. Reginald Phipps, Assoc.M Inst.C.E., Borough Surveyor and Waterworks Engineer, Town Hall, Basingstoke, on payment of 1l. for each contract. Tenders, on the prescribed form only, endorsed "Reservoir" or "Wind Engine," as the case may be, must be delivered by noon on May 1.

MAY 1.—GOSPORT.—WATERWORKS.—The directors of the Gosport Waterworks Company invite tenders for carting, handling, excavating for, laying, and jointing about 8 miles of 15-in. and 16-in. cast-iron pipe work, valves, and other fittings and works. Forms, etc., at the Company's offices upon payment of 5l. The contractor will be required to enter into a contract bond, with two sureties, for the due performance of the contract. Sealed tenders, endorsed "Machinery," and addressed to the Chairman of the Company, must be delivered at office of Mr. Edward P. Hillard, Assoc.M Inst.C.E., Engineer and Manager, Gosport Waterworks Company, 1, High-street, Gosport, not later than 12 noon on May 1.

MAY 1.—LEXTON.—NEW CAR SHEET.—The Lexton U.D.C. invite tenders for 200 tons of steel roof trusses, lattice girders, built-up columns, rolled-steel joists, and short cast-iron columns for their new car shed. Plans may be seen, and specifications, quantities, form of tender, etc., obtained from Mr. W. Dawson, Engineer, Town Hall, Lexton, on and after April 23, between 10 and 4 (Saturdays 10 to 12). Sealed tenders, in official envelopes, must be delivered at Town Hall, Lexton, before 8 p.m., May 1.

MAY 2.—BURMA.—STEEL AXLES.—The Board of Directors of the Burma Railways Company, Ltd., invite tenders for the supply of 3,000 steel axles for carriages and waggon. Specifications and forms of tender can be obtained at the Company's offices, each specification a fee of 1l. will be charged, which will not be returned. Tenders, enclosed in sealed envelopes and marked "Tender for Steel Axles," must be delivered not later than noon on May 2. A. G. Rechie, Managing Director.

MAY 3.—POPPLAR.—PLANT.—The Electricity Committee of the B.C. of Poplar invite tenders for a supply of overhead bunker and coal handling plant, comprising bunker, capable of holding at least 150 tons of coal, and elevator and conveyor (preferably combined), to deal with 23 tons of coal per hour. Alternative proposals of similar character may also be submitted. Forms, etc., at the office of the Borough Electrical Engineers, Electricity Works, Glancus-street, Bromley-by-Bow, upon payment of 1s., which will not be returned. Sealed tenders, endorsed "Tender for Overhead Bunker and Coal Handling Plant," must reach Mr. Leonard Poylar, Town Clerk, Council Offices, High-street, Poplar, on or before May 8, at 10 a.m.

MAY 10.—BELFAST.—WATER WHEELS.—For the supplying and erecting, at the Purysburn Asylum, near Belfast, two turbine water wheels with accessories, two continuous-current dynamos, two pumps, etc. Plans and specification of the work to be done can be seen at the office of the Resident Medical Superintendent at Purysburn, on application to Mr. Hill. Copies of specification and conditions may be had, accompanied by a deposit of 1l. from Messrs. S. M. Macrorie, Ltd., Limerick, by whom tenders will be received up to May 10.

MAY 11.—WOLVERLEY.—BRIDGE.—Worcestershire C.C. Highways and Bridges Department invite tenders for rebuilding in brickwork, Bury Hall Bridge at Wolverley, near Kidderminster. Form, etc., may be obtained from Mr. J. H. Garrett, County Road Surveyor, Shirehall, Worcester, on payment of 1l. 1s. Sealed tenders, and form of tender for Bury Hall Bridge," to be delivered at the office of the Surveyor on or before May 11.

NO DATE.—KENNEDY.—SETTING BOILER.—SOLING.—A 22 ft. by 6 ft. boiler, and building a "house," chimney-stack, etc., for the County Laundry Company, Birseghing Bridge. Apply to Mr. John Stalked, architect, 57, Highgate, Kenald.

MISCELLANEOUS.

APRIL 23.—EAST ASHPOND.—HAULAGE.—East Ashford R.D.C. invite tenders for the haulage of gravel. Form of tender, etc., to be obtained from Mr. T. W. Patten, Surveyor, Kennington. Sealed tenders to be addressed to the Chairman, and delivered to the Workhouse, Westborough, by 9 a.m. on April 23.

APRIL 23.—MEXBOROUGH.—FURNISHING.—Furnishing of the Mexborough Free Library and Public Hall. Particulars and details may be had on application to the Librarian at the Mexborough Markets Hall, daily from 10 a.m. to 4 p.m. Tenders to be sealed and endorsed, "Tenders for Furnishing," to be sent in to Mr. W. Turner, Chairman of the Library Committee, not later than noon on April 23.

APRIL 24.—IFORD.—WATER VANS.—Iford U.D.C. invite tenders for the supply of three water vans of a holding capacity of about 400 gallons each. Form of tender, etc., may be had on application to Mr. E. Shaw, A.M.I.C.E., Surveyor to the Council, Town Hall, Iford. Tenders, endorsed "Tender for Water Vans," must be delivered to Mr. John W. Linton, Clerk to the Council, Town Hall, Iford, Essex, on or before April 24.

APRIL 25.—CANNOCK.—CARTING.—Cannock R.D.C. invite from ratemasters in the district, tenders for carting road material during the current year on the various stations and wharves on to the roads under their control. Persons tendering must own at least two horses and carts. Particulars and form of tender may be obtained on application to Mr. H. M. Whitehead, District Surveyor, Penkridge. Tenders must reach Mr. A. W. Curver, Clerk to the Council, Tinkon Offices, Cannock, on or before mid-day, April 25.

APRIL 25.—SALFORD.—DISINFECTANTS.—The Lighting and Cleansing Committee of Salford invite tenders

for the supply and delivery of carboric powder (containing not less than 95 per cent. of pure carbolic acid, and of chloride of lime (strength not less than 10 per cent.), to be delivered as required for a period of twelve months. Sealed tenders, addressed to the Chairman of the Lighting and Cleansing Committee, Wilburn-street, Salford, endorsed "Tender for Disinfectants," must be delivered at that depot not later than 12 o'clock noon on April 25. Forms of tender may be had on application to the Superintendent, Cleansing Department, Wilburn-street, Salford.

APRIL 30.—GRAY.—YARMOUTH.—FIBER BLOCKS.—Great Yarmouth T.C. invite tenders for 440,000 Jarrah or Karri paving blocks in accordance with specification to be obtained at office of Mr. James William Cockrill, M.I.C.E., Borough Surveyor. Tenders to be on the form and in the envelope supplied, and delivered at the office of the Town Clerk, Town Hall, Great Yarmouth, not later than noon, April 30.

MAY 1.—BANBURY.—HOT CLOSET, etc.—Banbury Guardians invite tenders for the supply and fixing to the existing steam apparatus at the workhouse of a steam-heated hot closet and carrying table. Tenders in writing must reach Mr. E. Laimley Fisher, Clerk, Union Offices, Banbury, before 10 a.m. on May 1. Full particulars can be obtained of the Master of the Workhouse.

MAY 15.—AYR.—FURNISHING.—Ayr District Lunacy Board invite tenders to supply furniture and furnishings for the new hospital and offices to be opened shortly. Schedule of specifications and of tender, to be obtained on application, in writing, to the Medical Superintendent, District Asylum, Ayr. Tenders and samples to be lodged on or before May 15.

MAY 21.—PRESTON.—FURNITURE.—The Corporation of Preston invite tenders for the supply and delivery of furniture, fittings, etc., at the Islington Hospital, Holme Road, Preston. Samples of the various articles may be seen at the Crash Rooms, Public Hall, Lane-street, Preston, between the hours of 9 a.m. and 4 p.m. from April 25 to April 27, both inclusive. Forms, etc., at the office of the Borough Surveyor, Town Hall, Preston, on payment of 1s. to whom sealed tenders, endorsed "Tender for Furnishing Islington Hospital," must be delivered by 12 o'clock noon on May 21.

MAY 25.—GREENWICH.—SCAVENGING.—Metropolitan Borough of Greenwich invite tenders for the removal by horse, of house refuse, road sweepings, slop, gully stuff, and any kind of refuse collected by the Council in the borough, and shot into the barges to be alongside the Council's depots, upon the banks of the Thames at East Greenwich and Deptford Creek respectively. The tender, which must be on the form to be supplied at the Town Hall, Greenwich-road, S.E., must be sealed up and endorsed "Tender for Barging Away Refuse," and must reach Mr. Francis Robinson, Town Clerk, Town Hall, Greenwich-road, S.E., before 12 o'clock noon on April 25.

PAINTING, etc.

APRIL 23.—DARLINGTON.—PAINTING.—Darlington Corporation invite tenders for painting, etc., the outside and inside of market buildings. Specification may be seen, and bill of quantities obtained, on application at the offices of Mr. George Winter, Borough Surveyor, Town Hall. Tenders, endorsed "Tender for Painting Market Buildings," to be sent to Mr. Hy. G. Stevenson, Town Clerk, not later than April 23.

APRIL 25.—PRESTON.—PAINTING.—For painting fifteen outside staircases at Whitingham Asylum, near Preston. Specification, etc., may be obtained at the Asylum. Tenders to be in before 10 a.m. on April 25.

MAY 2.—TOOTING AND BRENTWOOD.—PAINTING AND CLEANING.—External painting at Tooting Bee Asylum, and internal and external cleaning and whitening works at Hill Wood School, Brentwood, Essex, for the Metropolitan Asylums Board. Specifications, conditions of contract, forms of tender, and, in the case of Tooting Bee Asylum, bills of quantities, may be inspected at the office of the Board, Embankment, E.C., on and after April 25, and can then be obtained on payment of 2s. Tenders to be delivered at office of the Board before 10 a.m., May 2.

MAY 3.—BRISTOL.—PAINTING.—Bristol Guardians invite tenders for the execution of the following works:—(1) Painting, etc., at Headquarters Children's Homes, Sandford-road, Fishponds; (2) painting, etc., at Children's Homes, Downend; (3) painting, etc., at various Children's Homes at Montpellier, St. George, Horfield, and Staple Hill. Forms, etc., upon application to Mr. J. J. Simpson, Clerk to the Guardians, St. Peter's Hospital, Bristol, on or after April 18, and all tenders must be delivered not later than 12 o'clock at noon on May 3.

MAY 10.—STRATFORD.—PAINTING.—Distemping and painting at the Children's Homes, Stratford, near Grays, Essex, for the Guardians of the Poor of Stratford. Forms, Specifications and forms of tender may be obtained from the Clerk, Guardians' Office, Barnes-street, Commercial-road East, E., to whom tenders must be delivered before 4 o'clock on Thursday, May 10.

NO DUES.—HOUGHTON-LE-SPRING.—PAINTING.—Durham Education Committee invite tenders for the painting, etc., of the following Council schools:—West Hartington, Barnston, Tsworth Colliery, Newbottle, Newbottle St. Matthews, New Penning, Coxgreen, and Shiny Row Band Hill. Specification and form of tender may be had on written application to the District Clerk, Mr. John P. Tulip, Saville House, Houghton-le-Spring, R.S.O.

ROADS, SANITARY AND WATER WORKS.

APRIL 25.—HALFAX.—PRIVATE IMPROVEMENT WORKS.—Halifax Highways Committee invite tenders for the execution of private improvement works in Kebley-street, Osburn-street, Perseverance-terrace, and Kebley-street leading from Kebley Park-street to Wall-hall-terrace, two back streets leading from Wall-hall-terrace to Elmfield-terrace and back Albert-view. Forms, etc., on application to Mr. James

Lord, M.I.C.E., Borough Engineer, Town Hall, properly endorsed, may be seen at the office of Mr. Walter Walton, Town Clerk, on or before April 25.

* APRIL 25.—HENDON.—SEWERAGE, DRAINAGE, etc.—The Hendon U.D.C. invite tenders for (1) 430 ft. yds. 12-in. pipe sewer and surface water drain in Finchley-road, Golder's Hill, etc.; (2) 925 ft. yds. 9-in. pipe sewer, with manholes, flushing chamber, ventilators, etc.; (3) paving, leveling, kerbing, channelling, and covering, etc. in connexion with making-up of Ebenezer-road and news, Child's Hill. Drawings and specifications may be seen, and form of tender obtained, of Mr. S. Slater Grimley, Council's Engineer, Council Offices, Hendon, on deposit of 10s. Sealed tenders, endorsed "Finchley-road Sewerage, etc.," addressed to Chairman of Council, to be sent to Mr. H. Humphris, Clerk to the Council, Council Offices, Hendon, N.W., by 5 p.m., April 23.

APRIL 25.—WHITTLE-WOODS.—ROADWORK.—R.D.C. of Chorley (Highways) invite tenders for widening and improving gradient and building retaining walls on each side of highway, Mosslands, Whittle-Woods. Plans, etc., at the office of the Surveyor of Highways, Mr. Edward Lawrence Shaw, Green, Easton, near Chorley. Tenders, endorsed "Tender for Roadwork, Whittle-Woods," may be seen at the office, solicitor, 10, High-street, Chorley, on or before April 23.

APRIL 24.—CHEVINGTON.—STREETWORK.—Morphett R.D.C. invite tenders for the laying of about 2,000 super. yards of back streets, at Red-row, Chevington. Drawings, etc., on application to Mr. Andrew Adams, 53, Bridge-street, Morphett. Tenders, sealed and endorsed "Chevington," to be sent in not later than noon on April 24.

APRIL 24.—GATESHEAD.—PAVING, etc.—The Corporation invite tenders for the paving and tar macadamising the following streets:—Munby-street, Arkwright-street, cross back street between Silverdale and back Wensleydale-terrace (remainder of), back street between Tower-street and Benham-road, back Wensleydale-terrace, Westley, etc. Plans and specifications may be seen and quantities obtained at the office of Mr. N. P. Pattinson, Borough Engineer, Town Hall. Tenders are to be sent in, sealed and endorsed "Tenders for Street Making," on or before 2 p.m., April 24.

APRIL 24.—KING'S NORTON.—ROADS.—King's Norton and Northfield R.D.C. invite tenders for the making good of (a) Sandhurst-road, Westley; (b) Miller-road, Ton Acres. Forms, etc., may be obtained from the Engineer and Surveyor to the Council, Mr. Ambrose Cross, A.M.I.C.E., No. 25, Valentine-road, Walsley. Plans may also be seen at the said offices. Sealed tenders, endorsed "Tenders for Making Good Sandhurst-road and Miller-road," (as the case may be), must be sent to Mr. Edwin Docker, Clerk to the Council, 10, Newhall-street, Birmingham, not later than April 24.

APRIL 24.—NORTH SHIELDS.—ROADS.—Tyne-mouth Corporation invite tenders for excavating, laying a lime concrete foundation, and paving with Whitestone chips in Little Bedford-street and in the back street between the Bedford-street and Rydall-street, North Shields. Plans, etc., may be seen at the office of Mr. John F. Shuttle, Borough Surveyor, to whom endorsed tenders are to be sent by 12 noon on April 24.

APRIL 25.—BYREKELL.—DRAIN.—Bicester R.D.C. invite tenders for the laying of a new drain and construction of works in connexion therewith at Bucknell Plain, etc., near Bicester. Plans, etc., at the office of Mr. G. D. Payne, 2, Bath-terrace, Bicester. Tenders (sealed) to reach office of Mr. Gorden Walsh, Clerk, Bicester, not later than first post on April 25.

APRIL 25.—LONDON.—PAVING.—Greenwich Borough Council invite tenders for paving (a) certain areas of the unpaved portion of Woodlands Park-road, with patent imperial stone, for paving the channels with Gurnsey granite cubes, and for making up the roadway with broken granite, and (b) other works. Specification, etc., at the Borough Engineer and Surveyor's Office, Town Hall, Greenwich-road, S.E. Tenders, on forms to be supplied at the Town Hall, sealed and endorsed "Tender for Paving Woodlands Park-road," before 12 o'clock noon on April 25.

APRIL 25.—LYONCESTER.—SEWER.—Tyne-mouth R.D.C. invite tenders for the providing and laying of about 390 ft. yds. of 9-in. and 12-in. sanitary pipe sewer, with manholes, etc., at Eastfield road, Longenton. Plans and specifications may be seen at the office of Mr. A. S. Dinning, 22, Ellison-place, Newcastle-on-Tyne. Tenders (sealed and endorsed "Beuton Sewer") to be sent to Mr. A. Whitehorn, solicitor, 60, Swilley-street, North Shields, Clerk to the Council, not later than April 25.

* APRIL 26.—TAR PAVING.—The Guardians of the Southwark Union invite tenders for tar-paving work at their infirmary, East Dulwich-grove, S.E. Specifications and forms may be seen at the offices of the Steward at the infirmary, between 10 and 4 p.m., endorsed "Tar Paving Work," addressed to Guardians, and delivered to Mr. Howard C. Jones, Clerk, Union Offices, John-street West, Blackfriars-road, S.E., by 4 p.m., April 26.

APRIL 28.—GLASGOW.—PAVING.—Corporation of Glasgow invite offers for the paving of various streets in the city with asphalt and tar macadam, paving. Specifications and forms of offer may be had on application at the Office of Public Works, City Chambers, 64, Cochrane-street. Sealed offers, marked outside Office of Public Works, must be lodged with Mr. A. W. Myles, Town Clerk, City Chambers, Glasgow, not later than April 28.

SEWERAGE.—SHEFFIELD.—PAVING.—The Highway and Sewerage Committee invite tenders for the excavating and laying of tar macadam and foundation therefor in the carriage ways of certain streets within the city. Form of tender, etc., at the office of Mr. Charles F. Wike, C.E., Borough Surveyor, 10, St. James's-shed, Sheffield. Tenders, endorsed "Tenders for Tar Macadam Paving," to be sent in not later than 12 o'clock a.m. on April 28, addressed to "The Chairman and Members of the Highway and Sewerage Committee, City Surveyor's Office, Town Hall, Sheffield."

APRIL 30.—KENSINGTON.—PAVING.—The Council of the Royal Borough of Kensington invite tenders for providing and laying crossbed deal blocks on the streets of Holland, Park-avenue, Park-street, and Church-street (3,350 sq. yds.). Specifications, etc., at the office of Mr. A. R. Finch, A.M.I.C.E., Borough Engineer, 4, Curzon, Town Hall, Kensington. High-street. Tenders, sealed and endorsed "Tender for Wood Paving," to be delivered at office of Mr. Win. Chambers Leece, Town Clerk, Town Hall, Kensington, not later than 12 o'clock noon on April 30.

MAY 1.—ALDERSTOT.—PAVING.—Aldershot U.D.C. invite tenders for the supply of about 70 tons of 2-in. Derbyshire or Kenish rag limestone tar paving. Tenders, endorsed "Tar Paving," to be sent to Mr. Fred C. Uren, District Surveyor, Municipal Buildings, Aldershot, on or before May 1.

* MAY 1.—BROMLEY.—STEAM ROLLING.—The Bromley Borough Council invite tenders for supply of such cases, a 12-ton compound steam road roller, with a Morrison or other approved scarifier attached, in accordance with conditions, a copy of which can be obtained at the office of the Borough Engineer. Tenders, endorsed "Tender for Road Rolling," addressed to Mr. F. H. Norman, Town Hall, Clerk, Bromley, Kent, before 3 o'clock, May 1.

MAY 1.—LEWISHAM.—PAVING.—Lewisham Borough Council invite tenders for kerbing, channelling, and metalling the roadway and paving the footpaths with artificial stone (on separate contracts) of Sunningdale Road, London, and of the road, Honor Oak, Forns, etc., at the Town Hall, Calford (Surveyor's Department), and on after Saturday, April 21. Copies of the specification may also be had on payment of the hours of 10 a.m. to 4 p.m. which will not be returned. The tenders must be on forms issued by the Council, enclosed in an envelope, sealed and endorsed "Tender for Paving," and must be delivered to the office of Mr. J. L. at the Town Hall, and placed in the box there provided for the purpose.

MAY 2.—WALSLEY.—SEWER WORKS, etc.—Walsley U.D.C. invite tenders for the following works:—(1) Red Bridge-lane, 1,355 ft. run of 12-in. pipe sewer, with manholes, etc.; (2) Blake Hill, 2,459 ft. run of 12-in. pipe sewer, with manholes, etc.; (3) Alder-street, 2,000 ft. run of 12-in. pipe sewer, and providing and setting 1,749 ft. run of 6-in. Norwegian granite edge kerf, Forns, etc., in the Council Offices, Walsley, N.E., Surveyor's Department, between the hours of 10 a.m. and 4 p.m. Sealed tenders, on the forms and in the envelope provided, to be delivered at the Council Offices not later than 12 noon on May 2. Mr. William Blewitt, Clerk, Mr. Chas. H. Bressy, Surveyor, Council Offices, Walsley, N.E.

MAY 3.—SOUTHEND.—TAR MACADAM.—Southend-on-Sea Corporation invite tenders for the supply and laying of tar macadam on the western side of a drain, Palmira-parade to Grosvenor-road. Plans, etc., obtained on and after March 23 (on deposit of 10s.). Tenders, to be sent to Mr. E. J. Ebor, M.I.C.E., Borough Engineer, Sealed tenders, endorsed "Tar Macadam," to be accompanied by (a) a sample of the block furnace slag proposed to be used, and (b) a sample of the manufactured tar macadam, to be used, and by Mr. William H. Shaw, Town Clerk, Town Clerk's Office, Southend-on-Sea, before noon on May 3.

MAY 6.—BECCLES.—SCAFFOLDING.—Beccles Corporation invite tenders for scaffolding and rolling in the borough. Tenders to reach office of Mr. T. O. Cud-dihill, C.E., Borough Surveyor, Beccles, not later than 12 noon, May 6, endorsed "Tenders for Scaffolding."

* MAY 8.—WEST HAM.—STREETS.—Making up part of the following:—Drew-road, Leonard-street, Wythes-street, and also Lord-street. Plans may be seen, and specifications, form of tenders, etc., at the Borough Engineer's Office, Town Hall, West Ham, upon deposit of 1s. Contractor is required to enter into a bond and to give sureties for due performance of contract, and must comply with all the conditions of contract. Tenders, endorsed "Tender for Private Street Works," to be delivered at Town Clerk's Office, Town Hall, West Ham, not later than 4 o'clock on Tuesday, May 8.

* MAY 14.—CRAWLEY AND FIELD.—SEWERAGE WORKS.—The Horsham R.D.C. invite tenders for 7,784 yds. of earthenware pipe sewers, ranging from 7 in. to 15 in., with necessary tanks, pumping station, engines, and pumps, percolating filters, and laying-out of a sewage irrigation area, and other works in the parishes of Crawley and Field, Sussex. Drawings may be inspected, and copies of specification, quantities and form of tender obtained on application to Mr. Sidney R. Lowcock, engineer, 50, Queen Anne-street, Westminster, between 10 a.m. and 4 p.m. of payment of 5s. Sealed tenders, endorsed "Tenders for Crawley and Field Sewerage," to be delivered to Mr. C. Cook, Clerk, Council Offices, 9, Carlisle, Horsham, Sussex, before 12 noon on May 14.

* MAY 15.—LONDON.—Alteration of date for receiving tenders for paving works by the Corporation of London, from April 25 to May 15.

STONE, MATERIALS, AND STORES.

APRIL 23.—TONBRIDGE.—GRANITE.—Tonbridge U.D.C. invite tenders for the supply of granite curbstones. Forms of tender, etc., on application to Mr. W. Laurence Bradley, C.E., the Council's Surveyor, at the office of Tonbridge Castle, Kent. Sealed tenders, accompanied by samples (carriage paid), are to be delivered before noon on April 23.

APRIL 25.—WISHAW.—WIRE METAL.—1,500 tons of metal for the year from 15 to 15 next. Contractors wishing to tender to obtain copies of the specification and schedules by applying to Mr. William Rodger, Borough Surveyor, Wishaw. Offers may be received by Mr. J. Logan, Town Clerk, Wishaw, till April 25.

APRIL 24.—DESBOROUGH.—GRANITE.—Desborough U.D.C. invite tenders for the supply of about 300 tons of granite, delivered at Desborough Station. Plans and specifications may be seen at the office of Mr. D. J. Diver, Surveyor, to whom samples are to be sent. Tenders to be delivered in the office of the Surveyor on or before April 24, endorsed "Tenders for Granite."

April 25.—**CANNOCK.—TOOLS, ETC.**—Cannock R.D.C. invite tenders for the undermentioned articles for the year ending March 31, 1907:—(1) Roadmen's tools; (2) oil and waste; (3) Forage for horses; (4) disinfectants. Form of tender for Nos. 1, 2, and 3 may be obtained on application to Mr. H. M. Whitehead, District Surveyor, Penkridge. Form of tender for No. 4 may be obtained on application to Mr. T. F. Pickering, Sanitary Inspector, Oxley-place, Rushbury lane, Wolverhampton. Tenders must reach Mr. A. W. Carver, Clerk to the Council, Union Offices, Cannock, on or before Monday, April 25.

April 25.—**IRIAM.—MATERIALS.**—Irdium U.D.C. invite tenders for the following materials for the year ending March 31, 1907:—Broken granite macadam, limestone macadam and chippings, cinders and copper slag; also a water cart and road-sweeping machine. The Council also invite tenders for reaving, etc. (labour only), and hire of steam-roller. Form of tender and any further information may be obtained from Joseph Cooke, Clerk to the Council, Council Offices, Irdium, to whom tenders must be sent on or before noon on April 25.

April 25.—**HULL OILS.**—Kingsdown-upon-Hull Electric Lighting Committee invite tenders for the supply of machinery oils for their electricity works and sub-stations during the ensuing twelve months. Tenders may be obtained at the offices, Solicitors, Lane Works, where samples of the oils may be seen. Tenders, endorsed "Oils, Electricity Department," are to be sent in to the Chairman of the Electric Lighting Committee, Town Hall, Hull, not later than noon on April 25.

April 25.—**KINGSBRIDGE.—STONE, ETC.**—Kingsbridge R.D.C. invite tenders for the supply of:—100 cubic yds. unbroken limestones, delivered at Kingsbridge Quay; 60 cubic yds. broken limestones, and 60 cubic yds. limestone quartering, delivered at Embankment Bridge or Fegmore; 50 cubic yds. granite delivered at Kingsbridge Station; 200 cubic yds. broken trevillard or forder stones; and 100 cubic yds. trevillard or forder chippings, for use on the main roads in this rural district during the year ending March 31, 1907. Tenders for the limestones and flints must state the price delivered

as above, and for the trevillard or forder stones and chippings to state the price delivered at (a) Fegmore, (b) Embankment Bridge, (c) Salcombe, and (d) Kingsbridge. The prices quoted must in each case include the quay dues where such are payable. Further particulars may be obtained on application to Mr. William Beer, Clerk, Kingsbridge, to whom sealed tenders are to be sent on or before April 25.

April 25.—**DARWEN.—STONES.**—Darwen Gas Committee invite tenders for the supply of the following goods for one year:—Benzol, wrought-iron tubes and fittings; cast-iron mains and specials. Full particulars and forms of tender may be obtained on application to Mr. A. H. Smith, Gas Engineer, Darwen. Sealed and endorsed tenders must be delivered to Mr. William P. Halliwell, Town Clerk, Town Clerk's Office, Darwen, not later than April 25.

April 30.—**EDMONTON.—STONEWARE PIPES.**—Edmonton U.D.C. invite tenders for the supply and delivery of the undermentioned stoneware pipes during the period ending September 30, 1906:—50 lb in., 500 lb in., 500 lb in., 1,000 lb in., 1,000 lb in., 1,500 lb in., or more or less by the full truck load. Forms of tender may be obtained on application to Mr. G. E. Ebdish, Engineer to the Council, Town Hall, Edmonton. Persons tendering are requested to quote net prices without trade discounts. Sealed tenders (which must be upon the form supplied by the Council's Engineer), marked "Tender for Stoneware Pipes," to be delivered at office of Mr. Wm. Francis Payne, Clerk to the Council, Town Hall, Edmonton, not later than 12 o'clock noon on April 30.

May 1.—**BRENTFORD.—GRANITE SPALLS.**—Brentford Guardians invite tenders for the supply and delivery of 500 tons of best burnt Guesery granite spalls, 250 tons to be delivered forthwith. Forms may be obtained upon application, and tenders, upon such terms, must reach Mr. William Stephens, Clerk in the Guardians, Union Offices, Isleworth, W., not later than 4 P.M. on May 1.

May 1.—**KEPPELHURD.—ROAD MATERIALS.**—KEPPELHURD R.D.C. invite tenders at per yard for 300 yds. of clean hand-picked surface flints, unbroken, 650 yds. of 2 in. and 50 yds. of 3 in. quartzite Guesery

granite, or Mendip (at the discretion of the Council); 50 tons of Portland gravel, delivered in quantities as ordered, carriage paid to Uckfield Railway Station, by October 1, 1906. Payment will be made by instalments. Forms of tender to be obtained on application at the offices of the Council. Tenders, with samples, to be sent to Mr. Charles Dawson, Clerk to the Council, at the office of the Council on or before May 1, marked "Tenders for Road Material."

May 2.—**HOVE.—FLINTS.**—Hove Corporation invite tenders for supplying about 5,000 cubic yds. of Combe rock flints, to be delivered during the coming twelve months. They may be tendered for in parcels of not less than 200 cubic yds. each. Further particulars at the office of the Borough Surveyor, Mr. H. H. Scott. Tenders on forms supplied, addressed to Mr. H. Endicott, Town Clerk, Town Hall, Hove, and endorsed "Tender for Combe Rock Flints," will be received up to 6 o'clock on May 2.

May 3.—**LONDON.—STONES.**—Great Indian Peninsula Railway Company directors invite tenders for the supply of the following stores, namely:—Stationery, etc.; wrought-iron hinges. Specifications and forms of tender may be obtained at the office of Mr. J. I. Berry, Secretary, Company's Offices, 48, Copthall-avenue, E.C. on payment of the fee for the specification, which payment will not be returned. Tenders must be delivered in sealed envelopes, marked "Tender for Stationery, etc.," or as the case may be, not later than 11 o'clock a.m. on May 3.

May 3.—**RICHMOND.—STONES.**—Richmond Main Sewerage Board invite tenders for the supply of the following stores required at their works, Key Gardens, during the year ending May 31, 1907:—Buxton lime; grey lime; sulphate of alumina and green sulphate; filter cloth. Specifications and form of tender on application at the office of the Engineer to the Board, West Hill-road, Key Gardens, S.W., on payment of 10s. for each specification. Sealed tenders, on the forms supplied by the Board, to be delivered to Mr. J. Leslie G. Powell, Clerk to the Board, The Sessions House, Richmond, Surrey, on or before May 3.

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*CLERK OF WORKS.	Uxbridge Guardians	3l. 3s. per week	April 26

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*BUILDING MATERIALS, TRINITY ROAD, UPPER TOOTING—On the premises	Hooker & Webb	April 24
*FREEHOLD ESTATE, EAST FINCHLEY—At the Mart	Frederick Warman	do
*DEAF BATHS, ETC., Great West, Winchester House	Churchill & Sim	April 25
*OLD BUILDING MATERIALS, BOW—On the premises	Mark Lell & Bond	do
*FREEHOLD PROPERTIES, UPPER WARLINGHAM, SURREY—"The Greyhound," Croydon	C. & F. Rutley	do
*BUILDING MATERIALS TO CLEAR SITE, EATON-SQUARE, S.W.—On the Premises	W. H. Berry & Co.	do
*FREEHOLD ESTATE, CLAPHAM PARK, S.W.—At the Mart	Douglas Young & Co.	do
*FREEHOLD BUILDING LAND, LIFORD—At the Mart	Douglas Young & Co.	do
*SOLDING MATERIALS, HAMSTEAD-ROAD—On the Premises	Horn & Co.	April 26 & 27
*BIDERS' & CONTRACTORS' STOCK, WILKESDEN	J. Hubbard & Son	May 4
*BUILDING SITE, LADY-DYKE, E.C.—At the Mart	Ellis & Son	May 8
*LEASEHOLD PREMISES, LAMBETH & KENNINGTON—At the Royal Repository, Barlocan	B. N. Stollery	do
*BUILDING ESTATE AND RESIDENCE, ALDBERSHOT—At the Mart	Diver, Jones & Co.	May 22
*FREEHOLD BUILDING ESTATE, STRATFORD	Fulford, Horsey, Sons, & Cassell	do
*FREEHOLD BUILDING SITE, PARK ROYAL, ALSO ABBEY FARM HOMESTEAD—At the Mart	Debenham, Tewson, & Co.	June 13
*BUILDING SITES, WESTMINSTER, BATTERSEA, HERNE BAY—At the Mart	E. & H. Lumley	do

PATENTS.—Continued from page 445.

having a hole formed in each plate of a similar size and contour as the mouth of the chamber, the space between the said plates being closed, except at the top, by a distance piece slanted to the contour of the plates, a lid hinged to one of the plates for closing the top of the space, and held in position by bridges and bolts, a grooved seating formed on the inner surface of the outer plate for receiving the turned edges of a concavo-convex dished door employed for closing the space between the outer plate, and means consisting of hinged guides and eye bolts for temporarily holding the door in the grooved seating in the said space until it can be retained therein by the pressure of the steam within the chamber which is employed for hardening purposes.

13,691 of 1905.—F. MORTON and E. J. WHITEWOOD: *Spring Floors.*
This relates to spring floors. The floors are laid in any convenient manner on joists supported by lines of girders, each line of girder being divided into suitable lengths which abut together with a small space in between to allow for play, and are supported at each junction by a spring fitting, consisting of two metal casings, each containing a steel spiral spring. These casings are attached to the girders by means of horizontal bolts, two of which pass through each girder, one above and the other, the lower holes in the girders being suitably slotted so that when pressure occurs at the point of junction of the girders, the lower bolts will have sufficient play to slide in.

16,990 of 1905.—E. T. JOHN: *Locks or Latches.*
This relates to locks or latches, and consists essentially in the employment of a pivoted lever

for retracting the bolt, this lever being adapted to be pivoted above or below the bolt and to be reversed from the one position to the other, so that the lock or catch may be employed for either a right hand or left hand door, without the necessity of removing the locking bolt or other interior fittings.

22,810 of 1905.—A. CURWOOD: *Means for Balancing and Fastening Window Sashes.*
This relates to windows of the type wherein the sashes are provided with racks adapted to engage the sides and are counter-balanced by weights on the racks adapted to engage such pins on the opposite sides. The sashes are locked in any desired position by causing keys to engage the teeth of the pinions and thereby prevent rotation thereof.

24,527 of 1905.—C. EHRHARD: *Collapsible Frame Houses, Folding Tents, or the like.*
This relates to a collapsible frame house or folding tent, the sides and roof of which are separate and comprise detachable and collapsible or folding frames upon which a covering is supported, the relation of roof frame to the side frames being such as to leave ample space for ventilation and the structure being self-contained when erect.

24,535 of 1905.—J. J. HAROLD: *Metallic Piles.*
This relates to a metallic piling, and consists of a beam section comprising a plate provided with a flange at the outer edge of one side, a locking angle rigidly mounted on the same side and located adjacent to the opposite edge, said plate extending beyond the line of the free hook edge

of said locking angle, the best round hook edge of said locking angle being set at an angle preferably less than a right angle.

25,935 of 1905.—E. E. BURTON: *A Decoration for Panels and other Surfaces.*
This relates to a decoration for panels, walls, and other surfaces, and consists in the application to the backgrounds of prepared pieces of leather of any desired configuration, having their surfaces and edges shaded by burning and subsequently coloured, said pieces of leather each having a bevelled edge for attaching it by an adhesive substance to the background and to cause said pieces of leather to assume a natural and realistic angle.

733 of 1906.—W. J. THOMAS: *Chimney and Ventilating Shaft Tops.*
This relates to a chimney pot with four holes or open spaces of an oval shape made therein in four directions, north, south, east, and west, or the variants in an upward direction just above the ring at the base thereof, and four similar holes or open spaces in an upward direction made therein under the ring near the top thereof.

1,125 of 1906.—G. H. DORKEN: *Shelf Brackets.*
This relates to a shelf bracket, consisting of a blank, said blank containing a material for a vertical shank, a horizontal brace, and a middle strengthening rib which are folded in such a manner that the vertical and horizontal shanks stand symmetrically and the middle rib are formed of double sheets and a tong projecting from the vertical shank, said tong being folded and embraced by the material of the horizontal shank in order to strengthen the corner.

5,947 of 1905: W. FULLARD: Boring Tools.

This relates to a boring tool for use with excavating machines, comprising a rod having a screw thread thereon and a movable cap portion carrying a screw thread of increasing pitch, said screw thread being provided with pins, in combination with a surrounding tube having an enlarged extension.

6,325 of 1905.—E. C. POOLE: Method of Constructing Armoured or Reinforced Concrete Work and Erecting same.

This relates to armoured or reinforced concrete work, and consists in the method of constructing slabs, or blocks of reinforced concrete by placing and bedding the iron or steel bars in a continuous diagonal alternating direction arranged to cross or cross and re-cross the body of the slab, piece, or block in any direction and leave the bed of the bar projecting from the edge or edges of the slab or piece to form loops or eyes by which the adjacent or assembled slabs or pieces may be connected together by a continuous or other iron or steel bar, so as to form a monolithic whole.

19,579 of 1905.—J. MOORE: Laying of Subsoil, Drain, or Sewer Pipes.

This relates to the laying of subsoil, drain, or sewer pipes, and consists in the use of a shallow circular trough or support of large diameter as compared with that of the pipes which rest in arched recesses in the wall of said trough or support.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing various property sales including Bedford, Greystones, Fulham, St. John's Wood, Peckham, Putney, Stoke Newington, Forest Hill, Whipsnade, Berry-st., Canonbury, Tottenham, Weybridge, Stamford Hill, Ravenside, Rookwood, and Leabourne.

MEETINGS.

Friday, April 20. Junior Institution of Engineers.—Mr. F. J. Maddox on "The Internal Combustion Engine as Applied to Marine Purposes." 8 p.m.
Saturday, April 21. Edinburgh Architectural Association.—Visits (1) to Pinkie House, Musselburgh; (2) Church and Presbytery of Our Lady of Loreto, Musselburgh.
Monday, April 23. Royal Institute of British Architects.—Messrs. G. P. Bankart and Lawrence A. W. Turner on "Plasterwork," illustrated by lantern views, 8 p.m.

Surveyors' Institution.—Mr. J. V. Willis Bund on "The Effect of the Education Act, 1902, on Rural Districts."

Society of Arts (Cantor Lectures).—Mr. A. Maskell on "Ivory." 1. 8 p.m.
Institute of Sanitary Engineers.—Mr. T. B. Simmons on "Sewage Problems." 8 p.m.
Tuesday, April 24. Institution of Civil Engineers.—Annual general meeting of corporate members only, to receive the report of the Council, and to elect the Council and auditors for the ensuing year. 8 p.m.
Wednesday, April 25. Institute of Sanitary Engineers (Lecture to Students).—Mr. J. T. Griffin on "Disinfection and Disinfectants." 7 p.m.
Society of Arts.—Mr. F. T. Corbett on "The Production and Collection of Picture Postcards." 8 p.m.
Thursday, April 25. Institution of Electrical Engineers.—Mr. L. Andrews on "Long Flame Arc Lamps." 8 p.m.
Manchester Society of Architects.—Annual General Meeting. 6.30 p.m.
Friday, April 27. Architectural Association.—Mr. Walter Cave on "Fenestration." 7.30 p.m.
Institution of Mechanical Engineers.—Mr. Louis Greaven on "Petroleum Fuel in Locomotives on the Lehanpetate National Railroad of Mexico." 8 p.m.
Saturday, April 28. Junior Institution of Engineers.—Visit the works of the Croydon Gas Company, Waddon. 3 p.m.
Institute of Sanitary Engineers.—Visit to Fulham refuse destructor. 2.30 p.m.

TERMS OF SUBSCRIPTION.

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PRICES CURRENT OF MATERIALS.

Table listing prices for various materials including Hard Stocks, Pickled Stocks, Flat Irons, Red Wire Cuts, Best Farbeam Bed, Best Red Pressed, Buabon Facing, Staffordshire, Do. Bullnose, Best Stourbridge Fire Bricks, GLAZED BRICKS, Best White and Ivory Glazed, Stretchers, Headers, Quoins, Bullnose, and Double Stretchers.

STONE (continued).

Table listing stone products including Ancaster in blocks, Beer, Greenhill, Darley Dale blocks, Red Corschill, Closeburn Red Freestone, Bed Mansfield, YORK STONE—Robin Hood Quality, Scappled random blocks, HARBOR YORK—Scappled random blocks, Hopton Wood (Hard Bed) in blocks, and various SLATES.

WOOD (continued).

Table listing various wood products such as JOHNSON'S Wood, Petersburg first yellow deals, and White Pine, with columns for quantity and price.

JOISTS, GIRDERS, &c.

Table listing joists and girders including Rolled Steel Joists, Compound Girders, and Steel Compound Stanchions.

METALS.

Table listing metal products such as Common Bars, Sheet Iron Black, and Galvanised Corrugated Sheets.

LEAD, &c.

Table listing lead products including Lead-Sheet, Pipe in coils, and Zinc-Sheet.

ENGLISH SHEET GLASS IN CHATES OF STOCK SIZES.

Table listing sheet glass products with columns for size and price per delivered.

ENGLISH HOLLER PLATE IN CHATES OF STOCK SIZES.

Table listing holler plate products with columns for size and price per delivered.

... OILS, &c.

Table listing various oils such as Raw Lined Oil, Turpentine, and Gammine.

VARNISHES, &c.

Table listing various varnishes including Fine Pale Oak, Super Pale Copal, and Fine Elastic.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications...

TENDERS.

Communications for insertion under this heading should be addressed to 'The Editor,' and must reach us not later than 10 a.m. on Thursday.

Table listing tenders for Aberdeen projects, including carpenter, slater, plasterer, painter, glazier, blacksmith, and electrician.

ANSTRUTHER (N.B.).—For building a new police-station, for the County Council of Fife. Mr. D. Henry, architect, Church-square, St. Andrews, quantities by architect.

BOURNEMOUTH.—For erecting a refreshment shelter on the shore at Boscawen, for the Town Council. Mr. F. W. Lacey, Borough Engineer and Surveyor, Municipal Offices, Bournemouth.

BRAINTREE.—For 520 yds. of 9-in. stoneware sewer, for the Urban District Council. Mr. H. H. Nankivell Surveyor, Vestry Hall, Baintree.

BRANSTON FEN.—For erecting a farmhouse, Messrs. Saunders & Saunders, architects and engineers, Newark-on-Trent.

Table listing various contractors and their estimates for projects in Bournemouth, Baintree, Branston Fen, and Brighthelm.

COWPEN.—For laying 1,100 lineal yds. of kerb in Morphet-road, for the Urban District Council. Mr. H. Grievs, Surveyor, Seaford-street, Waterloo, Blyth.

EASTNEY.—For erecting St. Patrick's church hall and mission buildings in Eastfield-road, Eastney, Portsmouth. Mr. G. F. Smith, architect, Glenduro, 145, Victoria-road, North, Southampton.

GAINSBOROUGH.—For erecting an elementary school in Hopyry-road, for Lindsey County Council Education Committee. Messrs. Scorer & Gamble, architects, Bank-street-chambers, Lincoln.

LETTERKENNY.—For teacher's residence, Letterkenny, for the Select Vestry Parish Church, Conwall, Letterkenny. Mr. J. M. Intra, architect.

LONDON.—For making up the carriage-way of Wood-lawn-road, Section IV, for the Fulham Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.

LONDON.—For repairs and decorations to the Prince Albert public-house, Hoxton, N. Mr. H. Riches, architect, 8, Crooked-lane, King William-street, London, E.C. :—
 J. T. Robey £238 1
 F. Parsons & Son 285
 T. Osborn & Sons 236
 Sons* 165

LONDON.—For repairs and decorations to the Nag's Head public-house, Poplar, E. Mr. H. Riches, architect, 8, Crooked-lane, King William-street, London, E.C. :—
 A. W. Derby £507 0
 T. Osborn & Sons 447 0
 J. T. Robey 444 0
 T. S. Elkington & Sons £430 10
 G. Barker* 415 0

LONDON.—For erecting a new wing to the almshouses, Fulham Palace-road, S.W., for the Trustees of the Fulham Waste Lands and Lygon Almshouses Charity. Mr. E. Averis, architect, 13, Tynarley-road, Fulham, S.W. Quantities by Mr. T. Woodbridge Biggs, 10, Clifford-street, E.C. :—
 H. Haynes £1,785 0 0
 J. Barker & Co., Ltd. £1,457 0 0
 E. T. Clayton 1,453 0 0
 F. G. Minter 1,641 0 0
 E. E. Nightingale 1,415 0 0
 Patman & Pothering-ham, Ltd. 1,553 0 0
 H. Terry 1,560 0 0
 W. Johnson & Co., Ltd. 1,539 0 0
 E. Swan & Son 1,520 0 0
 W. Lawrence & Son 1,494 0 0
 Drake 1,387 0 0
 A. Brickett 1,368 0 0
 F. G. Lawrence 1,332 19 4
 C. Gray 1,320 0 0
 F. & G. Foster, Clifford-street, Norwood Junction .. 1,296 0 0

* Recommended for acceptance.

LONDON.—For rebuilding Mill House, at the Bow Brewery, London, E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. Quantities supplied :—
 F. J. Coxhead £2,250
 G. Barker 2,229
 K. & Kirk 2,100
 J. Jarvis & Sons 1,884
 F. & T. Thorne 2,100
 Todd & Newman 1,949
 J. T. Robey £1,933
 Courtney & Farham 1,925
 J. Jarvis & Sons 1,884
 Perry & Co.* 1,865
 W. Irwin 1,777

MORLEY.—For erecting a jam factory in Baker-street, for Messrs. Metcalf & Bradshaw. Messrs. T. A. Battersy & S. B. Birds, architects, Queen-street, Morley :—
 Masons : Pearson & Ainsworth, Morley* £280 0 0
 Joiner : E. Newton, Morley* 130 0 0
 Plumber : G. A. Firth, Morley* 24 17 6
 Plasterer : J. K. Crossley, Birstall* 16 10 0
 Slaters : J. May & Son, Morley* 25 0 0

MORLEY.—For erecting new woollen mill, for Mr. J. W. Appleyard. Messrs. T. A. Battersy & S. B. Birds, architects, Queen-street, Morley :—
 Mason : P. Rhodes, Leeds £2,100 0 0
 Joiner : I. Newton, Morley* 1,190 0 0
 Plumber : O. A. Firth, Morley* 204 0 0
 Plasterers : J. Huddle & Son, Birstall* 56 13 8
 Slaters : J. Atkinson & Son, Ltd., Leeds* 229 18 0
 Ironfounders : Morley Engineering and Pulley Co., Morley* 315 14 0

MORLEY.—For erecting a cotton-spinning mill, for the Morley Cotton Spinning Co., Ltd. Messrs. T. A. Battersy & S. B. Birds, architects, Queen-street, Morley :—
 Masons : J. Clegg & Son, Morley* £5,390 0 0
 Joiners : Smith & Bland, Leeds* 1,335 13 4
 Plumber : G. A. Firth, Morley* 194 0 0
 Plasterers and Concreters : Bagnall Bros., Wakefield* 1,178 19 11
 Slaters : G. Hogson, Morley* 24 5 0
 Ironfounders : Newsome & Ashiam, Batley* 2,722 0 0

NEWPORT (Isle of Wight).—For waterworks—Shal-leet water supply, for the Isle of Wight Rural District Council. Mr. A. Buxton, Surveyor, Ulavarra, The Avenue, Freshwater, I.W. :—
 Watson & Gow, Ltd. £230 10 0

PONTYCYMMER.—For erecting a new billiard room and certain alterations at the Ffaldale Institute. Mr. P. J. Thomas, architect and surveyor, Bridgend :—
 G. Jones £1,273 0 0
 P. Gavilard 1,200 0 0
 F. V. Longtour & Co. 1,039 2 6
 Pontycymer* £1,100 0 0

SOUTHAMPTON.—For laying a storm-water sewer on the western shore, for the Corporation. Mr. J. A. Crowther, Borough Engineer :—
 H. Lawrence £490 0 0
 R. Richards 452 5 8
 J. Douglas 449 4 5
 E. T. Ains & Co., Ltd. £415 0 0
 F. Osman 415 0 0
 F. Grace* 383 0 0
 [All of Southampton.]

SALTWOOD.—For sinking a well at Blushenge, for Hythe Corporation. Mr. C. Jones, Borough Engineer, Bank-buildings, Hythe :—
 O. Lawson £4,500
 Tully & Sons 4,313
 A. E. Nudd 3,831
 J. Moffatt 3,640
 R. D. Batchelor 3,611
 J. A. Bridge 3,118
 J. Sangwin 2,956
 Duke & Ockenden 2,955
 Johnson & Langley 2,893
 R. H. B. Neal, Ltd. £2,838
 Fenton & Sons 2,762
 J. H. Danson 2,681
 Timmins & Sons, Ltd. 2,625
 P. Smith & Sons 2,407
 W. Robinson & Sons 2,450
 E. Jeffery 2,227
 S. F. Baker & Son, London* 1,673 1
 [Borough Engineer's estimate, £2,729.]

SEASCALE.—For erecting a residence at Seascale, for Mr. G. R. Burnett. Mr. W. L. Mason, architect and surveyor, Ambleside :—
 D. Mackintosh, £2,739 0 0
 H. Ellibeck 2,618 0 0
 O. W. Bradley 2,507 0 0
 J. Lyson 2,417 13 2
 W. Oradwell & Co. 2,417 0 0
 L. Ferguson £2,389 0 0
 J. Laine & Son, Melbourn-street, Carlisle* 2,359 0 0

TWICKENHAM.—For private street improvement works, Southfield-gardens, Grove-avenue, and Athelton-road, for the Urban District Council. Mr. F. W. Pearce, Surveyor, Town Hall, Twickenham :—
 S. Atkins, Kingston-on-Thames* £709 10 0
 Athelton-road, Shepherd & Sons, Teddington* 498 0 0
 Southfield-gardens, Shepherd & Sons, Teddington* 819 0 0

WALSALL.—For street-making works, Bath-street, etc., for the Corporation. Mr. R. H. Middleton, District Surveyor, for the Urban District Council, Mr. F. W. Pearce, Borough Surveyor :—
 A. Cooper, Rotten Park-row, Birmingham £540 0 5

WARMINGHAM (Wilts).—For laying out playgrounds at the back of secondary school and Athenaeum, and enclosing same, for the Committee. Mr. W. H. Hardick, architect, Warmingham :—
 G. Billett £265 17 6
 H. Franklin 245 0 0
 R. Butcher & Son, George-street, Warmingham* 244 18 0

WRENHAM.—For widening cart bridge at Southsea, for the Rural District Council. Mr. T. Rees Evans, District Surveyor, Johnstown, near Rumbour :—
 T. Williams & Son £169 0 5
 S. Moss 132 15
 W. H. Wycherley 95 0
 W. Jones, Bryn-hydd, Ponkey, Rusbou* £89 10

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

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Sisters' Wing and Infirmary, St. George's Retreat, Burgess Hill.....	Mr. E. Goldie, F.R.I.B.A., Architect.
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San Francisco.



HERE is a strange irony of events in the fact that during the two years preceding the terrible disaster which has just devastated San Francisco, an elaborate scheme for the improvement and laying out of the city on new lines had been in process of development under the hands of an eminent American architect, and his Report and plans were completed and laid before the city authorities just six months ago. The scheme contemplated a complete re-adjustment of the main lines of thoroughfare and vista, and a gradual rebuilding of the city on a great scale, such as could only be carried out little by little, dealing with one portion of the city at a time. The relentless forces of Nature have at all events cleared the way for the improver. One is reminded of the Great Fire of London which was the opportunity for improved building, new lines of streets, and the erection of a great cathedral and a number of churches at the hands of one of the greatest architects whom this country has produced. Unhappily the opportunity for a new London, in the way of alignment of streets and the working out of a more dignified and centralised plan, was in great measure wasted through want of energy and of large ideas on the part of the authorities. It does not seem likely that this mistake, at all events, will be made in San Francisco. The plan for an improved San Francisco is ready in advance, and we are assured that there is every intention of rising above misfortune, and of making this calamity the opportunity

for rebuilding the city according to the most approved ideas of plan and construction. If it be thought that it is foolhardy to set about rebuilding a city on a spot which has been thus visited by earthquake in its most appalling form, we may cite the instance of Lisbon, which was nearly destroyed by a similar calamity just a century and a half ago, but has remained unscathed since. But there is a more rational ground of confidence to be recognised. We now learn that the steel-framed structures carried out on the modern and peculiarly American system which we have not been accustomed to view with much favour, have at all events shown that they are fairly proof against earthquake—the best and most valuable quality which we have yet heard of in connexion with them. They are reported to be almost intact, even in the case of a building which was not quite completed, the owner of which expects to be letting offices in it in a few days. The discovery that such structures will withstand an earthquake that overthrew every other kind of building (unless the Mint, mentioned by a correspondent on another page, is an exception) is one of great importance, and teaches a lesson which is not likely to be overlooked.

There seems to have been an impression that the magnitude of the disaster was in great measure owing to the presence of a considerable proportion of wooden buildings—what are called in America "frame houses"—in the city, and that San Francisco has paid dearly for overlooking the object lesson furnished by the fire which, within the memory of many of our readers, made such fearful havoc of the old wooden-built city of Chicago. This would of course be only as regards the fires that followed the earthquake;

for, apart from that danger, we should expect to find that wooden-framed houses would resist earthquake shock a great deal better than those built of ordinary brick and stone walling. But that San Francisco has been careless and indifferent in regard to the danger of extensive wooden building in a great city appears to be quite a misapprehension. On the contrary, the matter has been for some time past the subject of special building regulations carried out in a thorough spirit of reform; and from the following information, which may be relied on, it will be seen that, though it was not possible to do everything at once, the San Francisco authorities have for some years back been proceeding vigorously and systematically towards the removal of this source of danger.

Under the charter of 1898, drafted by twenty-five freeholders comprising the foremost practical business men and lawyers in the metropolis, San Francisco's building and fire ordinances underwent drastic changes. A Buildings Department, supervised by the City Architect; the Department of Electricity; and the San Francisco Fire Department, all co-operated to insure the highest degree of safety when permits for building or repairing structures were petitioned for. Having in mind the necessity for reducing the possibility of conflagrations to a minimum, the Building Ordinance of 1901 revolutionised all previous enactments having for their *raison d'être* the immunity of the city from fires.

The "fire limits" were extended, and each time a petition for repairs came before the Buildings Department the premises desired to be altered were inspected by the Buildings Inspector, under the advice and with the co-operation of the Fire Department; and so rigorous was the campaign waged against the

maintenance of unsafe wooden buildings within the fire limits, that in the majority of cases these were ordered to be dismantled, and modern fire-resisting structures took their places. The Merchants' Association submitted a Sign Ordinance in 1901, which was adopted. This did away entirely with swinging signs, except in cases wherein the signs were so arranged as to swing over the footway at night, when they were lettered in incandescent lights, and required to be lighted until past midnight. All other signs were required to be placed at least 8 ft. above the kerb line and not to project over the freehold line for a distance of more than 6 in. at that height, and not more than 12 in. when affixed to the building at a height of at least 12 ft. above the kerb line. Within a year after the passing of this Sign Ordinance one might have looked down Market-street from the City Hall to the Ferry without noting one offending projection athwart the line of vision.

The Building Ordinance provided, as to the fire limits, that all repairs to buildings originally constructed of inflammable materials, should be carried out by the use of fire-resisting materials; and where new structures were petitioned for, the buildings must be of brick or stone, the roofs to be sheathed in corrugated steel or tiles. For districts within and without the fire limits, every detail of the proposed structure was submitted to the City Architect, who examined the plans personally, and passed his recommendation

or refusal up to the Board of Public Works, which sat weekly. The petitioner, in case of refusal of the City Architect to recommend issuing of a permit, might have appealed in person to the Board, whose mandates were final and unalterable. Theatres were reconstructed so as to provide a large number of exits, and overcrowding was punished severely. Fire escapes of wrought-iron were attached to all buildings of two or more stories within the fire limits; and all doors and apertures in the buildings of mercantile and wholesale districts were shuttered in steel while the occupants were away. As in other American cities, the housekeeper is unknown in San Francisco, at least in buildings devoted to the conduct of business.

The San Francisco Fire Department was one of the city's glories; under the direction of Chief Sullivan it had reached a condition of efficiency hardly to be exceeded. Its members were required to pass physical and athletic tests which made its *personnel* second to none of the world's fire-fighters; and it is safe to say that had the late earthquake not broken the water-mains, little of the damage which has appalled the civilised world would have been done.

The era of wooden building in San Francisco, at least within the fire limits, has passed away. The steel and stone structure has nobly justified its existence, and the municipal authorities, we are assured, in taking measures for superintending the building of a

new San Francisco, will stand for stone and iron with one voice. Elasticity is a saving factor, and in steel we have a material that should enable structural engineers to provide an almost certain safeguard against future ruin of the city by earthquake. But if safety against fire is to be secured the steel framework must be protected by fire-resisting material attached so that it cannot be shaken off or even displaced. Terra-cotta tiles and similar refractory materials cannot easily be fixed to steel so as to comply with these conditions, and it is probable that, in virtue of its elasticity and cohesion, carefully-designed concrete-steel or concrete-cased steel construction would be found the most suitable for resisting earthquake and fire.

The general aspect of the streets of what must now be called Old San Francisco is indicated in the two subjoined sketches by Mr. Chidson, showing Market-street and Post-street. The former was, and under the new laying out will still be, one of the principal thoroughfares of the city, though it is a diagonal in reference to the most general direction of the street lines. According to the proposed plan it is to start from a crescent at the wharf in San Francisco Bay, culminating in a kind of circus at the foot of Twin Peaks Hill, the peaks of which are in a line almost on the axis of the street (one of the peaks is seen at end of Mr. Chidson's sketch of the then existing street). Halfway along its course a crescent-shaped *place* is to



Market-street, San Francisco, Looking South-West (Twin Peaks Hill in the distance) From a Sketch by Mr. C. R. Chidson.

open out from the street on its north-western side, which forms the starting-point for a great boulevard which is to branch out due west and conduct to the long narrow ornamental park which runs down to the western shore of the city. For San Francisco enjoys the advantage of having a sea front on three sides, north, east, and west; as at New York, the land transit access is rather restricted by this position, but the three-fold sea aspect undoubtedly makes for

hygienic conditions. According to the rule which holds good, no one knows exactly why, in almost all large cities, the western is the best residential side; the eastern margin has the quays and docks and is, we presume, the portion of the city referred to in *The Wrecker* as "the front." The city has several picturesque hills on its borders, or in one or two places almost within the city itself, and the treatment of these counts for something in the new scheme of laying out.

About two years ago the "Association for the Improvement and Adornment of San Francisco" issued a circular letter pointing out that San Francisco had suffered (like many other modern cities, we may add) from the want of a comprehensive plan which would be a guide in laying out new parks and streets, and suggesting that the construction of a boulevard round the shore, the position of public buildings so as to produce the best effect, and other minor matters



From a Sketch by Mr. C. R. Chidson.

bearing on the general appearance of a city, required consideration. Subsequently they invited a well-known American architect, Mr. Burnham, to draw out a regular scheme for the improvement of the city, and a studio was built for him on the slope of Twin Peaks, where he and his assistants occupied themselves for sixteen months on the plans, for the execution of which fate seems now in so terribly dramatic a manner to have cleared the ground, as if by previous arrangement.

A good American architect of course goes to Paris, not only when he dies, but in search of ideas while he is living. and Mr. Burnham introduces, as a key to his leading idea, a kind of skeleton plan of the system of laying out of Paris, which he reduces to the idea of three concentric elliptical main lines crossed by diagonals from the centre to the circumference. This ideal plan, however, can neither be said to represent Paris as a whole, nor is it as a whole represented in the new San Francisco plan. We have the diagonal streets and the exterior surrounding boulevard, but not the inner concentric lines; the main portions of the plan represent the scheme which seems to be such a favourite one in the artificially planned American cities, of a kind of gridiron of parallel streets and blocks, with other streets crossing at right angles, and penetrated at various points by diagonal streets, which generally begin and end in some kind of open space, larger or smaller. There is something to be said for this system of diagonals, in regard to locomotion; it has the geometrical merit that the hypotenuse is always shorter than the sum of the two other sides of a triangle. Has it any other merit? We rather doubt it. To the stranger in the city, these diagonal routes are puzzling in reference to direction; to the resident and the owner of building property they mean that a very large number of the buildings in the city are cut into triangular shapes equally inconvenient for the architect to plan or for the tenant to inhabit. Judging from some of the extraordinary and portentous-looking angle blocks ("gores" seems to be the name for them in Mr. Burnham's Report), illustrations of which come to us from across the water, it would seem that American architects find a certain diversion in the treatment of high three-cornered buildings with acute angles. Perhaps one may get used to anything; but to the European eye these are, and we hope will always remain, somewhat in the light of architectural monstrosities; and it is possible that the public of American cities, who have to see them and, if not to live, to do business in them, may get tired of them before long. We should certainly recommend, in the plan of the new San Francisco, a reconsideration of this system of diagonals, which is very well in a suburban neighbourhood among houses with plenty of ground round them, but involves a great deal of inconvenience in the manner in which it affects the sites for city buildings. After all, to get from one part to another by the shortest possible route is not everything in city life.

In other respects Mr. Burnham's scheme is a fine one. He makes the

most of the hills. He proposes to leave the tops of them as far as possible unbuild on, and to surround them with two or three zone roads with terraces, communicating by roads up the gradients of the hill, where not too steep. Where they are, it would be a good plan to have a spiral road winding up; we do not notice that this is suggested. In the flat portions of the city it is suggested that a great charm may be added to certain quarters by the elimination of some of the streets in the monotonous system of blocks, and the substitution of a chain of parklike squares, formed in a measure by the un-used or misused back areas. He observes that "the isolated square of the Old World, unless maintained by wealthy residents, is a quiet, almost desolate spot seldom feeling the throb of life. The chain is suggested to obviate this, and induce a current of life to flow agreeably from end to end, to the exclusion of unnecessary vehicles, thus leaving the main traffic to the intermediate streets." This is an idea very characteristic of the restlessness of the American temperament, which seems rather to eschew repose. In London it is this very quiet of some of the squares which are not general thoroughfares which is attractive to many residents, and is felt as rather an advantage than the reverse. Another sentiment in the Report will meet probably with general approval: "The first step in civic improvement should be towards ideal streets, faultless in equipment and immaculately clean. Until this is taken, monuments and statues are out of place; men and events can be much more effectually commemorated by street improvements." It is partly no doubt with this view of rendering the streets pleasanter in appearance that it is proposed that the diagonal arteries should be provided with an underground service of cars, the excavations for which could be made at the same time that the streets are constructed. It would seem then that these diagonal arteries are an entirely new feature; we have already commented on the drawbacks to them, but we admit that the opportunity of creating an underground traffic line would form their best excuse.

Mr. Burnham proposes to increase considerably the extent of public parks in and around San Francisco, forming as far as possible a chain of parks on the outskirts. He would select for parks ground which has a certain natural beauty but which, from its steepness, inaccessibility, or difficulties of drainage, is unsuitable for residences; and as such parks would be more or less on rising ground, the appearance which one will present as seen from another should be considered; and he makes the excellent suggestion that in whatever buildings are erected in such parks a consistent type of architecture of the greatest simplicity should be adhered to. "Buildings, the memorials of fêtes or expositions, no matter how interesting they may be, have no real sympathy with a park, and are therefore an unrestful influence." We may add that the crowds which any kind of exhibition on a large scale draws together are liable to spoil the appearance of a park to an extent which it takes a good deal of time and expendi-

ture to recover from. The Paris 1900 exhibition ruined the aspect of the Champ de Mars, and other portions of the ground covered, for a long time after; nor is its effect in this way yet obliterated. Mr. Burnham remarks that if statues are placed in the parks "it is better to make formal parterres and alleys for its reception than to scatter it haphazard"; but this should be taken *cum grano*. Statues should certainly not be placed "haphazard"; they should emphasise and give the central decoration to some special feature in the laying out of the ground; but anything like a collection of sculpture along one walk or parterre becomes a little too like an exhibition; and moreover, a really fine piece of outdoor sculpture will have more impression when seen as the sole object of the kind in the centre of a circle or as the culmination of a vista, than when aligned with a number of others.

In the main, however, Mr. Burnham's scheme is a noble one, and may render the revived San Francisco, with its exceptional advantages of position, one of the most beautiful cities of the world; and we can only add our best wishes for its realisation and for the future safety and prosperity of the city which has suffered for the time under such an appalling and heartbreaking disaster.

THE PRESENT STAGE OF INDUSTRIAL ART.



PAMPHLET has lately been issued by the Junior Art Workers' Guild* which has

attracted a good deal of attention among art workers. As far as we know, this is the first expression of the collective thought of the younger school of architects, artists, and craftsmen which has come into existence in late years, and in whom the difficulties they have to face have bred a seriousness and purpose that will surely have its effect in the years to come. It came out rather appropriately at the same time as the last of the Arts and Crafts Society's triennial exhibitions, each of which has marked a stage in the development of modern English applied art; and it seeks to determine the causes which have led to the curious situation in which we at present find ourselves—possessing, that is, a school of applied art which is admittedly the first in Europe, but which remains a thing wholly apart from the life and industry of the country, and of which the followers can obtain little or no effective patronage from the public. The pamphlet is at once a review of the history and present situation of the Arts and Crafts movement, an investigation of the forces which have militated against it, and some suggestions as to the remedy.

Two causes the authors consider to have been mainly instrumental in producing the present deadlock—one belonging to the course taken by the Arts and Crafts movement itself, and the other to the industrial conditions of the age. The first was the rash abandonment of tradition by the leaders of the

* "The Junior Art Workers' Guild: What it is and Where it Stands: An Appeal to Craftsmen." Post-free 2id., from the Secretaries, 12, Bedford-gardens, W.

movement in their revolt against what was stereotyped and academic, as to which the authors say:—

"At first this new philosophy seemed to promise excellent results. Men who were saturated with tradition, when they thus took to thinking for themselves, turned out very creditable work. But another generation came along who were without this training, and in their hands the results were very different. Little by little was created a new cult which we know now by the name of 'Now Art.' . . . It spread like a plague over Europe. It went from extravagance to extravagance, until finally it has produced what such things always do—a Nemesis of reaction.

"Unfortunately this reaction is telling against the Arts and Crafts movement with which 'Now Art' had become too closely identified—'Now Art' and 'Arts and Crafts' in the popular mind meaning the same thing—and so that which is real and vital promises to suffer from that which is bad and meretricious, and there is a danger that the good may be lost sight of and disappear."

The remedy proposed in the pamphlet is an intelligent—not slavish—return to tradition, a regrafting, as it were, of our art on to its parent stock, by making the study of the great work of the past an indispensable part of every artist's education. At all events, one of the first necessities of the case seems to be the establishment of a more universal standard of taste, even among artists themselves, which can only be reached by much greater sympathy and co-operation than at present exists among them. Individualism has been allowed too free a play and originality has been worshipped for its own sake, with the result that little progress has been made towards the formation of a national style or of a body of tradition capable of guiding the future development of the country's art.

The other force which the authors consider to have militated against the movement is the modern industrial system. Division of labour is the keynote of modern production; but division of labour, when carried beyond a certain point, makes craftsmanship impossible and turns men into machines. The present tendency of commerce is to separate designer and craftsman, the object of the Arts and Crafts movement is to bring them together. Here is, perhaps, the most serious obstacle to progress, and one for which it is difficult to see any remedy except in such a gradual improvement in public taste as will lead the public to demand such a standard of work as can only be reached by the artist craftsman.

Whether these results can be obtained at all under present social conditions is a point upon which the Guild in the present pamphlet do not commit themselves, but they end with the following appeal to their fellow-workers:—

"We fully appreciate the gravity of the situation that has thus been created and the necessity for finding a solution upon it. Indeed, in this connexion we feel ourselves in the position of commissioners in the Arts whose duty it is to investigate and collect evidence on these points.

"In these circumstances the Junior Art Workers' Guild will heartily welcome to its ranks all artists and craftsmen eligible for election who can lend a helping hand to the efforts it is making and sympathy with the efforts it is making to cope with the present situation. They feel that they should do something to organise the younger generation of artists and craftsmen, to bring together the best artistic thought of the day, and, where possible, to direct their energies into such channels as shall be most advantageous both to themselves and to the art of this country. In the accomplishment of this work they believe that it may be possible also to do something to arouse such a popular interest as will awaken the people to the ugliness of modern life, and that by taking in hand definitely the work of reform they

will find a common ground of interest with the public, and so discover the artist's and craftsman's rightful sphere of influence and usefulness in the social system."

NOTES.

The Labour Market.

THE latest labour returns show some improvement for the month of March, but the building trade shows only seasonal improvement, the continued activity in other industries still leaves this untouched. The total number of work-people affected by trade disputes which began or were in progress in March was 13,536 more than in the same month last year. The *Frankfurt Gazette*, quoted in the *Times*, April 18, gives some interesting figures in connexion with the German Labour Market, which in spite of the new tariff arrangements and a considerable influx of Austrian miners and Russian refugees, shows unusual activity, in which it is stated the building trade participates.

Roads Improvement.

FROM the annual Report of the Roads Improvement Association it is evident that the past year of this body has been one of great activity, and satisfaction must be felt that the House of Commons, some leading Government departments, and various local authorities have admitted the desirability of the recommendations made by the association in matters connected with the construction, maintenance, and administration of highways generally. The most welcome news contained in the Report is that a joint committee of the Roads Improvement Association and the Automobile Mutual Protection Association has been formed for the purpose of conducting experiments with the object of ascertaining the relative cost of constructing dustless roads, and the best materials for the purpose. Palliative measures have been found of little avail, and it has now been decided to lay experimental stretches of road with different materials, so that the effect of each can be separately studied. This work should be of much value to local authorities, as it will place at their disposal exact data as to the cost of dustless roads, and save them considerable outlay by rendering costly experiments unnecessary. In other countries investigations of the kind would be undertaken by the State, and it is really a disgrace that a private organisation should be compelled to act as an intelligence department in matters connected with the administration of the national highways.

The Petrol Nuisance.

CONSIDERING the rapid increase of motor vehicles in the streets of London it is quite time that more stringent regulations should be framed for the purpose of enabling the authorities to keep the atmosphere free from the fumes of petrol and lubricating oil. The petrol omnibus as at present made is a large and noisy contrivance, with a maximum capacity for the emission of noisome odours, but it is not the only offender. Petrol motor cars even of the most approved design are bound to leave behind them a distinct flavour, and it is certain that the promised supersession of horse-drawn

by mechanically-propelled vehicles is not a thing to be desired, unless all forms of motive power other than electricity are to be prohibited. Existing laws are sufficient, if strictly enforced, to prevent the emission of steam and smoke from road locomotives of every kind, but they afford no protection against invisible vapour and smell. Of course, constant improvements in design tend more and more to mitigate the undesirable characteristics of petrol engines, but even assuming perfection to be attained, such machines would still generate quantities of carbon dioxide—small individually but enormous in the aggregate. Hence the adoption of electrically-propelled vehicles is much to be desired, and the promised introduction of the electric omnibus on a large scale comes as a most welcome innovation, although it remains to be proved whether the difficulties which have hitherto militated against the financial success of such ventures have been satisfactorily overcome.

Electric Lifts.

THE paper by Mr. Crews on "Lifts and Hoists" which was recently read before the Manchester section of the Institution of Electrical Engineers gives an impartial account of the costs of the working of twelve hydraulic and twelve electric lifts. The examples seem to have been judiciously chosen, and therefore the comparison he makes is instructive. The simplicity of the design and the mechanical excellence of hydraulic working compare very favourably with the motors, starting resistances, and complicated switches required for electric working. Yet, according to the author, at least five of the leading English makers supply three times as many electric as hydraulic lifts. The manufacturers recommend them as being equally trustworthy in working, and the maintenance contracts in the two cases are practically identical. From the data given in this paper it appears that the prime cost of an electric lift is greater than that of a hydraulic lift; but the cost of the energy required in the latter case is six times that required in the former. In an electric lift the power required is proportional to the load, but in the single ram hydraulic lift the power consumed is the same at all loads. The annual cost of the energy, however, for an hydraulic lift is only about a third of the annual total cost when maintenance, wages, and depreciation are taken into account. It will be seen, therefore, that if the electric lifts are more liable to breakdowns, etc., the saving in the power bill may be dearly purchased. Mr. Crews says that many electric lifts have been working satisfactorily for over ten years. The number of fully automatic push button electric lifts is rapidly increasing. In the case of one in use for over a year the working results are in substantial agreement with the figures given by Mr. Crews.

Professor Curie.

By the untimely accident resulting in the instantaneous death of Professor Curie, France and the scientific world have suffered a great loss. Although recognised for many years past as an

investigator of unusual capacity, Professor Curie first became known to the general public in 1898 as the joint discoverer with Mme. Curie of radium. The remarkable properties which Becquerel showed in 1896 were possessed by uranium compounds, and the fact that certain uranium minerals were found to exhibit the quality of radio-activity in higher measure than metallic uranium, suggested to the Curies the probable existence of a new substance. Selecting pitch-blende as the material for examination, they proceeded in their search by methods of chemical analysis, and ultimately found an exceedingly small quantity of the radio-active substance now described as radium. Subsequent investigations showed, among other things, that radium possessed the extraordinary property of being able to emit heat continuously without perceptible diminution of bulk, and of transmutability into helium, thereby suggesting that the gropings of mediæval alchemists, ignorant as they may be considered, were not altogether based on folly. What further light the continued labours of Professor Curie would have been able to throw upon the hidden mysteries of nature no one can now say, but scientists in every part of the world have abundant reason for regretting the sudden termination of so exceptionally brilliant and valuable a career.

DR. WHEATON'S Report to the Local Government Board on the sanitary condition of the Abertillery Urban District.

seems to point to inadequate water supply as the most serious element in its unsatisfactory condition. The principal water supply is derived from the Tillery brook. From the intake the water passes to a small screening tank, and from this tank to filters; and thence to a clear water tank of 500,000 gallons capacity, from which it is distributed by gravitation. There are two of these tanks, but one is cracked owing to subsidence of the underlying strata, and cannot be used. The filtered water accumulates in the sound tank during the night, but is soon all drawn off in the morning, and at a time varying according to circumstances the supply becomes intermittent, the water running straight from the filters to the mains. Hence it is not surprising to read that with few exceptions water-closets are hand flushed, the water supply being insufficient to allow of the provision of flushing cisterns; it is also stated that the habits of the people are so rough that they would break any flushing apparatus provided in connexion with water-closets; and owing to imperfect flushing the boppers of the closets are frequently found to be in a filthy condition. The Report recommends that the local authority should endeavour to provide an increased supply of water from a reliable source, and should also at once proceed to the appointment of a district surveyor.

Framework Knitters' Almshouses, London. The freehold site of the old almshouses belonging to the Framework Knitters' Company has been placed in the market. The almshouses are situated in Kingsland-

road, Haggerston, having a frontage of 200 ft. to the main thoroughfare, with a return of 87 ft. 6 in. to Pearson-street. The charity was founded in 1727 by Thomas Bourne, who bequeathed 3,000*l.* to the Company for the erection and endowment of an almshouse, and directed his executors to lay out not more than 1,000*l.* in the purchase of ground distant within 5 miles from the City of London, whereon to build an almshouse for twelve poor freemen, or their widows, and to invest the residue of the bequest in lands to yield profits for maintenance. The Company bought the land for 145*l.*, in a favourite quarter for institutions of that kind; they expended 800*l.* upon the building of a block with two wings, containing twelve tenements, and invested the residue in Old South Sea Annuities. Subsequent bequests made by Mrs. Staunton, the founder's daughter-in-law, T. Cook, and T. Taylor (1759-1854), on behalf of the inmates, in money and in kind, augmented the trust funds to the additional extent of 2,500*l.* The total income of the charity is given as 131*l.* 18*s.* in an official return rendered some years ago. A water-colour drawing by T. Hosmer Shepherd, 1857, of the almshouses is in the Grace Collection.

Lectures on Greek Dress. PROFESSOR BALDWIN BROWN gave at the Royal Institution, on Tuesday last, the first of two lectures on "Greek Classical Dress in Life and Art." The main object of the first lecture was to show that the Greek dress, as represented in sculpture and in vase-painting, was not a mere artistic convention, but was, so far as realism in sculpture could be allowed to go, an actual representation of the dress of everyday life; and to explain how this dress was put on—one could hardly say how it was made, as all the normal forms of it could be made by folding and fastening a rectangular piece of stuff. This process of folding, making up (as it were) the costume as it appears in Greek sculpture, was practically illustrated by a series of photographs from life, showing the process of folding and fastening in its successive stages. The Greek dress was, he thought, one of the most characteristic artistic creations of the Greeks, for the simplicity of its elements and the variety and beauty of its actual form and arrangement. From the illustrations of the process of putting on one gathered the meaning of two or three characteristics of Greek drapery which must be familiar to everyone who has looked at Greek statues, but the practical origin of which has probably often been overlooked. The second lecture will be given at the Royal Institution at 3 p.m. on Tuesday next.

The Baillie Gallery. At the Baillie Gallery there is a mixed collection of works by Scottish painters—too many of them in what we call the "smudgy" style of landscape which is so prevalent now, and in which nothing seems to be distinctly made out; in Mr. M'Taggart's "Sunburst after Rain at Carradale" (7) there is hardly any distinction between the sea and the foreground beach or rock, as one must suppose it to be, on which figures are reclining

who look as if they were in the water. There are some good effects here and there; Mr. Cadenhead's "September Afternoon" (3) for instance; Mr. Campbell Mitchell's "Aberlady" (10); Mr. Gibson's "Landscape" (22); Mr. Evan Geddes's "Winter" (52). Mr. Wynne Apperley's Venice sketches in water colour are in the same unfinished style, but show good effects; the architecture is badly treated; no one has any right to paint a celebrated building in the way the Salute Church (78) is treated. A small collection of water-colours by Mr. Walter St. John Mildmay and Miss (?) Mabel St. John Mildmay show some good landscape effects, the lady's being the best; "The Coming Storm" (23) is a powerful sketch, and we like also "A Kentish Stream" (16), "A Venetian Canal" (29) and "The Mill Stream" (34).

The Fine Art Society. At the Fine Art Society's Gallery there is on view a large collection of old engravings of Oxford and Cambridge and of the Public Schools, not valuable mostly in an artistic sense—indeed, in the majority of them the buildings are very badly drawn, but of no little interest in a historic and topographical sense. With this collection is united an exhibition of a series of water-colour illustrations of Oxford and Cambridge as now existing, by Mr. Wallace Rimmington, and a smaller collection by Mr. W. Matthison. On the whole we prefer Mr. Matthison's in point of colour; but both sets form an interesting collection of illustrative water-colour art.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Mr. E. T. HALL presided on Monday over the fortnightly meeting of the Royal Institute of British Architects held at No. 9, Conduit-street, W.C.

Mr. Alex. Graham, Hon. Secretary, announced with regret the decease of Mr. R. A. Bryden, of Glasgow, Fellow, elected 1876, and Mr. W. Goldsmith, Associate, elected 1882.

Plaster-Work.

Mr. Geo. P. Bankart and Mr. Laurence A. Turner then read papers on "Plaster-Work," of which the following are abstracts:—

Mr. Bankart said that plaster had so long been looked down upon for its modern commonplace vulgarity of treatment that it seemed almost incongruous to think of it as a vehicle of art. Any really healthy revival seemed only seriously possible by again reverting to the beginnings, by the gleanings of some of that simple impulse which urged the artists of the past to find expression in materials and methods most in sympathy with their own nature, and in the right and full development of those methods.

What, the author asked, are some of the abstract points of value to be gathered from a general rumination amongst all the accumulated wealth of the labour of men's hands in the application and shaping of a kind of mud in or on buildings; and what may we rightly take to heart in pursuing or in attempting to give fresh hope and vitality to modern plaster-work? The shadow of the first half of the first century A.D. revealed to us remnants of modelled wall and ceiling decoration of a beauty, subtlety, and delicacy never since surpassed or even approached. It spoke to us of the extraordinary decorative instinct of the Greek and Roman in the combination of extreme simplicity of line and surface with refinement and power of execution. For the plasterer the lessons to be learned from these fragments of decorative art can never be too plainly noted or too highly praised. The stucco of the Romans tells us of their investigations, their admiration, and of their imitation. This imitation

as not the copying of the form, but of the spirit, of the art of the ancient Romans and Greeks. We of the XXth century have our own religion, our science, our folklore, or national virtues, our industries and manufactures, to embody in our art.

Tracing the history of the plasterer's art through Renaissance times, and speaking of its results brought about by the changes in building construction, the author demonstrated that each one of these developments had its marked effect upon the decorative art of the plasterer. From each of these ages it would be found that the plasterer produced his best work when the particular kind of plaster he used, whether stucco, gesso, or plaster of Paris, was worked in its own particular plastering way, and was not forced into simulation of carving in marble, stone, or wood.

The success of his art depended best assured when his material was put to the noblest right use without abuse. To the question, Did the Classic or the Renaissance architect consider whether the methods then employed were legitimate or not? the author was inclined to suggest the negative, but that they were accepted as the most convenient and durable methods of expression then known. The primary object of the decoration of a ceiling or of a wall, as in all decoration, was the giving of pleasure to the eye. The construction of the ceiling had undoubtedly its bearing on the design, but once the impression of sufficient support and strength satisfied the artist, he relied in his emulation to obtain the praise of his patron (eager to outshine his rivals); and to do this, while framing his work with due respect to reasonable economy, he thought highly of his enrichment, treated in the language of the time. This point concerning right or mistaken method, whether past or present, had an important bearing on all workmanship. Had the artists of the Italian Renaissance known of the method of casting from moulds of flexible gelatine, the author thought that they as artists would have carried their method to a much greater pitch of perfection, and not so much in mechanical skill as in suiting their forms more particularly to the advantages of the mechanism.

He claimed for plaster at least that respect and technical liberty which is due from the artist to any other material or medium of expression, whether the surface of operation be large or small. He believed each period of the art of the plasterer should be regarded on its own merits in combination with the peculiar circumstances and efficiency or inefficiency existing, according to the peculiar materials that it was then most convenient to procure and to manipulate. If mechanical skill be the plasterer's diploma, then should the XXth century be able to dim the glories of the Italian Renaissance; but we must go back again to simplicity of line, of form, and of spirit, in the giving of pleasure, with our money's worth. If this object is unattempted and unaccomplished, or undesired, by the lack of desire or knowledge of the sense of beauty on the part of the people and of the worker, then the world will be so much the poorer by ignoring, not only the art of the plasterer, but all of the lesser arts.

Mr. Laurence A. Turner took for his subject "Decorative Plaster Ceilings," which he divided into two broad divisions—lime plaster and plaster of Paris. These two materials, he said, required widely different methods in their use. As to which gave the most satisfactory plasteresque result there could not be two opinions. Lime plaster must take the first place, and ceilings in this material must be modelled *in situ*. The quality we should try to reproduce in plaster-work is that which we find in the Elizabethan and Jacobean lime-plaster ceilings. These form the best models and standards of work for the art. Most uses of lime-plaster; but there is no reason why the same effect should not be produced with plaster of Paris. The chief quality that made the old plaster-work so charming was the exceedingly soft, delicate, and subtle play of light and shade that was produced on its modelled surfaces. In modern work it is the hardness of line and sharpness of shadow, dead flatness of the non-modelled surface, that make it so dreadfully dull. The most satisfactory results in any plaster-decoration we possess are those in which there is no undercutting except in detached ornaments. Therefore, it is necessary, in modelling a ceiling, to avoid

all undercutting, hard edges, and rigidity of line. Court everything that is the reverse of these qualities—softness, rounded contours, soft shadows, breadth of surface, and extreme modulation of line and surface. Plaster-work worthy of the name must have the quality of softness. Every atom of it should be modelled. There should be a subtle play of light and shade all over it: the plain spaces as well as the mouldings and foliage should be alive with delicate modelling, and not dead and cold like the early Victorian ceilings. With the many new methods and materials discovered since that Utopian period for plasterers between 1400 and 1600, what can be done, the author asked, to produce a fine, satisfactory, decorative result at a reasonable cost? To make a ceiling nowadays in lime-plaster, using only the methods that those old people used, it is useless to imagine that anything can be done that is not very costly. Besides, the difficulty of obtaining the properly-scaled lime renders it almost impossible to model the plaster with the fingers. Tradition says that twenty years was not an out-of-the-way time for the lime to be slaked before use. The author advised the use of Keen's cement if well-slaked lime was not procurable. In ceilings he had modelled *in situ*, in which Keen's cement had taken the place of lime, he had always mixed silver sand and size with it, the latter to prevent the cement from setting too quickly. He did not personally incline to the method of modelling in plaster *in situ*. He preferred to model the ceiling on the bench, in Keen's cement and sand, and to use his fingers only. When the model is finished a mould of plaster of gelatine is made from it, and the work cast in fibrous plaster. If there is a doubt about the amount of relief required, it is easy to offer up a cast *in situ*, and there is the advantage of being able to repeat the pattern instead of having to model the whole ceiling. Another advantage is that, by using sand with the cement, one can by using a coarser sand, and more of it, prevent the work from becoming too small in detail or too elaborate in finish, for the material will not allow of it. Another advantage of fibrous plaster over lime is that the ceiling is three or four times lighter, and will not crack or fall, as the lime plaster on lathes sometimes does. The author confessed his partiality for ribbed or panelled ceilings, the method of construction of which he described in detail. Their beauty is chiefly dependent upon the modelled effect they should possess, the ever-varying play of light and shade of a most subtle kind. Very great care must be taken in modelling the plain ground for this type of ceiling, as the richness of effect is chiefly dependent upon it. The practice of using moulded wooden ribs, dividing up a ceiling into panels and painted white to appear like plaster, he strongly deprecated. It had the result of bringing a ceiling down and making it look heavy, whereas a well modelled ceiling of plaster does the reverse, making the room look lighter and giving a sense of greater space.

The ceilings of Wren's date, although very beautiful, depend upon their design for their beauty, and not upon that quality which is peculiar to plaster-work. They might equally well have been carved in wood or plaster. The Adams' ceilings, made, the author believed, entirely from carved-wood moulds or carved wooden models, are hard and uninteresting, though very refined; they depend for effect entirely upon their design, and not upon modelling.

With regard to the question as to how far the architect should supply drawings for a ceiling, the author thought that nothing more than a small-scale drawing indicating the type of work he required should be given to the modeller, more than that only hampered him. The architect should supervise and criticise the models, but unless the modeller did the details himself the result would probably lack life and freedom.

The author, in conclusion, emphasised his view that if a plasteresque effect be wanted, the whole ceiling should be softly modelled, mouldings as well as ground; but if that was not to be, then let it be, frankly, carving produced in plaster.

Professor Baldwin Brown, in proposing a vote of thanks to the readers of the papers,

said that a great many points must have occurred to everyone present, but he himself would only touch on one or two. The historical point of view of the question had not been dwelt upon so much that night as had been the case in previous lectures, but there was no doubt that the history of plaster-work was of very great interest, because the most ancient nations were perfectly familiar with the material, and used it for building purposes; but they did not apparently realise its artistic properties. The prehistoric Greeks, however, as one knew from the remains of modelled plaster-work found at Knossos, had a knowledge of artistic work in plaster. The later Greeks used terra-cotta where we now used plaster in decorative work. There was no doubt that the idea of the work at the Villa Farnesina at Rome came from the Greeks. He thought there could be no doubt that the work was elaborated at Alexandria, like so many of the technical details of building, and came into vogue afterwards in Rome; and that which we called Imperial Roman was really Greek adapted or imitated by the Romans. The subject of the modelled panels in the work of the Villa Farnesina was like those of sculptured reliefs which were known to be Alexandrian, and, as a matter of fact, some wall-paintings found in connexion with these plaster ceilings had Egyptian or Alexandrian subjects, which proved the case. As one saw it both in the Villa Farnesina and in the Tombs of the Via Latina, the plaster work hardly came up to the ideal which the lecturers had put before them—that there should be the same quality of handling for the whole of the ceiling, both for the figure parts and also for the mouldings. He thought the Roman or Greek work was partly cast from moulds, and it seemed to him a little incongruous that in the beautiful work of the Villa Farnesina the mouldings were rigid and obviously cast-work, while the other part of the work was modelled with extreme freedom by hand. There was a gap in the history of plaster-work which might be filled up, for it seemed to have reappeared again in the XVIIIth century as a consequence of the discovery of so many Roman buildings at that period which were decorated in this fashion, and the work was reproduced by many persons. As a matter of fact, there was no break in the history of modelled plaster-work, and there were some extremely fine examples of mediæval plastering. One of the finest was at Cividale, in the extreme north-east corner of Italy. In an old chapel there there was some extremely fine and bold modelled plaster-work, consisting of figures in very high relief and of about two-thirds life-size, and one might do worse than make a pilgrimage thither for the purpose only of studying this particular piece of work. It might date about 1100, and would, without doubt, be of the same period as that very interesting stucco screen in the church at St. Michael's, Hildesheim, Germany, where, again, the figures were about two-thirds life-size, modelled in high relief with bold foliage-work. Those examples of mediæval work showed that the art was alive. One matter about which he would like to ask a question was with regard to a recipe for preventing the plaster drying too rapidly, which was the mixing of baked meal with the plaster. There was a reference to it in regard to the plaster-work at the Palace of Non-such, and the late Mr. Robinson, who was so well known in connexion with plaster-work, said that he tried that material and found it worked very well. He said that the plaster remained plastic a long time under the fingers, and when it dried it gave a very fine old ivory tint. He would like to know whether the readers of the papers had tried that material to prevent the plaster drying too rapidly. He was glad to hear lime plaster indicated as being a finer material for working than plaster of Paris, and there was one use of lime plaster about which it occurred to one to say a word. If they read the earliest accounts they had of plaster-work by Vitruvius, they saw that the finish of plaster-work was of two kinds. The material was made of pounded marble mixed with lime, and Vitruvius spoke of "ten men with macerating rods carefully macerating the plaster for a long period of time." He did not know what effect this continual maceration of the material was supposed to produce. At any rate, the material was of such excellent quality,

and gave such a fine surface, that no additional treatment was necessary. And then another way was to apply to the plaster immediately it was finished a coat of pigment mixed with water, so that the whole work dried together. This was what was familiarly known as the fresco process. Now they all spent the greater part of their lives within plastered walls, and they as a rule treated these walls either by papering, by oil-painting, or by distemper, and none of these was a really satisfactory way of finishing the plaster-work. In each case an additional material was put on and hid the plaster, and neither the paper nor oil-painting could be properly cleaned, while the distemper could not be cleaned at all. Further, two or three processes of sizing and two or three coats of paint were required. Supposing as soon as the plaster was laid a coat of simple colour mixed with water was laid evenly over it when wet, then, according to the chemical processes with which everyone was familiar, the colour would be crystallised on the plaster, and would remain as a permanent finish to it. He thought everyone would agree that there was no surface so pleasing to the eye as a coloured surface produced by fresco, and it was the quickest and most beautiful way of colouring a surface. There was no doubt that people grew frightened of fresco-painting, as a great deal of fuss was made over it in connexion with the walls of the Houses of Parliament, but the colouring of the surface and the painting of a picture were very different. He hoped that when the Institute got its new building some of these experiments would be tried. It might be tried in a corridor, and they could see if they could restore this old process, which was perfectly familiar in ancient times.

Mr. Atkin Berry seconded the motion, and thanked the lecturers for the comprehensive way in which they had dealt with the subject.

The Chairman said they had had interesting papers on a subject which had a great fascination to every architect. The historical sketch which was given them by Mr. Bankart was very interesting, and he had referred to the remarkable plaster-work in the Temple at Knossos. They must all have been struck by the views which were presented to them by the excavator of Knossos some years ago in that room and with the wonderful paintings, which were interesting as examples of plaster-work, and also as representing to them a civilisation of which they had practically no knowledge until these buildings were discovered. Professor Baldwin Brown had given them a description of various adaptations and applications of plaster, and had told them that there was no cessation of this great art, but that it passed on through the centuries until they saw its great display at the beginning of the XVth century. Indeed, wherever there was a classical art they found that it had never been absolutely lost, but they found it cropping up in most unexpected corners. Their attention, however, was only drawn to it when they saw an exceptional display, as was the case with plaster-work at the period of the Renaissance. It had been suggested that in the building which the Institute was going to put up they should make experiments. He was not quite sure whether experiments were very desirable things when they were building their own home, because if there were failures he was afraid the public would simply think they were failures through their absolute inexperience and ignorance of the profession in which they were practising, and would not give them any credit for having tried to follow Professor Baldwin Brown in his suggestion with regard to the treatment of plaster when it was wet. One of the great difficulties which faced them in dealing with wet plaster was that they were so limited in the shades of colour they could use. They could use yellows and reds, but not greens and blues, and therefore they had a very limited field. He believed that many of them in their humble way had tried to carry out the suggestion of Professor Brown. He had himself, and found his clients dissatisfied with the result, because he had endeavoured to get some shade a little less common than yellow and red. He thought they were all grateful for the series of photographs on the walls. They could recognise in many of them

their influence on the brothers Adam and other men of the period. Such a display of photographs showing the methods of the past would serve to inspire those of the present day to try and attain equally beautiful results.

The motion having been heartily carried, Mr. Bankart said he had little doubt but that the early work of which they had seen the mouldings and the more mechanical parts dividing the panels were cast from moulds of some kind, but the panels themselves seemed to suggest that they were modelled almost *in situ*, and the surface-work seemed clearly to indicate that they were entirely the work of a free hand. Professor Baldwin Brown had mentioned some of the mediæval work, and Violet le Duc mentioned some work in France during the Carolingian Period which was also modelled in stucco, practically speaking, from the receipt given by Vitruvius. He mentioned it in a rather beautiful way, and said that this work was extremely slight, and merely to cover the bareness of the walls. That such work was going on in France during the Carolingian Period there was no doubt. With regard to the question of ingredients being used with stucco, they had it on record that log's lard and blood and common beer were used to retard the setting, and Vitruvius mentioned that the pounding of the lime for a long period was done chiefly to break up any particle which was not properly slaked. As regarded the colouring of plaster-work, he believed that nearly all the old stucco plaster-work that they knew to be coloured in fresco, as they called it, was done with fine temper-colour. At any rate, in the old Italian work about which Mr. Sumner read a most interesting paper before the Society of Arts, he gave a very interesting account of how the colouring was used in the old days, and how it was mixed with the liquid plaster, and how he himself mixed the different colours (mostly yellows and reds), and how extremely difficult it was to make use of blues. Mr. Sumner mentioned one blue which it was possible to use, the name of which he (the speaker) could not remember for the moment, but it was a mineral colouring of some kind.

Mr. Turner also responded, and said that the photographs belonged to Mr. Bankart. He had some there that night to learn, and would have liked to have heard Mr. Bankart tell them something of how the early men made their ceilings. It would be extremely interesting if some expert would write an account, as far as he knew, of how these old plaster-ceilings were made. He was inclined to think that they must have had other methods than those which, so far as he had read, were ascribed to them, and it was strange that they had not a single example remaining of the tools which were supposed to have been used. As regarded the treatment of the surface of plaster, one thing he had done to plaster ceilings after they had been fixed was to give them a coat of turpentine and beeswax, which gave a nice ivory tint, and also enabled the ceiling to be afterwards washed. They could not make the mistake of putting on too much, because the plaster would only suck up a certain amount, and they could do more. He had in a small way tried to colour plaster of Paris casts, and a delightful method of colouring could be done by using simple oil-colours and turpentine. One could not, however afford to make a mistake, for the plaster would only take one wash, and directly one tried to put on a second coat one got an opaque colour. With one wash they got the quality of water-colour on a piece of white paper—the white paper showed through the colour and gave a quality which could not be reproduced in any other way. He had made no experiments with meal. His experience had been almost entirely with plaster of Paris and a substitute for lime-plaster, because they could not get the lime properly slaked. He had referred to a village in Italy where the villagers slaked their lime for a long period, and he was told that the lime was slaked wet, and was not sifted. They only used the liquid plaster which exuded from one pit and flowed into another.

The International Congress.

The Chairman announced that the annual general meeting would be held on May 7 for the presentation of the annual Report and the transaction of other business. Previous

to that meeting there would be a special general meeting, when the Chairman would bring forward a resolution proposing that the present President and Council should retain office until the conclusion of the Congress to be held in July, and that by-law 30 be temporarily suspended in order to allow that to be done. They would all recognise that it would be an inconvenient and almost impossible position that the Council which had charge of the great International Congress should be a new Council coming in at the very last moment. The present Council had had all the labour of the arrangements for the Congress, and it would be in the interest of the Institute and in the interest of architecture that those who had had the arrangements should remain in office until the conclusion of the Congress.

THE NEW GALLERY.

The exhibition at the New Gallery does not include any work of the highest order of interest, but, among a certain proportion of weak and doubtful pictures, there is a good deal that is well worth attention. Perhaps the strongest works there are two portraits, that by Mr. Lavery of the Earl of Plymouth (143), and that by Professor Herkomer of General Palmer; the first notable for the fine and subtle colour which the artist has contrived to make out of an ordinary country costume; the second remarkable not so much for colour as for simple and vigorous characterisation. Mr. Hughes-Stanton's large landscape at the top of the north room, "Sand Dunes, Dannes-Camiers" (221), may also be singled as something exceptional in English landscape-painting for its large scale and monumental style; it is the kind of landscape one expects to find in the Salon rather than in an English exhibition, and it is certainly the most important work by this artist that we remember to have seen.

The South Room, in which the numbers commence, contains no figure picture that is really important except for its size, beyond a very charming half-length portrait of a lady (68) by Mr. Lavery; Mr. P. A. Hay's ideal personage "When Vanity Sleeps" (6) is too long in the neck, though there is something in the work, and the neighbourhood of "Rannoch Bridge" (9) by the same artist is at all events an evidence of versatility. There are some very good small landscapes. Mr. James's "Approaching Storm" (4) and Mr. Fisher's "A Lane—Antilles" (5), hung close together, illustrate by contrast (perhaps intentionally on the part of the hanging committee) two altogether opposite methods of regarding landscape: the first as imitation of nature (in this case by no means as commonplace as such imitations often are), the second as translation of nature through the medium of a special technique peculiar to the artist, and which precludes all idea of illusion. Mr. W. H. Bartlett sends two of his admirable Irish coast scenes; "From an Island in the West" (10) is a fine bit of sea-painting of rather unusual style; "For Island Pasturage" (14), the finer work of the two, is an admirable landscape composition. In Mr. Thorne White's "Children of the Downs" (18) the foreground and figures somehow hardly seem to belong to the middle distance, at least in colour and execution; they come into the composition all right, but have a kind of appearance of having been put in by another hand. Mr. Hill's "Evening on the Arun" (28) is a landscape of artistic completeness of feeling and composition; Mr. Arnold Priestman's "Heather Burning" (46), though a small work, is something more than that, showing not only composition and unity of design, but an effect of landscape gloom portrayed with great power—a picture which is a landscape poem, very different from the crude lumping together of dark masses of pigment in "A Cornish Valley" (56) by Mr. Peppercorn, whose work of this kind has become a fashion among art-critics, but will not take in those who have saner judgments than the art-critics of the present moment generally display; this kind of landscape convention is a very easy one, and there are plenty of other people who could do it if they thought it worth while. This cannot be said of Mr. Ernest Parton's convention, as illustrated once more in "Autumn Leaves" (49); this is delicate and highly finished and

entirely his own; but then it is so very conventional, and has been so often repeated.

In the West Gallery Mr. Melton Fisher's "Mrs. T. C. Bowen" (85) is a half-length portrait noteworthy for its delicate delineation of character and for fine colour; Mr. Coutts Michie's half-length of "Mr. Idris" (95), in some kind of official costume, is a very dignified portrait; Sir George Reid's of "Sir John Glover" (139), Chairman of Lloyd's, is of the best class of what may be called "Board-room portraits," which must be done, and should therefore be well done, but are not the most interesting contributions to a picture gallery, to those at least who have no personal or official interest in the subject of the portrait. Mr. Clark's attempt to emulate Watts in "Spiritus adversus Carnem" (163) is as ambitious and as unsuccessful as Mr. Dicksee's similar attempt in last year's Academy.

But Watts's magic could not be copied; he: Within that circle none thrust walk but he:

at least, if they dare, they are likely to come to grief. Mr. Austen Brown's "A Haymaker" (141), which looks rather like an inspiration from Millet, loses the effect of what is in the main a good picture by the want of strength and precision in the treatment of the head; a weakness still more evident in his other single-figure picture in the north room, "Meadow Flowers" (194), where modelling of the features is so curiously evaded that the figure suggests a ghost rather than a flesh and blood personage. Mr. Wontner's "In the Garden of Dreams" (115), on the other hand, is too hard and over-finished, a kind of furniture picture which may assist in decorating a room but leaves nothing for the imagination. The most really artistic conception among the figure subjects in the west room is Mr. Henry's "The Hourglass" (97), a title which serves to give, from one of the accessories, a distinguishing name to what is simply a piece of beautiful composition in drawing and colour, to which the spectator may attach any fancy that he pleases; in spite of its unsuggestive title, this is a really poetic work, which "The Garden of Dreams" (in spite of its title again) is not—there is no suggestion in it but of painstaking workmanship in a rather hard style. Mr. Llewellyn's "Bedtime" (112), where a half-length figure moves across a window which forms the background, carrying a sleeping child in her arms, is pleasant both in sentiment and in its broad and well-balanced execution.

In this room is the largest but hardly the best of Mr. Wetherell's contributions, "Dawn at the Gate" (90), where the effect of the morning light breaking, as if the farm-yard gate were being opened to admit it, is most fresh and charming, but the calves in the foreground seem singularly stiff and wooden in their structure. Mr. Wetherell's real gift is shown in his smaller but beautiful picture in the north room, "Joemud Day" (203), one of the idylls of rural life in which he mingles so well the real with the ideal. Among the other landscapes in the west room is a spring scene by Mr. Edgar Barclay, "Amidst Winter's Wreckage" (84), which is full of sunlight, and should have been hung on the line, where various works of quite inferior value have found place. A small landscape by Mr. H. W. B. Davis, "Glomming" (102), is noticeable especially because he has contrived to give a radiance to the moon without exaggerating her size; the majority of moons in landscape-painting are too large, as painters would find out if they would take the trouble to calculate what angle the width of the moon really subtends in the arc of the sky, and how many degrees of arc they are including in their picture: to find a moon really no more than the relative size of nature is an incident to make a note of. Mr. Thorne White's "Cornfield near Arundel" (111) is in a different and more vigorous style of execution than is usual with him; perhaps the sky is a little too restless, but it is a good picture. "The Old Garden at Tivoli" (130), by Mr. Harold Speed, is a moonlight effect, in which the moon does not, however, appear; it is an interesting and very clever attempt at a difficult effect. We have before referred to some of the architectural pictures which Mr. Sydney Lee has taken up as a special class of subject; he is making something very good out of this; his picture here of "The Belfry" (131), a simple rough-east country church tower with the upper

portion in sunlight, is excellent; even the churchyard wall is made pictorially interesting. Further on we come to a small but exceedingly fine seascape by Mr. Henry, "The Bell Booy" (150), one of the most real pieces of sea-painting we have ever seen. Mr. Brangwyn's large picture entitled "A Wine Shop" (167) is merely a very powerful piece of still life painting; it may be a question whether the subject was worth the extent of canvas bestowed on it. Mr. Talbot Hughes's "Music and Moonlight" (177) shows a young couple in evening dress in the moonlight on a terrace, beside an open door through which the sound of the music may be supposed to be heard; a clever picture both in light effect and in the graceful and *spiritual* figure of the lady.

In the north gallery Professor Herkomer's rather flaring portrait of a lady in bright blue dress (216) is conspicuous—rather too conspicuous; we prefer Mr. Melton Fisher's severe and monumental portrait of a lady in black (226). Mr. Hugh Riviere has a fine seated portrait of Miss Genevieve Ward (240), the face painted with great power; and Mr. Coutts Michie exhibits a three-quarter length of a beautiful girl in a crimson dress partly covered by a cloak, under the title "Ruby" (154). But one of the most interesting and characteristic figure paintings in this room also is one by Mr. Henry, "Summer Morn" (258), a life-size painting of a young lady at an open window, through which the summer landscape is seen; this is a picture quite out of the usual run of such things; there is a bright sprightliness and life about the look and attitude of the figure which is admirably imagined. Mr. Draper's small allegorical painting, too, "Art and the Jade" (220), should not be overlooked; "the jade" is Fortune with her wheel, whose half-nude figure appears as a vision behind the wandering artist seated in the foreground; it is worth attention both for idea and execution.

There are several fine landscapes in the north room, besides that by Mr. Stanton-Hughes already referred to; Mr. Hetherington's "Life on the Marsh" (188), with a grand warmly-tinted cloud hanging over the flat Norfolk country; Mr. R. W. Allan's "The Grey North Sea" (207), almost a repetition on a larger scale, of one of his works in the Society of Water-colours Gallery—on the whole we think the water-colour is the finer of the two; Mr. J. R. Reid's small coast scene under the title "Lobster and Crayfish" (215); Mr. Alfred Withers's "Moret—Evening" (238); Mr. Coutts Michie's "On a Lonely Moor" (247), a landscape in a simple broad style of design which reminds us rather of Georges Michel; and Mr. Adrian Stokes's "The Great Plain of Hungary" (257), with its curiously characteristic ragged trees and an admirably painted foreground. We should not have omitted to mention Mr. E. Lorne's "Burning Leaves" (199), which, for those who like pictures that look as if they were an inlay of pebbles with the figures let in flat, is worth looking at; we do not like the school, but in its way it is perhaps the best thing this artist has produced.

Among the sculpture exhibits in the Central Hall is one which has considerable interest for us—Mr. Natrop's blocked-out model of the Hyde Park screen with a quadriga on the central pavilion and figures of a man with two horses on each of the lesser ones: the sculptures being supposed to be bronze gilt. The work would be a fine addition to the screen, and we should be only too glad to think that there were any chance of its being carried out. The sculpture collection as a whole is not very important, but there is a charming fancy by Miss Esther Moore under the title "Youth's Dream of Joy" (531), of which we shall be able to give an illustration, the only way to rightly explain it. Mr. Tweed's "Latona" (531) is a well-modelled nude, though why the mother of Diana should be shown in this ungainly crouching attitude is not very obvious; it looks rather like a classic title given to what was merely a Life Study. There are three pretty statuettes by Mr. Derwent Wood intended as sketches for Garden Statues (523-5), and a panel by Mr. Roscoe Mullins, the centre of a memorial (503), a figure in relief and a heraldic shield which combine in very decorative lines, and which is worth a better position than has been given to it.

ACCIDENTS FROM MECHANICALLY-DRIVEN VEHICLES.

QUESTIONS have recently been asked in the House for returns as to accidents caused by motor vehicles, and the figures are interesting. In the cases ending fatally some returns can be obtained through the Registrar-General, but the figures as to non-fatal accidents are more vague since no notification of accident is compulsory, and the accidents of which figures can be returned are only those notified by the police. Seeing the danger incurred by the multiplication of faster vehicles it is time compulsory notification of accidents was introduced. The Legislature shows a curious indifference on this subject, in strange contrast to the grand-motherly legislation in relation to factories and where workmen are concerned.

The figures given by the Home Secretary for England and Wales of fatal accidents were the following:—For the years 1903 Motor cars, 39; motor-cycles, 15; electric and steam trams, 65; traction engines, 19; motor-wagons, 1; steam rollers, 4—total 141. The figures for 1904, for vehicles in the above order, were—59, 16, 54, 23, 9, and 5; the motor-omnibus also appeared and caused two deaths, making a total of 177 deaths. The Parliamentary Return of 1904 up to April, gave the number of motor-cars in the United Kingdom as 14,887; motor-cycles, 16,534—total 31,421. The total number of accidents known to the police to persons and property for the first three months of this year from motor-cars, motor-cycles, and motor-omnibuses was 1,726; if this first quarter of the year can be taken as representative this would show the number of accidents in the year to be about 5,278, or about one accident to every six vehicles, but, allowing for the increase in the number of cars and cycles, say, one accident to every ten cars and cycles. The total number of street accidents attributable to horse-drawn vehicles in the year ending April, 1904, was only 22,538, 7,921 being accidents to persons. The strict legislation for the protection of persons in steamships, railways, factories, and workshops will become an anomaly if the dangers of the streets are to increase and be perfectly neglected.

ART UNION OF LONDON.

MR. J. MACKRELL presided on Thursday, at the rooms of the Society of Arts, Adelphi, over a general meeting of the members of the Art Union of London to receive the report of the Council, and for the distribution of prizes of works of art.

Mr. F. L. Marriott, secretary, read the seventieth annual report, which stated that the commission to Mr. W. L. Wyllie, A.R.A., to make an etching of his "Trafalgar" painting as the plate for the year had been amply justified by the appreciation with which the work had been received. The entire *Remarque* proof issue was subscribed for within a few weeks of publication. The Council had again selected a few small water-colours of special merit for inclusion in the prize list, and it was hoped to make this a permanent feature. They were considering how far it might be possible for them to include the products of the sculptors' art amongst the works issued by the Union at a scale of subscription that might bring them within reach of all. Unusual interest belonged to the plate for the coming year. The picture from which it was taken, entitled "Day Dreams," by Mr. W. R. Symonds, was exhibited in the Royal Academy in 1904, and had been purchased by the Council with a view to its adoption as the first prize in the next distribution. They were fortunate in securing the services of Miss E. M. Hester to engrave the plate. In deciding upon the issue of this plate, the Council were not altogether influenced by the wish to mark the happy revival of mezzotint engraving, which was becoming increasingly apparent. They trusted that the election of two engravers by the Royal Academy might materially help forward the realisation of the National School of Engraving which the Council had so much at heart, and which it was hoped the Academy might see their way to undertake. The Society's supporters in Canada were still debarred from any share in the prize distribution, but the Council were by no means allowing the matter to rest.

Dealing with the year's art, the Council congratulated the National Gallery on the Venus and Cupid known as the Rokeby Velasquez and also on having commenced the rearrangement of all the Turner drawings. The National Gallery of British Art had been enriched by the purchase of 116 sketches and studies by Alfred Stevens and by other works of art. The National Portrait Gallery was fortunate in having been able to purchase the splendid crayon portrait of William Cooper, drawn by Romney. Reference was also made to the additions to the Victoria and Albert Museum and the British Museum, and to the exhibitions of the Royal Academy and many other exhibitions both of a public and private character in London and the provinces.

The Chairman, in proposing the adoption of the report, remarked that no more important picture had been exhibited than that of Mr. Wyllie of last year, and proceeded to give some of his father's recollections of the state of things in the country at the time of the battle of Trafalgar when an invasion by Napoleon was daily expected. With regard to the attempt of the Society to revive mezzotint engraving amongst their works of art, he trusted it would be appreciated by the public and would tend to increase their subscriptions. The depression in trade had not helped the Society, but still they had done better than last year.

The report was adopted. The draw for the 106 prizes was then proceeded with. The first prize of 100 guineas was won by Mr. R. C. Willis, of Palmer's Green.

Architectural Societies.

GLASGOW INSTITUTE OF ARCHITECTS.—The annual general meeting of the Institute was held in the rooms, 187, Pitt-street, Glasgow, Mr. John Keppie, F.R.I.B.A., President, in the chair. The President referred to the death of Mr. R. A. Bryden, F.R.I.B.A., who was one of the original members of the Institute, having joined in 1868, and it was agreed to minute an expression of deep regret. The secretary submitted the annual report, which stated that during the past session the Council had been actively engaged with the arrangements in connexion with the scheme for amalgamating the Glasgow Architectural Association with the Institute. The attention of the Council was called to the undue proportion of unpaid apprentices employed in many architectural offices, and, as the matter was considered of special urgency, a circular calling attention to this was issued to the members of the Institute, asking them to adhere, as far as possible, to the practice of employing one apprentice only to each draughtsman. The Council desired to call attention to the facilities for study which were available in the recently-established "Glasgow School of Architecture," conducted by the Technical College and the School of Art. With reference to the reconstruction of the Royal Infirmary, the report stated that the proposal to employ terra-cotta had, it was understood, been departed from. The report was adopted. The President, in his valedictory remarks, referred to the subject of registration as perhaps the most important matter before the architectural profession at the present time. Although the scheme for amalgamating the Glasgow Architectural Association with the Institute had not yet been formally carried out, he hoped the matter would be completed at an early date. The Council for the ensuing year was elected as follows:—Messrs. A. N. Paterson, John Keppie, H. K. Bromhead, James Lindsay, T. L. Watson, James M. Monro, Alexander McGilgibon, Andrew Ealfour, Charles Gourlay, Thomas Baird, jun., R. D. Sandilands, George Bell, Alexander Skirving, Robert Miller, John B. Wilson, and H. E. Clifford. The treasurer's accounts, which were submitted and approved of, showed that a funds were in a satisfactory position. A meeting of the newly-elected Council followed at which office-bearers for the year were appointed, viz.:—President, Mr. James M. Monro; Vice-President, Mr. George Bell; Auditor, Mr. Alexander Skirving; Secretary and Treasurer, Mr. C. J. MacLean. The various committees for the year were also appointed.

MANCHESTER SOCIETY OF ARCHITECTS.—By the annual Report of the Council (the forty-second) we learn that the Society now counts 223, an increase of 4 since last year. The Report refers specially to the legacy of the late Mr. Mills to the Society, which included 8,000*l.*, to be set apart and invested so as to produce so far as practicable a certain and permanent income therefrom for the benefit of the Society; and Mr. Mills further provided that his trustees should select such of his plate, plated articles, books, pictures, prints, statuary, bronzes, linen, china, glass, furniture, and other articles of household or domestic use or ornament as will be suitable for the purpose of furnishing a building or rooms for the use of members and students of the said Society or suitable for ornamental or instructive purposes in any building or buildings belonging to or under the control of that Society or for any such purpose. The Council has received from the trustees of the late Mr. Mills the articles selected by them, which are of the value of about 1,000*l.*, and are now stored till arrangements can be made to obtain suitable premises for the use of the members; a committee has been appointed with this object, and is now engaged endeavouring to find premises.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The annual meeting of the Association was held at 117, George-street, on the 18th inst., Mr. H. O. Tarbolton, the President, in the chair. The Chairman of the Committee of Management reported that 1907 would be the jubilee year of the Association, and it had been suggested that the event should be celebrated by holding an exhibition and inviting the Royal Institute of British Architects to hold their annual dinner and other meetings in Edinburgh that year. Mr. J. T. Baillie moved that Mr. Hippolyte J. Blanc, R.S.A., be appointed President for next session. Mr. W. T. Oldrieve, H.M. Office of Works, seconded, and the motion was unanimously agreed to. Mr. Baillie and Mr. Oldrieve were elected Vice-Presidents; Mr. Colin B. Cowrie, Hon. Secretary; Mr. W. G. Walker, C.A., Hon. Treasurer; and Mr. John Watson, Librarian. Mr. Tarbolton, in his address, said they looked forward to the time when the municipality would look to the Association for guidance in questions that affected the architectural development of the city. Matters dealing with the training of the architect student had been very much influenced by recent events, and possible forthcoming changes in art education in Edinburgh. The proposed new Municipal Art School would be concerned with the general principles of art education, but could not be expected to carry its students into the higher regions of the particular science of architecture. That such a school was likely to be instituted in Edinburgh was a matter for congratulation, and with it would be introduced, he hoped, a new era of activity. The foundation of this art school would be a task that would demand the most anxious attention on the part of the municipality, and he hoped no steps would be taken without consultation with acknowledged experts in architectural training. He maintained that the teaching throughout the school should be of a synthetic nature,—i.e., that there should be common groundwork for all the teaching, so that free inter-communication could take place between the various branches of study. All students should be trained up to a certain point before particularising in any one branch. Painters, sculptors, decorators, designers, and architects should have a definite and common basis of art training, for he was convinced by so doing the student would be enabled to discover his real vocation. Painters would benefit by an architectural training, and architects would gain immeasurably by a knowledge of the theory and possibly practice of painting. At present men following the various art callings worked on almost parallel lines which seldom touched, and more overlapping would produce mutual benefits. With regard to the subjects which would be necessary for the course of art and science training of the architecture student, he could only quote from the recommendation of the Board of Education of the Royal Institute of British Architects, as follows:—I.—The nature and properties of building materials. II.—Construction, including (a) applied mechanics and mathematics in so far as they

were necessary to the solution of problems of construction; (b) the practical methods of the building trades. III.—Architectural drawing, including (a) in the elementary course—geometrical, freehand, perspective, and graphic methods of working out problems, and such drawing as will train the student in the selection of form and in the study of mass and proportion; (b) in the more advanced course—drawing of a more advanced nature, and to include a course of study from the antique and life. (He should certainly like to add to this course the theory of colour, which he considered most important for all architects.) IV.—The study of architectural forms that have been evolved in the architecture of the past out of constructional necessities, and exercises in the design of construction to meet definite problems. V.—The study of the history of architecture in so far as it illustrates and explains the evolution of architecture through constructional material and social conditions. The new school for architectural training would not be complete without a workshop, where demonstrations could be given in actual materials. Modelling, too, should be taken as an item in the general art studies. Professor Baldwin Brown, in moving a vote of thanks to Mr. Tarbolton, said, with regard to the question of architectural education and the new art school that they hoped would be established before long, they would like to see architecture taught in the school according to a proper system, and that the whole decorative arts would be grouped together under architecture and looking to architecture as their head. He should like painting to remain, in their new system, entirely under the control of the Royal Scottish Academy, so as not to break the long and honourable tradition of the life school of the Academy. If that tradition were broken, they would do more harm than good to that branch of education. They would do best by building on the foundations they had.

Archaeological Societies.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—A meeting was held on the 18th inst., Mr. C. H. Compton, Vice-President, in the chair. An exhibition of Samian ware and flint arrow head discovered in Elmstead Wood, near Chislehurst, was made by Mr. Nichols. Mr. R. H. Forster, hon. treasurer, read a paper upon "The Tenth Iter of Antoninus and the Roman Stations in the North of England." He said the course of the tenth iter from Mediolanum through Manchester and Ribchester so far as Overborough has been generally agreed upon, but the positions of the remaining stations have been the subject of much speculation. Mr. Watkins ("Roman Lancashire") continues the route northwards, making Borrow Bridge, Alone; Kirby Thore, Galava; and Whitley Castle, Glanoventa, the terminus of the iter; but this is not satisfactory, as Whitley Castle is not a likely terminus, and a comparison of the distances given in Iter II. and Iter V. show that Kirby Thore was Bronconac—probably the same as the Braboniacum of the "Notitia." Old Carlisle, near Wicton, has been suggested, but it is hard to fit the intervening stations to known Roman sites. A more likely place is Ravenglass, which was an important post up to medieval times; and if Ravenglass be Glanoventa, Ambleside will be Galava, Watercrock, near Kendal, Aho, and Overborough. Galacum, the respective distances corresponding with fair accuracy if the route from Overborough be taken due west till the road from Lancaster to Watercrock is joined. Assuming that Glanoventa, Aho, and Bremetonacum of the Itinerary are the Glanibantia, Alone, and Bremetonacum of the "Notitia," we get three of the stations *per lineam colli* in a definite order, and it is possible to connect this line with the line from Segedunum to Amboglanna, if we take into account the duties of the garrison of the north of England, which at the date of the "Notitia" had been largely reduced. The wall across South Northumberland was fully garrisoned, but North Cumberland seems to have been strongly held; in fact, rather policed than garrisoned. The prime necessity in the West was the protection of the Cumberland coast from raids by the Picts and Scots, and most of the intervening stations must be sought for here. Possibly Petriana

was Stanwix, beside Carlisle, and the Ala Petriana may also have garrisoned Old Carlisle. Aballaba is identified with Papcastle, and the four remaining stations probably lie on the coast, viz., Congavata at Millray, Axeldunna at Maryport, Gabrosca at Burrow Walls, near Workington, and Tannocina at Aboresly, near Whitehaven, where a small natural harbour formerly existed. Olennacum and Virosidum remain, and these, if the line is continued, should be south of Ribchester—possibly at Wilderspool, near Warrington, and Brough, near Buxton. This arrangement suggests that a large part of the reduced garrison of Britain was employed in watching the hill tribes of the central mountain chain, and that the troops included in the second section of the Notitia list guarded the eastern and northern valleys, especially as we get a linea of Lavatre (Bowes), Vertere (Brough), and Brabonnum (Kirby Thore). Presidium may have been Brough, on the Hamber, Danum has been identified with Doncaster, and Morlum may be placed at Templeborough. Placing Arbeia at Alnborough, Dictis at Hkley, and Concaugium at Bainbridge, near Askrigg, we come to the linea mentioned. Longovicum seems to be Lancaster, in Durham, and the intervening stations of Maglova and Magva may possibly be found at Whitley Castle, near Alston, and Old Town, in Allendale. If the last station, Derwentio, were Elcheater, the linea would end only fifteen miles from Segedunum, where the "item per lineam vallii" section begins; but this would involve a change of name, and perhaps Derwentio is an outlying station on the Yorkshire Derwent. The paper was accompanied by maps and other illustrations. An interesting discussion followed the paper, in which the Chairman, Mr. Emanuel Green, Mr. Edmonds, Mr. C. J. Williams, and others took part.

Engineering Societies.

THE INSTITUTION OF CIVIL ENGINEERS.

At the annual general meeting of the Institution of Civil Engineers held on Tuesday evening, Sir Alexander Binnie, President, in the chair, the result of the ballot for the election of officers was declared as follows:—President—Sir Alexander B. W. Kennedy, LL.D., F.R.S.; Vice Presidents—Mr. W. R. Galbraith, Mr. William Matthews, C.M.G., Sir E. Leader Williams, and Mr. J. C. Inglis; other Members of Council—Lieut.-Colonel W. P. Anderson (Ottawa, Canada), Mr. B. Hall Blyth (Edinburgh), Mr. John Benton, C.I.E. (India), Mr. C. A. Brecken, Mr. R. Elliot-Cooper, Colonel Davis (Sydney, N.S.W.), C.B., Mr. Joseph Davis (Sydney, N.S.W.), Dr. G. E. Deacon, Dr. Francis Elgar, F.R.S., Mr. M. Fitzmaurice, C.M.G., Mr. R. A. Hatfield (Sheffield), Mr. G. H. Hill, Mr. Walter Hunter, Mr. J. H. Johns (Johannesburg), Mr. G. R. Jelli (Birmingham), Sir William T. Lewis, Bart. (Aberdare), Sir George Livesey, Mr. A. G. Lyster (Liverpool), Sir Andrew Noble, Bart., K.C.B. (Newcastle-on-Tyne), the hon. C. A. Parsons, C.B., F.R.S. (Wylam-on-Tyne), Mr. A. Ross, Mr. A. Siemens, Mr. J. Strain (Glasgow), Sir John I. Thorneycroft, LL.D., F.R.S., Prof. W. C. Unwin, B.Sc., F.R.S., Mr. A. F. Yarow. The Council of the Institution have made the following awards for papers read and discussed before the Institution during the past session:—A Telford gold medal to Mr. J. A. Sauer, a Watt gold medal to Mr. G. E. Stoney, and a George Stephenson gold medal to Dr. T. E. Stanton; Telford premiums to Mr. Leonard Burstow, Mr. H. S. Bidwell, Mr. J. J. Webster, Mr. Calheart W. Methven, Mr. H. A. Mavor, Sir Frederick R. Upcott, K.C.V.O., C.S.I., and a Manley premium to Mr. D. E. Lloyd-Davies. The presentation of these awards, together with those for papers which have not been subject to discussion and will be announced later, will take place at the inaugural meeting of next session.

Books.

Ecclesia Antiqua. By the Rev. JOHN FERGUSON. (London and Edinburgh: Oliver & Boyd, 1905.)

UNDER this title the author, who is the minister of Linlithgow, has written a very

full and exhaustive account of his fine parish church. From the nature of much of its contents the interest of this work will probably be, as the author suggests, largely local, but the building itself is so well known outside its immediate neighbourhood as one of the finest parochial churches of Scotland that this painstaking effort to record all that is most interesting from its foundation to the present will appeal to a wider circle of readers.

The church has undergone two restorations, and the result of each is shown by photographic illustrations. Of the first, in 1812, the less said the better. The second, commenced in 1904, has restored the church to something of its ancient beauty by the clearing away of the galleries and other disfigurements of the early part of the century and the opening of the church for its whole length. The depressed vaulted ceiling has still to be dealt with, and stalls provided in the choir.

In addition to a description of the church itself, a chapter is devoted to the ancient chapels connected with it; a list of the vicars is given from 1264, and in an appendix are given the dedications and details, as far as recorded, of the numerous altars that were formerly in the church.

Good photographs are given of the exterior and interior, and a ground plan. The latter, however, has no scale.

Hygiene. By J. LANE NOTTER, M.A., M.D., etc., and R. H. FIRTH, Lieut.-Col. R.A.M.C., etc. Sixth Edition. London: Longmans, Green, & Co. 1905.

The authors of this well-known text-book state in the preface to the new edition that "the present issue has been completely revised, in many places completely rewritten, and much new matter added." It contains eleven chapters, dealing with air, water, food, sites, and buildings, refuse disposal, personal hygiene, infection and disinfection, parasites, climate and weather, vital statistics, and sanitary law. Much of the matter is above criticism, but the architect will find in the chapter on sites and buildings the need of further revision. Fig. 34 is a case in point; the brick footings are badly bonded, the damp-courses are not continued under the wood sleepers, and water soaking from the ground into the outer lining of the hollow wall would spread over the damp-course at the bottom of the cavity and rise upwards in the inner lining. The wash-out water-closet is not one of the "best kinds," and the wash-down closet, illustrated in Fig. 45, is not "one of the best" of its class, but is defective in the shape of the basin and the position of the outlet joint. Zinc as a material for wastepipes and soil-pipes ought not to be mentioned, except for condemnation. The authors are more at home in the other chapters, which will be of great value to sanitary inspectors and others.

Sanitary Engineering: A Practical Manual of Town Drainage and Sewage and Refuse Disposal. By FRANCIS WOOD, M.Inst.C.E., F.G.S. Second Edition. London: Charles Griffin & Co. 1906.

Four years ago we reviewed the first edition of this book, and drew attention to a number of errors and misprints. We are glad to find that these have now been corrected, but it is a pity that the author has not taken the trouble to revise the whole work carefully, as we did not, in our short review, mention all the errors and loose statements which were to be found in the book. The latter part of the paragraph on pp. 175 and 176 still contains two or three serious mistakes: If the daily discharge of sewage per head is 18 gals., "an average house" which "contains five persons" will not produce "about 180 gals. per day," and if we accept the author's data as to the proportion of albuminoid ammonia, the quantity of water to be added in order to render the sewage "pure enough to be allowed to discharge into a river without treatment" will not be "67,500 gals.," nor anything like it; and what, we may ask, is to be gained by making the sewers of sufficient capacity to allow the sewage to be diluted with the surface-water produced by a daily rainfall of 8.5 in., 7-in. rainfall of more than 3,000 in. per annum! In the second paragraph of page 176 we pointed out an error in calculation, and our correction

(486 instead of 375) has been adopted in the new edition, but the author has not troubled to revise the next paragraph, where 375 still stands in company with other errors. The author's logic is more quaint than cogent; on page 177 we find (in both editions):—"The separate system [of drainage or sewerage] would be carried out in a town with good gradients; it is policy to do so, and if this is the case, which we may admit for the moment, then it is also policy to do so in all other cases." It is a pity that such blemishes as these should have been allowed to remain in a book which has many good qualities and contains much useful information. Two pages have been added to describe the method of refuse disposal adopted at Fulham, and a few small alterations have been made in the text, but, in the main, the new edition is a revised copy of the first.

Mechanics of Air Machinery. By Dr. WEISBACH and Professor HERMANN. Translation by Professor A. TROWBRIDGE. (London: Crosby Lockwood & Son, New York: D. van Nostrand Co. 1905.)

ENGINEERS in the United States are far more familiar than their English confrères with Weisbach's work on "Engineering Mechanics"—a treatise which was revised by Professor Hermann and has been translated in separate volumes for American engineers. The book now issued is the final portion of Weisbach's work published in the English language. It is not a complete treatise upon air machinery, being devoted mainly to the consideration of fans, blowers, and auxiliary apparatus, which constitute but a very small proportion of the appliances coming under the category of pneumatic machinery in the present day. The intending purchaser of the book before deciding whether or not it will fulfil his requirements. The theory of air movements and air-moving appliances is sound and admirably worked out, although some of the illustrative matter and data are now obsolete. The translator has evidently recognised the inadequacy of this chapter from Weisbach as a treatise on modern air machinery, for he has added an appendix, wherein descriptions are given of some modern air-moving machines, such as blowing-engines, blast furnace gas blowing-engines, air compressors, and high-pressure fans. As these are of American types and are only described in general terms, the appendix does not add very materially to the value of Weisbach's theoretical discussion of the subject. When an engineering treatise has arrived at the respectable age attained by Weisbach's classical work, mere translation into another language can scarcely be expected to effect the rejuvenation that is demanded by the requirements of a new generation.

Tables for the Conversion of Canal Boat Gaugings to Standard Tons. Compiled by S. L. THACKER, M.Inst.M.E. London: Iron and Coal Trades' Review, 1906.

This table serves as a further illustration of the general method of calculation recommended in Article XIII. of our present Student's Column. Recognising the disadvantages of the irregular and unsystematic methods hitherto adopted for computing the actual weights carried in canal barges, Mr. Thacker has calculated constants by which, with careful gauging, the standard weight can be ascertained by a simple multiplication within 5 cwt. The following example given by the author shows the labour-saving nature of his table of constants:—

"Boat 71 ft. × 7 ft. 1 in. New gauge 263 in. Then under 7 ft. 1 in. and oppo-to 71 ft. find 1.067. Then —26.5 × 1.067 = 28.3, say, 28 tons 15 cwt."

We may remark that, in the original, 26.5 is printed as 265, a little slip which the author and the publishers have doubtless noticed by this time. Those of our readers who make use of barges for the conveyance of materials should find the table of practical utility.

Gas and Oil Engine Management: A Practical Guide for Users and Attendants. By M. POWIS BALE, M.Inst.C.E., M.I.Mech.E. Second Edition. London: Crosby Lockwood & Son, 1905.

VERY little improvement could be made in the contents of the original edition of this

excellent companion for the user of internal combustion engines. But, as during the last year or two the adoption of gas-producers has been widely extended, the author has done well to add a chapter describing and illustrating some of the various producers in the market, and giving simple directions for their management. The subject-matter of this chapter is confined to appliances of small and medium sizes, such as are suitable for ordinary industrial establishments and public institutions, and by its addition the value of the handbook is materially increased.

Brass and Iron Founding. By JOSEPH E. DANGERFIELD. London: Dawbarn & Ward.

This pamphlet is No. 8 of "The Home Worker's" series of practical handbooks, and is virtually a complement to "Pattern Making" by the same author. The method of moulding various simple patterns is described in detail, and the patterns selected as examples serve in each case to illustrate some special artifice employed by moulders. The directions here given will no doubt be of service to the amateur and to others who merely require elementary knowledge on the subject of moulding.

The Water Supply of Villages and Small Towns. By H. C. H. SHENTON, M.S.E. London: S. Edgecombe Rogers. (No date.)

This pamphlet of fifty-six pages, eighteen of which are occupied by advertisements, index, and title, contains a reprint of articles contributed by the author to the *Local Government Journal*. According to the sub-title, the matter consists of "practical notes in a handy and portable form," and the description is accurate, but the addition of suitable illustrations would have added to the value. On page 35 there is an error in the calculations:— $1000 \div 25$ does not equal 200.

The Country Gentlemen's Estate Book, 1906. Edited and Compiled by WILLIAM BROOM-HALL. London: The Country Gentlemen's Association, 24, St. James's street, 1906.

This book shows no falling off in the variety and usefulness of its contents, most of which have appeared in previous numbers, whilst some are new, such as the paper on "The Protection of Agricultural Buildings from Lightning." Surveyors, architects, and builders who are concerned with country matters will find this book now, as heretofore, almost a necessity. Apart from its utilitarian purposes, it is often interesting reading.

BOOKS RECEIVED.

ENCYCLOPEDIA OF PRACTICAL ENGINEERING AND ALLIED TRADES. Edited by Joseph HEMER. A.M.I.Mech.E., Vol. III. (Virtue and Co. 7s. 6d.)

ELIAS DE DERHAM, RECTOR OF HARROW (Harrow Octocentenary Tracts, No. XII.). By the Rev. W. Done Bushell. (Cambridge: Macmillan & Bowes. 1s.)

PLASTERERS' WORK (Mechanics' Manuals). Edited by Paul N. Hasluck. (Cassell & Co. 6d.)

GLASS WRITING, ENBOSSING, AND FACIA WORK. Edited by Paul N. Hasluck. (Cassell & Co. 1s.)

FIRE TESTS WITH DOORS. British Fire Prevention Committee's Report, No. III. (Published by the Committee. 3s. 6d.)

THE ART OF GARDEN DESIGN IN ITALY. By H. Inigo Triggs. A.R.I.B.A. (Longmans, Green, & Co. 3s. 13s. 6d.)

Correspondence.

THE SAN FRANCISCO FIRE.

SIR,—The Press during the past week has been full of the earthquake and subsequent fire which has laid the greater part of San Francisco in ruins. In one of the accounts published by the London Press, it is stated that the only building which effectually withstood the fire was the "Mint."

It may interest your readers to know that the Mint was built of an extremely hard sandstone, of a light grey colour, with black specks. The stone was quarried on the east coast of Vancouver Island, north of Nanaimo—no suitable stone being nearer.

In 1889 I explored portions of the coast of British Columbia for sandstone for building

* This was evidently a mistake.—Ed.

purposes, and visited this disused quarry, finding the stone as above described; the appearance somewhat resembled grey granite, but on close examination it proved to be sandstone of the carboniferous series of Nanaimo. Local masons with whom I consulted also agreed that it was a sandstone, but said they had heard rumours that it had not weathered well, so when I visited San Francisco a few months afterwards I purposely went to the "Mint" and saw the clerk of the works in charge, who informed me the stone had weathered well and had given great satisfaction.

It should be understood that the "Mint" is a very substantial building (one built to last) and not of the usual American type.

JOHN J. ROBSON, M.Inst.C.E.

* * Was this a steel-framed building, or one depending on ordinary masonry? That is an important point.—Ed.

REINFORCED BRICK PIERS.

SIR,—In your report in the *Builder* of 21st inst. of the discussion of Mr. S. Bylander's paper on "Reinforced Concrete" at the joint meeting of the Architectural Association and the Junior Institution of Engineers, I am credited with suggesting Hennebique reinforcement for brick piers. This is hardly the impression I intended to convey. My suggestion was to build in vertical reinforcement at the points where the $\frac{1}{2}$ in. vertical joints of the brickwork intersect on plan, in order to reduce the cutting of the bricks to a minimum. A cheap and simple method of tensorial reinforcement would be obviously an advantage of the greatest importance in all brick piers subject to a bending moment, as in all tall piers and all piers loaded on one side only, and it does not seem to be impracticable. For instance, a 2 ft. 3 in. brick pier in cement would be reinforced in tension up to its full strength in

compression by building in vertically small angle sections which only entail the use of two half bricks in place of whole bricks at three places in each course. This would neither materially affect the bonding nor the cost. (See sketch.)



I have since heard that experimental piers built dry and reinforced with rods at the intersections of the joints have been built and tested with a marked increase of strength; but $\frac{1}{2}$ in. rods (the largest that could be built in without cutting the bricks) would be insufficient to develop sufficient strength in tension, and would not enable a tall or eccentrically loaded pier or a retaining wall counterfort to be loaded up to its full strength in compression. PERCY J. WALDEAN.

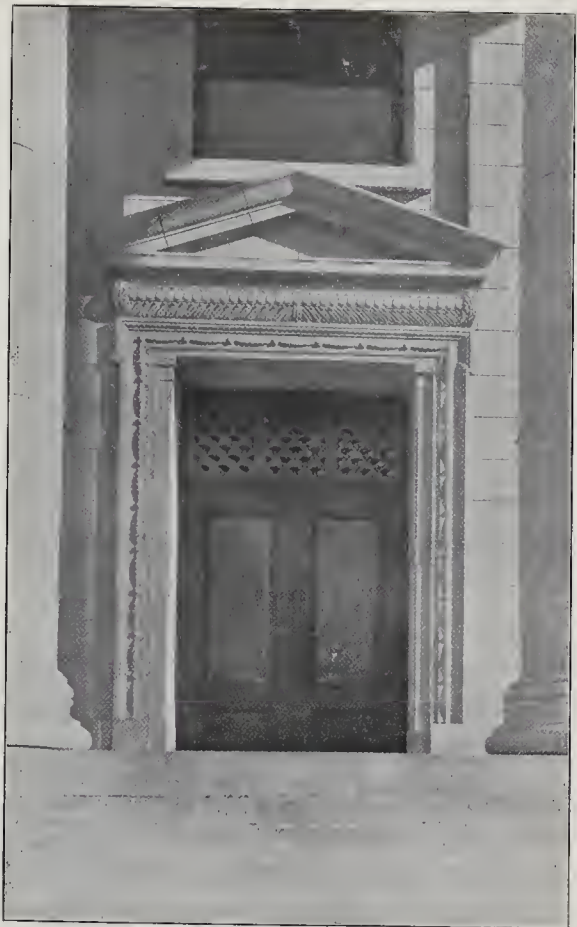
Illustrations.

THE CITY HALL, COLORADO SPRINGS, COLORADO.

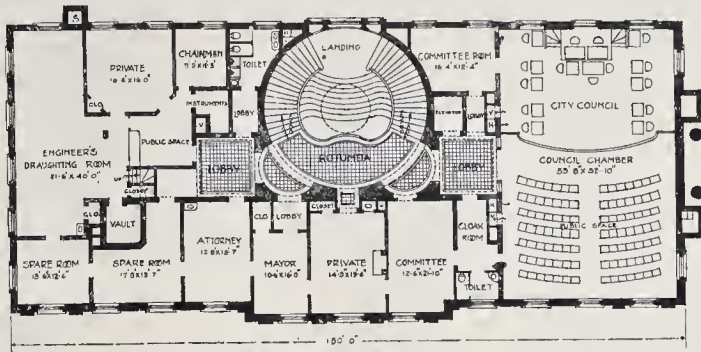


HIS building is constructed of Colorado barre granite, the texture and colour being similar to that of barre Vermont.

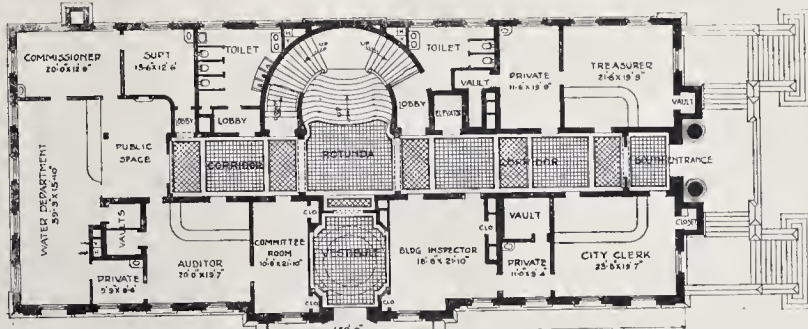
The basement and floor over are of fire-proof construction, the concrete in the floors



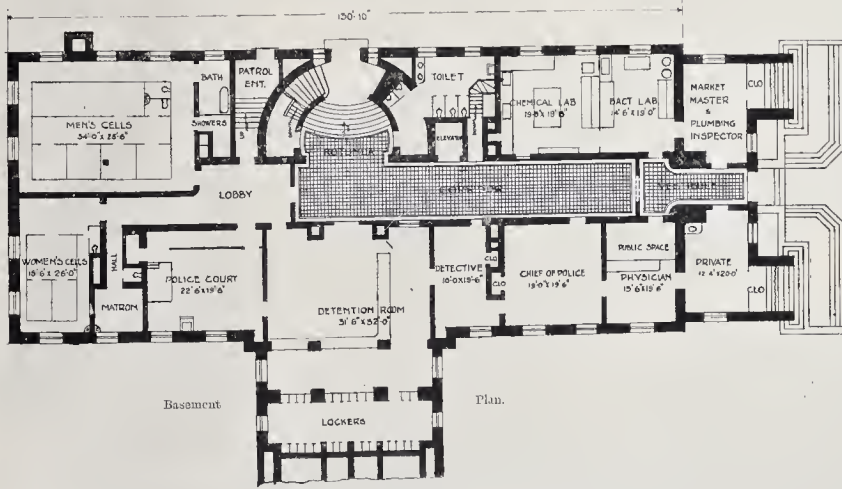
Doorway, City Hall, Colorado Springs.



Upper Plan.



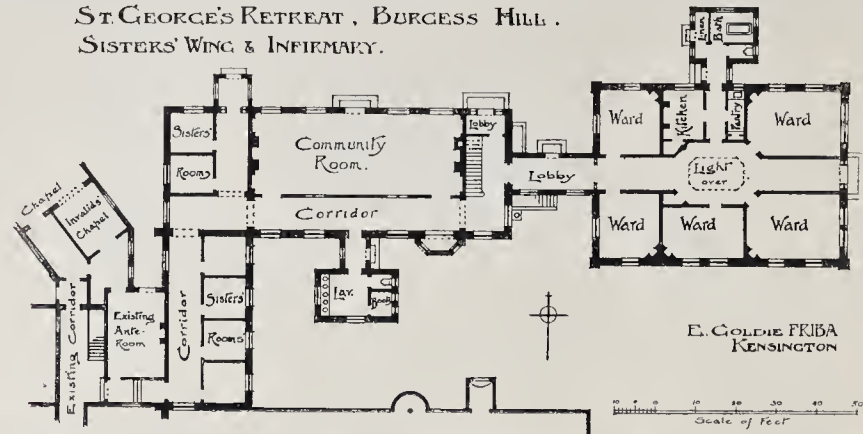
Ground Plan.



Basement Plan.

City Hall, Colorado Springs, Colorado. Plans.

ST. GEORGE'S RETREAT, BURGESS HILL.
SISTERS' WING & INFIRMARY.



being reinforced on the Roebbling method. Wood partitions in upper stories are covered with expanded metal lath, and cement plaster is used throughout.

The building is heated by steam on the Paul system, and with Johnson's thermostat temperature regulators attached. The steam is supplied from the city plant, thus obviating a boiler room in the building. For the ventilation of the larger rooms the Dickson system is used.

The plans herewith illustrated show the accommodations provided on the various floors. The staircase is roofed over by a simple-coffered dome and with a stained-glass light in the centre. The woodwork on the principal floors is of flat-sawn oak, and the council-chamber walls are wainscotted to a height of 15 ft. The woodwork is stained a neutral green.

The plans and specifications were prepared by Mr. T. MacLaren, architect, Colorado Springs (formerly of London), while the building was superintended by Mr. T. P. Barber, architect, and Mr. C. E. Thomas. The contractor was Mr. L. S. Atkinson.

SISTERS' WING AND INFIRMARY,
ST. GEORGE'S RETREAT,
BURGESS HILL.

A NEW wing has recently been added to St. George's Retreat, Burgess Hill, Sussex, affording accommodation for the sisters and an infirmary for the patients, which latter is provided with nine beds. It is mainly of brick and faced with local grey stocks, with red rubber arches, and is covered with green Whitland Abbey slates. The community-room is panelled with Kauri pine. All floors are of fireproof construction, and mainly laid in "Eubœolith" and wood-block paving. "Fram" partitions are used to divide the bedrooms. The infirmary being of one story only, the roofing has been so constructed as to form a promenade for the patients.

The whole building is heated with a low-pressure hot-water system, and is lighted by electricity supplied from its own station in the grounds.

The work has been carried out by Messrs. Parnell & Son, of Rugby, under the superintendence of Mr. Edward Goldie, architect, of Kensington, Mr. E. Wingfield-Bowles having acted as consulting engineer for the electric-light work.

DESIGN FOR AN OPEN-AIR
SWIMMING-BATH.

This design, by Mr. Adrian Berrington, of Prenton, Birkenhead, was submitted for the Title Prize of the Institute of Architects this year, for which it could have had no chance, as it is not in the Italian style, which is always a condition in the competition for the Title Prize, the prize having been founded with the special object of encouraging the study of the Italian style of architecture.

This, however, was only a misunderstanding, or an error of judgment, and as the design has in itself some fine qualities,

and shows very great promise as the work of a young student, we have wished to give him whatever encouragement he might derive from its publication in our pages.

The design was made when the author was a student of the age of eighteen in the Liverpool University School of Architecture.

In regard to his intentions in the design Mr. Berrington writes:—

"In my design I have striven to combine the monumental and mystic character of Egyptian architecture with the unity of conception of the Classic on broad Classic lines rather than on the distinctive Italian interpretation. I thought of it as being built in a town, hence its inaccessibility through all but the ordered entrances, and intended the large halls as a setting for splendour and the pseudo-underground apartments as a refuge from the heat; the open stadium and the spread of steps as an aid to the pageants with which I filled it in my mind's eye; the small courtyards, with their little colonnades as a foil to the plane expanses of the pylons, whose angles are carried to the ground and into the water; the whole, as a large white cup, where the rays of the sun might beat from side to side, and in which men might bask in seclusion in the town."

The name "J. Arthur Berrington" on the plates is a mistake; the father of the author wrote to us with that signature, and hence there arose a confusion between the two names, which was unfortunately not discovered till after the plates had been printed off.

Fifty Years Ago.

FROM THE *Builder* OF APRIL 26, 1856.

MONUMENT AT ST. PAUL'S TO THE DUKE OF WELLINGTON.—In reply to Viscount Chelsea, in the Commons, on the 18th inst., Sir B. Hall said that if the disposal of the 25,000*l.* balance of 80,000*l.* voted for the Duke's funeral were placed, by the Chancellor of the Exchequer, under his control, he would not rest satisfied with the two designs for a monument sent in by Mr. Baily and Mr. Foley at the time when these gentlemen and Mr. Gibson and Baron Marochetti were asked to compete, but would call in the aid of a greater number of artists of the highest eminence in this country, in order to see whether the genius of the country could produce some monument worthy of the memory of so great a man.

ALL HALLOWS CHURCH, EXETER.—The church in Goldsmith-street is being demolished for a widening of the thoroughfare. It consisted of a chancel and nave with a west turret, constructed of stone, and after the Decorated style, affording accommodation for 200 persons. It was rescued from destruction in 1658 by a parishioner, Robert Wilwayne, who bought the church for 50*l.* During the interval 1767-1822 All Hallows was used for vestry purposes only; the fabric was restored in 1883-4, and three years subsequently the west wall was rebuilt.

Competitions.

ST. PANCRA'S CENTRAL LIBRARY.—The Public Libraries Committee of St. Pancras reported on Monday having decided that the designs for the Central Library must be sent in not later than June 15. A copy of the requirements and conditions, together with a plan of the site, has been forwarded to each of the six competing architects, who have been requested to submit any questions not later than May 15.

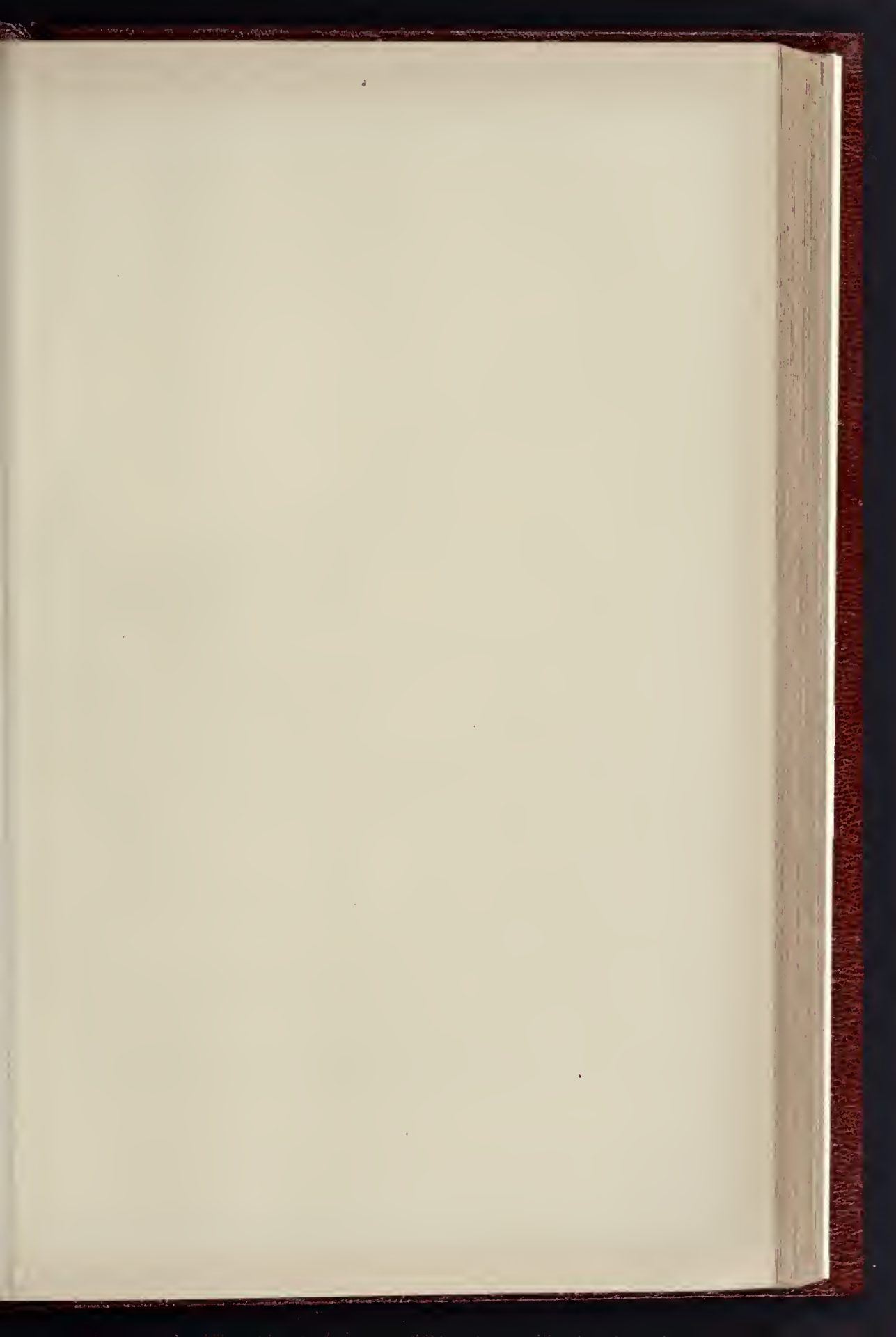
CHURCH AND SUNDAY-SCHOOL, WOLSTANTON.—In a competition held recently for a new Congregational church and Sunday-school at Wolstanton, Stoke-on-Trent, the design sent in under *nom de plume* of "Ready" was selected by the Architect to the Congregational Union, to whom the designs were submitted for adjudication. The author of this design proved to be Mr. Reginald T. Longden, of Burslem. The scheme includes a church to seat between 500 and 600, and with vestries, organ-chamber, etc., and Sunday-schools in distinct apartments for kindergarten, primary, junior, intermediate, and senior scholars respectively, with twelve classrooms, superintendent's room, and library, church parlour, and kitchens, etc. The building will be of local brick, with cherry-coloured, sand-faced, stock facings, with wide joints and stone dressings, panels of rough-cast being introduced. The roof will be of red tiling.

BANGOR FREE LIBRARY.—The first premiated design in this competition, as announced in our last issue, was that sent in by Messrs. Dixon & Potter, 65, King-street, Manchester. The second premiated design is by Mr. Vernon Hodge, 13, Grand-parade, Teddington, Middlesex.

LIBRARY, OLD KENT ROAD.—At the meeting on Wednesday of Southwark Borough Council the Libraries Committee reported that ninety-nine sets of designs had been received for the proposed public library, old Kent-road. The Committee had instructed the Town Clerk to communicate with Mr. Rowland Plumb, F.R.I.B.A., and Mr. A. W. S. Cross, M.A., F.R.I.B.A., inquiring whether they would undertake the selection of ten of the principal designs submitted and report thereon.

BIRMINGHAM, COUNCIL-HOUSE EXTENSION.—The following are the ten successful competitors for the final competition:—Messrs. Ashley & Winton Newman (London), Crouch, Butler & Savage (Birmingham), Greenway & Newbery (Westminster), H. L. Hare (London), E. P. Howard (London), Mansell, Mansell, & Dixon (Birmingham), Matesar & Simon (Liverpool), A. N. Prentice (London), Treadwell & Martin (London), Wills & Anderson (London).

NEW CHURCH, ASH VALE.—The foundation-stone is to be laid shortly of a new church at Ash Vale. The plans for the work have been prepared by Mr. Steadman, architect.



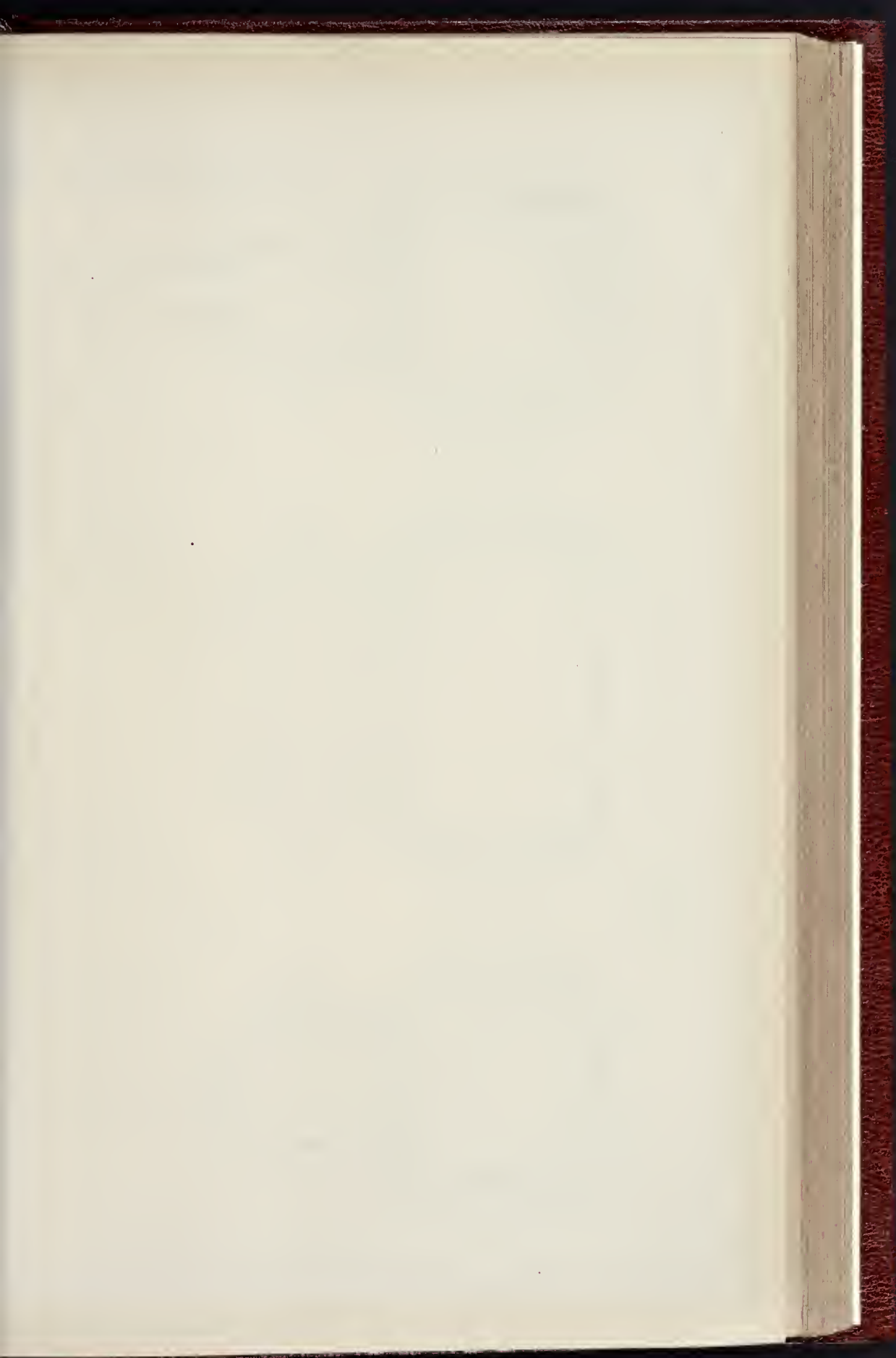


SISTERS' WING AND INFIRMARY, ST. GEORGE'S RET.

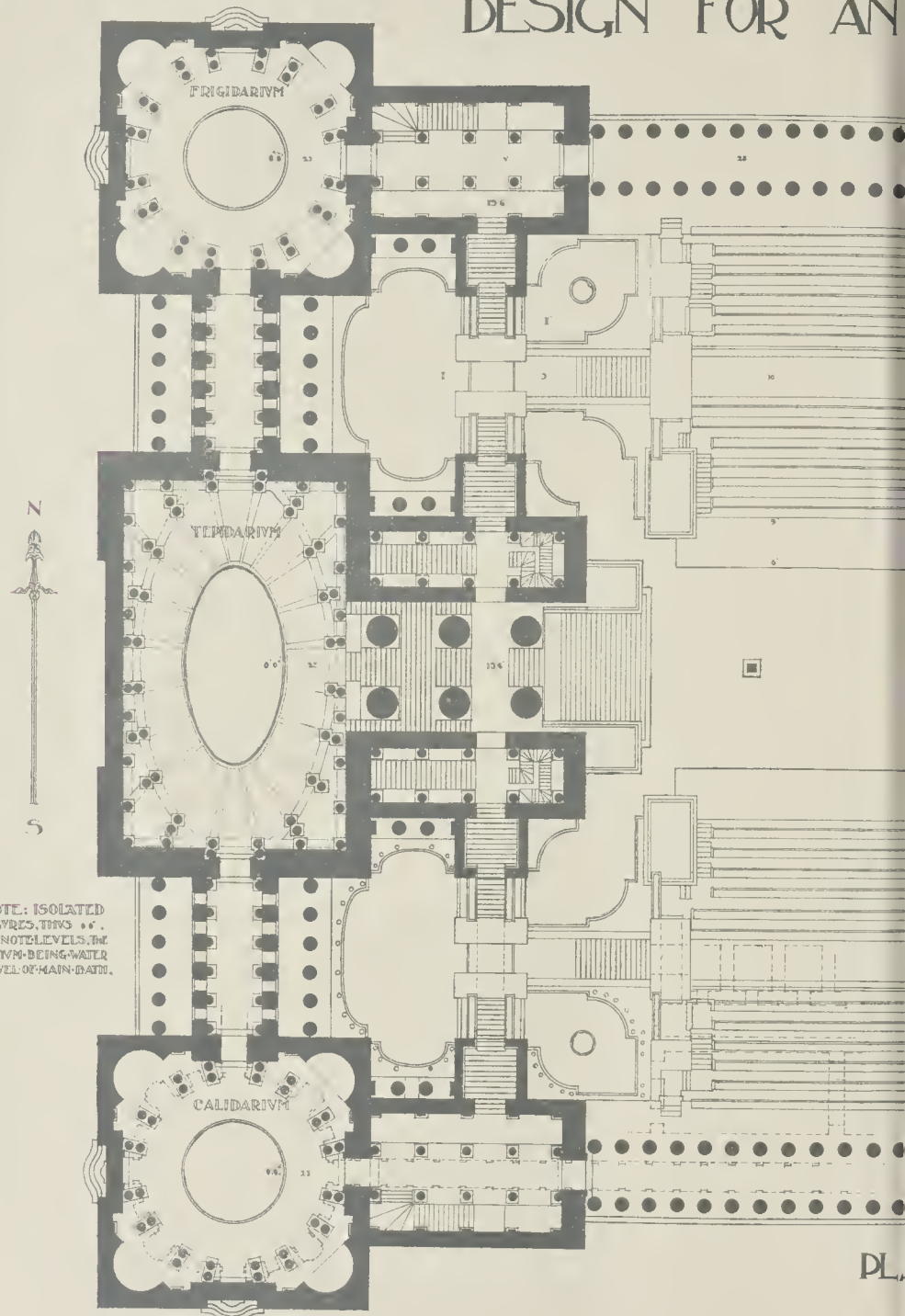


"INK PHOTO," SPRAGUE & CO. LYP 4 & S, EAST HARDING STREET FETTER LANE, E.C.

BURGESS HILL.—MR. E. GOLDIE, F.R.I.B.A., ARCHITECT.



DESIGN FOR AN

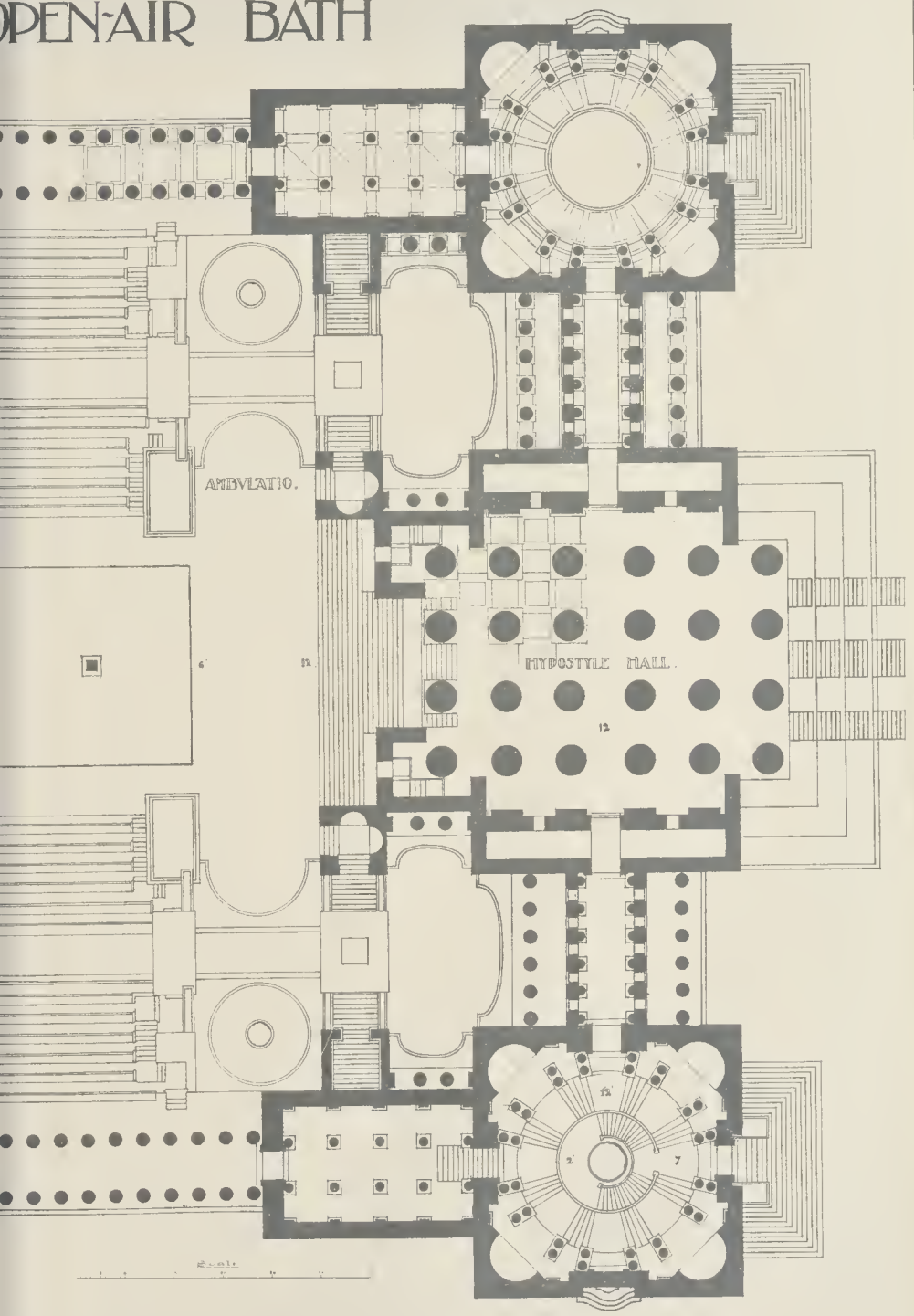


NOTE: ISOLATED FIGURES THUS 0'0" DENOTE LEVELS THE BATH-ROOM BEING WATER LEVEL OF MAIN-BATH.

Submitted in Competition for the Tite Prize

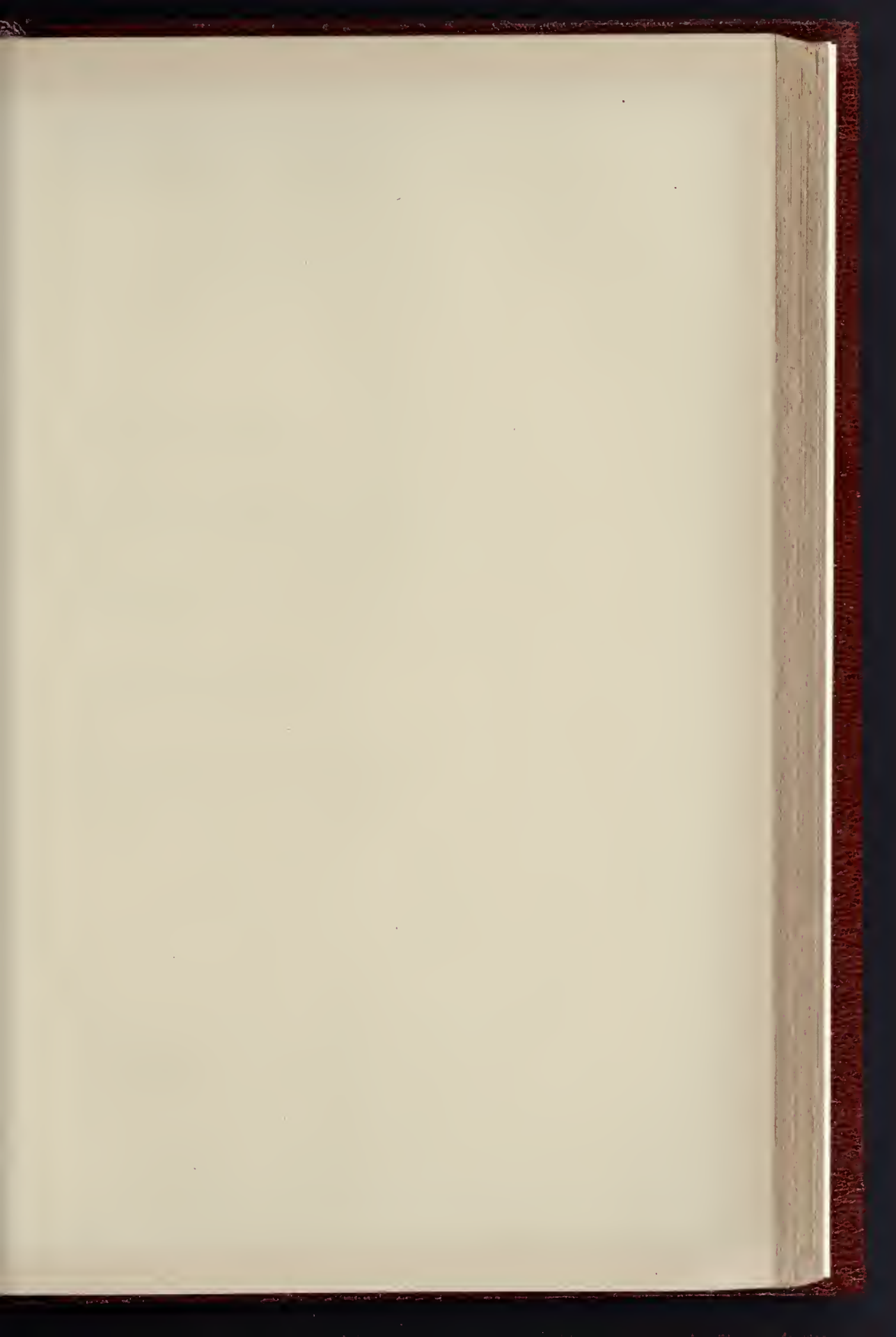
PL.

OPEN-AIR BATH

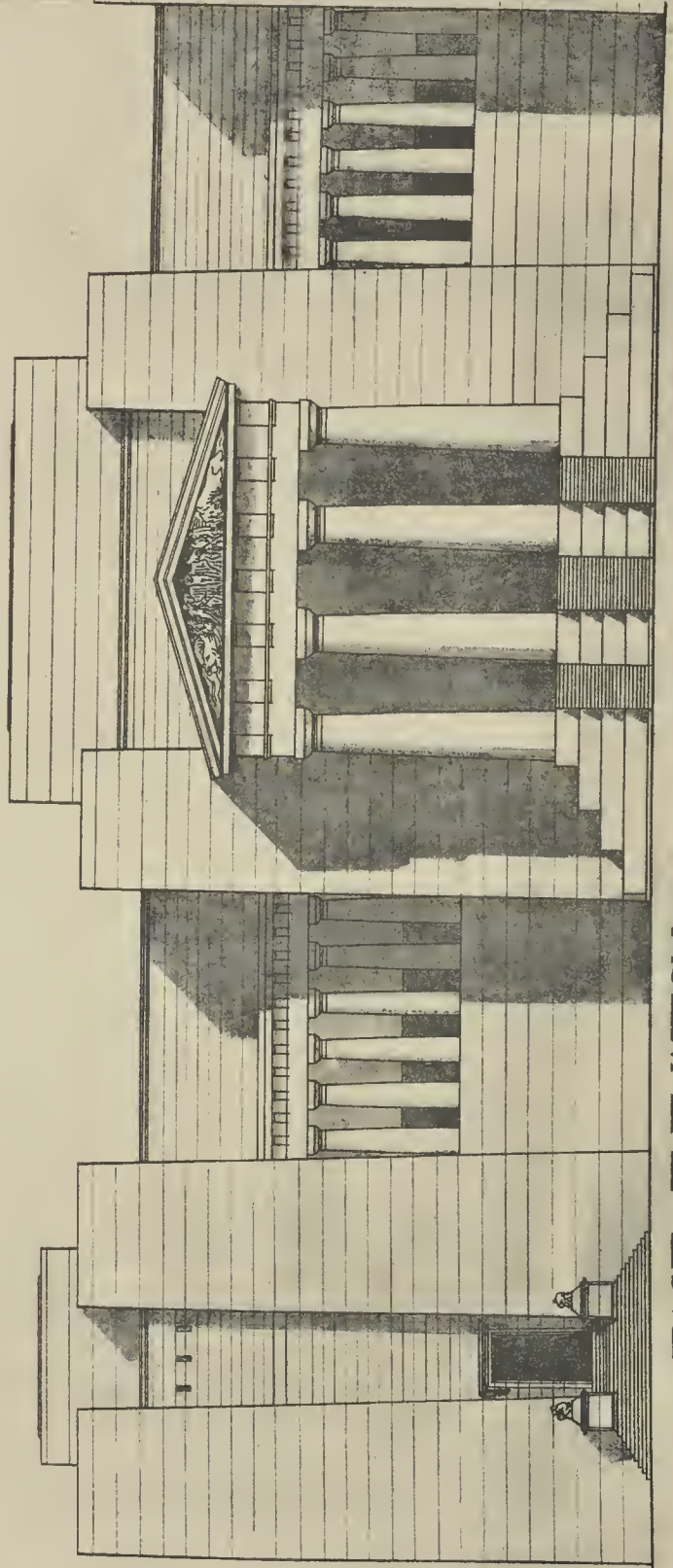


Designed by Mr. J. Arthur Berrington, A.R.I.B.A.

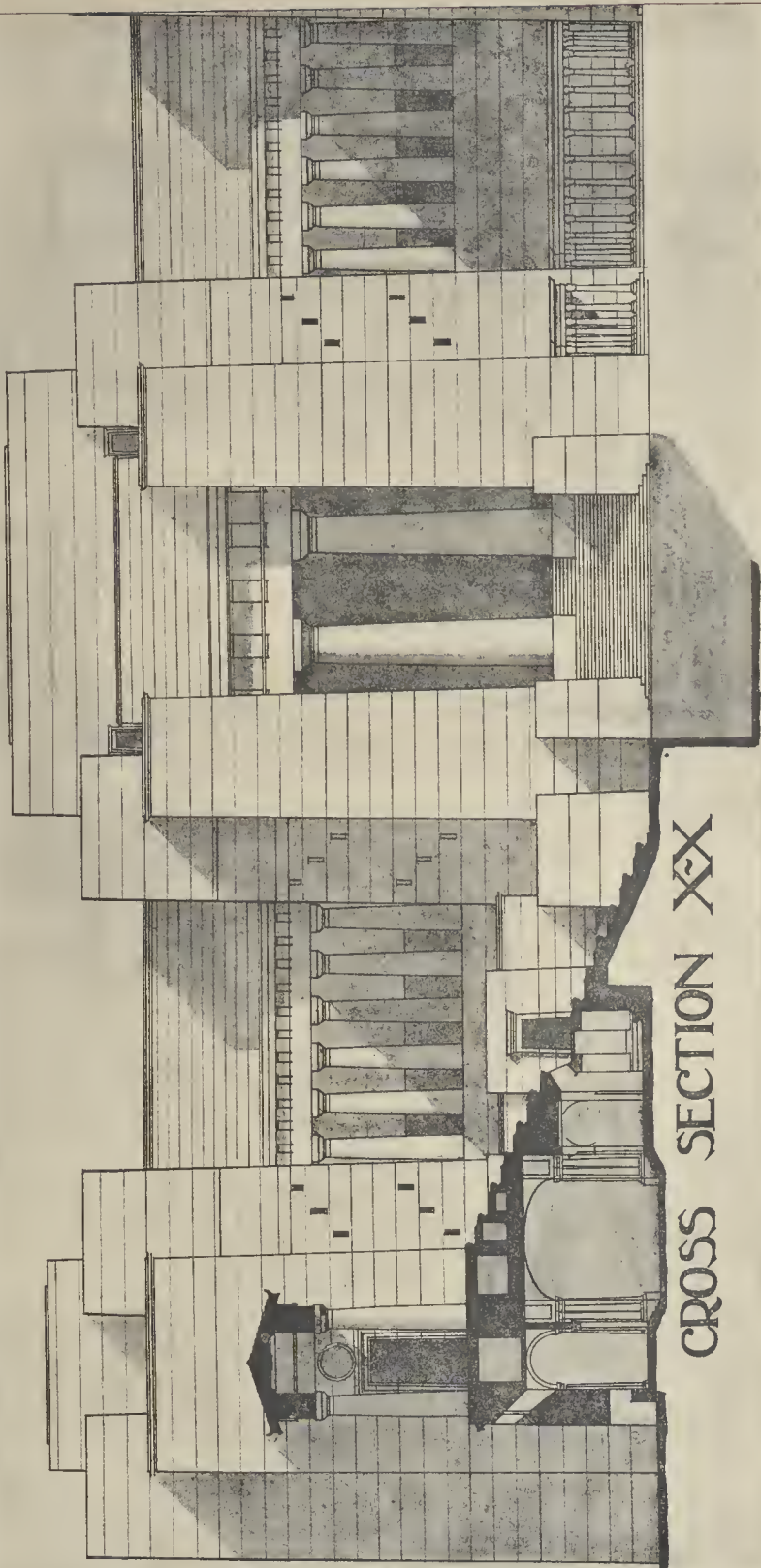
PHOTO LITHO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE E.C.



THE BUILDER, APRIL 28, 1906.



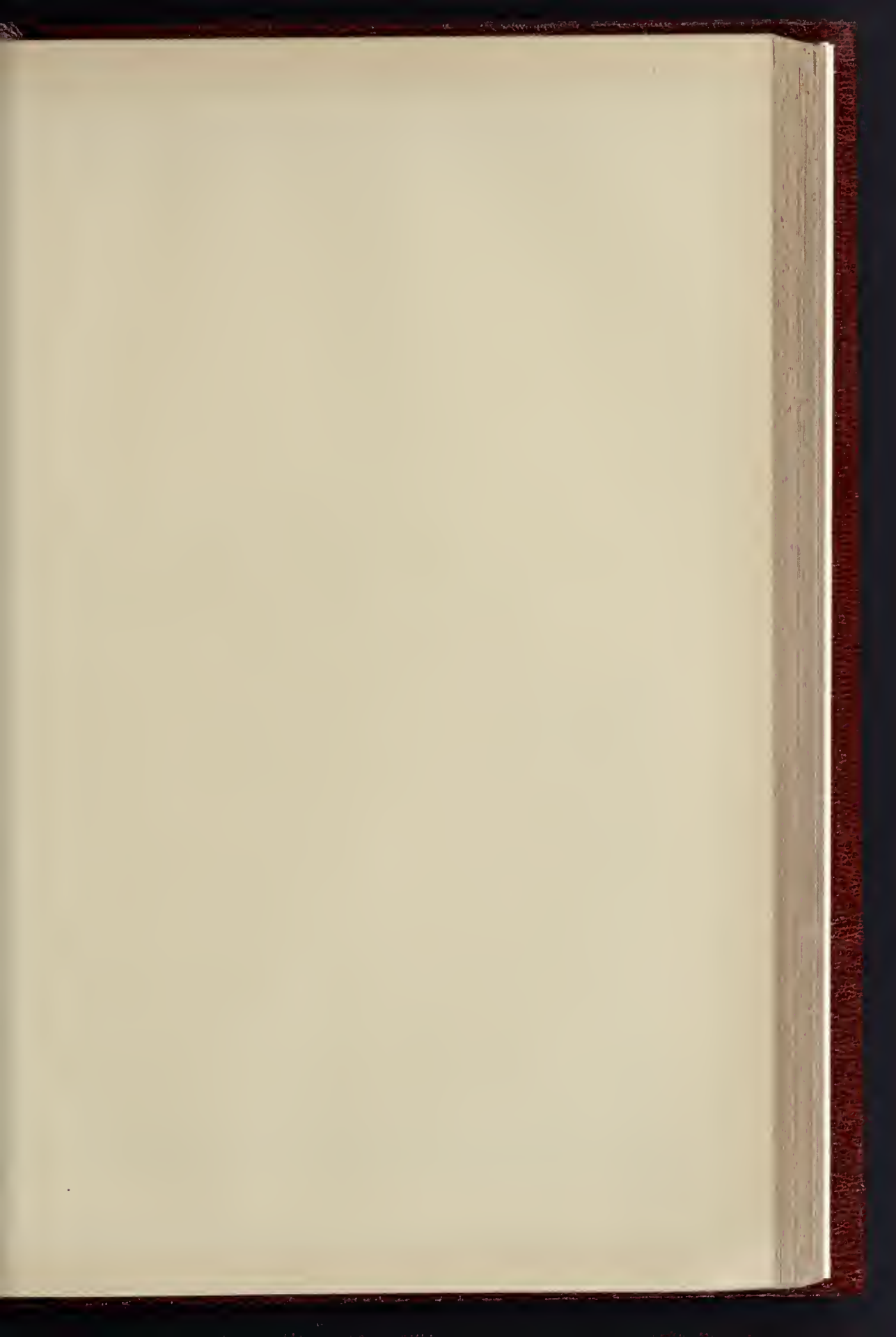
EAST ELEVATION



CROSS SECTION XX

DESIGN FOR AN OPEN-AIR SWIMMING BATH: SUBMITTED IN COMPETITION FOR THE TITE PRIZE

By MR. J. ARTHUR BERRINGTON, A.R.I.B.A.





CITY HALL, COLORADO SPRINGS, COL.



Sprague & Co., Ltd., Printers, 4 & 5 West Harding St., E.C.

—MR. T. McLAREN, A R.I.B.A., ARCHITECT.



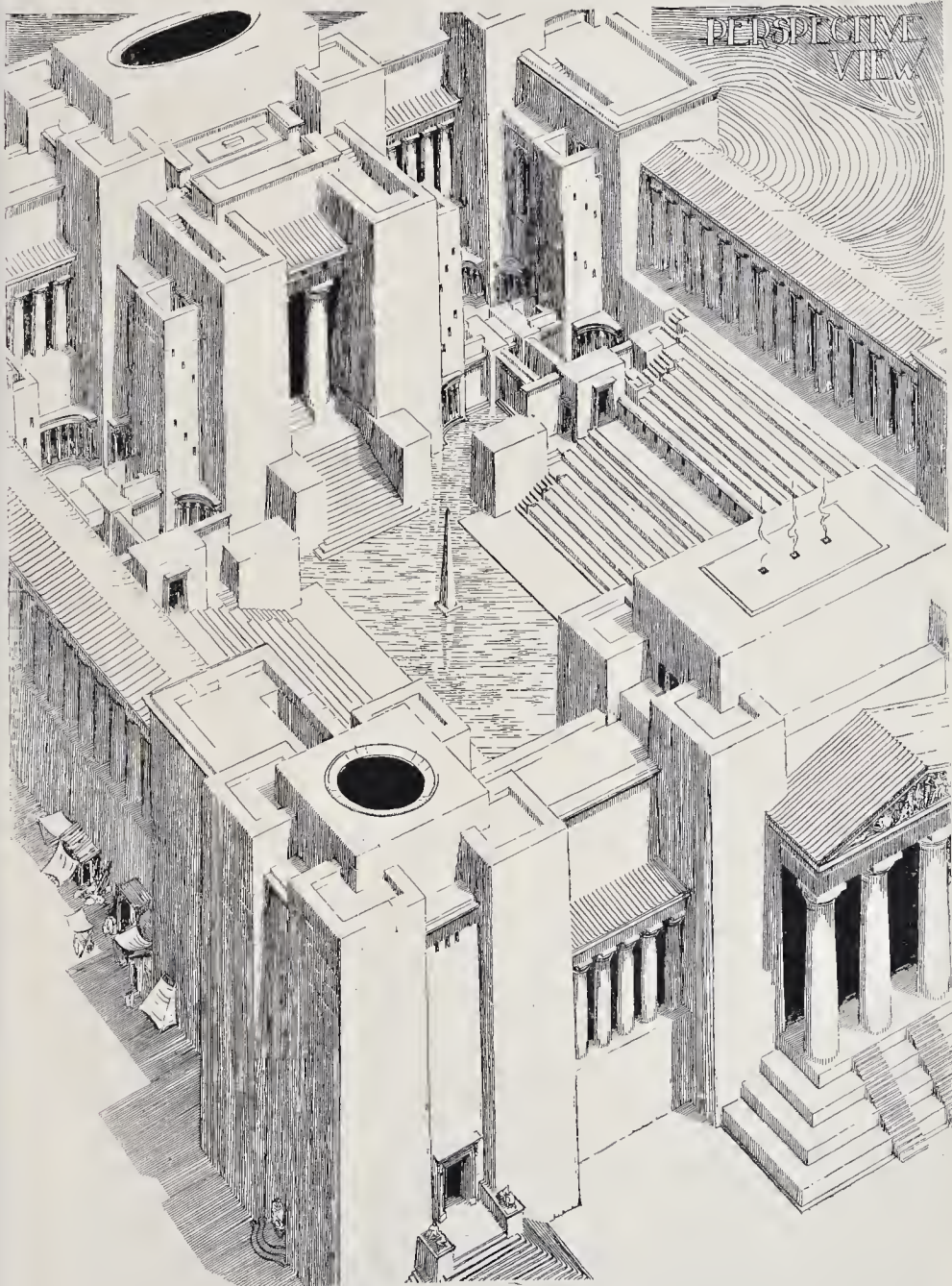
NORWEGIAN TIMBER, GRANITE, AND BRICKS.

Mr. F. GRAY, acting British Consul at Christiania, reporting on the trade of Norway for 1905, mentions that the amount of timber shipped from Norway during the last two years has been a trifle below the average, which is roughly 1,000,000 tons. The principal timber exporting town of Norway is Fredrikstad, which exports planed timber chiefly. The Vice-Consul at that

port states as follows:—The past year was not a remunerative one for Fredrikstad flooring exporters, and probably most of them have closed their books with a loss. The reason of this is chiefly owing to the unreasonably high prices that they have for some time past had to pay for their logs and sawn wood, which again was caused by the lively demand and strong competition throughout the year from the pulp mills and cellulose factories. The total export of timber

here as compared with two previous years has been as follows:—

	Quantity.		
	1903.	1904.	1905.
	Cubic metres.	Cubic metres.	Cubic metres.
Flooring boards	355,517	308,257	290,707
Sawn wood	134,743	114,792	143,401
Heavy timber	4,736	2,971	2,144
Round timber	59,334	42,836	41,305
Staves	23,757	24,791	26,052
Firewood	55,983	50,271	48,331
Total	633,170	544,018	551,944



Design for an Open Air Bath; by Mr. A. Berrington. Perspective Sketch.

intervals. In most cases where the three first figures are not printed they must be taken from the line above, the characteristic and decimal point being added as before. The exception to this rule is explained later.

Rule (1).—To find the logarithm for a number containing four figures, take the mantissa from the column headed (0) on the same line as the number, and add the proper characteristic.

Example (1):

log. 1008 (reading 0034605) = 3.0034605
 log. 100.8 (reading 0034605) = 2.0034605
 log. 10.08 (reading 0034605) = 1.0034605

The logarithms for numbers containing five figures, from 10,000 to 10,800, can be found in the same way.

Rule (2).—To find the logarithm of a five-figure number where only four figures of the number are printed in the column headed "No.," take the first three figures of the mantissa from column (0), opposite the first four figures of the number, and the last four figures of the mantissa from the column whose heading agrees with the fifth figure of the number, and add the proper characteristic.

Example (2):

log. 10075 (reading 0032451) = 4.0032451
 log. 1007.5 (reading 0032451) = 3.0032451
 log. 100.75 (reading 0032451) = 2.0032451

The logarithms for numbers containing six figures, from 100,000 to 108,000, can be found in a similar way.

Rule (3).—To find the logarithm of a six-figure or seven-figure number where only four figures of the number are printed in the column headed "No.," the mantissa for the first five figures is obtained as explained above, and to it is added a proportional part of the difference between that mantissa and the next higher mantissa.

The difference represents the change corresponding to an increase of one unit in the fifth figure of the number, and as the sixth figure represents *x*-tenths part of the unit, and the sixth and seventh figures *x*-hundredth parts of the unit, they may be considered as decimals of it. Therefore, if the difference be multiplied by the sixth figure or the sixth and seventh figures of the number in question, the product will be the correction to be added to the mantissa of the first five figures of the number, and, when so added, will give the required mantissa. The insertion of the proper characteristic and the decimal point will then give the complete logarithm of the number.

Example (3): Find the logarithm of 101,058.

Here 101,058 = 101,050 + 8.
 Then by Table XI.
 log. 10105 = 0.045363
 log. 10106 = 0.045793
 difference = 0.000430

Then $0.000430 \times 0.8 = 0.000344$
 and $0.045363 + 0.000344 = 0.045707$
 Therefore adding the proper characteristic,
 log. 101,058 = 5.0045707

Example (4): Find the logarithm of 1,010,585.

Here 1,010,585 = 1,010,500 + 85
 Then by Table XI.
 log. 10105 = 0.045363
 log. 10106 = 0.045793
 difference = 0.000430

Then $0.000430 \times 0.85 = 0.0003655$
 and $0.045363 + 0.0003655 = 0.0457285$.
 Therefore adding the proper characteristic,
 log. 1,010,585 = 6.00457285.

For ordinary calculations the corrections can be taken from the column headed "Diff.," where differences and their proportional parts are given—every third difference at the beginning, every second difference in the middle, and every difference at the end of the table. In cases where minute accuracy is essential and the exact difference is not given, the values must be calculated by the foregoing method.

It must be understood that the differences and their proportional parts are really decimal fractions, although printed in the table as if they were whole numbers, and that in each case the significant figures are understood to be preceded by a certain

number of ciphers, the exact number being readily obtained by inspection.

Thus in Table XIA:—
 difference 433 = 0.000433
 Because
 log. 10043 = 0.018635
 log. 10042 = 0.018202
 difference = 433 = 0.000433
 Similarly proportional part 390 = 0.000390
 and proportional part 43 = 0.000043.
 Because

$$0.000433 \times \frac{9}{10} (= 0.9) = 0.000390$$

$$0.000433 \times \frac{1}{10} (= 0.1) = 0.000043$$

Note.—It should be pointed out that the arrangement in which the first three figures of the mantissa are printed at intervals, and only in column (0), leads to apparent inaccuracy in some lines of a logarithmic table so designed.

Thus, referring to Table XI, we find that log. 10,023 reads 0009977, which is correct, and that log. 10,024 reads 0000411, which is manifestly wrong. Similarly, log. 107,994 reads 05339965, which is correct, and log. 107,995 reads 05330365, which is wrong.

The fact is that, after the value of the last four figures in any mantissa has passed beyond 9999, the value of the last figure in the first group requires to be increased by 1, so that for two of the numbers cited above the figures of the mantissa 000 and 0533 become 001 and 0534 respectively. But to record these increases in the middle of a line would be inconvenient, and to avoid disturbing the symmetry of the table, the figures 000 and 0533 are allowed to remain, the change being indicated by a thin line over the figures affected.

Therefore, to find log. 10,024, we must veil the last four figures of the mantissa in column (4) opposite number 1002, and the first three figures in column (0) opposite number 1003, thus obtaining log. 10,024 = 0.010411, which, with the addition of the characteristic, becomes 4.0010411.

In the same way log. 107,995 is found to be 5.0330365.

To Find the Number Corresponding to any Given Logarithm.

It may sometimes happen that the exact logarithm for which the number is required will be found in the table, but when this is not the case, the value may be ascertained in the following manner:—
 • **Rule (4).**—Take from the table the

logarithm next lower than that given, and write down the five figures of the corresponding number, which will be correct so far as they go. Then find the difference between the logarithm taken from the table and the given logarithm, and, in the difference column, opposite the proportional part equal to this difference, read the sixth figure of the number. In case the difference column does not contain the exact difference ascertained, take the next lower proportional part, and the number opposite to it will be the sixth figure of the number, but a seventh figure may be required to give a more exact value. The seventh figure is found by subtracting the last mentioned proportional part from the ascertained difference, appending a cipher to the remainder and considering the result as a new proportional part for which the corresponding figure must be found. This figure will be the seventh figure of the number. The process can be continued if desired until an exact agreement of the differences is reached, or until any required number of decimal places has been found.

Example (5): Find, by the aid of Table XI, the number corresponding to the logarithm 4.0034295.

Then, dealing only with mantissa
 Here we have
 given log. = 0.034295—
 next lower log. = 0.034174 = 10079
 difference = 121—
 next lower pro. part = 87 = 000002
 (append cipher) = 340—
 next lower pro. part = 303 = 0000007
 (append cipher) = 370—
 next lower pro. part = 346 = 00000008
 24 10079278

As the characteristic 4 shows the result will be more than 10,000, but not so much as 100,000, the required number is 10079.278.

Example (6): Find the number corresponding to the logarithm 0.03325376.

Here we have
 given log. = 0.3325376—
 next lower log. = 0.3325081 = 107957
 difference = 295—
 next lower pro. part = 284 = 0000007
 (append cipher) = 110—
 next lower pro. part = 80 = 00000002
 30 10795772

As the characteristic 0 shows the value of the result must be between 1 and 10, it follows that 1.0795772 is the required number.

TABLE XII.—SIX-FIGURE LOGARITHMS OF NUMBERS FROM 100 TO 9,999 WITH DIFFERENCES.

No.	0	1	2	3	4	5	6	7	8	9	D.
100	0.000000	0434	0868	1301	1734	2166	2598	3029	3461	3891	4322
1	434	4774	5181	5569	5938	6296	6644	6981	7318	7644	7961
2	890	9256	9581	9876	10151	10416	10671	10916	11151	11376	11591
3	01.....	.....	.....	.....	0300	0724	1147	1570	1993	2415	2834
4	15.7	2254	3080	4100	4521	4940	5360	5779	6197	6616	7030
5	47033	7451	7868	8284	8700	9116	9532	9947	.....	.....	.....
6	02.....	.....	.....	.....	.....	.....	.....	.....	0361	0775	1186
7	1183	1603	2016	2428	2841	3252	3664	4075	4486	4896	5302
800	99.655	5678	5721	5767	5811	5854	5898	5942	59.86	60.30	60.74
1	6974	6117	6161	6205	6249	6293	6337	6380	6424	6468	6511
2	6512	6555	6599	6643	6687	6731	6774	6818	6862	6906	6944
3	6949	6993	7037	7080	7124	7168	7212	7255	7299	7343	7384
4	7380	7424	7474	7517	7561	7605	7648	7692	7736	7779	7821
5	7825	7867	7910	7954	7998	8041	8085	8129	8172	8216	8258
600	99.825	8303	8347	8390	8434	8477	8521	8564	8608	8652	8694
1	8695	8738	8782	8826	8869	8913	8956	9000	9043	9087	9129
2	9131	9174	9218	9261	9305	9348	9392	9435	9479	9522	9564
3	9565	9609	9652	9696	9739	9783	9826	9870	9913	9957	9997

TABLE XIII.—FIVE-FIGURE LOGARITHMS OF NUMBERS FROM 0 TO 999 WITH DIFFERENCES.

No.	0	1	2	3	4	5	6	7	8	9	D.
0	inf. neg.	0.0000	30103	47712	60206	69897	77815	84510	90009	95424	—
10	1.0000	0.0432	0.0860	0.1284	0.1703	0.2119	0.2531	0.2938	0.3342	0.3743	415
11	0.4139	0.4532	0.4922	0.5308	0.5690	0.6070	0.6446	0.6819	0.7188	0.7555	379
12	0.7918	0.8279	0.8636	0.8991	0.9342	0.9689	1.0032	1.0372	1.0710	1.1049	344
13	1.1394	1.1737	1.2077	1.2415	1.2751	1.3085	1.3417	1.3747	1.4075	1.4401	323
14	1.4613	1.4922	1.5229	1.5534	1.5836	1.6137	1.6435	1.6732	1.7028	1.7321	268
85	97772	97818	97864	97909	97955	98000	98046	98091	98137	98182	46
86	98227	98272	98318	98363	98408	98453	98498	98543	98588	98632	45
87	98677	98722	98767	98811	98856	98900	98945	98989	99034	99078	45
88	99123	99167	99211	99255	99300	99344	99388	99432	99476	99520	44
89	99564	99607	99651	99695	99739	99782	99826	99870	99913	99957	44

Tables XII. and XIII. are examples of six-figure and five-figure logarithmic tables.

In Table XII. it will be observed that, in places where the values of the last four figures of the mantissa exceed 9999, the logarithms are continued on a separate line, thus obviating any correction of the kind indicated in the note made above in connexion with seven-figure logarithms.

The differences given in the column headed (D) in Tables XII. and XIII. enable the user to calculate proportional parts for numbers having more figures than those stated in the "No." columns, as illustrated in the examples following.

Example (7): Find the logarithm of 105.25 by Table XII.

$\log. 1052 = 022016$
 $D. 412 \times 5 = 206$
 $\therefore \text{Required } \log. = 2.022222$

Example (8): Find the logarithm of 105.2 by Table XII.

$\log. 105 = 02119$
 $D. 415 \times 2 = 83$
 $\therefore \text{Required } \log. = 2.02202$

Example (9): Find the number corresponding to the logarithm 0.387925 by Table XII.

given $\log. = 997925$
 next lower $\log. = 997910 = 9952$

$D. 44 \quad) \quad 15 = 000034$
 995234

$\therefore \text{Required number} = 9.95234$

Example (10): Find the number corresponding to the logarithm 0.389335 by Table XII.

given $\log. = 98935$
 next lower $\log. = 98900 = 975$

$D. 15 \quad) \quad 35 = 00077$

97577
 $\therefore \text{Required number} = 9.7577$

General Building News.

PROPOSED NEW CHURCH, BEDMINSTER.—It is proposed to erect a new church at Bedminster from the designs of Mr. W. V. Gough, of Bristol. The church has been designed to accommodate a congregation of 750, and will include a chancel, nave, two aisles, morning chapel, organ chamber, vestries, and basement. At present it is proposed to build the chancel end, and three bays of the nave with vestries below. The chancel will have an apsidal end—as will also the chancel of the morning chapel—with concrete domes, ultimately to be decorated and coloured. The walls of the building will be constructed of pennant, the interior being relieved by coloured stones and brick facings. The seating accommodation at present will be for 500, and it is proposed to use chairs. When the first part of the scheme has been completed there will then remain three bays to be added, and the organ porch.

WESLEYAN CHAPEL, BLUCHIER, NEAR NEWCASTLE.—A new Wesleyan chapel has just been opened in this village. The buildings, which are of Gothic design, have been erected with Seaton Burn bricks, supplied by the North Walbottle Coal Co., those for facing and the moulded string and label moulds for doors and windows being from Messrs. Ford & Maxwell's works at Pelaw. The church is 40 ft. by 27 ft., capable of seating 160 worshippers, with a Sunday school at right angles 42 ft. by 24 ft., to accommodate 170 children, so arranged that the two rooms can be thrown into one by the removal of a glazed swivel partition. At the rear of the church there are minister's and stewards' vestries, and advantage has been taken of the sloping nature of the site to provide a kitchen vestry, heating chamber, and storerooms in the basement. The woodwork for the pews, seats, rostrum, and dado cladding is executed in pitch pine, the remainder being in redwood stained and varnished. The front windows of the church are glazed with cathedral glass from the studio of Mr. C. J. Baguley, of Newcastle. The heating is on the low pressure system, and has been installed by Mr. Ernest Byles, of Newcastle, the painting and decoration has been carried out by Mr. E. Robertson, and the whole contract by Messrs. Brown & Bell, builders, of Newcastle. Mr. J. J. Winter has acted as clerk of works, under the supervision of Mr. J. Walton Taylor, architect, of Newcastle, who has designed the new premises.

COUNCIL SCHOOLS, ALTRINCHAM.—These new schools, in Navigation-road, Altrincham, were opened on Tuesday, the 24th inst. The schools are arranged in three separate departments and contain accommodation as follows:—Infants' department, 190; junior mixed department, 300; senior mixed department, 300. Special provision is also made for instruction in science and art,

cookery, and manual instruction, separate accommodation being provided for these purposes. The total cost of the school is approximately 13,247, and the work has been carried out from the designs and under the superintendence of Mr. Wm. Owen, Manchester, Mr. Thomas Clayton having acted as clerk of the works. The contractor for the general work is Mr. Wm. Thorpe, Old Trafford.

NEW ELECTRICAL SCHOOL, CHATHAM.—In the construction of the building for the electrical school for H.M. War Office at Chatham, considerable use is being made of reinforced concrete for floor beams of various types, designed in accordance with the Wells system, which, so far as can be judged from the drawings, appear identical with the Hennebique system except in respect of the members for resisting shearing stresses, and as these have one leg only in place of two, we do not think the new form possesses any recommendation. The building was designed by the late Colonel E. C. Moore, R.E., and is being erected by Stuaarts Granolithic Stone Co. under the supervision of Colonel A. Hill, R.E. (retired).

SUNDAY SCHOOL ENLARGEMENT, BOURNE-MOUTH.—The Sunday school of the Pakesdown Congregational Church is at present being enlarged and improved. The scheme comprises a continuation of the existing school, to a length of 45 ft., by 35 ft. in width, and the addition of four class-rooms, with cloak rooms, lavatories, etc., the construction being of red brick. Mr. R. C. O. Cooper is the architect, and Messrs. Jenkins & Son, Limited, are the builders.

SCHOOLS, BOURNVILLE.—The public elementary schools which Mr. and Mrs. George Cadbury have built at Bourneville have just been completed. The schools are designed to accommodate 540 scholars—270 boys and an equal number of girls—and have cost upwards of 30,000, to build, furnish, and equip. They stand in the centre of the village and have frontages to Linden-road and Thorn-road. On the south they are bounded by the village park, and to the north the children are to have the privilege of free entry, thus extending their playing space when at school to upwards of ten acres. The buildings have been designed in the Gothic style, freely treated, by Mr. Alexander W. Harvey, consulting architect to the Bourneville Village Trust, and their construction has been carried out by Messrs. J. Bowen & Sons, of Birmingham. Their most distinctive feature is a massive square tower, embellished with sculptured stonework, which forms the southeast corner, and furnishes entrances for the girls. These are rendered imposing by bold stone staircase approaches. The boys' entrances are from Thorn-road. The general plan of the building is rectangular, with a hall 84 ft. long and 32 ft. wide in the centre, and twelve class-rooms are arranged around it. The southern aspect is built up from a basement to provide for the natural fall of the land, and in this commodious rooms have been fitted for teaching technical arts and handicrafts to the boys and laundry work and cookery to the girls. In the two upper stories of the tower are a library and a laboratory. The schools are provided with the electric light, and heated and ventilated by a combined system. A distinctive feature of the schools is a carillon of twenty-two bells set in the tower. The bells have been cast by Messrs. Taylor, of Loughborough.

MISSION HALL, SALISBURY.—The new mission hall of the Salisbury branch of the Railway Mission has just been completed. The architect was Mr. A. C. Bothams (City Surveyor), and Messrs. Day Brothers were the builders. The total cost of the building has been about 1,690.

KING'S COLLEGE HOSPITAL.—At the last annual meeting of the court of governors, presided over by the Rev. Dr. Headlam, principal of King's College, the chairman stated that they had received about one-half of the sum of 300,000, for which an appeal is now before the public, and are now in full possession of the site on the Sanders estate, Denmark Hill, presented by the Hon. W. F. D. Smith, M.P., in memory of his father, the late Mr. W. H. Smith, treasurer of the hospital. Building operations will be begun forthwith and the out-patients' department will be the first to be constructed for which the selected architect, Mr. W. A. Pitt, has been instructed to prepare working drawings.

FREE CHURCH HALL, ROTTERDAM.—The new hall of the Rotherhithe Free Church in Lower-road was opened a short time ago. In shape the structure is an elongated octagon, with a span roof. The area has been excavated to the depth of about 6 ft., so that the audience pass down several steps to reach the floor. The platform rails and stair borders are painted white, and will be picked out with gold. When sufficiently dried the walls will be coloured a light green. A system of electric lighting has been installed by Mr. Wilton. The architect was Professor Beresford Pitt and Mr. W. A. Pitt, the builders being Messrs. W. Lawrence & Sons. The scheme also includes the erection of a school-room, book-room, club-room, and temperance hotel, but only the hall has been proceeded with at present. The contract for the main buildings and vestibule was signed for 5,650, which

did not include the cost of lighting, flooring, chairs, etc., which are estimated to cost 750, additional.

PUBLIC LIBRARY, BEVERLEY.—The new public library at Beverley has been completed. The lending library, reference library, and newsroom are all on the ground floor, entered directly from a staircase hall immediately to the left of the entrance hall. In the newsroom stands are provided around the walls for twenty-two or twenty-three newspapers. Adjoining the newsroom and separated from it by oak screens is the lending library, with sufficient space to give accommodation for some ten or twelve thousand volumes. The reference library is furnished with tables and chairs for thirty-four readers. On the first floor is a lecture-room, a committee-room, and an art gallery. The latter occupies the whole length of the back part of the building over the lending library and reference room, and is lighted for the most part from the roof. The fittings and internal woodwork are of oak and the floors of the art gallery and lecture-room of blocks of the same wood. The heating throughout is by means of hot water in pipes and radiators with a fireplace in addition in the committee-room. The building is illuminated by the incandescent light. The work has been carried out under the supervision of Mr. John Cash, architect, of London. The building contractor is Mr. G. Duce, of Beverley, and the sub-contractors are Mr. Robert Page, Beverley (stonework), King & Co., Hull (heating), Darlington School Purvising Company (fittings), Robert Canby, Beverley (painting).

RAILWAY OFFICES, YORK.—The staff of the North-Eastern Railway Company will, during the next few months, enter on possession of their new head offices at York, which have been five years in course of erection. The constructional work was completed last year, and the final stages of internal fitting and decoration are approaching completion. The building occupies the site of a Congeries of old tenement property lying between Station-road and Turner-row, with a main facade to a narrow street which divides it from the old offices. The design won the silver medal at the French Exposition two years ago, and has been exhibited at the Royal Academy, as a happy result of the co-operation of two architects—not always a successful experiment—Mr. Horace Field, of London, who is mainly responsible for the elevation, and Mr. W. Bell, the chief architect of the North-Eastern Railway, having collaborated with the most harmonious results.—*Yorkshire Post.*

LIVERPOOL COUNTRY HOSPITAL FOR CHILDREN.

—The new Liverpool Country Hospital for Children is being erected at Hessel, on an elevated site of 10 acres. When completed the new hospital will provide accommodation for 200 beds, and will be erected in the form of the letter "H." It has not, however, been found possible to proceed with the full scheme all at once. The portion now being undertaken is the central block, some part of which is to be utilised as temporary accommodation for wards until the ward blocks themselves can be erected. The central block will cost 25,000, and it will eventually be used as the administration block and as playrooms and schoolrooms, and accommodation will be found for 100 beds. The final one of the whole scheme is to be about 50,000. Messrs. H. & A. P. Fry, of Hucknashley, are the architects of the new buildings, and the contractor is Mr. W. H. Ford, of Birkenhead.

GLASGOW STOCK EXCHANGE ENLARGEMENT.

—The addition to the Glasgow Stock Exchange was opened on the 17th inst. The new wing, which faces St. George's-place, has been erected in conformity with the older building, the design being French Gothic in its treatment. On the ground floor accommodation is provided for the Post Office, which has a floor area twice that occupied by the old premises. Cloak-rooms, etc., have been added for the convenience of the staff, and the remainder of the floor is let for offices. The first principal floor comprises the new mining market, telephone corridor, and smoking-room. The new mining market is a room about 50 ft. by 42 ft., and 22 ft. in height, and is lighted by three windows facing St. George's-place. It is more than double the area of the old market, which will eventually be thrown into the present general market. The telephone corridor is a spacious apartment, and it will eventually open to the main staircase in the present building, and will be over 100 ft. in length. The flooring is laid throughout with india-rubber. The smoking room adjoins the mining market and telephone corridor. Practically all the second floor is occupied by the administrative department. This includes the general office, a private room for the secretary, with waiting-room adjoining, and a strong-room and typists' apartment. Communication with the old building is direct. Directly above, on the third floor, are situated the telegraph instruments room, the committee-room, and a number of offices. New lavatories and cloak-rooms have been provided, and the entire building is heated by the Reck system, while an Otis elevator connects all the

hours. The architect is Mr. John James Burnet, St. Vincent-street, Glasgow.

HOTEL, ANGLADES.—New licensed premises and hotel are about to be erected at the corner of Market-street and Guild-street, Aberdeen. Messrs. Sutherland & Pirie are the architects for the building, which will cost about 6,000l.

VICARAGE, OXFORD.—St. Paul's Vicarage, which has been erected on a site at the Woodstock-road, Oxford, on the site of the Woodstock-observatory-street, Oxford, was dedicated recently by the Bishop of Oxford. The house is of red brick, and has been built at a cost of about 1,500l. by Mr. J. Woodbridge, from the designs of Mr. F. C. Eden, Holborn, W.C.

HOSPITAL, FAZAKERLEY, LANCASHIRE.—The new Liverpool City Hospital, which has been opened at Fazakerley, provides accommodation for 350 beds. The administrative block and the nurses' home occupy the central position in the buildings, directly facing the main entrance, while the wards and isolation pavilions are ranged on the east and west sides. The erection of the hospital has been carried out from designs by the Corporation of Liverpool, Mr. T. Shillineau, and has cost about 121,475l.

CO-OPERATIVE BAKERY, BELFAST.—The opening of the Belfast Co-operative Bakery, Ravenhill-avenue, took place on the 16th inst. Mr. W. J. Gilliland was the architect, under whose superintendence the buildings have been erected. The buildings are constructed of brick throughout, with a central part of red brick, Belfast patterned brick, with white spot stone used in the principal elevation towards Ravenhill-avenue. The walls of the interior of the bakery are lined with channelled bricks. The general contractors for the building works are Messrs. W. J. Campbell & Son, Belfast. The ovens were erected by Messrs. J. M. Bell & Sons, Glasgow, and the electric installation by Mr. Stanley Johnston, Belfast. The plumbing and other fittings have been erected by Mr. W. T. Stone, Belfast. The plumbing fittings are supplied by Messrs. Doulton & Co., of London. The baking machinery has been supplied by Messrs. Melny & Co., of Glasgow, and Messrs. Pilsdery, Glasgow, and Messrs. Musgrave & Perkins, London. Messrs. Sturges & Co., Ltd., of Belfast, supplied the stable fittings. The electric installation was designed by Mr. Turner, of the Co-operative Society, Ltd., and Mr. Scott, engineer to the United Co-operative Baking Society, Ltd., has arranged the various items of baking machinery.

BOARDED LIBRARIAN, KENSINGTON.—The Borough Board of Education has been erected at the rear of the Bancroft-road Public Library upon the site of the disused mortuary and yard space adjoining. The building, which was designed by the Borough Engineer (Mr. M. W. Jamison), on the ground floor, a lecture hall 43 ft. in length, 28 ft. 6 in. in width, and 15 ft. in height, and a private study room 28 ft. in length, 16 ft. 6 in. in width, and 12 ft. in height. As occasion may require, these two rooms may be thrown into one. The partition dividing them consists of a series of doors swinging on pivots, which allow the whole to be folded against the wall without delay or trouble. The lecture hall is provided with a platform and an ante-room fitted with seats for the use of the lecturer. On the first floor is situated the Borough Librarian's office and a chamber to be used as the central reference reading room of the Borough, 60 ft. in length, 28 ft. 6 in. in width, and 20 ft. in height. Each side wall is divided into six, and each end wall into three panels by means of rows of pilasters and a cornice above, and ceiling cove above. The room is lighted by three windows at each end, in addition to the lights in the ceiling panels. A complete electric light installation has been laid throughout the building, and sufficient switches have been inserted to allow of any light being used independently. To provide for the warming of the room a special heating apparatus has been fitted in the newly-formed basement, connected with radiators placed in various parts of the building. Ample provision has been made in the basement for storage purposes, as may be found necessary. The building has been erected by Messrs. Patman & Fothergill. Special consideration has been devoted to the question of fire and other emergency, and by permission of the Mile End Board of Guardians an extra exit has been provided through their premises adjoining, to be used in case of fire only.

HOSPITAL EXTENSION, LANSDOWN, BUCKINGHAMSHIRE.—A new wing has been added to the Lansdown Hospital, near Nursing Home. The work is being carried out by Messrs. Erwood & Morris, contractors, from the designs of Messrs. Wilde & Fry, architects.

CHAPTER HOUSE OF THE LIVERPOOL CATHEDRAL.—The foundation-stone of the chapter house of the new cathedral will be laid shortly. It will be erected from funds provided by the Freemasons of the province of West

Lancashire as a memorial to the late Earl of Lathom. The architects are Mr. G. F. Bodley, R.A., and Mr. G. Gilbert Scott.

HOTEL ADDITIONS, MARGATE.—The Queen's, Kimber's, and High Cliff Hotels have recently been converted into one hotel. The necessary alterations were carried out from plans prepared by Mr. R. Dally Reeve, architect, Margate, the contractors being Messrs. Lockwood, of Westgate.

Stained Glass & Decoration.

MEMORIAL WINDOW, EDENSOR.—The dedication of a stained-glass window placed in the chancel of St. Paul's Church, Edensor, to the memory of the late Alderman E. G. Prince, J.P., a former Mayor of Longton, took place a short time ago. The subject which it depicts is the Birth, Crucifixion, Resurrection, and Ascension of Christ, and it has been erected under the supervision of Mr. J. H. Beckett, architect, by Messrs. Heaton, Barber, & Bayne, of London.

Appointment.

MR. HARRY BLACKADDER, Bargh Surveyor, North Berwick, has been appointed to the surveyorship of Bridge of Allan.

Sanitary and Engineering News.

THE LAW AS TO COMBINED DRAINAGE.—Puplar Borough Council has sent a circular letter to all the Metropolitan Borough Councils upon the question of combined drainage. They call attention to the unsuccessful attempts made by the London County Council in five sessions of Parliament to obtain an amendment of the law in respect of combined drainage by throwing upon owners the cost of maintenance and the combined drainage systems or other drains not approved by proper authority as sewers. They also refer to a deputation from the Metropolitan Borough Councils which waited upon the President of the Local Government Board in June, 1903, to urge legislation on the subject, when a sympathetic reply was given, but nothing was done to give effect to the desires expressed, and point out that the results sought might be achieved if the London County Council were to insert a clause in its next General Powers Bill dealing with the question, a precedent for which course was established by the Corporation of West Ham in its Bill of 1898 (61 & 62 Vic. Supp. 259 Sec. 42) by which it defined the word "drain" as including sewers. In conclusion, the various Borough Councils are asked to co-operate in requesting the London County Council to renew its efforts to amend the law in the direction indicated.

NECESSITY FOR FREE PUBLIC CONVENIENCES.—Dr. Collingridge, the Medical Officer of Health for the City of London, draws attention to the urgent need of having conveniences available for the portion of the public who cannot always pay the penny demanded at most of the public lavatory places; and more especially in the case of women. Dr. Collingridge says: "If it is not necessary to enter into details as to the serious injury that may be inflicted upon women by the absence of lavatory accommodation. Suffice it to state that serious and life long trouble is at times the result of such absence. This has already been recognized and provision made wherever practicable. While the ill-results are far more serious in the case of women than of men for physiological reasons, yet with the exception of the two places mentioned (Farrington-street south and Golden-lane) no free accommodation is provided for them, and unfortunately, as long as payment is required, for many it is beyond reach. The largest class of woman for whom free accommodation is needed in the City is composed of girls who carry materials to and from the shops and places where the work is carried out. The number of outworkers employed by City firms is considerable (already more than 7,000 have been registered), and of these only a very small proportion live in the City. These outworkers largely employ girls to carry the work to and fro, and these girls have frequently long distances to travel, often carrying heavy burdens, the nature of their employment entails upon them long waiting and need for haste on their return journey. For them no accommodation is provided at the workshop, and they obviously cannot afford to pay out of their scanty earnings even the small amount required for the use of the public conveniences, and the present provision being restricted to the Northern and Western Districts only, it is not available to many of these women to whom time is money, and who have but little knowledge of the grave consequences that often result from neglect of natural functions. It is necessary that free accommodation be

provided for women at each public convenience, and I recommend that this be at once arranged for." We are glad to read further down that on consideration of this Report the Committee decided at once to provide free accommodation at each public convenience within the City.

PROPOSED ESPLANADE, NEW BRIGHTON.—The Wallasey Improvement Bill is now being promoted in Parliament. It provides for the acquisition of the whole of the property known as the Lower Parade (or Ham and Egg Terrace), the Higher Parade, the Palace, the Pavilion, etc., lying between Victoria-road, the shore, Waterloo-road, and Virginia-road. All this is to be demolished, with the exception of the Higher Parade houses, which, after alteration and renovation, are expected to yield a fair revenue towards the payment of loan charges. The site of the single-storied shops, and a strip of the land upon which the other properties stand, will be laid out as ornamental grounds at the rear of the promenade, and the difficulty of the difference between the levels of the Higher Parade houses is to be overcome by the formation of a grass slope or embankment. A café, a few ornamental kiosks, and a large shelter form part of the scheme. Waterloo-road, between Virginia-road and the shore, is to be widened, and enclosures are to be made which will be laid out with trees and shrubs. The balance of the land not required for the promenade and the gardens will be sold, subject to certain conditions, for the erection of boarding-houses, private houses, and the like. The promenade itself is to be constructed behind a sea-wall to be built on the foreshore, and, independently of the decorative strips at the rear, its width will vary from 80 ft. to 100 ft. It will cover the frontage from the Pier to the western boundary of the Marine Park, and a part of the pavement will be so treated as to admit of the laying down of a double line of tram rails at any future time. When the scheme is completed, the promenade will be of a total length of little short of three miles. The cost of the projected works, including the acquisition of the property, is estimated at 122,000l., but it is calculated that, in actual effect, this will be reduced to less than 100,000l. when the capital values of the renovated Higher Parade dwellings, the café and kiosks, and the proceeds from the resale of land are taken into account. The scheme has been designed and prepared by the District Engineer and Surveyor, Mr. Walter H. Travers.

VENTILATION OF SEWERS.—The London County Council has sent a circular letter to the Metropolitan Borough Councils asking whether they are in favour of a suggestion that by-law No. 5 of the series of by-laws (Drainage, etc.) made by the Sanitary authority under sec. 202 of the Metropolitan Management Act, 1855, should be repealed. The by-law in question requires the provision of a suitable and efficient intercepting trap in every main drain or other part of a new building. The by-law is made to apply as far as practicable to the reconstruction of drains. The question of its repeal was brought forward some sixteen months ago by the Lewisham Borough Council, that body contending that if a return was made to the old system and the owner of each house compelled to have a ventilation pipe from the highest point of the drain, each one of these pipes would act as a ventilator to the sewer and the surface gratings in the road, in most cases, and act as fresh air inlets.

Foreign.

FRANCE.—On Saturday last Rodin's statue "Le Penseur" was officially inaugurated in its position at the foot of the Panthéon steps, on the axis of Rue Soufflot. The scheme for a new Mairie in the Rue d'Anjou, for the VIIIth arrondissement of Paris, is again talked of. If carried out, it will be from the plans and designs of M. Nénot, which have been already prepared. A large School of Chemistry, in connexion with the University of France, is to be built at the corner of Rue Saint Jacques and Rue Gay Lussac; the cost of establishment, about 3,000,000 francs, is to be divided between the Government and the Municipality of Paris. The Department of Public Instruction has decided on the creation of three new ateliers at the Ecole des Beaux-Arts, devoted to etching, wood-engraving, and lithography. For this latter atelier M. Maunon, President of the Société des Artistes Lithographes Parisiens, has been already chosen as Professor. M. Dujardin-Beaumez intends to establish a school of "Paysage et Plein-Air," which is to be installed at St. Cloud. A new college for girls is to be built at Saint-Dié, under the title of "Collège Jules Ferry." The monument to Desaix, formerly in the Place Dauphine at Paris, has been restored by M. Vauzet, and is to be set up in Desaix's native town, Roim, to which it has been presented by the Paris Municipality. A monument to the memory of those who perished in the wreck of the *Hilde* is to be erected at Roscoff. A well-preserved tomb of the Roman age has been discovered at Nîmes, on the margin of the ancient Roman road called "Dont-

tiome." The tomb was that of a lady; and jewels, an alabaster vase, and other objects have been found in it, which, along with the sarcophagus itself, have been placed in the Archeological Museum at Nîmes.—The death is announced, at the age of seventy-eight, of M. Bourard, the sculptor, who was a pupil of Duret and of Hippolyte Flandrin. Among his works may be named the "Joueur de Triangle" which is at the Palace at Fontainebleau, the figures of Tragedy and Comedy in the Théâtre des Celestins at Lyons, and the statue of Pope Urban II, erected at Chailion-sur-Marne.—The death is announced at Rennes, at the age of seventy-eight, of M. Martenot, architect, a pupil of Blouet and a former Inspector at the Louvre. He was, since 1898, a member of the Société Nationale des Architectes Français. He was appointed in 1858 architect to the town of Rennes, and built there the bellry of the Hôtel de Ville, the Lycée, the Savings Bank, the Palais du Commerce, and the decoration of the Jardin des Plantes, and the church of Bonne Nouvelle. He also carried out the scheme for bringing the water of the Minette and the Loisaune to augment the town water supply. He designed also the Imprimerie Oubertier and the Hospital of St. Yves.

SOUTH AFRICA.—Messrs. Parker & Forsyth, architects, are inviting tenders for erecting a new school and boarding establishment at Villersdorp.—The tender of Messrs. Peddie & Drummond, of Harrismith, has been accepted for the construction of the new Government schools at Bethlehem, which are to cost 5,000.—In Cape Town the new building for the National Mutual Life Assurance Company of Australasia, Ltd., is nearly completed. The exterior is of granite from the Paarl. Messrs. Baker & Masey are the architects.—At a meeting in Johannesburg of the Master Builders' Union a resolution was passed declining to tolerate any interference by the trades union with other skilled workmen when employed on any work which may not strictly belong to their own particular trade. The union also affirmed the principle that as far as possible tenders be accepted from members of the Association only.

GERMANY.—BUILDING, TIMBER, AND CEMENT TRADES IN GERMANY.—In his report on the trade of Germany for 1905, Mr. Schwabach, British Consul-General at Berlin, remarks that the year under review has been a good one for German industry and commerce both at home and abroad. The satisfactory economic conditions in the first half of the year became more accentuated and general in the second half. The demand for labour increased to such an extent that in some branches it could not be entirely satisfied by Germans, and necessitated the drafting into the country of Austrian, Polish, and Galician miners, as well as Italian and other foreign builders, labourers, and navvies. Market reports from the iron and coal centres and the textile, chemical, electrical, machine, and metal industries showed increasing orders, especially in the timber trade, too, business was brisk, while even the cement industry, which for the last five years has suffered from excessive expansion and ruinous competition, recovered to some extent. Those familiar with the aspect of Germany ten years ago cannot fail to notice the general improvement and greater prosperity; people dress better, houses are built better, numerous new and spacious factories bear testimony to the growing industrialisation, and the communities of small towns and large cities in all parts of the country spend considerable sums on street and sanitary improvements and public buildings. This aspect of increasing prosperity is confirmed by the returns of the savings banks, income tax commissioners, and insurance companies, and with an uninterrupted development at home the foreign trade of Germany is likely to follow an upward course. The imports of cement in 1905 exceeded twice the quantity of 1904, while the exports, though higher than in 1904, were smaller than in 1903 and 1902. Germany imported from Belgium 65,364 tons against only 9,337 tons in the preceding year. Brazil, Chile, Mexico, and Venezuela all imported considerably larger quantities of German cement than in previous years. The exports of cement to the United Kingdom during the years 1900-1905 were as follows:—(Quantity in 1,000 tons): 1900, 12.5; 1901, 33.5; 1902, 33.5; 1903, 36.7; 1904, 29; 1905, 16.1. A comparison of the figures for the last five years shows that asphalt, etc., is losing importance as regards the total imports while increasing quantities are being exported. The satisfactory conditions of the labour market in the first half year continued and even improved in the second half of the year. Agriculture and the building trade absorbed during the third quarter large numbers of new hands, and the improvement of the coal and iron market enabled the works in August and

September to put on new men; employment in the textile industries was good, and in September the machine-building, the electro-technical industries, and the metal trades received a fresh impetus. The great labour movements which in various parts of the country involved 10,000 men, did not interfere seriously with the general aspect of trade and industry. There was no sign of diminishing activity during the last quarter. The iron and steel industries as well as the metal and engineering branches continued very active; in the coal mining industry all orders could not be executed owing to a serious shortage of trucks throughout October and November. Building operations were actively carried on until late in the year. The great activity which has prevailed in the building trade for the past three years was accompanied by numerous labour disputes, but during the year under review they were rather more frequent than heretofore, owing no doubt to the expansion of the trade. Though the tariff movement has been very successful, the aversion of large sections of employers to agreements of this kind is by no means extinct, as testified, more particularly by the long and bitter disputes which raged in the Westphalian district. The coal mining at Munich lasted two months. It was caused by the demand raised by the employers in the course of the negotiations for the renewal of the old tariff agreement that the men should sign a declaration that they did not belong to a labour organisation. As, naturally, this demand was not complied with, the employers' association ordered a lock-out, involving about 2,500 men, but through the mediation of the Trade Tribunal an arrangement was ultimately come to and a new tariff established which expires on April 1st, 1908. The wages are fixed as follows:—

Profession	Wages per hour.	
	Average.	Minimum.
Masons	52	47
Carpenters	49	47
Assistants	38	36

From April 1, 1906, masons and assistants receive an additional 1 pf. per hour, and from April 1, 1907, an additional 2 pf. per hour; carpenters receive 2 pf. more per hour from April 1, 1906, and another 2 pf. from April 1, 1907. Ten pf. above the ordinary rates are paid for overtime and 20 pf. extra for night work. A board of conciliation, composed of six labour members and six employers' members under an impartial chairman, will decide differences, the Trade Tribunal forming the court of appeal. On the whole, the compromise was more favourable to the men, though they did not carry all their points, which included a reduction of the working time by half an hour, and the five o'clock stop of Saturday. The dispute in the Rheinisch-Westphalian building trade assumed much larger proportions than the one at Munich, the number of strikers and locked out numbers, at one time, over 20,000 and the struggle lasting sixteen weeks. It began at Dortmund where the organised masons demanded an increase of wages and subsequently a strike was declared. When the lock-out proved ineffective it was extended to a number of places in the vicinity, including Essen, Gelsenkirchen, Recklinghausen, Herten, Buer, and Gladbach, where a few months earlier tariff agreements had been concluded which only expire on April 1, 1906. This measure called forth an energetic protest from the Mayor of Essen, who had taken an important part in the conclusion of these tariff agreements, and now declared that the employers were guilty of a breach of contract, and that the municipal building operations which were interrupted through their action would be completed at their expense by the municipal authorities. He also moved a subvention of 1,000, for the locked-out men. The new tariff agreement extends over more than 200 different towns and villages and remains in force until May 1, 1908. It stipulates a ten hours working day (at places where eleven hours were worked so far) and a half will be worked until April, 1906; fixes wages according to local conditions at from 44 to 55 pf. per hour, increases the rates for overtime by 10 pf. per hour, and provides for the establishment of arbitration boards consisting of eight members, four appointed by the employers and four by the men; and also of a board of appeal composed of the labour organisation and five members nominated by the employers' association. All working rules and regulations contrary to the agreement will be considered invalid.

GERMANY.—The decoration of the great hall in the Kaiser Wilhelm Memorial Church is completed; the hall is decorated in white marble, whilst on the east wall there are representations in mosaic of the Prussian Kings from Friedrich Wilhelm onwards.—An exhibition of furniture representing three fully furnished houses is now being held at Biel; the furniture is from designs by and under the direction of Herr E. J. Propper.—The new church at Walestadt is completed; the building is in Romanesque

style, and the windows are from cartoons by Herr Burkhard Mangold.—A summer theatre is to be built at Karlsruhe, from designs by MM. Curjel & Moser.—The new town hall at Leipzig is to be enlarged; the original architect of the building, Professor Lieht, is to design the new portion also.

CHILE.—The Chilean "Diario Oficial" of 20th February contains copy of a law official throughout the country local bodies entitled "Councils on Workmen's Dwellings." The aim of these bodies is to stimulate the construction of cheap and salubrious dwellings for the working classes, and to take such steps as may be necessary for the improved sanitation of existing cheap dwellings. The law also sanctions the expenditure of 600,000 pesos (about 45,000l.) on the construction of dwellings for the minor grades of State employees.—Board of Trade Journal.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. W. S. Wetherley & Mr. Francis E. Jones, architects, have removed from 30 Cockspur-street to 2, Haymarket, corner of Suffolk-place.—Messrs. Frederic Whitfield & Co., wrought steel safe and door manufacturers, have removed their London office and show-room from St. Andrew's Hill to Godlinham House, Godlinham-street, Queen Victoria-street, E.C.

HOUSING AND IMPROVEMENT SCHEMES, ARMAUGH.—On the 9th inst. an inquiry was held in the Court House, Armaugh, before Mr. P. C. Cowan, Chief Engineering Inspector of the Local Government Board, on the petition of the urban council, who made application for the sanction of a loan of 15,000, for the erection of artisans' dwellings under the Housing of the Working Classes Act. The sum of 9,000, was asked for the carrying out of an improvement scheme, by which it was suggested to demolish about forty-six houses unfit for human habitation, and on the same site erect about sixty houses. The remainder of the 15,000, was for the erection of forty-eight artisans' houses. Mr. Francis Bergey, C.E., proved to the plans lodged for the proposed scheme, and gave evidence regarding the figures referred to by counsel as the probable cost.

PUBLIC IMPROVEMENT, BARNSTAPLE.—At the Barnstaple Guildhall, on the 10th inst., Mr. M. K. North, M.L.S., Local Government Board Inspector, held an inquiry, with reference to an application by the Barnstaple Town Council for the sanction of the Local Government Board to the alienation of two old cottages, the property of the Town Council, situate at the back of Nos. 95 and 96, High-street, Barnstaple, and lying between that of the premises belonging to the Barnstaple and North Devon Club. Mr. J. Bosson (Town Clerk) said that the owners of the club premises intended to pull down and rebuild and, for their premises, it being desired to set back the frontage of the club premises on rebuilding, a great improvement being thereby effected. It was desired to construct on the land a 16-ft. roadway as an approach from the Strand to the High-street property, this to be in substitution for the existing narrow and inconvenient approach thereto. The Town Council applied for the sanction of the alienation of these two cottages for the purpose of effecting this improvement. The Borough Surveyor (Mr. Arnold Thorne), in the course of the inquiry, said that the cottages were absolutely uninhabitable.

A CARICON BY MAFFEO.—Mr. Coe has recently deposited in the Constable studies, No. 76, Charlotte-street, Fitzroy-square, what is believed to be Maffeo da Verona's original painting, forming one of the designs, in part, of the Inferno for the decoration in mosaic of St. Mark's. In 1610-2 it was resolved to pay Maffeo 5 ducats for each whole figure in his designs to be executed in mosaic by Alvise Guetoro. The mosaic executed under the picture we mention is over the west doorway within the basilica, and no doubt is entertained of the genuineness of the picture as the work of Maffeo.

LEIGHTON HOUSE.—An appeal for contribution towards a sum of 15,000, is made by the Leighton House Committee, that they may be enabled to purchase the freehold of No. 2, Holland Park-road, and establish an endowment fund for its up-keep.

BOOK PRESSES, BRITISH MUSEUM.—To the late Dr. Richard Garnett, and his colleague in the Library, Mr. Henry Jenner, is due, it appears, the introduction of the sliding-press, as previously adopted in the Free Library at Bethnal Green, for providing additional means of storing books by means of new presses which are attached to the old ones with hinges.

MODEL OF THE ISLE OF PIRBREEK.—The Ordnance Survey authorities have just published a guide to the geological model of the Isle of Purbeck, with which they issue a geological map printed in colours, a plate of horizontal sections, and a collotype from a photograph of the model. Copies of the model, which is deposited in the Victoria and Albert Museum, have been executed

for the Geological Museum in Jernyn-street, London, and the museums in Edinburgh and Dublin.

SPARTA MUSEUM.—Mr. M. N. Tod, assistant-director, and Mr. A. J. B. Wace, student of the British School of Athens, have brought out a detailed catalogue of the contents, consisting of some 800 items, of the museum at Sparta. The text is divided into three sections upon inscriptions, sculpture, and miscellaneous antiquities, with separate introductions which classify and interpret the exhibits. The catalogue is issued by the Clarendon Press.

THE PICTURES OF THE BOLESLIAN.—A recent report drawn up by the committee dealing with the restoration of the pictures states that about 3500, is required to supplement the amount of 1,100, subscribed by the University and Colleges, and private individuals. A sum of 1,047, has been expended upon the restoration of 128 pictures, amongst those now in the hands of Messrs. F. Haines & Sons, of London, are portraits of Sir Kenneth Digby, and Robert Nelson, artist of the "Companion to the Festivals and Fairs." Those already repaired (the framing being entrusted to Messrs. Ryman & Co., of Oxford) comprise portraits of Lady Jane Grey, Elizabeth, Halley, Samuel Butler, Sir Henry Savile, and Peter Paul Rubens, and Dr. Wallis—the restoration of the last-named was undertaken at the charges of the Samuel Pepys Club; there are also Hudson's portrait of John Potter, Archbishop of Canterbury, 1737-47; and Riley's of the first Duke of Ormonde. Portraits of Archbishop Usler, Tyebo Brabji, John Sheffield, Duke of Buckingham, and the second Duke of Ormonde, and twenty other pictures will be dealt with, in so far as funds will permit.

NATIONAL GALLERIES, SCOTLAND.—The Bill introduced by Mr. Sinclair, Secretary for Scotland, is based upon recommendations made by the departmental committee, with Mr. Akers-Douglas as chairman, and an article of enquiry into the administration of the Scottish Board of Manufactures. The Government inessure proposes to transfer from the Board to a new body of trustees the management of the Royal Institution, the National Gallery, and the National Portrait Gallery in Edinburgh. The new board will consist of seven members, and will be appointed by the Secretary for Scotland. The present officers of the Board of Manufactures are to be transferred to the trustees; the buildings hitherto vested in the old Board are to be vested in the Commissioners of Works, and the charges for their repair and maintenance will be defrayed out of moneys payable under an article of the Treaty of Union under the Revenue of Scotland Act, 1718, will be transferred, under provisions of the Bill, to the Consolidated Fund.

COLLAPSE OF A WALL IN SHOREDITCH.—One man was killed and two men were injured by the collapse of a wall of a building in Rivington-street, Old-street, Shoreditch, on the 10th inst. The building, which was being converted into an electric sub-station. Two men were on a scaffold, engaged in facing a wall with glazed tiles, when suddenly the wall fell outwards, bringing down the scaffolding with it. A third man, who was working on the ground was overwhelmed in the debris. He was conveyed to St. Mary's Mission Hospital, where, after some time, he died from his injuries. The two other men, who were both cut about the head, were taken to St. Bartholomew's Hospital.

SCOTTISH BUILDING TRADES FEDERATION.—The half-yearly meeting of the Scottish Building Trades Federation was held on the 20th inst. at the Building Trades Exchange, 25, George-street, Edinburgh. Prior to the business proceedings the delegates lunched in the Royal British Hotel—Mr. Patrick Knox, President of the Federation, presiding over a company which included Mr. Gledhill, Glasgow Master Brickbuilders' Association; Mr. Charles Hezney, President, Glasgow Master Plumbers' Association; Messrs. John Morgan and James Leslie, Aberdeen Building Trades Association; Mr. Hewitson, secretary, Airdrie and Coatbridge Building Trades Federation; Messrs. William Macdonald and David Cook, Inverness Building Trades Federation; Mr. James Harper, Edinburgh Master Plasterers' Association; Messrs. William Thomson, Vice-President, and James Millar, Thomas Mackie, Robert Lamb, Simon Slater, and James Cameron, solicitor, secretary of the Edinburgh, Leith, and District Building Trades Association. Mr. Hewitson proposed "The Building Trades Federation," which, he said, was instituted in 1895, and had done good work with excellent results. He would shortly lay before the towns of the Federation. Legislation had been proposed calculated to favour workmen in relation to their employers. There was an effort to overturn the Taff Vale decision, which had such wide-reaching effects, and very possibly that would be effected in the present Parliament. They should mobilise their forces and extend the Federation's operations as far as possible. There was at present what had been a prolonged

and much regretted depression in trade. They all hoped that within the next few months there would be an improvement, but when it came the trouble would rise, and it would be then that the need of a complete organisation would be felt. That organisation must be carried out if the employers were to be in a position to protect themselves in the questions which assuredly would arise between them and the workmen. One of the aims of the Federation should be the securing of a uniform set of general conditions of contract throughout Scotland. Such a reform was urgently required. The Chairman, in replying, mentioned that the Federation included Aberdeen, Dundee, Inverness, Dingwall, Oban, Kilmarnock, Paisley, Perth, Edinburgh, Hawick, Dumfries, Banffshire, and Alloa. The Federation did not necessarily exist for the purpose of dealing with the men. They had the greatest sympathy with the men, and wanted to take the men along with them. There were many things in which employers had a common interest, such questions, for instance, as the matter of measurements, arbitration, and the conditions of contract, which last were a great burden, and more sometimes than they were able to bear. While the Federation had not done just so well as they might have, on the whole they were progressing slowly, but surely, and doing good work. He mentioned that they were negotiating with various parts of Scotland to get these to join their ranks. Mr. Leslie gave the toast of "The Edinburgh, Leith, and District Building Trades Association," saying that he had already found Edinburgh and Leith builders the men who had been taking the lead in all the affairs connected with the Federation. Mr. Simon Slater replied. The only other toast—"The Delegates"—was proposed by Mr. Robert Lamb, and responded to by Messrs. William Macdonald, Inverness, and John Morgan. At the half-yearly meeting of the Executive of the Federation Mr. Knox again presided. The proceedings were private, but at the conclusion of the business an official report was communicated. It stated that reports on the state of trade were submitted from all the centres, and that without exception these were of a more or less gloomy nature. In Perth, it was reported that building was at a standstill, and that there were no masons in employment there at present. Mr. James Leslie, of the Aberdeen Association, was appointed Vice-President of the Federation. A voluminous correspondence was read by the secretary which showed that he had been in touch with every town of note in Scotland with a view to extending the Federation, and as a consequence of this it was reported that several associations in the West and North had indicated their desire to become federated with the Scottish Federation. Arrangements were made for visiting these towns. The annual meeting of the Federation was fixed to be held at Edinburgh in September.

HOUSING SCHEME, LINTON.—Mr. E. A. Sandford, Esq., M.P., C.E., Local Government Board Inspector, and Mr. B. T. Kitchin, Architect to the Local Government, recently held an inquiry into the application of the Linton Rural District Council to borrow 1,500l. for the purposes of a scheme under Part III. of the Housing of the Working Classes Act, 1890, for the provision of cottages for persons of the working classes in the parish of Linton. Mr. W. Richardson (Clerk of the Rural District Council) gave the usual particulars as to area and population of the district, and said the Council proposed to purchase 2½ acres of freehold land for 160l. Mr. F. W. Chappell, the Sanitary Inspector, said it was proposed to obtain water by a bore well, 120 ft. deep, with 4 in. inside diameter boring. The buildings were to be constructed in groups of five, and were to have 9-in. party walls.

SIMFON'S HISTORY OF ARCHITECTURE.—The first volume of this book was issued without an index; we are asked to mention that one has now been prepared and can be had gratis from the publishers, Messrs. Longmans, Green, & Co., 59, Paternoster-row, E.C.4.

FIRE TESTS WITH ROLLING STEEL SHUTTERS.—The Report No. 111 of the British Fire Prevention Committee gives the particulars of a test with a set of double steel rolling shutter doors, and a single steel rolling shutter door, the shutters being of an American type known as the "K. K. near door," and supplied in London by Messrs. A. L. Gibson & Co. The result of the tests goes to show that a single rolling shutter is not to be depended on as fire-resisting, or at least as stopping the passage of fire, except imperfectly, and the shutter was bulged and otherwise damaged and could only be partially worked and with difficulty after the test. The test with the double shutters showed that though the inner shutter suffered considerably, as in the single-shutter test, it was an efficient protection to the outer shutter, which was reported as undamaged and in working order after a four hours fire reaching at its hottest to 1,700 degrees Fahr.

In this case the inner shutter also kept its alignment and could be worked after the test, though it had buckled a good deal. The result seems to be that double rolling steel shutters of this type constitute an effectual check to the spread of

fire. The shutters were 7 ft. wide by 8 ft. high, and overlapped the wall opening 2 in.; the exact distance between them is not stated in the Report, but it is given approximately by the fact that they were on the opposite sides of a 13 in. wall. The shutters are made of 20 (U.S.) gauge of galvanised steel, the ends of the strips being fitted with small malleable cast nibs.

Capital and Labour.

CONDITION OF THE BUILDING TRADES.—Employment in the building trades continued to show a general seasonal improvement, which was especially marked in the case of painters. Compared with a year ago, however, employment showed little change. Returns received through the Trade Correspondent from sixty-two London employers showed that in the last week of March they paid wages to 11,223 workpeople of all classes, compared with 11,152 in February, and 14,129 in March, 1905. Employment generally in London was rather better than a month ago, but a good deal worse than a year ago. Returns were received from Employers' Associations in seventy-three districts outside London. In two-thirds of these employment was reported as dull generally; at Stratford-on-Avon and Maidstone it was very good, at Birkenhead good, at Ashton and Huddersfield fairly good, and at the remaining towns moderate or fair. Compared with a month ago, no change was reported in fifty-two towns, while in fourteen, including Stockport, Portsmouth, Bournemouth, and Dublin, it was better, and in seven, including Hull, Chatham, and Swansea, it was worse. Compared with a year ago, employment was reported about the same in forty-four towns, worse in nineteen, and better in ten.—*Labour Gazette.*

Patents of the Week.

APPLICATIONS PUBLISHED.*

9,910 of 1905.—G. F. FLETCHER: *Wall or Hoarding Signs for Advertising Purposes.*

This relates to a wall or hoarding sign for advertising purposes, consisting of a raised representation of the article to be advertised, or its containing receptacle stamped or embossed in sheet metal, or other sheet material, deeply stamping or embossing the plate or sheet and suitably inclining those parts which would otherwise project at right angles to the sheet, such inclined parts being afterwards pressed in if desired.

11,048 of 1905.—A. H. GALE: *Traps for Sinks and Basins.*

This relates to a trap for a sink or basin having its limbs disposed in different planes oblique to one another, and having two openings normally closed by removable plugs and situated the one at the bottom of the trap and the other at or near the summit of the bend towards the exit of the trap.

17,875 of 1905.—C. M. GRAHAM: *Apparatus for Employment in Connexion with Register Grates.*

This consists in the combination with a fire grate of an adjustable plate hinged to the top of the grate and arranged to be suspended at an angle or vertically in relation to the grate, and a shutter hinged to the bottom of said plate and adapted to be folded upwardly against it or to be allowed to depend downward in front of the grate bars.

21,141 of 1905.—J. WICKER: *Building Blocks.*

This relates to a building block formed with a number of apertures arranged in a plurality of series, the apertures of each series having intervening necks, the necks of any series being out of alignment with the necks of either of the other series, two of the series being formed with half length apertures at the ends of the blocks.

22,668 of 1905.—F. C. WOODFORD: *Chimney Tops.*

This relates to a chimney top, consisting of a cylindrical stalk opening into the lower of two dish-like plates having an flange rim retained at a proper distance apart by flat tubes opening into the rims, the said plates and tubes being surrounded by a hand of greater diameter than the rims and held in position by cones opening into the hand and into the flat tubes.

22,679 of 1905.—W. C. FAIRWEATHER (G. NIE-MEYER): *Sash Windows.*

This relates to a sash window which can be displaced in its own plane and also moved independently at an angle thereto, while laterals cooperate with guide bars of the window to produce

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

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxx. Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

Contracts.

BUILDING.

APRIL 30.—**ABRAMAN—HOUSES.**—Building twenty-nine houses at Abramam for the Brambling Building Co. Plans, etc., at office of Mr. F. Rodrick, architect, Ashbrook House, Abberard. Endorsed tenders to be sent in to Mr. Fred. Erece, Secretary, Abramam-gardens, Abberard, not later than April 30.

APRIL 30.—**FRASERBURGH—VILLAS.**—The mason, carpenter, slater, plaster, plumber, painter, and glazier works of villas to be erected for Messrs. Wm. Bouz & Co. P. Barneil, Plans and specifications may be seen with Messrs. Reid & McRobbie, architects and C.E. Saltoun-chambers, Seaforth-terrace, Fraserburgh who will receive offers until Monday, April 30.

APRIL 30.—**NEW TREGGAR.—BUSINESS PREMISES.**—New business premises in Commercial-street, New Treggar, for Mrs. Morgan, "The Dorothy." Tenders, sealed and endorsed, to be delivered not later than April 30. Plans and specifications may be seen with Mr. D. W. Price, Cloth Hall, New Treggar.

MAY 1.—**CAMBRIDGE—SCHOOL ROOMS, ETC.**—Cambridge Town Council invite tenders for the erection of teachers' rooms and an iron outside staircase at the Brunswick Council Schools. Plans, etc., may be seen at the office of the architect, Mr. A. P. MacAlister, St. Andrew's-street, where copies of the quantities may be obtained on payment of the sum of 11. 1s. Tenders, endorsed "Tender for Mr. A. P. MacAlister, Brunswick Council School," to be sent to office of Mr. J. B. L. Whitehead, Town Clerk, Guildhall, Cambridge, on or before May 1.

MAY 1.—**CLAYFIELD CROSSING.—COTTAGE.**—The directors of the Great Western Railway invite tenders for the erection of a cottage at Clayfield Crossing, near Littleton and Bidsey Station, Wiltshire. Forms, etc., at the office of the engineer at Wolverhampton Station, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to Mr. G. K. Mills, Secretary, Paddington Station, London, and marked outside "Tender for cottage at Clayfield Crossing," will be received on or before May 1.

MAY 1.—**LANDILO.—MARKET.**—Landilo and District Cattle Market and Auction Mart Company, Ltd., invite tenders for constructing a cattle market and auction mart adjoining the Landilo Bridge Station, Landilo. Plans, etc., seen at office of Mr. Arthur S. Williams, architect and surveyor, Landilo, and quantities obtained on deposit of 11. 1s. Tenders, endorsed "Cattle Market," to be sent not later than May 1.

MAY 1.—**MUSSEVWIMMER.—SHOP.**—A shop in North-avenue, Mussevimmer, for Mr. W. H. White, Cardiff. Plans and specifications may be seen at office of Mr. Wm. J. Harris, architect and surveyor, Gilfach, Bargoed. Tenders to be sent in on or before May 1.

MAY 1.—**RAWMARSH.—CEMETERY WORKS.**—Rawmarsh U.D.C. invite tenders for the laying-out, forming roads and paths, drainage, erection of two chapels with central tower and spire, lodge, and outbuildings connected with same, boundary walling, entrance-gates, and site in Leigh-road, Rawmarsh. Names and addresses, accompanied with a deposit of 31. 3s., to the Architect, Mr. J. Platts, High-street, Rotherham, not later than May 1, after which date bills of quantities and form of tender, etc., will be forwarded to parties who have applied only.

MAY 2.—**BIRTLEY.—COTTAGES.**—North-Eastern Railway Directors invite tenders for the erection of six cottages at Birtley. Plans, etc., upon application to Mr. William Bell, the Company's architect, Central Station, Newcastle-on-Tyne. Contractors will be required to take their own quantities. Sealed tenders, marked "Cottages at Birtley," to be sent to the Secretary, at York, not later than noon on May 2.

MAY 2.—**GOSS.—ALTERATIONS TO PREMISES.**—For the whole or several trades, viz.: Bricklayer and mason, carpenter and joiner, plumber and glazier, plasterer, painter and slater's work, required in the alterations to licensed premises, known as "Bromley's Vanis," at the junction of Aire-street and Adam-street, Goole, for Messrs. Harbrey's Brewery Company, Ltd., of Snaith. Applications to Messrs. Thomas Wain & Son, architects, 24, Albion-street, Leeds, not later than May 2.

MAY 2.—**LONDON.—ECONOMISER AND PAN-ROOM.**—Hackney Guardians invite tenders for building, economiser and fan-room, and altering and extending boiler flues at the Workhouse, Silney-road, Homerton, N.E. Form, etc., at office of Mr. Frank H. Coles, Clerk to the Guardians, Clerk's Office, Hackney Union, Homerton, N.E., where also the plans (as prepared by Mr. J. J. Todd, consulting engineer, 25, Brooke-road, Stoke Newington, N.) may be inspected. Sealed tenders, endorsed "Economiser and Fan room at Workhouse," must be delivered not later than 2 p.m. on Wednesday, May 2.

MAY 3.—**GLENVILLET.—BUILDINGS.**—The mason, carpenter, and slater works for the following buildings, and for the plaster work of Nos. 3, 6, 10, 12, 13, and 14.—(1) Cart sheds, etc., at Tubshallam, Auchincloyne; (2) stable and cart sheds at Bogbeand, Auchincloyne; (3) dwelling-house at Bagebrae,

Auchincloyne; (4) Byres, etc., at Ellervick, Glenlimes; (5) cattle and turnip sheds at Abbarrow, Glenlivet; (6) stable and byres at Bechel, Glenlivet; (7) stable and byres at Shival, Glenlivet; (8) stable, byre, barn, and shed at Newton Stewart, Glenlivet; (9) dwelling-house at Tommalenan, Glenlivet; (10) dwelling-house at Tullich, Glenlivet; (11) dog kennels at gamekeeper's cottage, Gallowhill, Glenlivet; (12) dwelling-house at Minnamarrow, Strathavon; (13) dwelling-house at Lergar, Cobarach; (14) dwelling-house at Brick, Cobarach; (15) stables at Glenmore Lodge. Plans and specifications may be seen at the Gordon Richmond Estates Office, Drumlin, Glenlivet; or with Mr. A. Thomson, architect, Fife-Kelty; and offers will be received by Mr. W. Phipister, at Drumlin, on till May 3, at 12 o'clock noon.

MAY 3.—**GREAT LEIGHS.—ALTERATIONS, ETC., TO SCHOOL.**—The Managers of the Great Leigs Council School invite tenders for structural alterations, and building new classroom, to the Council school, Great Leigs. Plans, form of contract, etc., may be inspected at the office of the architect, Mr. Frank Whitmore, 75, Duke-street, Chelmsford, between the hours of ten and five o'clock, on any working day except Saturday. Names and addresses to the architect, on or before May 3. Sealed tenders, endorsed "Tender for Great Leigs School," to be sent to Mr. J. W. Nicholls, Secretary, County Offices, Duke street, Chelmsford, not later than May 17.

MAY 3.—**PORTOBELLO.—ALTERATIONS TO LIBRARY.**—Alterations of public library, etc., in Town House, Portobello. Plan and specification seen at office of Mr. R. Morrison, City Architect, Public Works Office, City Chambers, Edinburgh, or at the office of Mr. Baxendale, Registrar, Town House, Portobello, where copies of the specification may be had on deposit of 11. 1s. by crossed cheque. The estimates may be sent to City Architect by 10 a.m. on May 3, sealed and marked "Tender, Portobello Library," etc.

MAY 3.—**PORT TALBOT.—SHOPS, ETC.**—Three shops and dwelling-houses at Station-road, Port Talbot. Plans, etc., to be seen at office of Mr. R. O. Clark, C.E., architect and surveyor, Station-road, Port Talbot, between the hours of 10 a.m. and 5 p.m. Tenders are to be sent in not later than 10 a.m. on May 3.

MAY 3.—**TARACHI.—HOUSES AND SHOPS.**—Houses and shops at High-street, Tarachi, Port Talbot. Plans, etc., to be seen at office of Mr. R. O. Clark, C.E., architect and surveyor, Station-road, Port Talbot, between the hours of 10 a.m. and 5 p.m. Tenders are to be sent in not later than 10 a.m. on May 3.

MAY 4.—**OVERSEA.—SCHOOL.**—Derbyshire C.C. Education Committee invite tenders for the erection of a Council school at Oversea, together with sanitary conveniences, drainage, and other works connected therewith. Form, etc., may be obtained from the architect. Sealed tenders, upon forms supplied, and endorsed "Tender for Council School at Oversea," are to be sent to Mr. W. H. Simpson, architect and surveyor, The Corridor-chambers, Market-place, Leicester, not later than 10 a.m. on May 4.

MAY 4.—**WEST SOMERSET.—SCHOOL ENLARGEMENT.**—Norfolk Education Committee invite tenders for the enlargement of West Somerset School. Names to the Secretary, Norfolk Education Committee, 57, London-street, Norwich, at which office plans and specification can be inspected and bills of quantities obtained. Tenders must be delivered by 12 noon on Friday, May 4, addressed to "The Secretary," and endorsed "Tender for West Somerset School."

MAY 4.—**BURWADSEY.—SCHOOL ALTERATIONS.**—Alterations and additions to the school buildings at Burwadesey. Plans and specifications can be seen at the office of Mr. H. Beswick, County Architect, Newcastle-street, Chester, and quantities obtained on deposit of 11. Tenders to be sent to Mr. H. Grant Bailey, Clerk, Crypt-chambers, Chester, on or before May 5, endorsed "Tender for Works at Burwadesey."

MAY 5.—**THORPE HESLEY.—CHAPEL.**—New Wesleyan church, Thorpe Hesley, Rotherham. Quantities can be obtained at the office of Mr. A. E. Lambert, architect, 22, Portland-street, Rotherham, and may be seen at the Wesleyan Day Schools, Thorpe Hesley, any day except Saturday, between the hours of 9 a.m. and 4 p.m. Tenders to be delivered not later than 11 a.m. on May 5.

MAY 5.—**YVYSDALE.—HOUSES.**—Four houses at Yvysdale for Mr. W. H. Stone, Bank Prince Hotel, Yvysdale, Mon. Plans and specification can be seen at the hotel premises, sealed and endorsed, to be delivered to Mr. Stone, at the above address, not later than noon on May 5. Mr. W. A. Griffiths, architect, Pontefract, Mon.

MAY 7.—**ALDERLEY.—EDGE.—TENDERS, ETC.**—Alderley Edge U.D.C. invite tenders for the erection of a new lodge, boundary walls, fencing, and other work at their new cemetery on the Chelford-road, Alderley Edge. Bills of quantities, etc., from the Surveyor to the Council, Mr. Harold Sheldon, Council Offices, Alderley Edge, by payment of a deposit of 11. 1s. Tenders, sealed and endorsed "Tender, New Cemetery, Alderley Edge," must be delivered to the Council Offices, Alderley Edge, before 12 o'clock, May 7, addressed to Mr. Walter Cobbett, Clerk to the Council, Council Offices, Alderley Edge.

MAY 7.—**ASHBY.—CHAPEL.**—A new Wesleyan church at Ashby, Lincolnshire, near Freston, Plans

and specifications may be seen at the following address, to which tenders are to be sent not later than 12 o'clock noon on May 7, sealed and endorsed "Tender for Ashby Wesleyan Church." Particulars may be had, upon receipt of a deposit of 21. at Mr. W. H. Buttrick, architect, 28, Wells-street, Spalding.

MAY 7.—**CWMPARE.—CHAPEL.**—Enlargement of Parc C.M. Chapel, Cwmpare, together with new assembly-hall and classrooms. Tenders to be delivered to Mr. Thomas Morgan, Ardwyn, Cwmpare, on or before May 7, sealed and endorsed "Tender." Offers may be made, and specifications may be seen, at office of Mr. R. S. Griffiths, architect and surveyor, Excelsior-buildings, Tonypandy.

MAY 7.—**LEADS.—WORKHOUSE.** ADDITIONS.—Leeds Guardians invite tenders for the bricklayers and masons, carpenter and joiners, plumbers, plasterers, slaters, painters, masons, ironfounders, tilers, hot-water heating, and electric lighting required in the alterations of three floors of the Council's house at the Workhouse, Beckett-street, Leeds. Names to the architects, Messrs. Thomas Wain & Sons, 24, Albion-street, Leeds, on or before May 7, when bills of quantities will be forwarded. Each application must be accompanied by a deposit of 21. 2s.

MAY 8.—**BARNSTABLE LAVATORY BUILDINGS.**—New lavatory buildings and general alterations, and for building new dormitory in connexion therewith, at the North Devon Infirmary, Barnstaple. Application to Mr. J. C. Southcombe, architect, Barnstaple, from whom plans, specifications, and quantities may be obtained, and to Mr. R. S. Symons, Secretary, North Devon Infirmary, Barnstaple, on or before May 8.

MAY 8.—**HAMPDEN.—PORTER'S LODGE AND PUBLIC CONVENIENCES.**—Erection of porter's lodge at Isolation Hospital, Exbridge-road, Hampton Hill. Also two five-small public conveniences, one in High-street, the other in Bell Hill, Hampton. Drawings, specifications, and quantities may be seen, and forms of tender obtained, on deposit of 21. on or after April 23. Sealed tenders, endorsed "Tenders for Lodge, etc.," to be delivered to the Clerk, Public Offices, Hampton, Middlesex, not later than 4 p.m. May 8.

MAY 8.—**SOUTHAL.—LODGE, ETC.**—Southall Norwood U.D.C. invite tenders for the erection of a lodge, etc., at the recreation ground. Forms, etc., of Mr. Richard Brown, A.M.I.C.E., etc., Engineer and Surveyor to the U.D.C., Public Offices, Southall, between the hours of 10 a.m. and 4 p.m., and on Fridays, between 10 a.m. and 4 p.m. Sealed tenders, in the envelopes supplied, and endorsed "Tender for Lodge, etc.," must be delivered to the Clerk of the Council not later than 4 p.m. on May 8.

MAY 8.—**WEST HAM.—WHIRF WALL.**—Construction of new wharf wall on the Channelsea river at Sewage Pumping Station, Abbey-road, West Ham. Plans and specifications may be seen, and form of tender, bills of quantities, etc., obtained of the Borough Engineer, Town Hall, West Ham, upon deposit of 11. The contractor is required to enter into bond with two sureties for due performance of contract, and must not underlet or make a sub-contract. Tenders, endorsed "Tender for West Ham Wharf Wall, etc.," to be delivered at the Town Clerk's office, West Ham, on Tuesday, May 8, not later than 4 o'clock on Tuesday, May 8.

MAY 10.—**NEWBELL.—CHAPEL.**—The mason, carpenter, slater, joiner and plaster, plumber, and painter and glazier works to be done in connexion with the renovation of chapel at Newburgh, Aberdeenshire. Plans and specifications to be seen with the Rev. J. S. Louth, The Manse, Forcraig; also copies to be seen by Mr. John Robertson, architect, Inverness, with whom offers are to be lodged on or before May 10.

MAY 11.—**KENT.—SCHOOL.**—The Kent Education Committee invite tenders for new Council schools for 230 children at Crockenhill, near Swanley Junction, in accordance with drawings and specifications prepared by Mr. W. H. Robinson, Architect to the Committee, which may be inspected in the office of the Committee between 10 and 4. Persons wishing to tender must send their names to the architect, with a deposit of 11. not later than May 11. Tenders, on the form supplied, to be delivered to Mr. J. C. Hayward, Sessions House, Dartford, before noon, May 11.

MAY 11.—**ROCHESTER.—SCHOOL.**—The Kent Education Committee invite tenders for new Council school for 128 children at Cliffe, near Rochester, Kent, in accordance with drawings and specifications prepared by Mr. W. H. Robinson, Architect to the Committee, which may be inspected in the office of the Committee between 10 and 4. Persons wishing to tender must send their names to the architect, with a deposit of 11. not later than noon on May 11. Tenders, on the form supplied, to be delivered to Mr. J. R. Povey, Union Offices, Strood, Rochester, before noon, May 11.

MAY 12.—**MANCHESTER.—ALTERATIONS, ETC., TO SCHOOLS.**—The Manchester Education Committee invite tenders for alterations and additions to the Lancasterian Municipal School, Marshall-street, Oldham, with a deposit of 11. not later than noon on May 12. Tenders, on the form supplied, may be obtained at the Education Offices, Deansgate, Manchester, on depositing 21. 2s. Tenders on the official form enclosed in envelopes provided, not later than May 12.

Surveyor, Town Hall, at which place tenders must be delivered before 12 o'clock on May 7.

May 8.—HALIFAX.—ROOF COVERS FOR CARS.—Halifax Tramways and Electrically Committee invite tenders for the equipment of twelve cars with roof covers. Sample car may be inspected at the Skircoat-road Dept. Specifications may be obtained on application to the Tramways Manager, Skircoat-road, between Tenders, endorsed "Roof Covers," must be sent to Mr. Keighley Walton, Town Clerk, on or before May 8.

May 14.—DUBLIN.—SLEEPER BLOCKS.—Great Northern Railway Company (Ireland) invite tenders for the supply of 30,000 10-in. by 10-in. sleeper blocks. Specification and form of tender can be obtained from Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street, Terminus, Dublin, on payment of a fee of 1s. each. Tenders, which must be made out on the forms supplied by the Company, and endorsed "Tender for Sleeper Blocks," should be delivered not later than 1 a.m. on May 14.

No Date.—BRANDON.—HEATING.—Trustees of the P.M. chapel, Brandon Colliery, Co. Durham, invite tenders for the installation of a heating apparatus for school and chapel. Applicants apply to Mr. R. Halliday, 21, Albert-street, Brandon Colliery, Co. Durham.

PAINTING, etc.

April 30.—MELBOSSE.—PAINTING.—The Roxburgh, etc., District Board of Lunacy invite tenders for the painting work required to be done in the new wing for female patients at the Asylum, Melbrosse. Schedules of quantities will be supplied, not later than April 30, by Messrs. Sydney Mitchell & Wilson, 33, Young-street, Edinburgh, the Architects to the Board.

May 3.—POPULAR BURTON.—CLEANING AND PAINTING.—The Midland Railway Company invite tenders for (1) cleaning and painting a Poplar Goods Depot, London, and (2) cleaning and painting engine sheds, etc., at Burton. Specifications may be seen, quantities and particulars obtained, on application at the Engineer's Office, Derby, sealed tenders to be sent to the Secretary of the Way and Works Committee, Midland Railway, Derby, before 9 a.m., May 3.

May 3.—SKIPTON.—PAINTING.—The Midland Railway Company invite tenders for painting, etc., to buildings, etc., at Skipton and Ingleton. Specification may be seen, quantities and particulars obtained, on application at the Engineer's Office, Derby. Sealed tenders by post to the Secretary of the Way and Works Committee, Midland Railway, Derby, before 9 a.m., May 3.

May 7.—STAFFORD.—PAINTING.—Stafford Corporation invite tenders for painting bridges and fencing, also for the exterior painting of Elmhurst, Tillicott, and the thirty-one municipal cottages, Crooked Bridge-road. Forms of tender and other particulars can be obtained on application to Mr. Wm. Blackshaw, Borough Engineer, Borough Hall, Stafford. Sealed tenders (in official covers) shall be delivered at the Town Clerk's Office, Martin-street, Stafford, not later than 10 a.m., May 7.

May 9.—RISINGTON.—PAINTING.—Durham County Education Committee invite tenders for painting and colouring the following schools during the midsummer holidays, viz.:—Haswell and Station Town, windows inside, and wood and ironwork outside only; Trimdon Foundry; Wheatley Hill; Winge; by and Wincate Grange. Forms, etc., stating for which school or schools sum are required, may be obtained from the District Clerk, and must be returned on or before May 9 to Mr. C. Neate, District Clerk, Haswell, Sunderland.

May 10.—SOUTHWARK.—PAINTING, ETC.—White-washing, cleaning, and painting work at the Infirmary, East Dulwich-grove, S.E., for the Southwark Guardians. Specifications, etc., can be obtained from the Infirmary Steward, as above, between 10 a.m. and 4 p.m. Tenders endorsed "Painting, etc.," addressed to the Guardians, to be delivered at the Union Offices, John-street West, Blackfriars-road, S.E., by 4 p.m., May 10.

May 14.—WEST HAM.—CLEANING, REPAIRS, AND PAINTING OF SCHOOLS.—To be executed during the summer vacation for the Education Committee of the County Borough of West Ham. Persons wishing to tender to make written application to Mr. William H. Winge, Architect to the Education Committee, 2, Fen-court, E.C., for copy of specification and form of tender on or before May 5. A deposit of 5l. to accompany the application. Sealed tenders in the envelope supplied to be sent to Education Department, 95, The Grove, Stratford, E., before 5.30 p.m., May 14.

No Date.—NEWCASTLE.—PAINTING.—Newcastle-upon-Tyne Education Committee invite tenders for painting and cleaning of several schools. For particulars apply to Mr. Alfred Goddard, Secretary, Education Office, Northumberland-road.

No Date.—SEAFORTH.—PAINTING, ETC.—Painting and decorating the Congregational Church, Seaforth. Apply, in first instance by letter, to Mr. W. T. Bankroft, 12, Cecil-road, Seaforth.

ROADS, SANITARY AND WATER WORKS.

April 30.—SNARBLOW.—SEWERAGE.—Shanblow R.D.C. invite tenders for the removal of night soil, house refuse, etc., in the parish of Draycott, from May 1, 1906, to April 30, 1907. Forms, etc., can be obtained from tenders must be sent to Mr. I. W. Newbold, Clerk to the Council, Red-street, Derby, not later than April 30, endorsed "Sewage-removal, Draycott."

May 1.—NEW MALDEN.—U.D.C.—The Maldens and Coombe invite tenders for the making up of Bladon-road, New Malden (about 2,000 ft. in length) and also for the construction of about 750 ft. of 9-in. surface water sewer in the same road. Particulars obtained from the office of the Engineer and Surveyor to the Council, Council Offices, New Malden, upon the deposit of a postal order for 1l. 1s. Tenders must be sent to Mr. C. T. Lewis, Clerk to the Council, Council Offices, New Malden, in the printed envelope, and must be sealed and endorsed "Tender for Bladon-road," and must reach the Clerk not later than 12 o'clock on May 1.

May 1.—OLDHAM.—PAVING.—Oldham Surveyor's Committee invite tenders for the paving, flagging,

and completing of Frederick-street, from Chamber-road to Hollins-road. Forms, etc., obtained at the office of the Borough Surveyor, Town Hall, and addressed to "The Chairman of the Surveyor's Committee," to be returned not later than May 1.

May 2.—BARBASTON.—SEWERAGE.—Barboston R.D.C. invite tenders for providing and laying about 340 yds. of 9-in. and 44 yds. of 6-in. earthenware socket pipe sewers, together with a manhole and retaining tank at Barlestone. Plans and specifications may be seen on application to Mr. W. M. Sykes, Surveyor to the Council, Chapel-street, Ilkstock, between the hours of 9 a.m. and 2 p.m.

May 2.—HOVE.—ROADS.—Hove Corporation invite tenders for laying a stoneware pipe sewer for a length of 732 ft. in Portland-road, between Titian-road and School-road flint carriage-way, and for cutting in Portland-road between Rutland-gardens and School-road. Further particulars may be obtained, and drawings and specifications seen, at the Borough Surveyor's Office, Town Hall, Hove. Tenders, on forms supplied, addressed to Mr. H. Eudicot, Town Clerk, Town Hall, Hove, and endorsed "Tender for Portland-road Works," will be received up to 6 o'clock on May 2.

May 3.—LEISTON.—SEWERING.—Leiston-Cum-Sizewell U.D.C. invite tenders for providing and laying about 423 yds. of 9-in. pipes with manholes, gullies, etc., in accordance with the drawings and specifications, which may be seen at the office of Mr. James Balry, Surveyor, Leiston, Surveyor. Tenders, sealed and marked "Sewering" to be sent to Mr. John French, his office, Saxmingham, Clerk of the Council, by 5 p.m.

May 4.—BRIGHTON.—ROADS.—Forming roadways and laying concrete foot pavements in King-street and Paris-street, Brighton. Plans and specifications may be seen at the Borough Surveyor's Office, and tenders lodged with him, on or before May 4. Mr. James Jameson, Borough Surveyor, 77, High-street, Brighton.

May 5.—LEEDS.—PAVING, ETC.—Leeds Highways Department invite tenders for the paving and flagging of the following streets:—Lancaster-gate, Harold-grove, Westery-road, Western-terrace, Western-grove, Western-mount, Western-street, Warrels-road, and Stratford-street. Plans and specifications may be seen at the Engineer's Office, Municipal-buildings. Tenders on forms supplied, must be sent to the Town Clerk's Office, on or before May 5, addressed to the Highways Committee, and endorsed "Tender for Private Street Works."

May 7.—SURBITON.—SEWER.—The U.D.C. of Surbiton invite tenders for the construction of a 9-in. sewer, with manholes, for the purpose of receiving the effluent of house drains at Oak Hill-grove in the above urban district. Tenders, made out on the form and sealed in envelopes supplied, must be delivered at the District Council Office, 10 a.m., on May 7. Plans, etc., inspected, and a copy of the surveyor's estimated quantities obtained, on application to the surveyor's office, 10 a.m., on May 7.

May 8.—WEST HAM.—STREETS.—Making up part of the following pipe-paved roads:—Conard-street, Wythe-street, and also Lord-street. Plans may be seen, and specifications, form of tenders, etc., obtained at the Borough Engineer's Office, Town Hall, West Ham, upon deposit of 1l. in receipt. Tenders to be sent in a hand with two sureties for due performance of contract, and must not underlet or make a sub-contract. Tenders, endorsed "Tender for Private Street Works," to be delivered at the Clerk's Office, Town Hall, West Ham, not later than 4 o'clock on Tuesday, May 8.

May 9.—SWINTON.—BACTERIA.—Bep., Swinton and Pochinart U.D.C. invite tenders for the construction of a bacteria bed at the Swinton Sewage Works. Plans, etc., on application to Mr. Henry Entwistle, Surveyor of the Council, Council Offices, Swinton. Sealed tenders to be returned in the envelope provided not later than May 9.

May 10.—WARE.—ROADS.—Ware U.D.C. invite tenders for sewerage, levelling, paving, kerbing, installing, channelling, and making good Cross-street, Garland-road, and Rainsford-road, Ware. Forms, etc., at the office of the Surveyor to the Council, New-road, Ware. Tender, in sealed envelope, endorsed "Street Improvement," addressed to Mr. Geo. H. Gibby, Clerk to the Council, Town Hall, Ware, Hertis, to be delivered not later than 4 p.m. on May 10.

May 14.—ACTON.—NEW SEWERS.—The Acton U.D.C. invite tenders for construction of three and three-quarter miles of sewers, varying from 6 in. to 6 ft. in diameter, 25 acres of filter beds and works connected therewith. Instructions for tender and form of tender, with the form of contract and schedules annexed, can be obtained, and drawings inspected, at office of Mr. A. H. B. Smith, Borough Engineer, Great George-street, Westminster, on payment of 2l. Tenders, enclosed in sealed cover, and addressed in manner provided in the instructions for tender, must be received at the office of the Clerk to the Acton U.D.C., 242, High-street, Acton, before May 14.

May 14.—CRAWLEY AND IFELD.—SEWERAGE WORKS.—The Horsham R.D.C. invite tenders for 7,784 yds. of earthenware pipe sewer in Crawley and Ifeld, varying 15 in. with necessary tanks, pumping station, engines, and pumps, percolating filters, and laying-out of a sewage irrigation area, and other works in the parishes of Crawley and Ifeld. Plans and drawings may be inspected, and copies of specification, quantities, and form of tender obtained on application to Mr. Sinner, R. Lowcock, engineer, 50, Queen's-bench-street, Westminster, between 10 a.m. and 4.30 p.m., on payment of 5l. Sealed tenders, endorsed "Tenders for Crawley and Ifeld Sewerage," to be delivered to Mr. A. C. Cooke, Clerk, Council Offices, 9, Carfax, Horsham, Sussex, before noon, May 14.

May 14.—ENFIELD.—SEWAGE DISPOSAL.—The Chesham U.D.C. invite tenders for the construction of an addition to existing engine-house, a tank, No. 4 filters, the supply of water, and a vacuum, a centrifugal pumps in duplicate, the laying out of land, together with all necessary carriers, mains,

etc., at sewage disposal works at Enfield, Middlesex. Drawings and specifications may be seen at and after April 30 at the offices of the Engineers, Messrs. Pollard & Tingle, 31, Old Queen-street, Westminster, and at the Council Offices. Form of tenders obtained only from Clerk to Council, upon deposit of 5l. Bills of quantities can only be obtained from the Engineer upon production of the form of tender. Sealed tenders, addressed to the Chairman of Council, endorsed "Sewage Disposal," must be delivered at the Council's offices before four on May 14.

May 16.—SOUTH SHIELDS.—SEWER IMPROVEMENTS.—South Shields Corporation invite tenders for the laying-out, formation, and construction of new roads across Benits from Eskine-road continuation southwards towards borough boundary. Drawings may be seen, and a copy of the form of tender, obtained at the office of Mr. S. E. Burgess, M.I.C.E., Borough Engineer and Surveyor, Chapter-row. Tenders to be fully priced out in the schedule and (sealed) must be delivered to the Town Clerk, Court-buildings, South Shields, not later than 10 a.m. on May 16, endorsed "Tender for Benits Roads."

May 25.—LEVENSHULME.—STREET WORKS.—Levenshulme U.D.C. invite tenders for sewerage, draining, paving, curbing, flagging, channelling, and completing the following streets and passages in the council's district:—Emley-street extension, Gordon-avenue, passage-rear of Delamere-road, South-west-avenue, passage-rear of Delamere-road and Stanhope-street, passages rear of Derby-street, Emley-street, and Chipping-street, passage rear of 1 to 25 and 2 to 24, Harrison-avenue, and passage-rear of Randolph. Specifications, etc., from the Council's Surveyor, Mr. James Jepson, Guardian-chambers, Twiwt Dale, Stockport, on payment of 2l. 2s. Tenders, endorsed "Tender for Twiwt Dale works," to be sealed and endorsed and delivered to Mr. J. Orden Hirdicker, Clerk to the Council, Northern Assurance-buildings, Albert-square, Manchester, on or before May 25.

No Date.—PLYMOUTH ST. MARY.—ROADWAY.—Making of a roadway, about 60 yds. in length, and 12 ft. wide, from George-street to Plymouth-street, near the junction of Plymouth St. Mary, for Mr. G. W. C. Soltan-Symons. Plans and specifications may be seen, and further particulars can be obtained, of Mr. W. Soltan, surveyor, 7, Courthouse-gate, Plymouth.

STONE, MATERIALS, AND STORES.

April 30.—GOVAN.—STORES.—Govan Town Council invite tenders for yearly supply of:—(1) Engine-room stores, oil, waste, etc.; (2) cables; (3) cast accessories; (4) masonry; (5) construction of new roads; (6) boxes; (7) wrought-iron tubes and fittings; (8) cast-iron pipes; (9) bricks and cement; (10) ironmongery, brushes, etc.; (11) paints, soap, varnishes, etc.; (12) iron and steel; (13) iron and steel; (14) iron and steel; (15) joint boxes; (16) motors; (17) motor starters. Schedules and forms of tender can be obtained from Mr. T. C. Parsons, Borough Electrical Engineer, 15, Market-street, Govan, Glasgow. Sealed tenders, endorsed "Tender for Stone," to be sent to Mr. J. A. Houston, Town Clerk, Town Hall, Govan, on or before Monday, April 30.

April 30.—LYDD.—STONE.—The supply and delivery either at (a) railway station, Lydd; or (b) at the roadside where required by the Surveyor (1) 750 tons 24-in. quartzite, or 550 tons 14-in. basalt; (2) 100 tons 18-in. basalt; (3) 150 yds. double-screned gravel; (4) 230 yds. Kent razz broken. Sealed tenders, endorsed "Tenders for Stone," must be sent to Mr. Rhoads, Office, Borough Surveyor, Lydd, on or before April 30.

May 1.—DOCKING.—MATERIALS, ETC.—R.D.C.—The Docking invite tenders for the supply of materials and construction of road for the Docking district for the year ending March 31, 1907. Forms, etc., from Mr. W. W. Hopking, Great Bircham, or Mr. E. B. Burton, Burnham Overy, on or before May 1. Tenders must be returned to the Town Clerk to the said Council, Workhouse, Docking, King's Lynn, by post, and marked outside "Tender for Materials" or "Tend Labour," as the case may be, addressed to the Works Committee, King's Lynn, not later than 10 o'clock a.m. on May 1.

May 1.—SOUTHERN MAHARATTA.—TOOLS, ETC.—Southern Maharratta Railway Company, Ltd., Directors invite tenders for miscellaneous tools and stores, as per specifications and drawings, which may be seen at the offices of the Company, 46, Queen Anne's-street, London. The charge for the specification is 1l. 1s. each, which will not be returned. Tenders must be sent in, addressed to the Secretary, Mr. Edw. Z. Thornton, marked "Tender for Miscellaneous Tools and Stores," not later than 12 o'clock noon on May 1.

May 2.—GLASGOW.—STORES.—Glasgow Corporation invite offers for the supply of the undernoted, as may be ordered for one year from May 31, next:—(1) cartage; (2) coal and dress; (3) oils, paints, etc.; (4) glass; (5) mason work; (6) firelay pipes; (7) field drain pipes; (8) smith work; (9) timber; (10) white metal and castings. Forms may be obtained on application to the Clerk of the Council, intended at Parks, City-chambers, 299, George-street, Glasgow, and sealed offers, marked "Parks," to be delivered to the Clerk of the Council, 10, George-street, Glasgow, on or before May 2.

May 5.—ASHBY-DE-LA-ZOUCH.—GRANITE.—Tenders for the supply of Nos. 1, 2, and 3, or X, XX, and XXX, broken granite or limestone as may be obtained Worthing year ending March 31, either delivered at the under-mentioned railway stations or by carts from the works to the several parishes in the district as are hereunder mentioned:—Railway stations, Ashby-de-la-Zouch, Heather, Measham, Moira, Donisthorpe, Snaresstone, Shackerston, Woodville, Worthington. Parishes: Packington, Coleorton, Thringstone, Swannington. Drawings may be obtained from Mr. George Farmer, Clerk to the Council, Ashby-de-la-Zouch, marked "Tender for Granite or Limestone," together with samples of stone, on or before May 5.

May 3.—ISDA.—STORES.—The Great Indian Peninsula Railway Company Directors invite tenders for the supply of the following stores, namely:—Miscellaneous articles and materials; fencing wire; strand; Sheffield tools, etc.; fencing materials. Forms, etc., may be obtained at office of Mr. J. L.

Berry, Secretary, 48, Cophall-avenue, London, E.C., on payment of the fee for the specification, which payment will not be returned. Tenders must be delivered in sealed envelopes, addressed to Mr. Berry, marked "Tender for Miscellaneous Articles," or as the case may be, not later than 11 a.m. on May 3.

MAY 3.—PORTFUSH.—STORES.—The directors of the Portfush Gas Company, Ltd., invite tenders for the supply of stores for the year ending March, 1907, as follows:—Meters; galvanized tubes; steam tubes; copper pipe; fittings; galvanised; fittings; steam; oils—machine, gas engine, exhauster; paint; red oxide. Further particulars can be obtained from the Manager, Mr. W. C. Pinkney, Gasworks, Portfush. Tenders, endorsed "Stores," to be delivered on or before 12 noon on May 5, to Mr. Thos. Bamford, Secretary.

MAY 5.—LEXDEN.—MATERIALS.—Lexden and Winstree R.D.C. invite tenders for the supply of local materials and team labour, and also for steam road roller, in the several parishes of the district. Tenders to be delivered on or before 12 noon on May 5, to Mr. Thos. Bamford, Secretary. For the carting of stones from the quarries in any parish of the district; (2) for the supply of good pit stones at the various quarries in the district; (3) for the carting of stones from the quarries to the various parishes; (4) for the supply and delivery of broken Kentish flints alongside the wharves at East Mersea, West Mersea, Hard, the Steved, Saled, East Donnyland, Finninghoe, and the Hythe, Colchester; (5) for the unloading and carting from the above wharves to the roads in the various parishes; (6) for the hire of one or two steam road rollers, Forms, etc., from Mr. John Emmins, Surveyor's Office, Copford, near Colchester. Tenders to be sent to Mr. Chas. H. Tompion, Clerk, Victoria-chambers, Colchester, not later than May 5, at 4 p.m.

MAY 7.—WARRINGTON.—CEMENT.—Warrington Paving and Sewerage Committee invite tenders for 50 tons of cement, manufactured by one of the following makers:—Earle & Co., Hull; Saxon Portland Cement Company; and Rugby Portland Cement Company. Specifications and any further information may be obtained at the office of the Borough Surveyor, Town Hall, at which place tenders must be delivered before 12 o'clock, on May 7.

MAY 7.—WEST ASHFORD.—GRANITE.—West Ashford R.D.C. invite tenders for the supply of about 1,750 tons of either of the following:—Best blue Guernsey, Cleo Hill, Aberdeen, Penlee, Basak, or Cherbourg quartzite, to be delivered at the railway stations at Charing, Northfield, Ashford, Puckley, Headcorn, and Great Chart Sidings, in such quantities as the Surveyor shall from time to time order, for the year ending March 31, 1907. Forms of tender can be obtained on application to Mr. Alfred Sims, Surveyor to the Council, Surveyor's Office, Charing. Sealed tenders, accompanied by samples of the material, endorsed "Tender for Granite," addressed to the Chairman of the R.D.C., are to be delivered at the Union House, Westwell, Ashford, Kent, not later than May 7.

MAY 9.—BRADFORD.—MATERIALS.—Bradford Corporation invite tenders for the supply and delivery of the following articles, namely:—Pitch and oil required for street paving purposes; cast-iron gullies, ventilators, and storm gratings; glazed earthenware pipes, blocks, and junctions; timber for sewerage and other works. Forms, etc., may be obtained on application at the office of Mr. J. H. Cox, City Surveyor, at the Town Hall. Sealed tenders, endorsed "Tender for Materials—Street Works," to be sent to Mr. Frederick Stevens, Town Clerk, Town Hall, Bradford, on or before May 9.

MAY 10.—MELFORD.—ANNUAL CONTRACTS.—Melford R.D.C. invite tenders for the supply of the under-mentioned materials, etc., as may be required during the year ending March 31, 1907:—Broken granite; sized sanitary drain pipes, 4 in. to 42 in. diameter; blue Staffordshire bricks and kerbs; York stone kerb; Portland cement; granite concrete flags; flints; chalk; road gratings and frames; team labour; steam rolling. Forms from Mr. Wm. Carver, C.E., Surveyor, 5, Melford-road, Sudbury, Suffolk. Sealed tenders to be sent in not later than May 10, addressed to Mr. H. C. Canham, Clerk, 63, Friars-street, Sudbury, Suffolk.

MAY 24.—GLASGOW.—MATERIALS, ETC.—Glasgow Corporation invite offers for materials and jobbing work required in the various departments (hospitals excepted) as follows, viz.:—(1) Ashlar; (2) asphaltic grouting; (3) asphaltic paving; (4) bricks; (5) brick-work; (6) Chalfness and Arbroath pavements; (7) plaster work; (8) casework work; (9) jobber work; (10) lime and cement; (11) manholes and gratings; (12) painter work; (13) paving and drainage works; (14) pipes and sewer bottoms; (15) pitch and oil; (16) plank work; (17) plumber and gasfitter work; (18) repairing barrows, etc.; (19) sand; (20) smith work; (21) slater work; (22) whin and granite metal and binding. Specifications and forms of tender may be obtained on application at the office of Public Works, City-chambers, 64, Cochrane-street. Sealed offers, marked outside "Offer for State Labour Department," must be lodged with Mr. A. W. Myles, Town Clerk, City-chambers, Glasgow, on or before May 4.

NO DATE.—DENTON.—TAR.—Denton U.D.C. Gas Committee invite tenders for tar, the same to be sent in on or before May 3. Particulars may be obtained from the Gas Engineer, Mr. J. Chadwick Smith, Gasworks, Denton, near Manchester.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*BUILDING AND SANITARY INSPECTOR.	Egham U.D.C.	135 <i>l.</i> per annum	May 5
*CLERK OF WORKS.	Derbyshire Education Comm ^{tee}	3 <i>l.</i> per week	May 6

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date, of Sale.
*FREEHOLD PREMISES, ELMHURST WORKS, STOKE-ROD, GOSPORT.—On the Premises	Llewellyn Puttock & Co.	May 3-4
*BUILDING SITE, COPPILL AVENUE, E.C.—At the Mart	Kills & Son	May 4
*FREEHOLD BUILDING LAND, HERTFORD.—Hertford	Norris & Devall	May 5
*SURPLUS PLANT AND STOCK, TOTTERHAM.—At Works, Handley-road, Totterham	Fuller, Horsey, Sons, & Cassell	May 8
*FREEHOLD BUILDING ESTATE, STRATFORD.—At the Mart	Edwin Fox & Bonsfield	May 15
*FREEHOLD BUILDING EST., PARK ROYAL, WILLESDEN & TWYFORD.—At the Mart	Fuller, Horsey, Sons, & Cassell	May 22
*FREEHOLD PROPERTY, HEMMINGFORD, N. HANTS.—At the Mart	Debenham, Tewson, & Co.	do.
*CONTRACTORS' PLANT & MACHY, STIMPTON.—Contractors' Depot, Southampton Docks	Debenham, Tewson, & Co.	do.
*FREEHOLD BUILDING SITE, KING'S CROSS, W.C.—At the Mart	Fuller, Horsey, Sons, & Cassell	do.
*FREEHOLD BUILDING SITE, SHAFESBURY AVENUE, W.—At the Mart	Edwin Fox & Bonsfield	do.
*FREEHOLD CEMENT WORKS, DOVERCOURT, HARWICH.—At the Mart	Edwin Fox & Bonsfield	do.
*FREEHOLD SITE, ETC., KENNINGTON PARK-ROAD.—At the Mart	Debenham, Tewson, & Co.	do.
*FREEHOLD BUILDING ESTATE, SEAFORD.—At the Mart	Farebrother, Ellis, Breech, Galsworthy, & Co.	May 29
*BUILDING PROPERTY AND SITES, SEAFORD.—At the Mart	Farebrother, Ellis, Breech, Galsworthy, & Co.	May 31

PATENTS.—Continued from page 473.
a wedge-like locking action, and the invention consists of the arrangement that the racks are engaged by pinions on a shaft having loose rollers for guiding the chains or the like supporting a counter weight suspended from the window frame, so that the lowering and raising of the window take place independently of the racks, which serve only to produce the movement of the window against the packing.

12,254 of 1905.—E. H. BENTLEY: *A Dust and Draught Excluder for Doors*.
This relates to a dust and draught excluder and recessed to interlock and overlap, the stretcher attached to the door overlapping the bottom stretcher, and the latter being of such a section and hinged to the former in such a manner that when the door is open it oscillates upon its hinges and lifts the bottom edge clear of the door step or floor. A stud anti-friction bolt or the like mounted upon the door-jamb acts to return the hinged stretcher into position immediately the door is closed.

13,595 of 1905.—W. J. AKERS and J. A. ROCHAIN: *Devices for Preventing the Down Draft in Smoke and other Flues*.

This relates to an apparatus for use in flues or chimneys, and consists of a frame fitted across the flue, and a fan or rotating vanes driven by the updraught and mounted on a bearing carried by a slide withdrawable from the flue, and a brake operated from outside the chimneys retarding the rotation of the vanes.

13,843 of 1905.—W. BENTLEY and W. J. D. BRONSON: *Sliding Windows and Window Frames*.

This relates to a sliding window-sash and window-frame, and is characterised by means

whereby outside of the window-frame is fitted with one window-guide for each sash, and the window-sash or sashes are provided with guiding members, each having two contact points to engage the opposite sides of the window-guides and hold the window-sash relatively thereto.
24,526 of 1905.—E. COGNET: *Reinforced Concrete Foundations*.

This relates to the establishment of foundations, comprising inverted vaults, or arches, or plane slabs, the chief of which, by the intermediary of piers constituted in the form of longitudinal girders receiving the heaviest concentrated loads, the other secondary assisting the former by causing the participation in the support of these loads of the greatest possible extent of ground and of the intermediary of secondary piers which are likewise constituted as girders either cantilever fashion upon the principal pier, or resting at each extremity upon a principal pier.

26,685 of 1905.—A. E. WATSON: *Window Sash Fastener*.

This relates to a window sash fastener, wherein a pawl is furnished with a lever extending therefrom to facilitate its release from a serrated plate, a spring being also applied to said lever to press the pawl into the serrations of said plate.

26,757 of 1905.—E. EAST and J. MEAD: *Draught and Weather Excluder for Windows and the Like*.

This relates to draught and weather exclusion apparatus for windows and the like. In carrying the invention into effect, a metallic movable flat bar is constructed, with two slots, and through these slots the movable bar is supported by means of half round-headed screws, screwed into the top bar of a glazed frame, and when the aforesaid glazed frame is being closed the movable bar in its action at one end slides or travels into its

locking position by a quadrant plate, which is screwed into a recess cut in the window-frame, and the movable bar at the other end slides or travels up a sloping path formed at the base to an opening constructed in the metallic locking plate until it arrives on a ledge or shelf, when the glazed frame is closed. When the glazed frame is opened, the flat movable bar drops or falls on the screws by means of the slots described.

16,197 of 1905.—J. MOWAT and J. MACKINNON: *Lamps for Street Lighting*.

This relates to a lamp for street lighting, having its body of corner astragals made integral with the encoline or batten frame by forming the latter with sockets to which the astragals are united by running with molten metal.

19,686 of 1905.—W. FREAKLEY and R. BILL: *Process and Apparatus for the Manufacture of Materials for the Construction of Dustless Roads and like Surfaces*.

This relates to the preparation of materials for the construction of dustless roads and like surfaces by the process of saturating crushed furnace slag with tar, creosote, or other suitable bituminous substance or solution in a heated state, by the application of heat and atmospheric pressure.

25,321 of 1905.—C. ATHERTON: *Heat Radiators*.

This relates to a heater comprising oppositely disposed heat boxes, a burner tube extending between the same, radiator tubes likewise extending between said heat boxes, the hot gases being conducted in the same direction through certain of said radiator tubes, and an exhaust chamber in one of said heat boxes in communication with one of said radiator tubes, the passage of the gases through said last-mentioned tube being in a direction opposite to said first-named direction, each of the heat boxes being provided between the rows of radiator tubes with air passages,

SOME RECENT SALES OF PROPERTY:

Table listing property sales with columns for location, date, and price. Includes entries like 'Brighton - 4, Clifton-ter, f. y. r. 611' and 'Whitechapel - 123 and 125, Whitechapel-rd.'

TO CORRESPONDENTS.

Notice regarding correspondence, including instructions on how to submit articles and drawings, and how to handle rejections.

MEETINGS.

Calendar of meetings for various professional societies, including the Architectural Association, Institution of Mechanical Engineers, and Royal Institution.

Institute of Sanitary Engineers.—Mr. G. W. Chilvers, on "Meteorology in Relation to Sanitary Work."

Civil and Mechanical Engineers' Society.—Paper by Mr. W. O. Travis, M.A., entitled "Some Observations on Bacterial Tank Operations."

Royal Institution.—Professor G. Waldstein, on "English Furniture in the XVIIIth century."

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of the per annum £10 0 0.

PRICES CURRENT OF MATERIALS.

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

Table of material prices including Bricks, Hard Stocks, Picked Stocks, and various types of Bricks and Tiles.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Table of stone prices including Bath Stone, Portland Stone, and various types of Granite and Marble.

Table of stone prices (continued) including York Stone, Hopton Wood (Hard Bed), and various types of Slates.

Table of slate prices including various types of slates and their prices per 1000 or per doz.

Table of brick prices including various types of bricks and their prices per 1000 or per doz.

Table of tile prices including various types of roof tiles and their prices per 1000 or per doz.

Table of wood prices including various types of wood and their prices per standard or per load.

Table of building wood prices including various types of wood and their prices per standard.

Table of stone prices including various types of stone and their prices per standard.

Table of stone prices (continued) including various types of stone and their prices per standard.

WOOD (continued).

Table listing various wood products such as Joists, Girders, and Metals, with columns for quantity, price, and specifications.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

Table listing rolled plate products like Hartley's, Figured and Oxford Rolled, and others, with columns for price and specifications.

UITS, &c.

Table listing oils and varnishes such as Raw Linseed Oil, Turpentine, and various Varnishes, with columns for price and specifications.

PUBLISHER'S NOTICES.

Nat. Tel. 612, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) FOR VOLUME LXXIX. (July to December, 1906) was given as a supplement to the issue of January 1906.

COMPETITIONS, CONTRACTS, AND NOTICES ISSUED BY BEST FOREIGN BODIES, COUNTY AND OTHER COUNCILS, PROPERTIES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, &c., &c.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

TERMS for series of Trade advertisements, and for front page and other special positions, on application to the Publisher.

SITUATIONS WANTED (Single-handed-Labour only).

PREPAYMENT IS ABSOLUTELY NECESSARY.

ADVERTISEMENTS for the current week's issue are received up to THREE O'CLOCK P.M. on THURSDAY.

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

ADVERTISERS in "THE BUILDER" may have Replies addressed to the Office, Catherine Street, Covent Garden, W.C.

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

READING CASES 1 NINEPENCE EACH.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays.

ALLOTMENT.—For street works, Queen-street, &c., for the Town Council. Messrs. T. Frame & Sons, Surveyors, 43, Mill-street, Allox.

BEANWORTH.—For erecting school and house, for Southampton County Council. Mr. W. J. Taylor, County Surveyor, The Castle, Winchester.

BECKENHAM.—For making-up Westfield, Studland, and Christ Church roads, for the Urban District Council. Mr. J. A. Angell, Surveyor, Beckenham.

BIRMINGHAM.—For additions to premises Canal-street, for Messrs. Goodman, Ltd. Messrs. Ingham, Son & Mitton, architects and surveyors, 3, Temple-row West, Birmingham.

CARDIFF.—For new warehouse premises, Tredegar street, for Mr. Alfred Lewis, estate agent, Cardiff. Messrs. Habeshon, Fawcetter, & Co., architects.

CHELSEA.—For the execution of street improvement works in Hayward's row, for the Corporation and Surveyor to Charlton Kings Urban District Council (jointly).

COSBY.—For repairs, new vestry, etc., to Cosby church, seven miles from Leicester. Mr. H. Cayley, architect, Bank-chambers, Rothwell, Kettering.

CHELTONHAM.—For making up private streets, for the Urban District Council. Mr. B. Collins, Surveyor, Public Offices, Enfield.

ENFIELD.—For making up private streets, for the Urban District Council. Mr. B. Collins, Surveyor, Public Offices, Enfield.

ENNSKILLLEN.—For erecting buildings for stores at Springfield Creamery, for Springfield Agricultural Society. Mr. W. Scott, architect, Victoria-terrace, Ennskilllen.

GREAT BADDON.—For pair of villas. Mr. R. Gawhood, architect, Chelmsford.

HASTINGS.—For erecting four cottages in the parish of Brede, for the Corporation. Mr. F. H. Palmer, Borough Engineer, Town Hall, Hastings.

URQUHART.—For laying granite causeway at Urquhart road, for the Town Council. Mr. W. Dyack, Burgh Surveyor, 41, Union-street, Aberdeen.

Table listing English Sheet Glass in crates of stock sizes, with columns for quantity, price, and specifications.

Table listing various glass products and other materials, with columns for quantity, price, and specifications.

Table listing various glass products and other materials, with columns for quantity, price, and specifications.

LONDON.—For alterations and extension to premises, No. 45, High-street, Lewisham, for Messrs. Cheeseman Bros. — Kennard Bros. £838 10

LONDON.—For Spanish mahogany work in forming new offices for Messrs. Knight & Co., Tooley-street, S.E., from drawings prepared by Messrs. A. Thwaites & Co.:— C. A. King, late D. King & Son £793

LOUGHBOROUGH.—For Shepshed water supply works, for the Water Committee of the Corporation, Mr. A. H. Walker, Waterworks Engineer, Town Hall, Loughborough:—

Table with 2 columns: Name and Amount. Includes H. E. Buckley £2,057 13 6, J. & J. Warner £3,57 0 0, Johnson & Langley 2,900 0 0, F. G. Collingswood & Co. 2,802 0 0, Mitchell & Sons 2,888 0 0, J. Moffatt 2,857 18 3, Hardy & Co. 2,735 15 10, J. Lincoln & Sons 2,512 0 0, E. Tabor 2,439 19 5, H. Shardlow 2,401 17 11, C. B. Cox & Co. 2,370 18 0, J. T. Ball 2,360 0 0.

LYNN.—For rebuilding, etc., of the Flower Pot public-house, Norfolk-street, for Messrs. W. & T. Bagge, Lynn, Mr. H. T. Tulson, architect, Railway-road, King's Lynn:—

Table with 2 columns: Name and Amount. Includes J. Medwell £1,662 0 0, Dye & Allen 1,614 0 0, Spaulding & Hampton 1,550 15 0, T. Ash & Langley 1,549 16 9, W. A. Catley £264 10, T. Foster 285 0.

MIDSOMER-NORTON (Somerset).—For erecting an open-air swimming bath, for the Urban District Council, Mr. W. Bevan, Surveyor, Town Hall, Midsomer Norton:—

Table with 2 columns: Name and Amount. Includes W. A. Catley £264 10, J. Bird, Radstock £245 0, T. Foster 285 0.

MONMOUTH.—For the erection of a pair of houses in Redbrook-road, Monmouth, for Mr. H. F. Perklas, Mr. E. G. Davies, architect, Hereford and Monmouth:—

Table with 2 columns: Name and Amount. Includes G. R. Edwards £796 3 8, J. J. Walsh 720 0 0, T. & C. Pantler 698 10 6, G. Jones 690 0 0, R. L. Friend 680 0 0, W. C. Bok 634 0 0, T. Pembroke 634 0 0.

MONMOUTH.—For the drainage, with necessary man-holes, etc., at the Union for the Board of Guardians, Mr. E. G. Davies, architect, Hereford and Monmouth:—

Table with 2 columns: Name and Amount. Includes O. Parry £277 17 0, R. L. Friend £175 0 0, Philips 188 10 0, G. Jones 184 0 0.

MONMOUTH.—For alterations and additions to Penny-walk, Tregare, for the Rev. Wm. Evans, vicar, Mr. E. G. Davies, architect, Hereford and Monmouth:—

Table with 2 columns: Name and Amount. Includes G. Coombes £357 18, R. L. Friend 300 0, T. H. Jones 273 0, Wood & Mackie 195 0.

ROXWELL (Essex).—For rebuilding house at Boggiss Farm, Mr. R. Mawhood, architect:— Baker & Sons £400

SHOEBURYNNESS.—For erecting five cottages, Friars-street, Mr. T. J. Winter, architect, 9, Norfolk-avenue, Southend-on-Sea:—

Table with 2 columns: Name and Amount. Includes J. & W. Ventris £1,125 0 0, E. Wingrave 1,095 15 0, G. S. Saunders 1,065 10 0, A. J. Harris 970 0 0.

SKIPTON.—For paving, kerbing, and channelling of Rostie Top-street, Easby, for the Rural District Council, Mr. A. Rodwell, Surveyor, Skipton:—

Table with 2 columns: Name and Amount. Includes J. W. Hopkins, Easby £413 10 6

TAMWORTH.—For new buildings and alterations to premises in Orchard-street, for the Industrial Co-operative Society, Ltd., Mr. Francis B. Andrews, architect, 95, Colmore-row, Birmingham:—

Table with 2 columns: Name and Amount. Includes W. Bishop £5,185 0 0, E. Williams 5,113 0 0, J. Smith & Sons 5,078 0 0, C. E. Shuttleworth 5,022 10, J. Barnsley & Sons 5,002 0, H. Smith 4,936 0.

TREORCHY.—For the extension of Horeb English Baptist Chapel, for the church trustees, Mr. W. D. Morgan, architect, Victoria-chambers, Penryn:—

Table with 2 columns: Name and Amount. Includes J. Evans £1,401, G. Edwards, 1, Station-road, Treorchy* 1,300

WALTON-ON-THAMES.—For constructing 270 yds. of 8-in. cast-iron pipe sewer, Russell-road, for the Urban District Council, Mr. R. Wilds, Engineer and Surveyor, Council Offices, Walton-on-Thames. Quantities by Engineer:—

Table with 2 columns: Name and Amount. Includes S. Lane £1,161 17 9, J. Shebourne & Co. 865 14 8, G. Chessewell 843 6 0, W. H. Gaze & Sons 695 9 9.

WIMBLEDON.—For the extension of the Slipper baths, Latimer-road, for the Corporation, Mr. C. H. Cooper, Engineer and Surveyor, Town Hall, Wimbledon:—

Table with 2 columns: Name and Amount. Includes Parsons & Townsend £2,907, J. Barrett 1,913, G. Bellou 1,888, H. E. H. Buckincham 1,844, J. Purges & Sons 1,800, E. P. Bull & Co. 1,773, F. & G. Foster 1,759, J. Garrett & Sons 1,747.

WORKINGTON.—For altering and extending the Central Hotel, for Workington Brewery Co., Ltd., Messrs. Oliver & Dodgson, architects, Carlisle:—

Table with 2 columns: Name and Amount. Includes T. Mackenzie £3,757 14 4, H. Killip 3,179 0 0, T. Johnston 2,924 18 6.

Refreshment Shelter, Boscombe.—In our last issue, page 451, we stated that Messrs. Jenkins & Sons, Ltd., of Boscombe, had secured the contract at 75d. for a refreshment shelter on the shore at Boscombe. This should have been 75d.

W. H. Lascelles & Co. LIMITED, 121, BUNHILL ROW, LONDON, E.C. Telephone No. 1365 London Wall.

HIGH-CLASS JOINERY, LASCELLES' CONCRETE. Architects' Designs are carried out with the greatest care.

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CHURCH BENCHES & PULPITS. ESTIMATES GIVEN ON APPLICATION.

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The Builder.

VOL. XC.—No. 3300.

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Architecture at the Royal Academy.



THE collection of architectural drawings at the Academy this year seems a good one; there is plenty of variety and a good deal of interest, and a considerable

proportion of fine drawings. The most general interest will probably attach to the three drawings representing Mr. Norman Shaw's scheme for rebuilding the front of Regent's Quadrant and for remodelling what is still called, though it has ceased to be, Piccadilly Circus. The fact that such a design has been called for at all is a satisfactory indication that the Government are waking up to the fact that the street architecture of London is of some importance; as the Treasury said that they must have a scheme before they would allow the Quadrant to be touched. In spite of the tame character of Nash's cement architecture, the Quadrant, with its long sweeping lines, was really one of the best bits of street effect in London. It is bad enough that the general design of Regent-street as a whole has been cut into and all but destroyed; it was a well-intended effort to give architectural dignity and unity to an important new street, and any alterations and rebuilding in it ought also to have been made as parts of a definite scheme to be carried out by degrees. But to have cut up the Quadrant into different heights would

have been still worse; a street which is laid out on a circular plan is worth nothing unless the lines are continuous; and it is fortunate that the official powers recognised this before it was too late. An Advisory Board was appointed consisting of Sir John Taylor, Sir Aston Webb, and Mr. Belcher, and they in turn invited Mr. Norman Shaw to make the design and plan now exhibited, and which, by the kindness of the architect, we are enabled to bring before our readers as the illustrations to our present number.

The intended effect of the Quadrant is well shown in the splendid perspective drawing which occupies the central position on the east wall of the Architectural Room. The cornice line is about 14 ft. 6 in. higher than the present cornice line; that it should have been raised at all is matter for regret, for the proportions of building and street are better as they are, but the commercial demand for raising street property higher has become so insistent that probably any proposal to keep the buildings to their present level would have met with determined opposition. As the street width from front to front is 84 ft., however, and the height to the top of the cornice 65 ft. 6 in., this is not at all events such an exorbitant disproportion to street width as we find in too many of the new buildings recently erected. The remainder of the height which was considered to be commercially necessary has been obtained in the roof, the ridge of which scales 97 ft. above street level, but which, being set well back, will not count to the eye as a portion of the architectural height.

The front is a grand piece of masonry design, for which on the whole we can express nothing but admiration, and a satisfaction that the Quadrant should be rebuilt in so monumental a manner; and as Mr. Shaw has made out all the full-size details with his own hand, there is a certainty that the design will be properly worked out in execution. The ground story with its massive rusticated arches will have a grand effect, and the design makes a most impressive whole, though of course, as the section shows, the great depth of recess on the upper stories must be obtained by building on girders set back on the cross walls; however, the girder is everywhere now, and we suppose it is an affectation to ignore the possibilities it offers. We are not quite sure whether we should not have preferred the columns without the rustication on their lower portion; it has a very powerful effect, no doubt, and is duly ranged with and linked up to the intervening portions of the design—indeed, the careful manner in which the relation of the various details of the design to each other has been considered is one of the finest qualities in the scheme; but it seems just a question whether this very bold column rustication is not a little too weighty for its position, though we should not like to come to any conclusive opinion on the point without seeing the design drawn out without them. The treatment of the chimneys as great blocks at wide and regular spacing is a fine point; and whatever difference of opinion there may be on

some details, the design as a whole is one which we think can only arouse a general feeling, not only of satisfaction, but of enthusiasm: its complete carrying out, which must be a matter of time, will be a great and important addition to London street architecture.

On the proposal for the treatment of what had now better be called Piccadilly-place rather than Piccadilly-circus we have no criticism to make except that it seems, as one may say, too good to be true; too thorough a reforming to have the best chance of being carried out. The circus form attempted to be given to this open space had long ceased to exist except in name; and in fact, a small circus with several streets cutting into it, however the ends of the building blocks may be conscientiously fitted to the curve, can never affect the eye as a circular design; the lines are too much interrupted. Mr. Shaw's plan explains itself fully, except that we may mention that it is proposed to retain the design of the front of the County Fire Office, a very good and dignified front of its type, but to set it back to the general line of front and rebuild it in stone. The effect of the open arcade in the ground story will be retained architecturally, but (as shown on the plan) it will enclose the entrance steps instead of the street pavement; so far we regret this, for the arcing of the street pavement (as done in the Ritz hotel) is always in itself a pleasant and picturesque incident in a street; but the gain in effect to the *place* by widening the street opening counterbalances this. There is a proposal, it will be seen, to mask the commonplace architecture of the London Pavilion, towards the *place*, by a loggia (intended to have a building over it); if the whole building could be removed it would be architecturally so much the better. The two wide openings westward, approximately of the same width, into Piccadilly and the Quadrant, will give a fine, spacious, and symmetrical effect; and there is no doubt that the scheme, if carried out, will rank as a London improvement of the first order.

Sir Aston Webb's "Proposed New Buildings, Merrion-street, Dublin, for the Royal College of Science and Government Offices" is shown by three drawings in one frame (1468). The main building forms four sides of a quadrangle, and is in a dignified classic style, with a central feature formed by an order of four Ionic columns which can hardly be called a portico, though as shown on the detail perspective they have a bolder projection than would be gathered from the general drawing, where the centre feature looks a little too flat. The wings are very simply treated, the centre being slightly emphasised by pilasters and a broken pediment: the cornice is carried round the whole three sides, but the frieze and entablature only maintained at the central features. The pediment over the main entrance is seated not on the main entablature, but rises from a very bold though simply treated attic over it, a departure from the more usual tradition of making the attic the background to the pediment; but the effect is quite satisfactory. There is a cupola over the entrance, with

a slight flat projection on each face of the plan, carrying a clock-face, and a seated figure of Britannia at the apex; viewed from a distance, the perspective makes the dome look a good deal distorted; it looks all right from a position near the foot of the drawing; but it illustrates the wisdom (as we have always thought) of always choosing a long point of sight for a dome drawing, whether exterior or interior; as for the latter of course it may be said that you can then show very little of the dome, but the fact is that the interior view of a dome in perspective is an impossibility except on a conventional system of viewing one-half of it from a distance with the intervening architecture removed. This, however, is a digression on drawing; before quitting the design referred to we may notice the pleasant effect of the planning of the re-entering angles of the quadrangle with a square projection crowned by a little open cupola on colonettes. On the plan the corridors are continuous but for the Chemical Laboratory, which occupies the whole width of the building; they are partly next the quadrangle and partly in the centre between two sets of rooms; in that case we conclude that they are one-story and lighted from the top; they must be rather dark otherwise. Sir Aston also exhibits "Detail elevation of the New Admiralty building at the East end of the Mall" (1470); the whole building was illustrated in our issue of April 29, 1905. This drawing shows one bay of the order in the concave portion of the front, and the treatment of what may be called the blunt ends of the plan adjoining the circular portions. This is powerfully treated with a couple of heavy rusticated pilasters with a pediment over; between them at the upper portion is some rich decorative carving of shields and other attributes, and below this a niche with a seated allegorical figure holding a sword; the inscription "Nelson" on the podium looks a little too much as if the figure above were intended as a portrait statue of Nelson. The curved face is decorated with a freely treated Ionic pilaster order and windows between; the crown moulding over the middle window just cutting out beyond the face of the pilaster and returned on it; a pretty little point in detail.

Coming to the exhibits of another member of the Academy, Mr. Belcher, the chief one takes the form of a large model, showing "New Structure in Williamson Park, Lancaster" (1613). This is apparently a stone pavilion on a large scale, erected, like a triumphal arch, purely for architectural effect; a kind of chance an architect does not often get in these utilitarian days. It shows a classic pavilion with a ground story with concave lines on plan carrying a lofty pavilion and dome above on convex (circular) lines; the spaces at the angles over the lower pavilion are filled up by smaller erections with cupolas. Without knowing more precisely what is the idea or the object at the root of the architectural conception it is difficult to judge of it; the whole effect is picturesque and striking, though one has a feeling that, with a free hand on such a work, a little more might have been made of it. The finest point in the

design is the treatment of the great flights of steps which lead up to the building; the two lower flights sweeping round in a fine curve to join the centre flight above, and leaving between them a facade of heavy rusticated classic detail with a columned recess in the centre, in which is seen a figure with a globe on his back symbolical of something, but we know not what. When we publish the design perhaps we shall be able to give more information as to its intent than is furnished in the catalogue. Mr. Belcher also exhibits, high up in an angle of the room a "Model of upper part of Angle, rebuilding of Winchester House" (1513); it is chiefly of interest as showing the grouping of sculpture, but the substructure being cut short in the model, it is difficult to judge of its relation to the architecture. In No. 1553 Mr. Belcher shows one of those fine geometrical elevation drawings with the projections profiled on, of which he has pretty nearly set the example in the architectural room, an example which we wish were more followed. This is a front marked by a very powerful rustication in the ground story; the upper part of the elevation is decorated with terminal pilasters developing into Telamon figures, and classic metal tripods are introduced above the cornice; these have no meaning, perhaps, on a modern building, but there is a pleasant antique association about them. Mr. Belcher's "New Premises, Oxford-street" (1563) suffers from the demands of the shop-front fiend (as in respect of architecture we may call him); the architect has made a heroic effort to provide a solid architectural base for his substructure; but alas! these thin tall columns are as inadequate to the eye, as they would be in fact, without other assistance than visibly appears. The treatment above is very pleasing; plain square piers first, and over them coupled columns, the windows being played with between the piers. It strikes one that the solid arcing above the columned story looks a little too heavy for its position, but in the main the upper part of this front is very pleasing work, and the balustrade grilles above the ground story are rich and effective in design.

Mr. Jackson exhibits three small drawings, one of which, "Enlargement of Billinge Church, Lancashire" (1604), is a slightly executed pen-drawing showing an interesting scheme for the addition of an octagon choir in Gothic style to an apparently very commonplace Jacobean nave; perhaps the plan of Giggleswick chapel left its tradition on the preferences of the architect. Liturgists, we believe, consider it an unorthodox plan; architecturally we think it an interesting idea, if only the exterior covering might have been made a little more gracious to the sight. Of the view of the interior of Giggleswick chapel we can only say that we do not understand the author's architectural position, nor why he chose to render the interior of his fine sober monumental-looking chapel such a curious mingling of suggestions borrowed from various styles and epochs. We should certainly have preferred to see the simplicity and unity of *motif* of the exterior more

represented in the interior. The organ-case looks as if it should be an effective piece of work.

Mr. Reginald Blomfield's "Part elevation of New Club House for the United University Club, Suffolk Street" (1435), though exceedingly simple, is a scholarly and pleasing piece of work of the classic tradition. It is shown in a large severely treated elevation drawing; the projecting wing on the left is treated solidly in rusticated masonry with pilasters, the recessed portion with an Ionic order running through the first and second floors, and an exceedingly well-designed decorative grille to the balconies. Except this latter detail, there is nothing new or original; but it is a satisfactory piece of dignified masonic street architecture with a style and treatment suggestive of a Club.

Mr. Bodley exhibits an elevation of his "First design for the monument to the late Marquess of Salisbury in Westminster Abbey" (1512), an altar tomb with a recumbent figure.

We have confined ourselves on this occasion, owing to considerations of space, to noticing the exhibits of architects who are members of the Royal Academy, to whom the first place is naturally due; other exhibits, some of them important, must be left to future articles.

BUILDERS AND THE WORKMEN'S COMPENSATION BILL.

IT may be of interest shortly to consider what will be the position of builders under the Workmen's Compensation Bill if it becomes law. The Bill has one good effect, it simplifies the law; the old questions as to the height of a building, "what is a scaffolding?" and whether a mortar-mill is a factory, will all be set at rest. But it must be remembered that the difficulties which have been experienced under the Workmen's Compensation Act have largely arisen from the desire of the Legislature at the time that Act was passed to exempt the small class builder from liabilities which it was felt he was ill able to bear. Under the new Bill this object has been sought to be attained by a general exemption of employers employing less than five workmen, but this exemption will in no case apply to builders, and the new Bill will embrace all classes of builders. This is in accordance with the recommendations of the Departmental Committee, but it will bear heavily on an industry which the labour returns show to be suffering from greater and more continuous depression than any other in the Kingdom. The clause exempting employers of less than five workmen is Clause 1 (2) (d); it is as follows:—

"This Act shall not apply in any case where the employer proves that the number of workmen employed by him at the time of the accident did not exceed five, unless the accident was attributable to the use by the employer of machinery driven by steam, water, or other mechanical power, or unless the workman at the time of the accident was employed in the care or management of horses or in mining, quarrying, or building operations, or in laying or repairing any electric line or work."

By Clause 13 "building operations" includes

"the construction, alteration, repair, decoration or demolition of a building, and the work of preparing for and laying the foundation of an intended building." This definition seems to include every possible operation upon a building, but even should this not be the case definitions so framed are never held to be exhaustive definitions, but merely declaratory, as was held in *Smith v. Coles*, a case under the Workmen's Compensation Act, 1900, relating to agriculture; and there can be little doubt that all building operations whatever are included—plumbing, for instance. This being so, it is to be observed that the builder not only does not benefit by the exemption in favour of employers of less than five workmen, but he is in a worse position than these employers, since they, if machinery is being used, can still claim the exemption if they can show that the accident was not attributable to the use of the machinery; but the builder has no such defence, and the mere fact of his employing workmen on building operations renders him liable.

In one other respect does this Bill bear more heavily on builders than it does on other employers. By Clause 9 it causes certain industrial diseases to be the subject of compensation as though they were accidents, and these diseases are those to which the workmen employed in building operations are peculiarly liable. These diseases are set out in the Third Schedule to the Bill—Anthrax, lead poisoning, mercury poisoning, phosphorus poisoning, arsenic poisoning, ankylostomiasis. Opposite to these diseases in the Schedule appears a description of certain processes which may give rise to them, and if the workman, at or immediately before his disablement, or suspension under rules made under the Factory Act, was employed in any of these processes the disease set opposite to it in the Schedule shall, unless the employer proves the contrary, be deemed to have been due to the nature of that employment. Otherwise apparently the onus of proof lies on the workman. The inclusion of these diseases within the Bill was not recommended by the Departmental Committee, and has introduced some complication in the Bill; the disease may be a gradual process, and although the last employer is made liable to pay the compensation, he can call upon other employers for contribution or indemnity. The above are the only provisions in the Bill which will especially affect builders as distinguished from other employers, but the general burden of compensation will be increased by the substitution of the period of one week for the fortnight at present in force for the period of incapacity before which compensation is not to be payable, in the case of accident as well as disease. The figures proved before the Departmental Committee showed how enormously this would increase the claims.

The extension of the Bill has naturally enabled it to be framed in simpler terms; but there is still room for improvement in this respect, and there is little doubt that some of its provisions will yet afford work for the lawyers.

THE TRADE DISPUTES BILL.

THE Second Reading of the Trade Disputes Bill last week has in no way elucidated the question as to what the Government intend should be the law as regards the liability of trade unions; this question, according to the statement of the Solicitor-General, is apparently now to be left to the opinion of the House. We venture to think that the course the Government has adopted towards this matter of principle is almost unprecedented, especially having regard to their unusually strong position. That this question is a matter of principle, and not the mere matter of detail which the Solicitor-General endeavoured to make out, can be proved from the speech of the Attorney-General, who, as representing the Government, introduced the Government measure, and with reference to the policy now introduced by the Labour Party Bill, and accepted as an immaterial amendment by the Government, used these words:—

"The alternative method is the royal road. The argument one bears is, why trouble to very carefully define liability? Why trouble to reconcile the law of agency with the administration of bodies of this kind? Why not say no action whatever shall be brought? But just let me ask the House to face that proposition. The proposition, I understand, is that, however great and ruinous the loss that may be suffered by an individual, however unjustifiable the conduct of the union which may occasion that loss, even in the case of that conduct having been carried out by means of the use of the funds which are controlled by the union, yet those funds, the property of the union, are not to be made liable to redress the claim consequent on that loss." He then pointed out that if such immunity were granted to trade unions other bodies would speedily claim similar exemption, and he cautioned the House against creating injustice to individuals in seeking to do justice to the unions, and he pointed out that it was a proposal to create class privileges, an inconsistent policy for a democratic government to adopt. He concluded, "Do not let us create a privilege for the proletariat and give a sort of benefit of clergy to trade-unions analogous to the benefit of clergy which was formerly enjoyed and which created an immunity as against certain sections of the community."

In the face of these unexceptionable expressions of opinion on the part of the Government the Solicitor-General (in the absence, through illness, of the Prime Minister and the Attorney-General) had an uphill task in reconciling the subsequent action of the Government towards that clause in Mr. Hudson's Bill which grants an immunity to the trade unions which is hardly enjoyed by even the Crown. He stated that it was the intention of the Government from the first to invite the opinion of the House on the clause of this Bill which relates to the liability of trade unions, but in face of the above statements he could hardly assert that it was their intention to act as they have done towards a Bill introduced as an alternative to their Bill, and which proposes to carry out what the Government

had urged the House it was not advisable should be done. Such is the position, however, of the Government.

We desire to notice one new argument brought forward by the Solicitor-General. He asserted that as the trade unions did not enjoy all the privileges of corporate bodies, that as they were bodies which could not sue their own members, it would be unfair to make their funds liable without giving them the privilege of enforcing their contracts against their own members; and he drew a fancy picture, if incorporation were granted, of the Unions calling in the police, and even the military, to enforce injunctions obtained against their own members. Injunctions have not, as a rule, been enforced by the military, and if the trade-unions took the course suggested by the law officer to enforce their contracts we imagine they would very soon cease to exist: for, after all, trade-unions only consist of a number of private individuals, and were their methods to be applied to their own members their existence would very soon be in jeopardy. It is also to be observed that many classes of persons in the State are under certain disability, but they, nevertheless, do not enjoy immunity from liability for these tortious acts. All the same, if incorporation and the right to sue is to be the complement to the right to be sued, we think it would be far preferable to grant the unions these rights, and as a consequence to make their funds liable. That, however, is unfortunately not the position the unions contend for, but is merely a herring trailed across the scent to divert attention from the extraordinary conduct of the Government towards one of the most serious questions of the day.

NOTES.

Rural Housing. A SECOND reading was given last week by the House of Commons to a Bill brought in by Mr. Mackarness, a private member, to facilitate the building of cottages in rural districts. The debate was remarkable for the general agreement on both sides of the House to the need for these cottages. But both Mr. Long and Mr. Burns agreed that legislation was useless unless local authorities would put the law in force and make use of their powers. It is no use to enact that a district council may borrow money and build cottages, when private owners do not provide enough, if such council will not move a hand. It is obvious, therefore, that there should be some power by which, if a public authority, which is primarily responsible, will not move, the Local Government Board should have the power to carry out the work of such body. As Mr. Burns truly said it is far better to keep men on the land than to try to send them back to it. The first essential to make rural life acceptable to manual workers is that there should be a proper supply of good and wholesome dwellings.

Recent Wages in San Francisco. THE scale of wages recently paid in the building trades in San Francisco would seem almost incredible in this country; but it

seems to have arisen from an abnormal position in local politics. Owing to an unexpected *coup d'Etat* in 1901 the United Labour Party of San Francisco were able to elect a Mayor, Mr. E. E. Schmitz, who has held the mayoralty ever since. Under his rule, combined with the recent unprecedented prosperity of the Western port, her isolation from the centres where labour offers its services cheaply, and the "trust" methods fostered by the various Guilds of Labour, a scale of wages arose which is unheard of elsewhere. Thus, the minimum to unionised unskilled labour was 8s. 6d. per day; to carpenters, 16s. 6d.; bricklayers and their assistants, 24s. 6d., and a sovereign respectively; plasterers and lathers, 26s. 6d.; plumbers, 24s. 6d.; and it is asserted, nevertheless, that these rates of pay have been justified by the employers' balance-sheets, without perceptible hardship upon them. Large fees for initiation were collected before outside labour might join the various unions. Each union was bound to the others for mutual protection, and great building enterprises were pushed forward by the capitalists with amazing assurance and courage. Having the whole municipal government dependent upon their votes for re-election, it is difficult to say where the increase in wage to artisans and unskilled labourers might have ended. What may be the influence upon it of the recent catastrophe remains to be seen.

Generating-Stations in London. IN view of the large number of Bills introduced into Parliament for the generation of electrical energy in London, the Commissioners of Works have felt it their duty to inquire into the possible injury of trees, plants, and flowers in the public parks, and of the national treasures in museums and picture-galleries, by the products of combustion emitted from the chimneys of generating-stations. They have come to the decision that the attention of Parliament should be called to the point so that it may be fully taken into account when electricity supply Bills come up for consideration. The objection to huge factory chimneys is not based entirely upon the nuisance caused by the emission of black smoke, for other products of combustion, such as sulphurous and sulphuric acids, and small particles of mineral ash, are particularly injurious to vegetation and buildings, as well as to pictures, marbles, and other works of art. Moreover, the oily steam which is frequently ejected from generating-stations is an unpleasant and deleterious mixture. While agreeing with the views of the Commissioners that effectual means should be taken to enforce the adoption of the most approved apparatus for the consumption of smoke in generating-stations, we are strongly of opinion that no more of these huge factories should be built within the metropolitan area. It is a perfectly easy thing to generate electricity at a distance from the place of consumption: The cost of establishing generating-stations could be largely reduced by building them in places where land and labour are cheap, and the transmission of current for a given distance would certainly be less costly than the transport

of fuel to London. If we are ever to get the benefits promised by the advocates of electric light and power, the necessary current must be provided without the accompaniment of smoke and other deleterious products—a condition that cannot possibly be fulfilled so long as the present irrational system of generation is permitted.

The Education of Engineers. AT a meeting of the Institution of Mechanical Engineers, held in April, 1903, it was proposed by Mr. Dugald Drummond—during the discussion of a paper by Professor Dalby on "The Education of Engineers in America, Germany, and Switzerland"—that the then incoming President of the Institution of Civil Engineers should be invited to form a committee, including representatives of kindred institutions and technical colleges, to discuss the question of the education of engineers in all its bearings. In November, 1903, the committee was appointed under the chairmanship of Sir William White, and, after deliberation extending over two years and a half, has issued a report based upon the opinions expressed by nearly some 270 experienced engineers. It says much for the practicability of the recommendations in the report that they should rest upon so secure a foundation, and we hope that efforts will now be made with the object of giving them practical effect. Speaking in general terms, the committee consider that engineering training must include several years of practical work as well as a proper academic training. To obtain the latter is not difficult in these days of technical schools and colleges, but the former can only be secured by such sympathetic assistance on the part of employers as is readily given in Germany, the United States, and other countries. Assistance of the same kind is available in Great Britain but not to the extent that could be desired, and as Sir William White observed at the annual dinner of the Institution of Mechanical Engineers last week, engineers must all pull together with a view to obtaining some definite results from the recommendations of the committee.

The City Central Markets. ALTHOUGH the Charing Cross failure was the result of a purely accidental flaw, impossible of detection by the most rigid examination, the City Corporation, like a good many other public bodies and railway companies, have been influenced by that occurrence to take steps for the purpose of satisfying themselves as to the safety of the iron and steel roofs under their care. The most important structures of the kind owned by the Corporation are those covering the Central Markets at Smithfield, a block of buildings erected at a cost of about 2,000,000*l.*, and so largely used by the public that any failure would result in an appalling catastrophe. Therefore the Corporation have acted most wisely in deciding to have the whole of the iron and steel work in the structures and sub-structures of these buildings thoroughly examined by Mr. A. T. Walmisley, M.Inst.C.E., of Westminster. It would probably be difficult to find an engineer more competent

for the performance of this onerous task than Mr. Walmisley, whose qualifications are sufficiently indicated by the iron and steel work of Olympia, the new roofing of the Borough Markets, and the roofs of the Carlisle Corporation Markets. Among the sub-structures to be examined are those in the railway tunnels beneath the Central Markets, the object being to ascertain whether the railway companies are properly discharging their obligations to the Corporation. It is to be hoped that similar investigations will be made with regard to the iron and steel structures of all the market and other public buildings both within and without the jurisdiction of the City authorities.

Steel Rolling Stock. SINCE the year 1844 railway engineers have been progressing gradually in the direction of substituting iron and steel for timber in the construction of goods waggons and passenger carriages. There has been no undue haste in this matter, as the large amount of timber used in modern vehicles abundantly shows, and it may be hoped that the paper read by Mr. H. G. Sheffield before the Tramways and Light Railways Association may help forward the present active movement in favour of all-steel trucks and cars. So far as concerns the former class it may be noted that tentative efforts were made as far back as 1850 to 1854 by the Great Western Railway and the London and North-Western Railway to introduce iron goods waggons, but the conservatism, which is as predominant in railway offices as in Government departments, seems to have prevented the general acceptance of the innovation, and no decided preference for metal was shown until steel waggons were introduced at a comparatively recent date in the guise of an American novelty. As for passenger carriages, although the Great Northern Railway built a few vehicles with steel bodies nearly a quarter of a century ago, the introduction of all-steel cars is really due to the extension of electrically-operated railways. As modern steel-built goods waggons have had the effect of converting much of the dead load into paying load, so may the increased strength and reduced weight of all-steel passenger cars, as compared with existing steel and timber vehicles, be utilised to the pecuniary benefit of railway companies. But the public have a right to demand the abolition of timber as a material of construction, for by its continued use the horrors of railway accidents are quite needlessly aggravated.

A Minor Budget Proposal. It is always pleasing to note any reform in the direction of improved postal facilities, and a passing remark may be made on the Chancellor of the Exchequer's statement on this head. His proposal to devote 135,000*l.* of his surplus to this purpose will enable the Postmaster-General to make some very useful reductions in the Parcel Post rates—commencing with 5 lb. parcels, which will be carried for 6*d.* instead of 7*d.*, while parcels weighing from 7 lb. to 11 lb. will be charged at the rate of 1*d.* per pound. It may be taken for granted that where this figure underbids the railway com-

panies, the latter will promptly follow the lead of the Post-Office. The reduction will, doubtless, prove very acceptable to the public generally, and to some industries in particular—as well as to the agricultural interest, on whose behalf the concession is primarily made. A reduction in the cost of postal orders and an enlargement of the definition of documents transmissible by post at 3*d.* will also be very generally appreciated. It has long been acknowledged that the rules regulating the 3*d.* post have been confusing and anomalous, and the benefit of that rate is to be extended to all purely formal communications.

Arc Lamps. THE paper by Mr. Andrews on "Long Flame Arc Lamps," read to the Institution of Electrical Engineers last week, is a valuable contribution to the very scanty literature of the subject. The lamp which forms the main subject of the paper is the "Carbone Arc," which is now extensively used in Berlin. By increasing the electric pressure between the carbons, by inclining them to one another at a small angle, and particularly by a most ingenious device for always keeping the arc between the ends of the carbons, M. Carbone has succeeded in appreciably increasing the efficiency of the conversion of electrical energy into light. Considerable importance was attached by the lecturer to the whiteness of the light emitted by the Carbone Arc, but we are inclined to agree with a suggestion made by Mr. Trotter in the discussion that this whiteness may be only apparent. The light coming from the lamps shown at the meeting certainly appeared to be white, but if they were placed in bright sunlight it would probably be noticed that the light they emit is really coloured. Mr. Andrews showed a striking experiment to illustrate the different colours assumed by ribbons, etc., when placed under different types of lamp. This experiment proved that indoor lighting by means of flame arcs between chemically-prepared colours would be impossible in practice, as their light is very deficient in blue and red rays. We think that the lecturer laid too much stress on the poisonous nature of the fumes emitted by these lamps and on the excessive ash. Their efficiency is exceedingly high and they can be used in low frequency circuits where ordinary lamps would flicker most unpleasantly. It was suggested that large halls can be economically lighted by arc lamps having the lower parts of their globes of clear glass and placed 30 ft. or 40 ft. above the floor. The lecture theatre was shown illuminated in this fashion, but we thought the variations of the luminous intensity too large to be admissible. The author's theory is that the lamp may send unobscured rays vertically downwards, as they do not then come within the usual visual range, and so the dazzling effect is negligible and we get the increased illumination.

The Abuses of Public Advertisement. THE National Society for Checking the Abuses of Public Advertising, whose similar Bill was read a third time in the House of Lords last session, have re-introduced a measure in Parliament for

empowering local authorities to control all hoardings above 12 ft. in height; to prevent the display of any advertising notice that might affect injuriously the amenities of any public park or pleasure promenade, or disfigure the natural beauties of a landscape; and to prevent the affixing of advertisements upon private property without the owner's consent.

Plowden Buildings, Middle Temple. WE notice that it has been found necessary to shore up the east wall of the block, Nos. 3-6, Plowden-buildings, in Middle Temple-lane, and it is expected that a reconstruction of the wall must be speedily taken in hand. Nos. 3-6 constitute the remaining portion of the original buildings; Nos. 1-2 were rebuilt by James Savage, who died in 1852. The two blocks are named after Edmund Plowden, the eminent jurist and author of the "Commentaries or Reports," and treasurer of the Society. Plowden was buried in the Temple Church (1584), where is a monument, with recumbent effigy upon an altar tomb, to his memory. Plowden was a student and reader of the Middle Temple; his bust and coat-arms are in the Hall, which was built in 1562-72, and, as Dugdale records, "Mr. Edmund Plowden being constituted treasurer for that work."

Lectures on Greek Dress. AT his second lecture on Greek Dress at the Royal Institution, on Tuesday afternoon, Professor Baldwin Brown commenced by remarking that Greek dress was specially Hellenic in a sense not previously mentioned—that it was a kind of representation of the history of the Greek spirit in art, the object of which was to give artistic form to that which was at first formless. The treatment of the dress in sculpture was gradually perfected, first in one portion and then in another. The hair, which was difficult to treat in sculpture, remained conventional in treatment the latest. It was only in the period of perfected Greek art in the time of Pheidias that the whole drapery was, so to speak, vitalised. Examples were shown of archaic figures in which the idea of the folds of the drapery was only conveyed in a formal and conventional manner. In the perfected art it fell into natural folds which assisted in giving expression to the figure, or to its action; sometimes to assist the appearance of rapid motion, as in some of the hurrying figures in the Parthenon tympana; in one of the figures of the Niobe group; in the Niké of Samothrace, descending through the air with the raiment flying behind her; or, in the more reposeful figures of the Panathenaic frieze, its lines assisted in the expression of repose and dignity. The more intricately folded parts of the linen tunic were contrasted with the broader and heavier folds of the *himation*, and both contrasted with the smooth contours of the limbs where exposed. The gradually increasing use of drapery to assist composition was illustrated in a series of the metopes, in which drapery was obviously used to fill up what would otherwise have been awkward spaces between the figures. The Ionic *chiton* was shown not to be a sewn garment; all its effects

could be got by a long and rather narrow single piece folded so as to droop in long hanging folds at one or both sides, and fastened at intervals on the arms; the process being illustrated by photographs from the living model. It was obvious, the lecturer said, from the whole consideration of the subject, that the drapery of the figure of the great period of Greek sculpture was not an ideal evolved by the sculptor, but represented the most perfect arrangement of the dress as actually worn; and it was remarkable that in the period of the most highly idealised sculpture we found the most lifelike and least conventional treatment of the dress. The lecture was illustrated by a large and most interesting collection of lantern slides from Greek sculpture and from dress arranged on living models.*

THE Munich Art Exhibition
The Grafton Gallery, at the Grafton Gallery only calls for a brief notice, for its value consists chiefly in the contributions of two artists, Herr von Kaulbach and the late Herr Lenbach. Herr von Kaulbach's portraits, which form the chief portion of his contribution, are excellent in composition, drawing, and character (notice especially "Fräulein F.," 114), and they are free from that heaviness and dinginess of colour which seem the besetting sins of the modern German school. From this defect Lenbach's are not free, and a collection of a good many of his portraits confirms us in the impression we have always had, that the praises of his work which appeared everywhere at the time of his death a year or two ago were somewhat exaggerated. He had a wonderful power of characterisation, of which his well-known portrait of Bismarck (which is included in the exhibition) is a remarkable example; and a portrait of a lady, "Frau Geheimrath Jost" (148), is remarkable in the same way; but the portrait of Gladstone (143), however powerful in expression, is spoiled by its heavy handling and disagreeable colour. There are three examples of Herr von Uhde's naturalistic treatment of the life of Christ, of which "The Sermon by the Sea" (250) is pleasing in character and expression, though not in colour. Among the others there are many things ugly and fantastic, and but few to pause before. Herr von Bartels' "Meditation" (8) is a good study of a fisher-girl seated among the dunes; Herr Cairati's "Mantua" (25) is a good architectural picture of the old castellated walls red in the evening sunlight; Herr Kaiser's "Coming Thunderstorm" (104) is a landscape of some power; Herr Samberger shows a rather fine head under the title "Poetry" (195); Herr Walter's "Study of a Head" (245) which is effective both in expression and lighting; and Herr Zimmermann's "Christ" (271), a half-length figure, is solemn and dignified. But the exhibition as a whole illustrates the poverty and (in some cases) the grotesqueness of modern German art.

* It is to be regretted that the second of these admirable lectures was very poorly attended, which, we suspect, is owing to the time first advertised having been altered from 5 p.m. to 3 p.m. This was announced as far as possible, but it is always difficult to ensure that people take note of a change of this kind, and it is unfair to an able and learned lecturer to put him at this disadvantage.

At Messrs. Walker's Gallery, Mr. Hitchens' Pastels, 118, New Bond-street, is a small collection of landscapes in pastel by Mr. Alfred Hitchens which contains some very beautiful work, and shows what fine landscape effects can be obtained in this medium of colour. The subjects are largely taken from the grand country about Ballachulish and Loch Linnhe; among these a view in the Pass of Glencoe (22) is particularly fine, and others in the same neighbourhood may be noted; also "A Mountain Path" (21), which reminds one somewhat of one of Alfred Hunt's water-colours; "Pines beside the Loch" (17); "Springtime, Windsor Park" (18), a beautiful study of forest effect; "At the Foot of the Mountains" (19); "The Rising Moon" (30); "By the Side of the Loch (Scam-madale)" (1); these are among the best, but all are good. Mr. Hitchens exhibits some good life-size portraits in pastel also; but it is in the landscapes that the real interest of the exhibition lies.

THE landscapes by Mr. J. A. M. Lomas exhibited at the Quest Gallery in Bond-street may be characterised (though they are not specially called so) as decorative landscapes, in which there is no attempt at literal translation of nature, but the representation of broad effects of light and composition in flat tints. Though we cannot call this landscape-painting in the true sense of the word, in their own category these works are very effective and suggest a good deal of the poetry of nature, Nos. 10, 11, and 12 especially, and as an effort in a special field of art they are of interest. In a gallery attached to a private house (17, Cliveden-place, Eaton-square), Mr. Hubert Medleycott is exhibiting a collection of water-colours in which architectural subjects, views of cathedrals and bits of the street architecture of ancient cities, play a considerable part. The "Old Clock Tower, Dinan" (1) is a delightful piece of architectural picturesque; among the London subjects "Old Chelsea Church and Wharf" (13) and "Battersea Bridge when Building" (17) are excellent specimens of water-colour art, the latter especially, which is perhaps the best thing in the collection. "Porte de Gand, Bruges" (33) is noteworthy for its fine colour; and "Boats at Ostend" (34) is a charming little reminiscence of the effect of the white-sailed boats on a calm misty day, looking like ghosts of boats on the still water. At the Lyceum Club a room is filled with the paintings of "The Advisory Board of Painters" connected with the Club, among which may be mentioned a fine and pathetic picture by Mme. Caiziani; some interesting studies of effects of twilight and artificial light by Miss Ida Lees; and a pastel by Mrs. Deric Hardy, "Fairy Tales," a very good figure composition with two charming children in it.

Putting Architects up to Tenders. FROM a newspaper report of a recent sitting of the Carmarthen Board of Guardians it appears that the Board, as a means of settling what architect should be employed to rebuild part of

their workhouse which had been burned, adopted the plan (alike discreditable to themselves and insulting to the architectural profession) of applying to various architects to know for what commission they would undertake the work. One firm, Messrs. G. Morgan (of Carmarthen) very rightly replied that 5 per cent. was the professional standard, and that no architect of any training or standing would depart from this scale in any important building. This lesson had no effect upon the Board, who by a majority of 18 to 11 appointed a local architect who undertook to do the work at 1 per cent. on the contract, "and would not require any clerk of works" (!)

REINFORCED CONCRETE.

JOINT REINFORCED CONCRETE COMMITTEE.*

WE reprint the following information from the last issue of the Royal Institute of British Architects' Journal:—

The following statement, which was read at the first meeting of the Concrete Committee, gives an idea of the nature and scope of the investigations the Committee has been formed to carry out:—

This Committee has been nominated by the Royal Institute of British Architects to consider and report upon the use of reinforced concrete in buildings and other structures. As we all know, reinforced concrete is largely used in other countries—in America, France, Germany, Italy, Russia, Egypt, etc.—and is now coming into use here, but very slowly.

The conservative nature of our people may be responsible for part of our reluctance to use reinforced concrete, but another reason why we lag behind is that no responsible or representative body of skilled men—no one man even whose name carries great weight—has pronounced in its favour. Also Building Acts and By-laws do not facilitate its adoption. The architect and engineer hesitate to use it until the material and what can be done with it has been generally agreed upon; until, in fact, they have some assurance that it may safely be employed.

Now, as the Royal Institute of British Architects has been the promoters of this Committee, you may naturally look to its representatives for some general idea of the line of action to be taken. Exactly what may be done must be settled by the Committee itself; and in submitting to you a general rough sketch idea of a programme, it must be understood that the sketch is necessarily only an introduction, and not in any way a finished scheme, for your guidance.

First, then, it appears that we should inquire into what has been done already, and ask the owners or architects or engineers of such works for particulars, and how the buildings have stood the test of time.

We shall have a Secretary who can apply to railway companies, owners of mills, private owners, architects, engineers, and others, who will no doubt willingly place the results of their experience at our service in connection with such works; some have actual experience in the new system; and when we have digested this knowledge we can as a body express an opinion as to its usefulness, its safety, its permanence, and other qualities, which opinion we may fairly hope will be of value to our fellow countrymen.

Something of this kind has been done already in other countries. The German Association of Architects and Engineers in conjunction with the Concrete Association have drawn up a report; the American Institute of Civil Engineers in conjunction with various other bodies have appointed a Committee which is at present engaged on similar work, and it is suggested that we should apply for copies of such information or interim reports as may be at its disposal; the French Government also is said to have appointed a Committee to prepare a set of recommendations.

A general expression of opinion as to its value would not help other architects or engineers very much; we should therefore consider and report upon the following amongst other matters, as to which there is doubt:

(1) Whether such constructions are permanent or likely to deteriorate with time. The steel skeleton is said by all those who have studied the subject not to rust, and even when steel is embedded in a material such as coke-breeze concrete containing a proportion of sulphur there is said to be no rusting. As any reduction in the section of the metal by rusting might endanger the work,

* The Committee consists of representatives of the Royal Institute of British Architects, the District Surveyors' Association, the Institute of Builders, the Incorporated Association of Municipal Engineers, the War Office, and distinguished scientists.

we should consider if it ever does rust, and under what circumstances, so as to advise upon any necessary precautions, or to reassure the doubters on this head.

(2) The resistance to fire. We shall have to consider what has been done in experimental tests, such as those of the City of Hamburg Authorities in 1891, and of the British Fire Prevention Committee just made. Also the results of tests in actual fires in buildings such as the Baltimore fire, where the conditions were exactly those we have to provide against. We may thus be able to form definite conclusions of value to all interested.

(3) The method of contracting. There are about fifty different so-called patent systems, and it is usual to entrust the design of any proposed work to one of the firms who make a speciality of this class of construction, obtaining from that firm a guarantee of strength. This arrangement is probably quite desirable; but as a certain responsibility must always lie on the engineer or architect who accepts or recommends for acceptance any such design, it is desirable for us to define as best we may the responsibility of the parties.

For instance, it may be made clear that the contracting firm undertakes all responsibility; you may consider it wise to require that the drawings should first be submitted to the architect or engineer, and should be signed by the contracting firm, or by some responsible person on their behalf. Some firms try to make a secret of their system, and object to showing the drawings.

It may appear to you that to accept a plan for floor or roof or wall or column or bridge or water-tank (all matters of construction in which we are supposed to be specially skilled) by making ourselves acquainted with what is to be done is dangerously foolish; and, if so, your opinion may have sufficient weight to settle that question. Captious interference we should all deprecate of course, but the engineer or architect must be in command, and must know, not only what is proposed to be done, but how it should be done.

We can still leave ample freedom to the experts in the design of the work, in the choice of material and method of carrying out the work.

(4) The materials also will no doubt be considered; these are—

- (a) The metal, iron or steel.
- (b) The cement.
- (c) The sand.
- (d) The aggregate, ballast or stone, etc.

For the steel and the cement we shall have the standard specification of the British Engineering Standards Committee, and must inquire if qualities of the standard kinds are suitable for reinforced concrete work.

As to the sand, you know how universally the qualities of good sand are given as *clean* and *sharp*. We have to review all that in the light of recent knowledge. In America many experiments have been made which show that cleanness is not so all-essential as has been supposed, and that washing does not improve every sand. These results were arrived at by experiments on material not only seven days or twenty-one days old, but were made on pieces of various ages up to three years.

Certain work in that way is being done here, and when we have collected and considered the facts our opinion based on knowledge should be of value.

Next as to sharpness. You may find that sharpness is not so important as variety in size of the grains of sand. Compactness and freedom from voids appear to play a most important part in the strength of mortar, and that freedom from voids may best be obtained by variety of size. These questions we should study with an open mind, free from ancient prejudice.

Then there is the aggregate of stone, gravel, coke-breeze, etc., what proportion to use, what material to use to get the best results in given cases. If we find that washing the sand may be saved, and that concretes of leaner mixture may be used than hitherto with equal safety, we shall have done some good.

Questions arise as to the mixing. We want to know what is the proper way to mix our concrete; how much water to use; whether the sand, gravel, and cement should all be mixed together and the water added, or whether the sand, cement, and water should be made first into mortar and the gravel or stone added, as recommended by some. We want to know the value of mixing machines, and whether it is wise to allow a smaller proportion of cement, say 10 per cent. less, if the concrete is mixed by machinery, owing to the fact that it is better mixed. Into all these we must inquire, so as to be able to advise our brother architects and engineers.

(5) Another subject is the carrying out of the work. Should we require that only skilled men under skilled supervision be employed; that the work be kept wetted, be stopped in frosty weather; how long the centres should be kept up, etc.? All these can only be indicated as matters for your consideration and judgment, and upon which an authoritative pronouncement would be desirable.

(6) One important question which we must consider is what are the safe stresses to allow in various cases. There is apparently no such general agreement upon the safe stresses and

methods of calculation as we find in regard to steel or iron, and it is possible that in the present state of knowledge we cannot tell with sufficient accuracy what are the internal conditions in a non-homogeneous beam, to enable us to determine rules which are not open to criticism or improvement with the advance of experience.

Reinforced concrete is, however, being used, and there is need of rules—tentative though they may be—to guide us until we get formulas which will command general assent. Much has been done in the way of experiment in recent years so that we are in a much better position to test any of our theories by the results of actual work.

It may be found desirable to refer this part of our subject to a Sub-Committee of those amongst us who are specially qualified by reason of their mathematical attainments to pronounce upon it.

Our Commission is limited to preparing suggestions and recommendations, and therefore any report that may be made will be in the way of advice and not as fixed and immutable rules.

How far our Building Acts and By-laws should be altered to permit of the use of reinforced concrete walls may also be considered, because as they stand they interfere with the reasonable use of the material.

There is a general feeling that our regulations as to walls should be relaxed in all buildings, at least in rural districts. The agitation for reform in this respect has not yet spread to urban districts, save in regard to the material we are studying; and it certainly seems that if the strength is increased by the use of a metal skeleton the thickness of a concrete wall may be correspondingly reduced.

We fortunately have with us municipal and county engineers and district surveyors whose experience in the working of these by-laws will be of value in restraining too much reforming zeal should we display it.

All the questions thus briefly reviewed are matters upon which the general body of architects and engineers and others interested would no doubt value the consensus of opinion of skilled and disinterested men who have studied the subject. Such an opinion will help the introduction of the material by giving those who hesitate to employ it through want of knowledge and fear of the responsibility, the assurance of the

conditions under which it may safely be used, and give that confidence which is at present lacking. It will call attention to its advantages where it has any, such as road bridges over railways, which at present deteriorate rapidly with rust.

THE ARCHITECTURAL ASSOCIATION: PENETRATION.

An ordinary general meeting of this Association was held on Friday evening last week at No. 18, Tufton-street, Westminster, Mr. E. Guy Dawber, President, in the chair.

The minutes were read and confirmed, and Messrs. H. S. Watling, E. J. Tanner, and A. R. Ashby were elected members.

It was announced that the first summer visit would take place on May 12 to All Saints' Church, Footing (Mr. Temple Moore, architect), and the second summer visit on May 26 to Marsh Court, Hampshire (Mr. E. L. Lutyens, architect).

It was also announced that on May 8 the Sketching and Measuring class would commence, and that the annual dinner will be held on May 17 at the Georgian Hall of the Gaiety Restaurant. Tickets, price 5s., may be obtained at No. 18, Tufton-street.

The New Officers.

The Chairman then read the scrutineers' report on the election of officers for session 1906-1907. The following is the result of the election—

- President, *R. S. Balfour.
- Vice-Presidents, Walter Cave, 394 votes, and *A. Neefman Wilson, 352.
- Council, *E. Guy Dawber, 346 votes; *Arnold Mitchell, 279; *L. Ambler, 255; *J. B. Fulton, 249; *A. Marjon Watson, 253; J. Murny, 243; W. Curtis Green, 201; Arthur Keen, 193; and E. W. M. Wonnacott, 183.
- Hon. Treasurer, *Henry T. Hara.
- Editor of the A.A. Journal, *Maurice E. Webb.
- Hon. Librarian, E. Gunn.
- Hon. Secretaries, *H. Tanner, jun., and C. Wontner Smith.

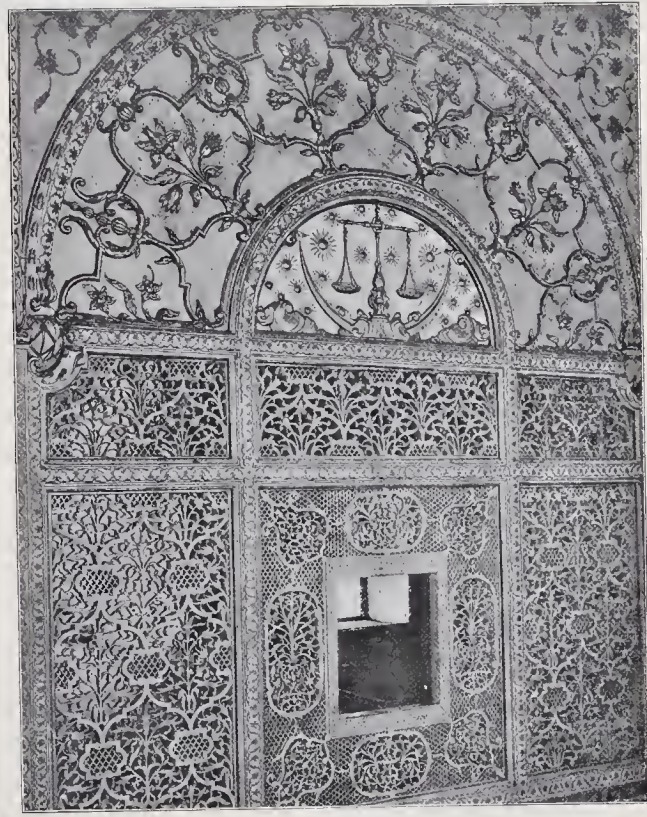


Fig. 1. Window at Delhi.



Fig. 2. Ravenna: S. Apollinare in Classe.

Hon. Solicitor, W. H. Jamieson.
Hon. Assistant Librarians, H. J. Worrow and Percy May.

The following were not elected:—

F. D. Clapham, 179 votes; *J. S. Gibson, 171; *J. Maclaren Ross, 149; Theodore Fryc, 119; *E. A. Rickards, 110; R. Douglas Wells, 79; E. F. Wheatly, 70; S. J. Tatchell, 69; and A. N. Peckham, 66.

On the motion of the Chairman, a vote of thanks was accorded to Messrs. T. L. Dale, G. F. Blackburne Daniell, R. A. V. Harrison, and T. J. Wetherall for acting as scrutineers.

Votes of Thanks.

The Chairman said that they would miss their late Treasurer, Mr. F. Hooper, very much. Mr. Hooper had been treasurer for the last five years, and the amount of time, trouble, zeal, and devotion he had given to the Association could not be overestimated. The Association must desire to accord their hearty thanks to Mr. Hooper for all he had done for them during the last five years, and he accordingly moved a hearty vote of thanks to him.

This was unanimously agreed to, and a vote of thanks was accorded to the School of Design Visitors and to the Press.

Mr. Water Cave then read the following paper on "Fenestration"—

Fenestration.

"Fenestration—or the disposition of window-openings in relation to the structure—is a subject which is inseparably connected with the whole history of architecture, and the manner in which light was introduced into buildings has always been one of the most important elements in determining their style.

The influence of climate, the necessity for protection, the manufacture of glass, and the relative positions of buildings have all affected the size and shape of windows; and in the following paper it is proposed to deal with the subject in some sort of chronological order, which will enable the development of

fenestration to be more easily followed, and to show how these various influences in different countries have left their mark on the architecture of the time.

In all the great buildings of past ages, which consist of halls arranged side by side, the method of admitting light was constructionally the same. We find in the vast temples of Egypt the same arrangement of clearstory which the Gothic builders brought to such a pitch of perfection. The central hall, or nave, was taken up higher than the side halls or aisles, and this plan in itself was a determining factor in the design.

In the gigantic temple at Karnac, which may be taken as typical of the Early Hypostyle buildings in Egypt, we find a clearstory which was never glazed; and in the temple at Kalasche, built during the Roman occupation, we find the same system employed to light four successive chambers, one behind the other, each, of course, having the ceiling at a lower level. The introduction of light generally throughout a building was not considered a necessity—partly due, perhaps, to the mysterious rites of the Egyptian religion, and partly, perhaps, due to the wonderfully-brilliant skies of the East, which not only gave the smallest openings their utmost value, but made a cool and dim interior of infinite value in the desert.

In later times there is evidence that the domestic buildings had openings in the front walls over low screens, and in the temples of Edfu and Dendera the same arrangement can still be seen.

But this method of admission of light must not be treated at length in a paper dealing with fenestration, except as an instance of the simplest method; for in reality these openings were only the omission of the wall-screens, either between the columns and the lintels of the clearstory, or between the columns in the façade, and to pursue this subject would partake too much of an archaeological discussion.

Grecian.

When we consider Grecian architecture

and the method in which the interiors of those wonderful temples were lit, we are faced with a greater difficulty and more uncertainty. In the Erechtheum and the great temple at Agrigentum, in Sicily (420 and 480 B.C.), we have, according to the accepted restorations, windows in the side walls, but these are both exceptional instances, and even here the problem of how the central part was lit remains a matter of conjecture.

In the Erechtheum the three windows which appear to have existed are so placed that they seem to have been almost an afterthought. The windows themselves are square-headed, rectangular openings, about two squares in height, tapering towards the top, and placed somewhat uncomfortably as regards their heads which come some distance below the caps of the columns; they were probably fitted with pierced marble screens.

In the temple at Agrigentum the windows appear to have been somewhat narrower in proportion, and the heads so arranged that they more nearly line with the caps, and seem to have formed a part of the original design, but have a very crowded effect.

Both these examples, as has been stated above, are exceptional, and may be taken as proving the rule, that the Greeks did not consider that openings in the screen-walls was the best form of lighting their temples.

All Greek architecture came, we know, from the South, the land of brilliant sunshine, where windows, as we understand them, were either unknown or of quite subsidiary importance.

They were very few in number in all Classical work, and never placed to form more than one tier. We can thus, I think, draw the conclusion that windows, such as we require, are never really successful in columnar architecture. The Greeks felt this, and never developed the scheme, and the modern attempts to combine fenestrated with columnar architecture show the impossibility of making a happy compromise between two totally conflicting styles. Take the instance

* Members of present Council.

of the Royal Institution in Albemarle-street, where we find a single Corinthian order the full height of the façade, in itself well proportioned, but its general effect marred by the introduction of windows, which look mean and squeezed in between the columns, and spoiling the effect of the connecting screen-walls.

If the columns are detached and in their proper proportion, either the windows are darkened and become too small, or the general effect of the façade is weakened by bad intercolumniation if the windows are designed to give their full lighting value to the interior.

That the Greeks had a method for lighting their temples is generally accepted by all archaeologists, and it seems evident that if it was not from the side walls, it was from some form of roof or clerestory window. There is, however, one other theory which has a literary foundation. In the tragedy of Iphigenia, in Tauris, it is actually stated that the intervals between the triglyphs in a certain temple were left open, and were to be utilised as a means for thieves to enter. This is a possible solution; but the evidence of words is apt to be misleading in such a case, and it is more probable that some form of clerestory adapted to a sloping roof, as suggested by Mr. Fergusson in his "History of Architecture," was the real method of lighting these interiors, and in support of this we have the evidence of the Egyptian temples. St. Peter's, Eaton square, is an attempt, and a successful one, to light a church in this method. But, again, the subject becomes of more archaeological than architectural interest, and it is not till we come to the great buildings of the time of the Roman Empire that the admission of light came to be considered as the integral part of the design.

It is thus apparent, and the following remarks will make it more evident, that fenestration became more important as the art of building advanced westward and northward until it reached its most interesting development in our own country, where the necessity for light is of such great importance.

Roman.

The great eye of the Pantheon is a good starting-point for a more detailed consideration of the subject. In this truly remarkable building we have an interior completely and perfectly lit by one central opening in the dome, 27 ft. in diameter. The total cubical contents of the Pantheon represent nearly 2,000,000 cubic ft. (1,934,600), which gives the extraordinary result that each square foot of skylight lights 3,380 cubic ft. of space. This instance has been quoted to show the enormous value of a vertical light, which, according to generally-accepted rules, can be taken as about thirty times as valuable as an horizontal one.

The arch and dome construction of the Romans gave an opportunity for windows, which were introduced high up beneath the vaulting and above the four barrel arches supporting the dome; these were usually great semi-circular openings, and divided by massive mullions into three divisions, finished according to Viollet le Duc, with frames of bronze enclosing panes of glass, alabaster, or simply lattice-work. This, it seems probable to suppose, was the usual way of lighting the great central courts of the Roman buildings, and from their plans we know that the various rooms ranged round this court must have been lit only by borrowed lights from the central court itself.

The Influence of Glass.

We now come to a very important consideration in fenestration, and that is glass. During the Early Eastern work, briefly referred to above, both in Egypt and Greece, there is nothing to lead us to suppose that glass was used in windows. The openings in the Greek temples were almost certainly unglazed or fitted with marble screens, and the position of these, either in the frieze or as concealed dormers, would not make it an absolute necessity. That glass was in use for domestic utensils at a very early date is undoubted, but it is not until the beginning of the Christian era that we have a definite reference to its use in windows. Pliny, who died in 115 A.D., describes, in his "Laurentine Winter Villa," a glass door and curtain, and we may assume that, at least in some

cases, glass was used in screens to light the smaller rooms round the great courts of the Roman buildings. It is interesting to note that the great group of the Laocoon was found in one of these inner chambers with no external opening.

Thin slabs of alabaster were, no doubt, used in some instances, similar to those still to be seen at Orvieto Cathedral, and pierced marble screens, like those from the Taj Mahal (built by Italian workmen in 1630), Agra and Delhi, India (Fig. 1); and plates of glass, 7 in. by 9 in., cast in marble frames, are still to be seen at St. Sophia, at Constantinople, which probably date from the building of the church by Justinian, A.D. 540.

Bede mentions that in 680 A.D. Abbot Biscop sent to Gaul "manufacturers of glass for windows," which shows that the habit of glazing windows was by no means common in the west of Europe at that time. Even in England during the 11th century glass was not in common use, for there are instances of church windows, which were closed by shutters of wood or stone, which were unglazed.

Roman Client and Architect.

But to return to the Roman buildings; it is of importance to note that great regard as to aspect was observed. In the Baths of Caracalla—a typical building—the lights beneath the domes opened towards the most

favourable points of the compass. Vitruvius, in discussing this subject of orientation, says that "due regard should be had to climate (i.e., latitude), for the same arrangement will not suit in Egypt and Spain, and it must be different in Pontus and in Rome. In northern countries the buildings should be vaulted, well closed in, and their openings small facing a warm aspect. On the other hand, in southern countries, subject to the burning heat of the sun, the openings should be large and face the north and north-east."

In Cicero's letter to Atticus we have a very interesting passage where he quotes his architect's reasons (which seem to be somewhat modern!): "Know that in blaming my windows as too narrow you are finding fault with my architect, Cyrus—happily it is only with the architect. When I was saying the very same thing to him he pointed out to me that wide windows looking into a garden did not offer a prospect so agreeable to the sight. For let A be the eye of the spectator, B and C the object he sees, D and E the rays proceeding from the eye to the object—you understand what follows!" This unfinished demonstration, is not in itself particularly convincing, but may be taken as an instance of mystifying the client—which is not entirely confined to the time of the Roman Empire. He further adds, "If you find anything to criticise in other parts, I shall always be prepared with a

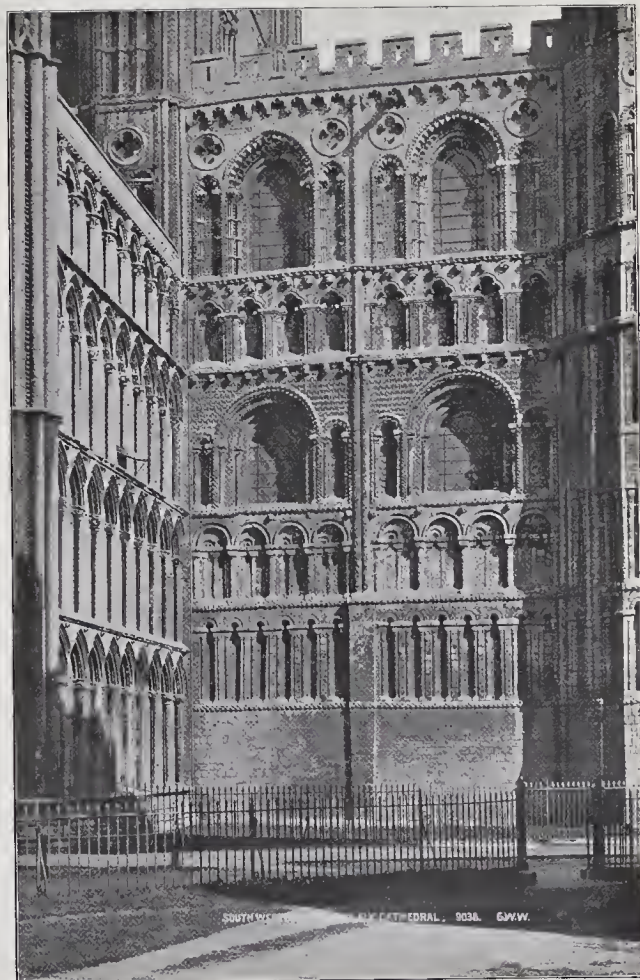


Fig. 3.



Fig. 4.

tolerable justification, unless I can make a change for the better at a smaller cost!"

The true Roman architecture was based on the use of the Greek lintel construction combined with the Etruscan arch, and, without going into the details of the origin of the latter, it is sufficient for our purpose to note that this combination gave an opportunity of lighting buildings from the side walls. The intercolumniation of the Greeks, as has been pointed out, precluded a satisfactory form of fenestration, but, with the pillars placed at a distance from one another equal to their own height, the intervening screen-wall was well adapted, if not obviously intended, for window-openings. In later times by superimposing one order above another, giving a series of stories, the opportunity for systematic fenestration was attained, and the windows thus became an integral part of the design. This plan ultimately led to the very elaborate wall arcading, which is seen in so many buildings from 500 to 1200 A.D.; but its use as a means of systematic fenestration was rare, and, as a rule, was a mere necessity of construction.

Early Christian Architecture.

In many of the Early Romanesque buildings in Italy we find a curious arrangement of windows. For instance, in the great basilica of S. Apollinare in Classe (Fig. 2), at Ravenna, begun in 538 A.D., the window-openings are very small, and made quite subordinate to the wall arcading on the exterior; but from the inside the spacing of the windows is most thoughtfully carried out, as in the case of the sister church of S. Apollinare Nuovo.

This system of designing the window-openings from the inside with little regard to exterior is typical of a people who were developing a style of architecture suited to their western requirements based on the eastern tradition; and it is highly probable that the Early Christian antagonism to all the heathen practices may have led them to ignore their exteriors, on which the Greeks spent so much thought and labour.

In the Byzantine style the same remarks, to a certain extent, hold good, but it is now proposed to leave the eastern architecture and follow the progress of fenestration westward, and see how the Gothic builders treated their window-openings.

It would take too long to enter into a comparative detailed account of the various national styles in Europe, and we will at once proceed to the English Gothic buildings.

English Gothic Windows.

The first thing to be noticed is the same arrangement of subordinating the windows to the external wall-decoration, as has been described at Ravenna. These windows in our Early Norman work were small, and their size was due to various causes; the desire for protection against enemies in these troubled times when churches (and especially their towers) were used as places of defence and refuge; the difficulty and expense of obtaining glass, resulting in their generally being unglazed, and only a shutter of stone or wood used to keep out the weather; and, as has been before mentioned, the form of window itself came from the East, or the land of sunshine.

The treatment of the window-openings in the early church towers is very effective. In most cases they were small, and arranged in groups high up, with a baluster-shaft dividing the lights; the main part of the tower was left plain, and great dignity is thus produced. With the advent of the pointed, or lancet, windows of the XIIIth century a real attempt was made to make a design in fenestration both from the inside and out. In the lofty square-ended fronts of the Cistercian buildings we find the windows ranged in deeply-set arrays of varied arcading. But, as a rule, the Early Gothic windows in the arcades were subordinated to the general wall scheme, and at Crowland, Durham, and Ely (Fig. 3), the Benedictine monks built tier upon tier of arcaded galleries, with occasional windows, which reminds one of the Romanesque work at Pisa.

Towards the end of the XIIIth century came a most remarkable change in the window treatment of our great Gothic buildings, "which," as Mr. Prior says in his valuable work on Gothic Art, "must be judged as no mere freak of a designing architect, but as a revolution worked by Gothic creativeness in some thirty years, such as the centuries of Egyptian or Greek art did not accomplish."

Inventors are rarely theorists; the invention must be suited to the necessity, before everything, and the theory may follow if anybody cares for it—for a theory is nothing

but an attempted explanation, and the fact must exist before it can possibly need explaining.

The history of the development of tracery is so well known that I do not propose to dwell on it now. In its earliest and best stages it was always treated as a part of the whole design, and the masons used their stonework with a due regard for its constructive possibilities. The development of glass-painting in connexion with window-tracery is a branch of this subject on which a whole paper might be written.

The lancet windows, especially those on such a grand scale as Chartres and Paris, measuring 6 ft. or 8 ft. across, made a magnificent field for the glass-painter such as he did not get again till the end of the XVth century, when homogeneous Gothic art was a thing of the past. The increasing richness of glass was for a long time only a part of the general scheme of enrichment, and the development of tracery was really due to the mason; but with the rise of individualism, which was one of the main causes of the decadence of Gothic, the extremely decorative character of this form of ornamentation called for wider fields for its display. At Selby the combination of tracery and glass reached such a pitch that the tracery practically becomes the cloissons of a great masoned enamel.

With the introduction of the transept to divide these great windows into tiers—each division fitted with niched saints—we seem to feel the desire to recall the great sculpture galleries and fronts of Wells, Lichfield, and Exeter. Gradually the glass-painter exercised more and more influence over the mason, and thus we find, at Gloucester and King's College Chapel, Cambridge, windows of such a size that the intervening wall spaces are only piers to carry the lofty stone vaults, and these windows, fitted with the magnificent glass of the period, reach the utmost limits of engineering skill in this direction.

It is, perhaps, scarcely fair to notice here a modern parallel, but, in studying these wonderful examples, one cannot help thinking of the modern plate-glass windows of our streets, where the visible means of support are reduced to a minimum, and all the skill and knowledge of material we have at our disposal is utilised to obtain the greatest possible amount of glass space.

There is, however, a lesson to be learnt

from the two cases which may, for practical purposes, be taken as parallel.

With the Gothic builders the glass itself was set back at a considerable distance from the wall-face on the exterior, and, though the mouldings themselves had become comparatively shallow with the growth of the Gothic style, still they were not ineffective, and served to give a certain amount of shadow.

In too many instances the exact reverse is the case to-day, and if the great sheets of plate-glass in our modern shop-fronts were recessed, their hopelessly bald effect would, to a certain extent, be minimised. It may be taken as a broad rule that the larger the window the more the glass should be recessed from the outer wall.

With the decay of Gothic, which, for purposes of classification, may be taken as about 1500, a foreign influence began to make itself felt in England, and the interest in the national style, which had been mainly confined to the ecclesiastical structures, was transferred to the domestic buildings after the dissolution of the monasteries under Henry VIII.

The Tudor Period.

Italian art was first of the long series of outside influences which affected English architecture. The great Renaissance in art and letters may be said to have begun with the fall of Constantinople in 1453, which Mr. Gough says "flooded Western Europe with Greek scholars and Greek literature. Italy was the centre of the new movement which eventually reached the distant shores of England, but, as the stream flowed across Europe, it became tinged with the peculiarities of the various lands over which it passed." But before the classical traditions had really been thoroughly assimilated by the English builders there arose, under Queen Elizabeth, a marvellous growth of stately country houses, in which the followers of the fast-perishing Gothic style made their last effort to accomplish something new. The great country houses of the XVIth century, with their stone-mullioned windows in many divisions, fitted with well-proportioned leaded

glazing, are to be found scattered up and down the length and breadth of the country. The wonderful ease with which this form of fenestration was adapted to the great façades of Kirby and Montacute, as well as to the modest gables of the Cotswold manors, took such a hold on the national mind that this style of window may be said never to have completely died out. The Gothic origin of these windows is obvious, and at Cowdray House, in Sussex (Fig. 4), the growth is well exemplified.

The necessity for a defensible house had by this time disappeared, and the reaction was, like all reactions, inclined to the opposite extreme; and we find, in cases like Astley Hall, Lancashire, and Little Moreton, a range of windows practically dividing the façade into alternate horizontal bands of glass and solid wall surface.

The development of the bay window is also one of the striking characteristics of these times, and they are to be found in all kinds of buildings. From the earliest date we see them almost invariably on the dais of the great halls, and in later examples, as at Bradford-on-Avon (Fig. 5), they become the most important feature in the whole composition.

The proportions of these mullioned windows is worthy of careful consideration. The single transom was generally placed so that its lower line was nearly in the centre of the window. The proportion of glass to mullion was usually one of mullion to two and a half of glass. The glass line took the centre of the mullion, and the face of the mullion, if not flush with the external wall, had only a small member beyond it. The mullions were about twice as deep as they were wide. Where more than one transom was used the divisions became less, towards the top—with some curious exceptions, as at Kirby Hall. The proportion of the lead-glazing varied considerably.

In the earlier type of houses, and in the smaller examples—as, for instance, in the Cotswold district—the windows were small, and the amount of plain wall surface thus produced made up a composition in

fenestration which can hardly be equalled for its dignity and sense of repose.

In many instances we find that the windows decreased in size, and in the number of lights, as they ascended the gable, and were kept a long way from the angles. This satisfies the eye—as a logical arrangement—for the mind easily follows the relative size and proportions of the rooms within, and it also gives that peculiar conviction that the house has an inside, much as we can distinctly feel by a glance at a face whether there is really a mind behind it.

As a contrast to the diminishing number of lights as seen in the gables of the Cotswold manors, it is of interest to notice the arrangement of the window-openings in the towers of many of the Lombard churches. At the Cathedral of Sienna we see the exact reverse of this treatment, and from the single light on the lowest stage of the tower we find an additional light added at every step till at the top there is a range of seven lights, the object probably being not only to produce an effect of lightness, but actually to diminish the amount of masonry.

Small windows, well placed, undoubtedly make for good architecture, and it is not always possible to convince those concerned that a room can be overlit; the modern building requirements seem especially framed to prevent good proportion, both on account of the placing of the windows in relation to the floor and ceiling and as to their size in proportion to the room itself.

These regulations may be of use for ignorant builders in crowded towns, but are sadly hampering in the country.

But the classical ideas which had, by the end of the XVIth century, gained a firm foothold in the interior of the house, at last showed themselves both in the arrangement and details of the windows, and the outer member of the jamb developed into the architrave, though the mullion and transom held its ground. Woolaton Hall is typical of the transitional period, but the effect of the fenestration cannot be considered entirely satisfactory. It has all the defects of proportion and misuse of classical detail

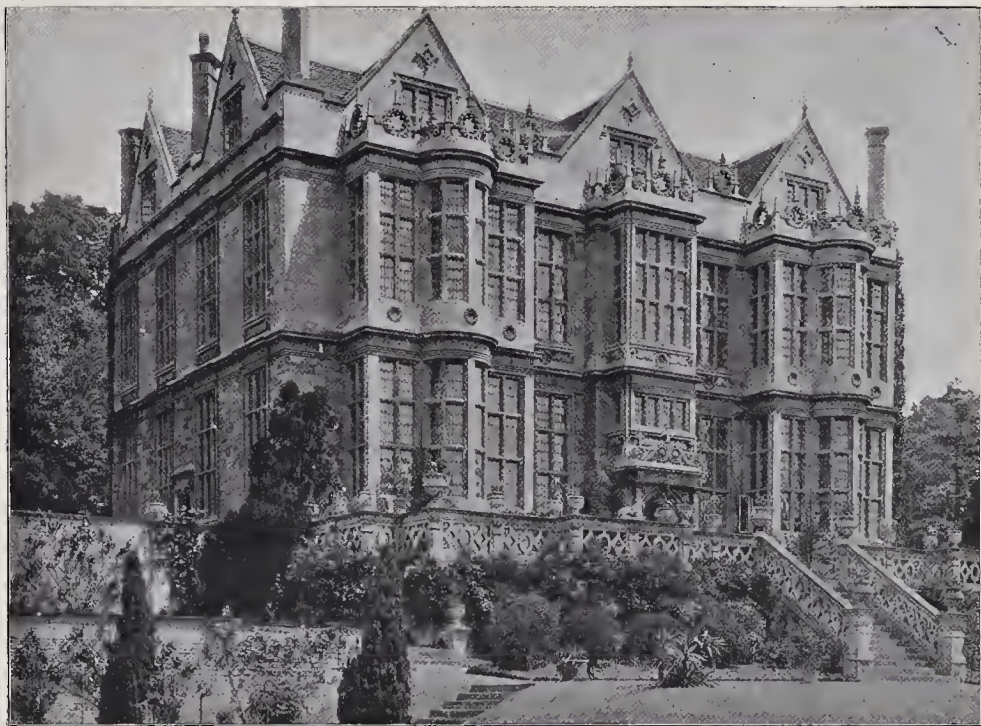


Fig. 5. Kingston House, Bradford-on-Avon.

inseparable from the attempt to combine an imperfectly-understood style with our own traditional methods. But if we consider what a revolution was taking place in all matters connected with art, we cannot fail to pay a tribute to the builders of these great country palaces, which are not only stately and picturesque, but essentially English.

[Owing to pressure of other matter, we are compelled to divide our Report of the meeting. The conclusion of the paper and some notes of the discussion which followed will appear in our next issue.]

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

VII.—SOUTH-EASTERN HOSPITAL.

AN additional spring visit was arranged for Saturday, April 28, so that an opportunity might be taken of inspecting the reconstructed South-Eastern Hospital, which will shortly be ready for patients. This institution, which belongs to the Metropolitan Asylums Board, is situated in the Old Kent-road, S.E., and is intended for the treatment of scarlet and enteric fevers and diphtheria. Four hundred and eighty-eight beds are provided in ten pavilions and two isolation blocks, each building having two stories, and the whole is sited to advantage upon a site measuring 11 acres, representing approximately forty-four beds to the acre.

The hospital now completed is a reconstructed scheme, with the exception of the administrative block (which has been rearranged and enlarged) and two pavilions built in 1896 and two nurses' homes in 1894. The wards in the pavilions contain eighteen to twenty-four beds, and each block has additional separation wards of one or two beds. The isolation blocks have wards of varying sizes from one to six beds.

Messrs. T. W. Aldwinckle & Son, the architects, have made a very successful reconstruction, and have introduced many interesting and new matters of detail. We see, for instance, that the sanitary annexes are situated in the centre of the length of the wards instead of at the far end, thus adding to the convenience of working whilst outweighing certain objections to the change of position.

The floors of the wards are finished with mosaic paving for cheapness, durability, and facility of cleaning compared with wooden floors. The wards are 28 ft. wide, and have a lineal measurement of 11 ft. per bed, instead of the customary dimensions of 26 ft. and 12 ft.; this arrangement gives greater working space in the centre of the ward and allows the beds to stand farther from the outside walls. A cubic air space of about 2,000 ft. is secured for each bed. The sashes and hopper lights have two thicknesses of glass, all angles are rounded, including the terrazzo skirting, and all the subtle, yet important, details down to the removable traps to the scullery sinks have received most careful study.

The warming of the wards is well considered, and a somewhat lower temperature is designed than is usually found. A low-pressure hot-water system, with augmented circulation, supplies warmth to radiators placed below the windows in the wards. Air is admitted behind the radiators, each of which has a metal inclosure with brass hit-and-miss gratings at the top and folding-doors to the fronts, so that the heat may be utilised to suit the open or closed position of the sashes. Foul air is extracted from panels in the ward ceilings by the agency of electric fans, and the proportions of inlet and exhaust have been suitably arranged.

The contractors are Messrs. Godson & Sons, of Kilburn, and the total cost of the work is about 123,000. The work is full of intricate detail too extensive to deal with at the present time. The attendance of the architects at the visit added materially to the success and interest of the occasion.

A GARDEN CITY IN KENT.—Proposals are being formulated under the superintendence of Sir Robert R. Wilnot, Chairman of British Garden Cities, Ltd., for laying out the Wigmore estate, near Chatham, as a garden city. The projected plans provide for a public park and large gardens for all the houses, and the public buildings include a hall, a library, and schools.

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Easter recess was held on Tuesday in the County Hall, Spring-gardens, Alderman E. Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 1,818*l.* for street improvement; Kensington Royal Borough Council 3,355*l.* for street improvement; Poplar Borough Council 1,670*l.* for sewer and paving works; St. Marylebone Borough Council 44,850*l.* and 12,000*l.* for electric lighting purposes; and Shoreditch Borough Council 14,905*l.* for electric lighting. It was also agreed to sanction the borrowing by Lambeth Borough Council of 35,000*l.* for municipal offices.

Vauxhall Bridge.—The Improvement Committee reported as follows:—

"The Council, on May 19, 1903, upon the recommendation of the late Bridges Committee, approved the design, then submitted, of the new Vauxhall Bridge, and the proposed architectural and artistic treatment of the same, but reserved for future consideration the question of erecting propylæa on the abutment piers. Models have been prepared and designs submitted to us for propylæa which are suitable for erection on the bases as now constructed. With regard to the question whether any artistic treatment at all of the abutments should be attempted, we think that, unless something be done in this direction, the bridge will appear in every respect incomplete and unsatisfactory. The alternatives are, therefore, presented, either of erecting propylæa on the abutments, or of covering them with large groups of statuary. There will be little difference in the cost of the two schemes, and as, in our opinion, the erection of propylæa will produce a much better effect than groups of statuary, we think the Council should sanction the erection of propylæa. We have caused models of the propylæa, and copies of a statement describing the same, to be placed in the lobby of the Council chamber. One of the models (No. 1) is square and of plain design; the other (No. 2) has rounded ends and some decorative treatment of the sides. The total estimated cost of erecting, in granite, propylæa for both approaches to the bridge, in accordance with design No. 1, would be 22,600*l.*, while if design No. 2 be adopted, the cost would be 15,120*l.* We think that design No. 1 would be in greater harmony with the general features of the bridge than No. 2, and we propose that it should be adopted; but we would ask the Council to authorise us, if necessary, to introduce some slight modification on the Lambeth abutment. We have also considered the arrangements to be made for the erection of suitable figures on the summits of the propylæa. Mr. Alfred Drury, A.R.A., has been engaged, in collaboration with Mr. E. W. Pomeroy, A.R.A. (Mr. Drury being the contracting artist), to model and cast the panels for the piers of the bridge, and we consider that he should also be engaged to design and provide the figures for the propylæa. He is prepared to provide four subjects, different in design, but in harmony with each other, in a composite material, for a total sum of 2,800*l.* The material, which we are advised is an excellent one, has been used, in most other works, for the fountains at Versailles, and for work at Hampton Court. We think that Mr. Drury's offer should be accepted, but that Mr. Bertram Pegram, who was originally suggested by the Bridges Committee to collaborate in the work, should be associated with him in the provision of two of the groups. The unexpended balance of the several votes passed by the Council for the construction of the bridge is only sufficient to cover the cost of the works proposed, and we recommend:—

(a) That expenditure on capital account not exceeding 15,400*l.* be sanctioned for the erection of propylæa, with suitable groups of statuary thereon, at both approaches to Vauxhall Bridge. (b) That granite propylæa be erected at both approaches to Vauxhall Bridge, in accordance with design No. 1 submitted to the Improvements Committee on March 22, 1906; and that the Committee be authorised to arrange for minor modifications of the design of the structure on the Lambeth abutment, and for the execution of the complete work. (c) That the solicitor do prepare and obtain the execution of an agreement with Mr. Alfred Drury, for the modelling and casting, at a total cost of 2,800*l.*, of four groups of statuary, to be placed on the propylæa; that Mr. Bertram Pegram be associated with Mr. Drury in the case of two of the groups; and that the agreement of the Council be affixed to the agreement (in duplicate)."

Mr. Leven Sharp moved that the matter be referred back, because he did not think the architect should have his own way entirely in the matter of the design of the propylæa. Quite apart from the question of expense, he also thought that the work should be worthy, not only of the Council, but of the City, and the best art of the present time. He thought that the design of the bridge was satisfactory, but he did not approve of this large expenditure for the purpose of making decorative additions, which, perhaps, might be one day carried out by a private citizen at his own cost. He thought that a group of statuary would be better than these huge pylons.

Sir Melville Beachcroft seconded, and said that he had often remarked that matters of this kind ought to be considered by some

Architectural Authority or Committee of Taste, but unfortunately there did not exist such an authority. He could not see any justification for an expenditure of 15,000*l.* on this work. It was supposed that the figures to be erected on the bridge were to be symbolic or decorative, or both, but he was inclined to think that in the course of a year or two they would be neither the one nor the other, but a mere smutty representation of goodness knew what.

Mr. Penn Gaskell contended that these propylæa would be a useless expense, and would utterly destroy the artistic appearance of the bridge.

Mr. Straus, M.P., said he regretted that the name "propylæa" had been substituted for "pylon." Propylæa originally meant an entrance to a sacred place, and he did not think that Vauxhall Bridge could be called a sacred place. He thought it was absurd to suppose that any private individual would come forward and pay for the work proposed, and he reminded the Council that the Alexander III. Bridge, Paris, which was much smaller than Vauxhall Bridge, cost about three times as much.

Mr. A. Smith said he did not think that the Bridges Committee should be responsible for deciding such questions.

The Chairman of the Committee then agreed to take the report back.

The Aldwych Site.—Mr. Hubbard, the Chairman of the Improvements Committee, in reply to Sir M. Beachcroft, stated that he was unable to say anything with reference to the progress of the negotiations for the leasing of the Aldwych site to a syndicate at a rental of 55,000*l.* a year, but he hoped next week to make a definite report.

Cost of Gas Fittings.—Mr. Cyril Cobb called attention to the fact that during the first four months of the year the Council had spent in the elementary schools 1,333*l.* 8*l.* 3*d.* on repairs to gas-fittings, 645*l.* 2*l.* 8*d.* in rearranging gas-fittings, 1,222*l.* 17*l.* 5*d.* on new gas-fittings, 147*l.* 8*l.* 5*d.* on gas-globes, and 669*l.* 8*l.* 7*d.* on mantles, a total of 3,018*l.* 5*l.* 4*d.* on fittings alone. It would probably astound members to hear that during these four months no fewer than 40,166 mantles had been used in the schools, and he thought the Council was entitled to know whether these mantles were brought on contract or otherwise, and whether any proper means were taken to check the accounts.

Lord Welby replied that the figures were new to him, and he could not give any answer until he had consulted the responsible officials, which he promised to do.

Public Baths and Washhouses.—The Education Committee reported, and it was agreed:—

"That the amended drawings submitted to the Education Committee on April 25, 1906, by Mr. James F. Franck on behalf of the Hammersmith Metropolitan Borough Council, of the public baths and washhouses proposed to be erected on the site adjoining the London County Council Hammersmith Technical Institute, be approved, subject to the solicitor advising that such drawings are in legal conformity with the agreement entered into between the Council and the borough council, and subject to the express condition that such approval shall not interfere with the operation of the provisions of the London Building Act."

Fire Brigade Inspection.—The following recommendations of the Fire Brigade Committee were agreed to:—

"(a) That the resolution of November 8, 1904, approving the proposal to form an inspection department in the fire brigade, and instructing the Fire Brigade Committee to consider and report what arrangements should be made therefor, be rescinded.

(b) That, without express instructions from the Council, requests that advice may be given by the fire brigade, as to the fire arrangements of buildings other than places licensed for public entertainment, common lodging-houses, and Government buildings, be not acceded to.

(c) That the authorised strength of the fire brigade be increased by one district officer and decreased by one station officer, and that an additional clerk be employed at the chief station of the fire brigade in a temporary capacity, at the rate of pay of 30*l.* a week."

Catford Bridge.—The Improvements Committee recommended, and it was agreed:—

"That, notwithstanding the fact that the estimated net cost of reconstructing the bridge carrying Catford Hill over the South-Eastern and Chatham Railway, should be 57,500*l.* instead of 33,900*l.*, the application in the present session of Parliament for authority to reconstruct the bridge be proceeded with on the basis that the Lewisham Metropolitan Borough Council be not required to contribute towards the cost a larger sum than 25,500*l.*, and that, in the event of the net cost of the work being less

than 55,000l., the difference shall be deducted equally from the respective proportions of the cost to be borne by the Council and the borough council."

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Erection of Buildings on the Site of Nos. 247 to 267, Fulham-road.

Chelsea.—Buildings on the site of Nos. 247 to 267, Fulham-road, Chelsea (Messrs. Elms & Jupp for Mr. R. C. H. Sloane-Stanley).—Consent.

Lines of Frontage and Projections.

Hammersmith.—Buildings on the southern side of Bulwer-street, Wood-lane, Hammersmith (Messrs. Macintosh & Newman for Mr. E. J. Clayton).—Consent.

Paddington, South.—One-story shops in front of Nos. 119 and 112, Westbourne-grove, Paddington (Mr. J. A. L. Gimblett).—Consent.

Strand.—A fascia addition to the projecting shelter in front of the Tivoli Music Hall, Strand (Mr. H. Tozer).—Consent.

Dulwich.—Bay windows, porches, wooden eaves, and sham half-timber work to ten semi-detached houses on the north side of Burbage-road, Dulwich (Mr. W. Griffiths for Mr. J. Watson).—Consent.

Greenwich.—Half-timber work and a projecting porch to a house on the northern side of Liskeard-gardens, Blackheath (Mr. A. M. Torrance for Mr. N. McDougal).—Consent.

Kensington, South.—That the application of Messrs. Millard & Pryce, for the Royal Exchange Assurance, for an extension of the period within which the erection of buildings on a site on the south side of Kensington-road, Kensington, to be also upon Palace-gate, was required to have been completed, be granted.—Agreed.

Lewisham.—Additions in front of Nos. 4, 6, 8, and 10, Loanpit-oval, Lewisham (Mr. J. Webster for Mr. A. E. Woollett).—Consent.

Strand.—A deviation from the plan approved, for the erection of a projecting flue on the eastern side of the Savoy Hotel extension to project in Savoy-buildings, so far as relates to the erection of an additional flue (Messrs. Colclutt & Hamp).—Consent.

Islington, North.—That, at the request of the Holloway Press Company, the Council do permit the retention of a show-case on the forecourt of No. 449, Holloway-road.—Consent.

Norwood.—A covered way in front of No. 160, Knight's-hill-road, Norwood (Messrs. Hammond & Son for the Colour Type Company, Ltd.).—Refused.

Lines of Frontage, Projections, and Construction.

Finsbury, Central.—Three external iron gangways, affecting the first, second, and third floor levels of Nos. 9 and 10, Lendsen-place, Finsbury, an external iron staircase at the eastern end of No. 8, Lendsen-place, and two external iron staircases and landings connecting Nos. 8 and 9, Lendsen-place, at the first and second floor levels (Messrs. L. Tubbs & Welch).—Consent.

Width of Way and Lines of Frontage.

Hackney, North.—Buildings on the site of Nos. 34 to 40 (even numbers), Boleyn-road, Kingsland (Mr. F. J. Staines).—Consent.

Hackney, South.—Buildings on the eastern side of Mare-street, Hackney, to abut upon Tudor-road (Messrs. Crossman, Pritchard & Co. for Mr. J. King).—Consent.

Camberwell, North.—An addition to a factory building on the north-western side of Leppis-road, Camberwell (Mr. E. J. Stevens for Captain Wood).—Refused.

Width of Way and Space at Rear.

Haggerston.—Buildings on plots Nos. 8 and 9, Goldsmith's-row, Haggerston, to abut upon Goldsmith's-row, Dove-row, and Hay-street (Messrs. Woodrow & Helsing for Mr. D. Dear).—Consent.

Width of Way and Construction.

Islington, North.—Two external iron and concrete balconies at workshop premises on the north-west side of George-street-messers, Holloway (Mr. J. Farrer for Messrs. Foxton Brothers).—Consent.

Rotherhithe.—A wood and urinalie addition to a saw mill, Rotherhithe-street, Rotherhithe (Messrs. Burt, Boulton, & Haywood, Ltd.).—Consent.

Width of Way and Temporary Buildings.

Rotherhithe.—Wood and iron buildings of a temporary character at Lower King and Queen Wharf, Rotherhithe-street, Bermondsey (Messrs. J. R. Wood & Co., Ltd.).—Consent.

City of London.—The retention of a covered way of a temporary character over a portion of Capel-court, Bartholomew-lane, City (Messrs.

Joseph & Smithem for the Alliance Assurance Company).—Consent.

Formation of Streets.

Lewisham.—That the Council do consent to the application of Messrs. Eastman Brothers for an extension of the period within which a new street for carriage traffic, to lead from Dartmouth-road to Sydenham Hill-road, Lewisham, was required to be clearly defined throughout by posts and rails or so otherwise as the Council might permit and thrown open to the public as a highway.—Consent.

Lewisham.—A dwelling-house on the eastern side of an extension of Oaksford-avenue, Wells-road, Sydenham (Mr. W. Wilkinson for Mr. T. Covel).—Consent.

Dulwich.—That an order be issued to Messrs. Worsfold & Hayward sanctioning the formation or laying out of a new street for carriage traffic, to lead from Peckham-rye to Dewar-street, Camberwell.—Consent.

Lewisham.—That an order be issued to Mr. G. A. Lansdown sanctioning the formation or laying-out of new streets for carriage traffic to lead from Manor-park to Manor-lane, Lee, Lewisham, and in connexion therewith the widening of a portion of Manor-lane (Messrs. W. J. Scudamore & Sons).—Consent.

Hampstead.—That an order be issued to Mr. R. J. Worley refusing to sanction the formation or laying-out of a street for carriage traffic to lead out of the eastern side of West End-lane, Hampstead (for the Midland Railway Company).—Refused.

Space at Rear.

Kensington, South.—A deviation from the plan approved in connexion with the erection of a building known as Thorney Court, Palace-gate, Kensington, so far as relates to an alteration in the position of the building (Messrs. Millard & Pryce).—Consent.

St. George, Hanover-square.—A modification of the provisions of sect. 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the southern side of Oxford-street, to abut also upon Davies-street, with an irregular space at the rear (Messrs. W. A. Lewis for Messrs. Perry Brothers).—Consent.

Kensington, South.—A modification of the provisions of sect. 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building to abut upon Silver-street and Edge-street, Kensington, with an irregular open space at the rear (Mr. W. G. Hunt).—Refused.

Paddington, South.—Buildings on the eastern side of Richmond-road, Paddington, on the space at the rear of No. 112, Westbourne-grove (Mr. J. A. L. Gimblett).—Refused.

Alteration of Buildings.

Kensington, South.—The retention of openings uniting Nos. 4 and 6 to No. 8, Lexham-gardens, Earl's-court (Mr. E. L. Wratten for the Misses Brown and Charles).—Consent.

Strand.—The uniting of No. 45, Piccadilly, with a building on the eastern side of Albany-courtyard (Mr. G. D. Martin).—Consent.

Conversion of Buildings.

Lambeth, North.—The conversion of No. 27, Belvedere-road, Lambeth, into two separate tenements (Mr. P. N. Gilman for the Works Committee of the Council).—Consent.

The recommendation marked † is contrary to the views of the local authorities.

Architectural Societies.

MANCHESTER SOCIETY OF ARCHITECTS.—At the annual general meeting of the members of this Society, held on the 26th ult., the following officers and members of Council were elected:—**President**—Mr. J. H. Woodhouse; **Vice-Presidents**—Messrs. J. W. Beaumont and Edward Hewitt; **Hon. Secretary and Treasurer**—Mr. Paul Ogden; **Assistant Hon. Secretary**—Mr. George Brown; **Members of Council**—(Fellows) Messrs. John Ely, J. B. Gass, W. C. Hardisty, C. H. Heathcote, J. D. Mould, F. P. Oakley, Isaac Taylor, G. H. Willoughby, and P. S. Worthington; (Associates) Messrs. Godfrey Colles, A. E. Corbett, and J. H. Gibbons.

NORTHERN ARCHITECTURAL ASSOCIATION.—The forty-seventh annual Report of this Association records that the total number of members is now 253, as against 220 in the previous year. The Report refers with deep regret to the death of Mr. Francis Edward Caws, who was elected a member in July, 1893, since which time he had held office on the Council as Vice-President, etc., and as President in 1901 and 1902. The Report alludes with regret to the death of Alderman W. H. Dunn, of Gateshead, who had held every office in connexion with the Northern

Architectural Association, having been President, Treasurer, and Hon. Secretary, etc.

CARDIFF, SOUTH WALES, AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—The annual dinner in connexion with the Cardiff, South Wales and Monmouthshire Architects' Society was held on the 27th ult. at the Royal Hotel, Cardiff. The President (Mr. J. H. Phillips) presided, and amongst those present were Principal Griffiths, Messrs. E. Seward, E. J. Williams, David Morgan, Cholton James, C. L. Wilson, H. Teather, E. H. Fawcner, C. H. Priestley, Edgar G. C. Down (Hon. Secretary), etc., the company numbering about forty. The Chairman submitted the loyal toasts, and Mr. E. Seward proposed that of "Our Pastors, Legislators, and Defenders," to which the Rev. J. Baker, Councillor Lewis Morgan, and Capt. E. H. Fawcner responded. The toast of "The Royal Institute of British Architects" was given by Mr. D. Morgan and responded to by Mr. Seward, in the absence of Mr. Dare Bryan, of Bristol. Mr. Seward dwelt upon the need for steps being taken to protect legitimate members of the profession, and for the establishment of a defence fund for architects, subjects which he said were well worthy their attention. Mr. Ernest Buntz (London) proposed the "Cardiff, South Wales, and Monmouthshire Architects' Society," and said such a body was of great service to the Institute in London. Suggestions from the provinces obtained far more attention in London than suggestions from members of the London body itself. He urged them to lay their views before the Institute, and said he was strongly in favour of some measure of legislation if they were to keep their status and improve the condition of building in this country. As regarded Cardiff, he trusted that the local Society of Architects would do their utmost to see that the extension of the city was carried out on artistic lines, and follow the example set in their new town hall, which he had seen and admired. The Chairman replied, remarking that the Society had been in existence about twelve years, and had done really good work. He acknowledged the valuable work done by Mr. Edgar Down on behalf of the Society. Mr. G. H. Birkenhead proposed the toast of the "Master Builders," and Mr. W. Thomas returned thanks after which Mr. C. James submitted that of "Local Governing and Educational Bodies," and observed that the County Council did not altogether treat architects as they should do. The members of the Corporation had acted in quite a different way, and wisely. It might be well for the Glamorgan County Council to take a lesson from their Corporation. He suggested that the chairman of the Education Committee should convey to the Corporation the advisability of submitting all plans of proposed buildings in Cathays Park to a committee of qualified architects before they were erected. Principal E. H. Griffiths said, in response, that after a study of other university colleges, he thought they would have in Cardiff one of the most perfect university colleges in the kingdom. He could not judge of the artistic exterior, but he said, unhesitatingly, as regarded the internal arrangements, that he would not exchange it for any other that he had seen. Mr. E. J. Williams proposed the last toast of "The Visitors," to which Mr. C. H. Priestley replied.

RURAL BUILDING BY-LAWS.—The Public Health Acts (Amendment) Bill, introduced by Lord Hylton, came before a Committee of the House of Lords, Lord Balfour of Burleigh presiding, on the 1st inst. The object of the Bill is to amend building by-laws in many particulars in England and Wales, exclusive of the Administrative County of London. Earl Carrington remarked that he had a number of amendments, but with the exception of these the Government had no objection to the Bill. One provision was that "two dwelling houses separated by a party division of fire-resisting material shall be deemed to be a single building," but Earl Carrington asked that the division should be "not less than 9 in. in thickness." Lord Hylton entered a plea for more elasticity in building by-laws, and asked if the words proposed by Lord Carrington were absolutely necessary. Lord Carrington said there had been much discussion about this, especially on the London County Council, but as this Bill was practically confined to rural districts he thought he could properly give way. The amendment was therefore withdrawn, and the Bill was ordered to be reported with amendments.

THE SURVEYORS' INSTITUTION: PROFESSIONAL EXAMINATIONS, 1906.

The following student candidates have passed the Intermediate Examination:—

England and Wales.

- J. C. C. Affleck, High Wycombe.
H. J. Amore, Hanwell.
W. H. Baines, Burslem.
C. A. Balcumb, Boscombe.
S. W. Bettridge, Croydon.
A. G. Bird, Kensington.
H. S. C. Bishop, London.
W. L. Bosker, Clapham.
W. A. Bott, Burslem.
B. Bradley, Worcester.
G. L. Broad, Lewes.
C. G. Brown, Herefield.
H. I. Brown, Tottenham.
H. H. Buckmaster, West Hill-road, S.W.
G. S. Chiff, West Ealing, W.
W. J. Carlisle, Bayswater.
E. P. Canon, Sheffield.
H. Chatley, Holloway-road, N.
P. C. Crimes, Lawton, Kildgrove.
A. G. Culme-Seymour, Wye.
A. H. Davis, Ladbroke-grove, W.
F. L. Elmes, Canterbury.
C. England, Bourne-mouth.
E. H. Ewin, Sharnbrook.
A. E. B. Fielding, Cardiff.
D. L. Ford, Upper Tooting, S.W.
B. Francis, Southend-on-Sea.
L. P. Gale, Wallingford.
G. H. Garrad, Wye.
H. Gawith, Southport.
R. A. Godin-Austen, Great Missenden.
L. B. Gumbrell, Kingston-on-Thames.
A. L. Hicks, Egham Hill.
S. G. Hine, Harpenden.

Ireland.

C. J. Dunlop, Bray, Co. Wicklow.

The following non-student candidates have also passed the Intermediate Examination:—

England and Wales.

- A. Abbott, Totnes.
A. Anderson, Wye.
S. H. Anstead, East Ham E.
H. B. Archer, Sheffield.
S. H. Ashton, North Shields.
A. Askwith, Newcastle-on-Tyne.
C. C. Atkinson, Headingley.
E. G. Bagnall, Ashford.
G. C. Bailey, Clifton.
J. R. Ball St. Albans.
H. C. Barrett, Harringay, N.
W. T. McN. Barrett, Brixton, S.W.
R. D. Bartlett, Cornwall-gardens, S.W.
A. R. A. Bates, King's Cross, N.
W. M. Bax, Catford, S.E.
E. Bayden, New Cross, S.E.
H. C. Bell, Grantham.
H. J. Benjamin, Maiden Vale, W.
O. P. Devan Carleton, E. Bevington, Stroud Green.
M. A. Bing, Richmond.
C. V. Bisley, Rotherhithe, S.E.
B. F. Blois, Bourne-mouth.
D. Bloxham, Bide.
C. H. C. Bond, Backingham Gate, S.W.
H. J. Bouwick, Crouch End, N.
D. Bradford, London.
A. M. Bramall, Highbury New Park, N.
C. B. Britton, Oxford.
A. E. Bridger, Winchfield.
B. F. Bristol, East Finchley, N.

* Penfold Silver Medal. † Institution Prize. ‡ Special Prize.

- R. J. Forge, Twickenham.
T. P. Frank, Leeds.
H. J. Franklin, Wealdstone.
C. W. Giffin, Westminster, S.W.
W. F. Gill, Brighton.
W. S. Goff, Exeter.
J. Y. Grant, Thames Ditton.
J. A. Gray, Hampden Club, N.W.
G. H. Grellier, Bedford.
G. G. Grimwood, Ipswich.
L. R. Hargreaves, Lyndhurst.
P. W. F. Harrison, Herne Bay.
J. Hart, London.
A. C. Hewitt, Acton, W.
H. C. Hickmott, Longfield Court.
L. M. Holman, Brighton.
W. D. Hooper, Thornton Heath.
D. Hughes, Twyn.
A. Hutchings, Seaford.
E. J. Ingley, Roundhay.
C. J. Jeffery, Notting-ham.
S. S. Jenkinson, Hornchurch.
A. W. Johnson, Harrogate.
W. G. Jones, East Dulwich, S.E.
W. E. Julian, Southsea.
S. A. Kelly, Aintree, Liverpool.
F. P. Kindell, Waltham-stow.
A. J. Laidlaw, Reading.
L. M. Kinton, Fulham, S.W.
R. M. Knight, Brockley.
J. B. Knowles, Burton-on-Trent.
W. W. Ladd, London.
J. L. Laidlaw, Reading.
W. F. Lake, Tulse Hill, S.W.
J. G. Large, Surbiton.
W. Leah, Longlevens, Gloucester.
W. Leaning, Gainsboro'.
J. P. Lee, Hereford.
A. J. Leydon, Reading.
A. D. McKinstry, Wye.
J. E. G. McSheehy, Wimbeldon, S.W.
H. Martin, Redhill.
T. P. V. Maslen, Bredonbury, N.W.
H. T. Merrett, London.
F. B. Moncreiff, Bakerswell.
G. Montgomery, London.
J. L. Newton, Oldham.
J. Oldham, Fallowfield, Manchester.
W. V. Packe, West Wickham.
J. H. Parole, Hitchin.
H. Paton, Grantham.
F. G. Payne, Denmark Hill, S.E.
A. W. Percival, Plymouth.

Scotland.

- W. A. Ballantyne, Laurieston, by Edinburgh.
D. Ferguson, Lennox Town.
E. N. Harvie, Mossend.
D. E. Herrah, Leith.
W. Lindsay, Glasgow.
W. R. Young, Falkirk.

Ireland.

J. K. Stephenson, Kells, Co. Meath.

The following Professional Associates have passed the Final Examination:—

England and Wales.

- H. C. Amies, Exeter.
A. L. Armstrong, Harrogate.
P. M. Ashbridge, Wansstead.
G. T. Ayward, Basset, Southampton.
P. H. A. Bailey, Dudley.
H. J. Barber, Andover.
P. G. Bateman, Ealing, W.
J. C. Bayes, Baddett, R.S.O.
A. H. Bell, Addlestone.
A. W. Bentley, Regent's Park, N.W.
H. P. Berry, Westminster, S.W.
F. E. Bunt, Liverpool.
E. W. Brodby, Leek.
W. Broadbent, Leeds.
H. Brook, London.
H. Burch, Highgate, N.
J. T. Burrac, Redland, Bristol.
J. Burn, London.
P. C. Clarke, Richmond.
H. R. Cowley, Southend-on-Sea.
P. C. Plumb, Leicester.
H. W. L. Plumstead, Highams Park.
A. R. Popham, Woldingham.
E. de B. Porter, Chesnut Green.
O. G. Porter, Tottenham.
W. G. Powell, Woolwich, E.
A. Race, Burrow-in-Furness.
W. E. R. Randall, jun., Chatham.
W. Richards, Shrewsbury.
S. F. Rider, Richmond.
T. R. Ronald, London.
W. S. Runshy, Bourne-mouth.
V. A. Butler, Streatham Hill, S.W.
A. Sasson, Cirencester.
G. F. Searing, Bedford.
H. W. Sefton, Harringay, N.
F. S. Sentance, New Cross, S.E.
W. L. Shelley, Herne Hill, S.E.
J. M. Sheppard, Bedford-square, W.C.
H. R. G. S. Smallman, Cleapside, E.C.
G. Smith, Brighton.
J. E. Smith, Bedford.
H. V. Sorrell, Southend-on-Sea.
H. P. Stagg, Clapham, S.W.
A. A. Stamford, Cambridge.
A. Underland, Croydon.
G. B. Symons, Newport Pagnell.
A. Thomerson, Waltham-stow, E.
T. E. Thompson, Jervaulx Abbey, Middleham.
G. N. Tomkins, Brixton Hill, S.W.
A. H. Tucker, Sneyling.
H. R. Vaughan, Thurston.
H. J. Venning, Brixton, S.W.
E. Welford, Farnham.
P. B. Weeks, Tunbridge Wells.
B. A. Westbrooke, Beckenham.
T. E. Whittington, Betchworth.
E. Williams, Brislington, Bristol.
H. C. Willis, Clifton.
F. A. Windsor, Sheffield.
I. T. Wright, Birkenhead.
W. H. Ventman Biggs, Hartlebury.
M. E. York, Westminster, S.W.
A. E. Young, South Croydon.
D. F. Young, Hord.
T. Young, Aspatria College.

- E. T. Haslehurst, Weybridge.
E. R. Huxkins, Downham Market.
A. L. Hayward, Harlow.
F. J. Henson, London.
J. G. Houghton, Woodford Green.
W. B. Ibbotson, London.
A. H. P. Iverson, London.
G. E. James, London.
J. F. Jones, London.
A. J. Lambert, Dorset-square, N.W.
H. U. Lavarack, Hampstead, N.W.
T. D. Le May, Tonbridge.
R. W. Lines, Tring.
A. H. Llewellyn, London.
J. Luke, Leicester.
H. B. Mackenzie, London.
J. W. McKeerrow, Newcastle-on-Tyne.
R. H. Maghew, Anerley, S.E.
A. F. Mirams, Muswell Hill, N.
* S. J. Marrell, London.
P. A. Myton, Welshpool.
W. W. Newman, Loughborough.
C. C. Oldfield, King's Lynn.
A. S. Palmer, Nunhead.
J. O. Payne, Bromley.
W. Plant, Leicester.
F. C. Pritchard, London.
P. C. Rawley, High Wycombe.
F. W. Randle, Swansea.
W. H. Rand, Ealing, W.
H. W. Redfern, High Holborn.
G. N. Reeve, Croydon.
B. L. Rice, Willesden Green.
F. W. Rivers, London.
E. V. Rogers, Bayswater, W.
L. N. Rogers, London.
P. H. Ross, Tufnell Park, N.
H. M. Russellworth, Purley.
H. G. Russell Sutton.
H. N. Savill, Broudbourne.
W. G. Salvey, Broxbourne.
W. G. Shipwright, Catford, S.E.
F. M. Skell, Leytonstone, Park, N.W.
A. D. Smith, Bradford.
H. R. Smith, Ipswich.
N. R. Stevens, West End-field.
C. T. Steward, Westminster, S.W.
C. J. Strachan, Belsize Park, N.W.
A. D. Sturley, London.
T. O. Taylor, London.
E. F. Terry, Surbiton.
E. A. Tolner, East Acton.
E. P. Turner, Addison-combe.
A. S. Vernon, High Wycombe.
A. A. Vigers, London.
P. J. Wildman, London.
I. W. Widdersfield.
W. H. Webber, Bedford-row, W.C.
W. Wheeler, London.
S. D. Whiddington, Crutch End, N.
H. Whitaker, Eye.
J. S. White, Stamford Hill, N.
W. K. C. White, Curridge, near Newbury, Berks.
A. F. Wickenden, Tunbridge Wells.
C. Williams, Wembley.
J. Woodhams, London.
E. H. Wright, Plumstead, S.E.
H. Myles Clapham, Common, S.W.
H. O. Young, Rock Ferry.

Ireland.

C. J. Bouchier, Tullamore, King's Co.

The following candidates have passed the Direct Fellowship Examination:—

England and Wales.

- B. C. Apps, Dartford.
W. D. Jenkins, Carmarthen.
H. de B. Wilmet, Watlington.
H. A. Wright, London, then.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XVII. DECIMAL LOGARITHM TABLES AND THEIR APPLICATION.



Now come to the very useful and convenient form of logarithmic tables comprising four-figure logarithms and four-figure antilogarithms, which are natural numbers corresponding to a given series of logarithms.

Tables of the kind are to be found in several pocket-books and appended to various scientific treatises, but as usually arranged they exhibit the disadvantage that the logarithms extend over two pages and that the antilogarithms extend over two other pages, thus making it necessary for the user to keep turning one leaf of the book backwards and forwards. This drawback constitutes one of those small hindrances that are better avoided if possible, and it is aggravated to a considerable extent when books are used where the two tables extend over eight pages.

In cases such as the latter the loss of time involved in the performance of numerous short calculations becomes a serious item, and it happens occasionally that isolated calculations can be done by ordinary arithmetic in less time than would be occupied by the acts of taking down the book, finding the place, extracting and writing the logarithms, and finding the natural numbers at the end of the calculation.

Waste of time in this way can be avoided by obtaining two copies of any inexpensive book in which the tables are printed, and pasting them in convenient form on a piece of cardboard for office use.

We give in Tables XIV. and XV. extracts from complete series of four-figure logarithms of numbers from 1 to 9999, and four-figure

* Penfold Gold Medal. † Crawford Prize. ‡ Gaisworthy Prize. § Such as the "Mechanical World Pocket Diary and Year Book," price 6d.

antilogarithms corresponding to the mantissa of logarithms from 0.00 to 0.9999.

Table XIV. gives under the column headed "No." the first two figures of various numbers from 100 to 9999; the next figure is given at the top of the first group of columns headed 0 to 9, extending the range to 100 to 999; and the last figure is given at the top of the second group of columns similar headed, extending the range to 100 to 9999.

Notes.—In what follows we use the abbreviation "log." to denote the mantissa of a logarithm, and "complete log." to denote the mantissa with the addition of the proper characteristic.

To Find the Logarithm for any Given Number.

Rule (1).—The log. of a one-figure number is found in column (0) on the line opposite the given number multiplied by 10.

Example (1): Log. 8 = 9031; Complete log. = 0.9031.

Rule (2).—The log. of a two-figure number is similarly found in column (0).

Example (2): Log. 25 = 3979; Complete log. = 1.3979.

Rule (3).—The log. of a three-figure number is found in the column of the first group, having at the top the same figure as the third figure of the given number.

Example (3): Log. 459 = 6618, the log. being found in the column (9) of the first group on the line opposite the number 45. Complete log. = 2.6618.

Rule (4).—The log. of a four-figure number is found by taking the logarithm of the first three figures as in Rule (3), then adding the difference stated in the second group of columns for the fourth figure of the given number.

Example (4): Find log. 3,494. Here 3494 = 3490 + 0004, log. 349 (first col. 9) = 5428, add diff. for 0004 (second col. 4) = 5 5433

Therefore the complete log. = 3.5433.

Rule (5).—The log. of a number containing more than four figures can be obtained approximately by discarding the excess figures, at the same time adding 1 to the fourth figure if the fifth figure has the value of 5 or more.

Example (5): Find log. 34,945. Here 34,945 = 34900 + 00045 (say 0005) log. 3490(0) (1st col. 9) = 5428, add diff. for (0005) (2nd col. 5) = 6 5434

Then the complete log. = 4.5434.

Rule (6).—A more accurate method is to calculate the proportional part of the difference as explained in connexion with seven-figure logarithms.

Example (6): Find log. 34,945. Here 34,945 = 34900 + 00045, log. 349(00) (1st col. 9) = 5428, log. 350(00) (col. 0) = 5441, diff. = 13 x 45

correction = 585

Therefore, log. 34,945 = 5428 + 000585 = 543385, and the complete log. = 4.543385.

Example (7): Find log. 349,457.

Proceeding as in example (6)—log. 349(000) (1st col. 9) = 5428, log. 350(000) (col. 0) = 5441, diff. = 13 x 45

correction = 5491

Therefore, log. 349,457 = 5428 + 0005941 = 5433941, and the complete log. = 5.5433941.

Note.—In the following rules and examples we employ the abbreviation antilog. to denote antilogarithm, or the significant figures of a natural number corresponding to the mantissa of a logarithm.

To Find the Number Corresponding to any Given Logarithm.

Table XV. gives a selection of antilogarithms corresponding to mantissa from .000 to .9999.

This table is used in the same way as Table XIV., and gives antilogs. to four figures, which may be correct or slightly incorrect as to the fractional inaccuracy of the differences in the second group of columns. Moreover, if the figures in Tables XIV. and XV. are used conversely with regard to identical numbers discrepancies will often appear in the final figure.

Example (8): For the log. .7049 Table XV. gives—antilog. .704 (0) (1st col. 4) = 5058, diff. (.0009) 9 (2nd col. 9) = 5069

while by Table XIV. log. 5,069 = 7050.

Example (9): By Table XIV. log. 5587 = 7471, while by Table XV. antilog. 7471 = 5586.

It does not follow that the usefulness of four-figure logarithms is seriously impaired by slight inaccuracies of the kind mentioned above.

The point may be illustrated by multiplying together the figures of the numbers 5,069 and 5,587 employed in examples (8) and (9), and comparing the result obtained by the use of Tables XIV. and XV. with that given by ordinary multiplication.

Example (10): By Table XIV. log. 5,069 = 7050, log. 5,587 = 7471, 4521

By Table XV. antilog. 4521 = 2832

The same figures multiplied in the ordinary way give the product

5069 5587 35483 40552 25345 25345 28321573

Now inserting decimal points after the eighth, sixth, and fourth, and second figures respectively the same figures give the comparison:—

28320000 and 28320503 283200 and 283205.05 2832 and 2832.0503 28.32 and 28.320503

The two following comparisons have been made by the use of numbers taken haphazard from Table XIV.:

Table XIV.—FOUR-FIGURE LOGARITHMS. A large grid with columns labeled No., 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 1, 2, 3, 4, 5, 6, 7, 8, 9. It contains numerical data for logarithms of numbers from 10 to 99.

Example (11): Multiply 3.209 by 415.6 By Table XIV.

log. 3209 = 5063, log. 4156 = 6186, 1249

By Table XV. antilog. 1249 = 1333, and the complete log. = 3.1249 = 1,333.

By multiplication 3209 x 415.6 = 1,333.6604. Example (12): Multiply 95.43 by 23.48. By Table XIV.

log. 9543 = 9796, log. 2348 = 3707, 3503

By Table XV. antilog. 3503 = 2241, and the complete log. = 3.3503 = 2,241.

By multiplication 95.43 x 23.48 = 2240.6964. Examples (10) to (12) show that the errors caused by the employment of four-figure logarithms are too small to affect the substantial accuracy of most calculations performed in connexion with the ordinary practice of an architect or building contractor.

In addition to tables containing logarithms of numbers, those containing logarithms of special character should be mentioned.

(1) Cologarithms.—These are simply logarithms of the reciprocals of numbers, their chief use being to permit the process of multiplication to be substituted for that of division, in accordance with the rule that multiplication by the reciprocal of any number gives the same result as division by the number itself.

Cologarithms can be obtained by subtracting the mantissa of ordinary logarithms from 0, but making the characteristic negative for whole numbers and positive for fractions.

Thus Complete log. 8,091 = 3.9080, colog. 8,091 = (0 - 3.9080) = 4.0920.

The reason for the reversed sign of the characteristic is made still more clear by finding the cologarithm from the reciprocal of the number 8,091.

Thus 1/8091 = 0.0001236, Colog. = Log. 0.0001236 = 4.0920

In a general way the use of cologarithms is not to be recommended, as reference to two sets of tables means some waste of time and the risk that mistakes may be made inadvertently.

TABLE XV.—FOUR-FIGURE ANTILOGARITHMS.

Log.	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
.00	1000	1062	1035	1007	1009	1012	1014	1016	1019	1021	0	0	1	1	1	1	2	2	2
.01	1023	1026	1028	1030	1033	1035	1038	1040	1042	1045	0	0	1	1	1	1	2	2	2
.02	1047	1050	1052	1054	1057	1059	1062	1064	1067	1069	0	0	1	1	1	1	2	2	2
.03	1072	1074	1076	1079	1081	1084	1086	1089	1091	1094	0	0	1	1	1	1	2	2	2
.04	1096	1099	1102	1104	1107	1109	1112	1114	1117	1119	0	1	1	1	1	2	2	2	2
.12	1318	1321	1324	1327	1330	1334	1337	1340	1343	1346	0	1	1	1	2	2	2	2	3
.13	1349	1352	1355	1358	1361	1365	1367	1371	1374	1377	0	1	1	1	2	2	2	2	3
.14	1380	1384	1387	1390	1393	1396	1400	1403	1406	1409	0	1	1	1	2	2	2	2	3
.35	2238	2244	2249	2254	2259	2265	2270	2275	2280	2286	1	1	2	2	3	3	4	4	4
.36	2291	2296	2301	2307	2312	2317	2322	2328	2333	2339	1	1	2	2	3	3	4	4	5
.37	2344	2350	2355	2360	2366	2371	2377	2382	2388	2393	1	1	2	2	3	3	4	4	5
.45	2818	2825	2831	2838	2844	2851	2858	2864	2871	2877	1	1	2	2	3	3	4	4	5
.50	3161	3170	3177	3184	3192	3199	3206	3214	3221	3228	1	1	2	2	3	3	4	4	5
.51	3236	3243	3251	3258	3266	3273	3281	3289	3296	3304	1	1	2	2	3	3	4	4	5
.52	3311	3319	3327	3334	3342	3350	3357	3365	3373	3381	1	1	2	2	3	3	4	4	5
.53	3385	3393	3401	3410	3418	3426	3434	3443	3451	3460	1	1	2	2	3	3	4	4	5
.54	3467	3475	3483	3491	3499	3508	3516	3524	3532	3540	1	1	2	2	3	3	4	4	5
.55	3548	3556	3563	3573	3581	3589	3597	3603	3611	3622	1	1	2	2	3	3	4	4	5
.60	3931	3939	3949	3959	3968	3977	3986	3995	4004	4013	1	2	3	4	5	6	7	8	9
.61	4013	4023	4032	4041	4051	4060	4070	4079	4088	4098	1	2	3	4	5	6	7	8	9
.70	5012	5023	5035	5047	5058	5070	5082	5093	5105	5117	1	2	3	4	5	6	7	8	9
.71	5129	5140	5152	5164	5176	5188	5200	5212	5224	5236	1	2	3	4	5	6	7	8	9
.72	5248	5260	5272	5284	5297	5309	5321	5333	5346	5358	1	2	3	4	5	6	7	8	9
.73	5370	5383	5395	5408	5421	5433	5445	5457	5470	5483	1	2	3	4	5	6	7	8	9
.74	5495	5508	5521	5534	5546	5559	5572	5585	5598	5610	1	2	3	4	5	6	7	8	9
.87	7143	7150	7157	7164	7172	7179	7186	7194	7201	7209	2	3	5	7	9	10	12	14	16
.90	7913	7922	7931	7939	7947	7955	7963	7971	7979	7987	2	3	5	7	9	11	13	15	17
.95	8913	8923	8933	8943	8953	8963	8973	8983	8993	9003	2	3	5	7	9	11	13	15	17
.96	9013	9023	9033	9043	9053	9063	9073	9083	9093	9103	2	3	5	7	9	11	13	15	17
.97	9113	9123	9133	9143	9153	9163	9173	9183	9193	9203	2	3	5	7	9	11	13	15	17
.98	9213	9223	9233	9243	9253	9263	9273	9283	9293	9303	2	3	5	7	9	11	13	15	17
.99	9313	9323	9333	9343	9353	9363	9373	9383	9393	9403	2	3	5	7	9	11	13	15	17

owing to the reversed nature of the rules under which tables of cologarithms are applied.

Example (13): Find the value of $37.5 \times 90 \times 36$
 $3 \times 0.024 \cdot 74$,
 using (a) ordinary logs, throughout, (b) ordinary logs, for numerator, and cologs, for the denominator.

By Table XIV.

	(a)	(b)
log. 37.5	= 1.5740	log. = 1.5740
90	= 1.9542	= 1.9542
36	= 1.5563	= 1.5563
log. 3	0.4771	colog. = 1.5229
0.024	2.3802	= 1.6198
74	1.8692	= 2.1308
	4.3580	4.3580

By Table XV., anti-log. 3580 = 2280, and as char. 4 demands five figures in the product the required value = 22.8.

Gaussian Logarithms.—These are sometimes termed addition and subtraction logarithms, their object being to enable the sum or difference of the logarithms of two numbers to be found when the numbers themselves are not known.

Although the first published table of these logarithms was due to Gauss, of Göttingen, that distinguished mathematician was not the originator of the system which bears his name.

Gaussian logarithms consist of two series, B and C respectively, bearing certain relations to each other and to ordinary logarithms, which we will term Series A.

Thus Series A. = $\log. x$
 „ B. = $\log. \left(1 + \frac{1}{x}\right)$
 „ C. = $\log. \left(1 + x\right)$

Taking $x = 500$ by way of illustration, we have

A. = $\log. 500$ = 6990
 B. = $\log. \left(1 + \frac{1}{500}\right)$ = $\log. 1.002$ = 0008
 C. = $\log. (1 + 500)$ = $\log. 501$ = 6998

As the processes of addition and subtraction applied to ordinary logarithms result in multiplication and division, the convenience of Gaussian logarithms is obvious, but their use is chiefly limited to trigonometrical and actuarial calculations.

Logarithms of Trigonometrical Functions.

Numerous tables have been published giving logarithmic sines, tangents, secants, and other angular ratios.

Such tables published in this country have been derived by adding 10 to the logarithms of the natural functions, the object being to void the use of negative characteristics.

For instance, the natural $\sin. 0^\circ 1' = 0.0002909$, log. $0.0002909 = 4.4637261$, and adding 10, we have $(10 - 4)4637261 = 6.4637261$.

For the sake of uniformity the same treatment is adopted with respect to all trigonometrical ratios, although it is not necessary for any other reason in the case of functions whose values are always greater than unity.

THE LONDON BUILDING ACT.

TRIBUNAL OF APPEAL CASE.

ON Tuesday the Tribunal of Appeal sat at the Surveyors' Institution to hear an appeal by Mr. John W. Watkin, solicitor, on behalf of the South-Eastern and Chatham Railway Company's Managing Committee and others against the certificate of the Superintending Architect of Metropolitan Buildings, dated March 24, 1906, under sects. 22 and 29 of the London Building Act, 1894, defining the general line of buildings on the north-west side of Crystal Palace-parade, Camberwell, between College-road and Farquhar-road. Mr. Frank Mellor appeared for the appellants and Mr. R. P. Mahaffy was for the respondents. Mr. Tagg, Town Clerk, represented the Camberwell Borough Council.

Mr. Mellor, in opening, said he attended for the Managing Railway Committee, the Coal Co-operative Company, and Mr. Stewart, a builder. The Crystal Palace-road was a road between the Crystal Palace and the north-east side of the Crystal Palace High Level Station. The Superintending Architect had defined the general line as being the existing line of the wall of the station itself. The corner where the building was being erected immediately adjoined the exit for the High Level Station, the exit having a covered way to the curb. What the Managing Committee of the railway company contended was that, having regard to sect. 31 of the Act, the laying down of this general line would affect the exercise of their powers. The point was whether or not this particular building was not exempt from the operation of the Act. The railway company was empowered to do what they had done—viz., let a small portion of the corner frontage for a temporary purpose, reserving to themselves the right to resume possession of it if they required it for their own purposes.

Mr. Hudson asked what the company's grievance was.
 Mr. Mellor said that the Superintending Architect had given them notice requiring them to remove the building or proceedings would be taken.

Mr. Hudson asked if the position of the appellants was not that of paying no attention to the notice, and then if the architect proceeded the appellants could state their powers.

Mr. Mellor said that was certainly one position they might have taken up, but he submitted that it was more convenient for them to come there, because should the respondents take police-court proceedings then his clients might be prejudiced by having paid no attention to the Superintending

Architect's notice. This was a general line laid down entirely on railway property.

Mr. Mahaffy said his contention was that the Tribunal had no right to say whether or not the buildings were exempt. It was a matter for the High Court, and several cases of a similar character had been decided.

Mr. Mellor contended that the Tribunal had special power to deal with such cases, and it could not be said that the appellants were not aggrieved.

Mr. Hudson. The question is whether the Superintending Architect has any power to define this general line.

Mr. Mellor: I say he has not.
 Mr. Hudson said if that was so then the appeal must be dismissed. If the architect had no power, then he could not hurt the appellants.

Mr. Mellor said if the Tribunal did a notice. Mr. Hudson said if the architect had no power, then the notice was wastepaper.

Mr. Gruning asked if the appellants said the line laid down was not the general building line.

Mr. Mellor said his submission was that the general building line should be laid along the retaining wall between the road and the railway company's property.

After consultation Mr. Hudson said that apparently the Tribunal had powers to consider whether or not the line proposed to be fixed would affect the railway company's statutory powers.

Mr. Hudson proposed to put in Acts of Parliament and plans showing that the land in question was owned by the companies, and it was within their power to pull down the present station wall and build a platform on the land if they cared to. Consequently he contended that it was within the railway companies' power temporarily to let a portion of the land, as had been done in this case to the Coal Co-operative Society, at one week's notice, for a coal office.

Mr. Hudson asked if Mr. Mellor wished to decide that the certificate affected the exercise of the powers conferred upon the railway company for railway purposes, and, therefore, was invalid. Mr. Mellor said if the Tribunal did that he did not want any further building line fixed.

Mr. Lloyd, engineer, was called to prove that the land was not superfluous land.

Mr. Mahaffy said the London County Council submitted that the case raised a legal issue, and for them to decide the case was usurping the position of the High Court. On the merits of the case he contended that exemption from the Building Act would only apply to land actually used for railway purposes. It was not to be contended that a railway company could hand over their exemption under the general law to other persons.

Mr. Tagg argued that the appeal was against the defining of the building line, and if the building were used for railway purposes then the line would not apply. Under the agreement with the Coal Co-operative Company the company had to pay the rates and taxes, and it could not be said that it was a building erected for railway purposes.

The Tribunal reserved their decision.

Illustrations.

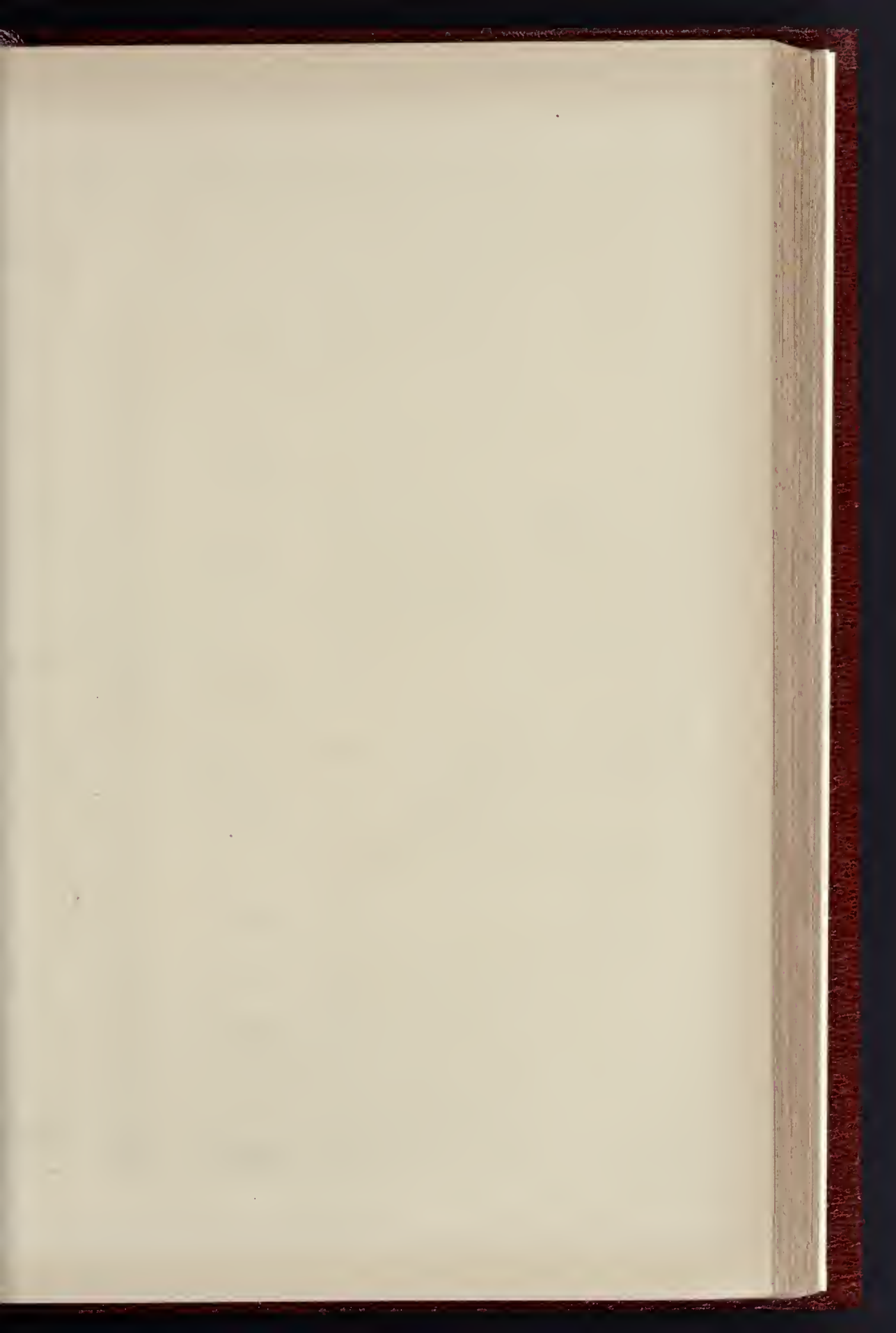
REGENT'S QUADRANT.

THE illustrations in this issue are all portions of what may be regarded as one scheme, from the design of Mr. R. Norman Shaw, R.A., for the rebuilding of the street front of Regent's Quadrant, and for remodelling the site and frontage lines connected with what is at present known as Piccadilly-circus.

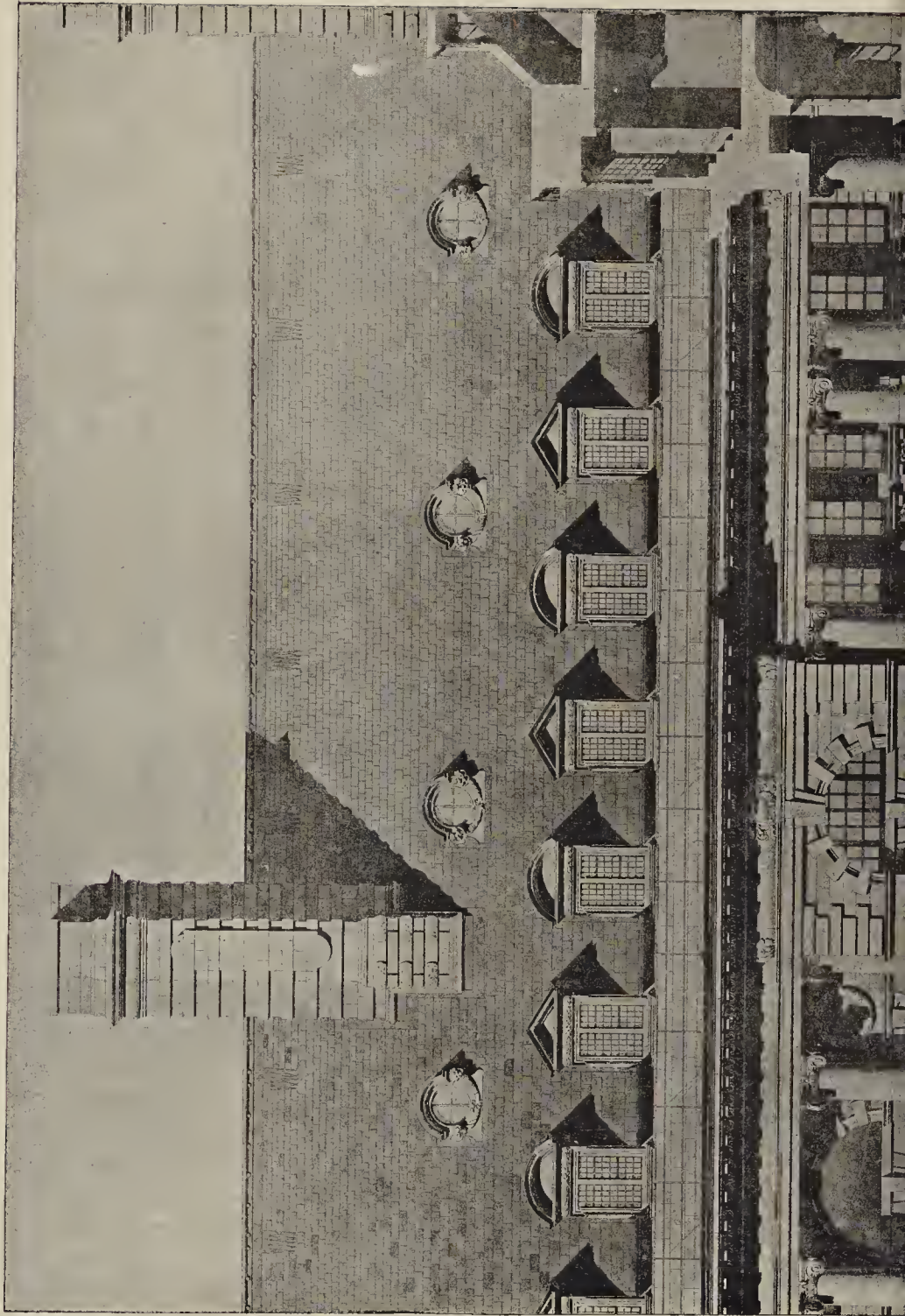
The whole scheme is described and commented on in the first article in this issue, to which the reader is referred.

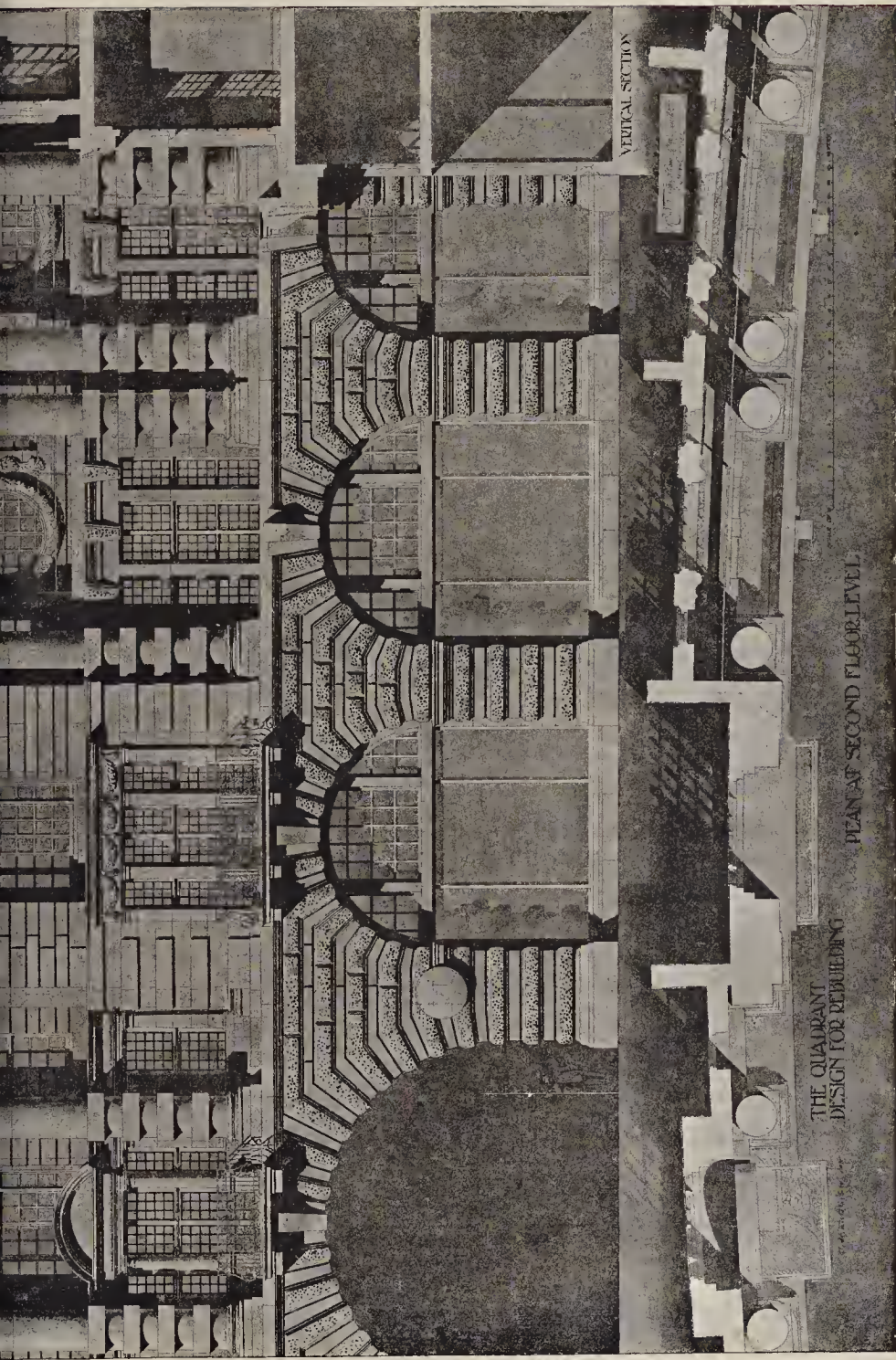
WAR MEMORIAL, CARMARTHEN.—On the 27th ult. Major-General Mackintosh unveiled the monument which has been erected at Carmarthen in memory of the local men who fell in the Boer war. It consists of a massive grey forest stone base, with sub-base of red Aberdeen granite, the whole being surmounted by a rather more than life-size figure of a British officer in white Sicilian marble. The total height of the monument is about 22 ft. The design was prepared by Messrs. Collier & Jencks, architects, Carmarthen.

The T-Square Club was held on Tuesday last at the Galleries of the Royal Society of British Artists. Among the more noticeable items on the long programme were the recitations by Mr. William Poel and Mr. Richard Temple, the singing of Mr. James L. T. Tanner (a daughter of Mr. Augustus Tanner, Clerk of the Bench), and concert by Arthur Grover, the violin playing of Mrs. A. H. G. Patey, and the imitations of actors by Mr. Lewis Benet. Among those present were Sir Aston Webb, who presided, and Lady Webb, Mr. and Mrs. Caröe, Mr. Alexander Graham, and other well-known members of the profession.



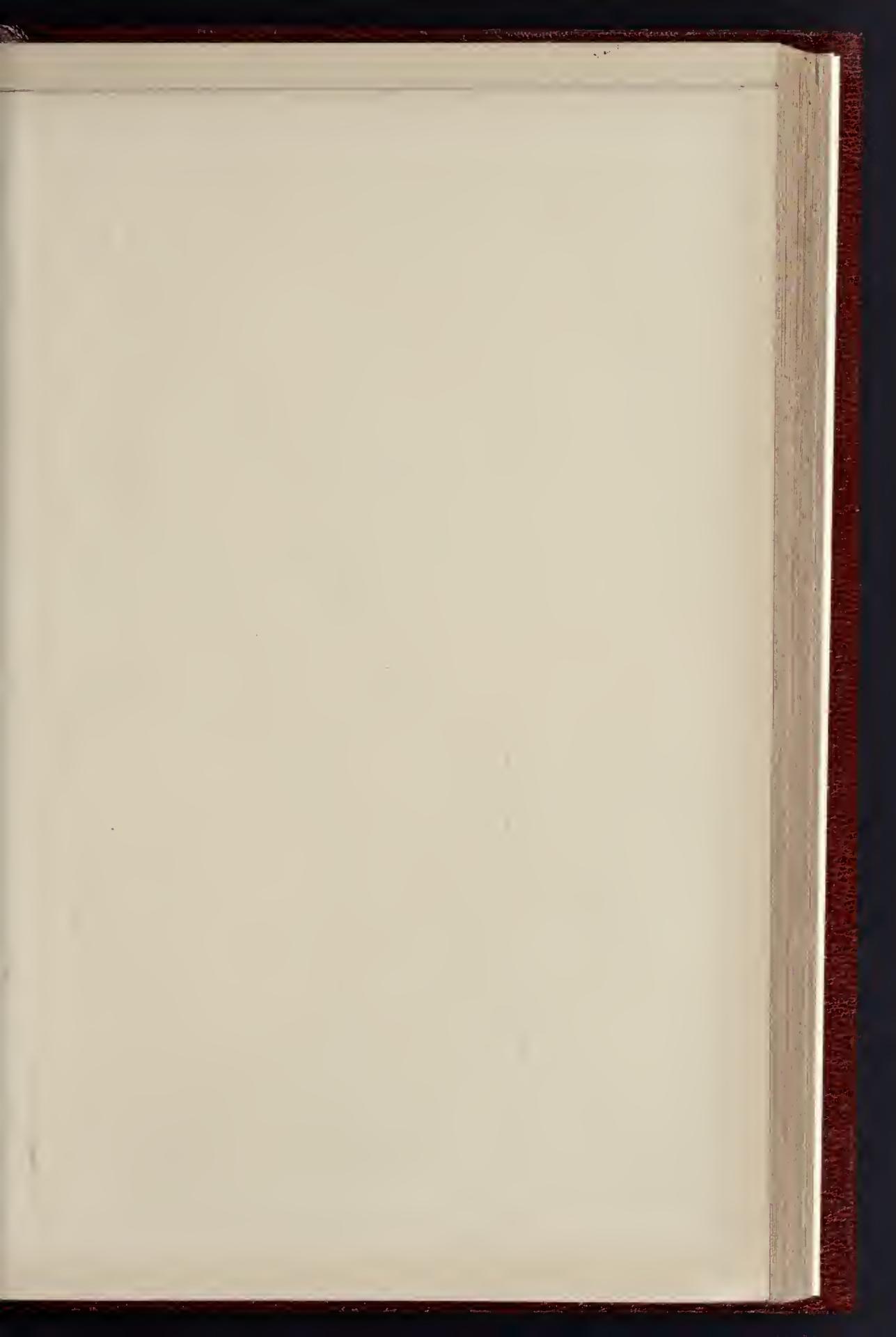
THE BUILDER, MAY 5, 1906.





INK PHOTO SPRAGUE & CO. 4.5 EAST HARRING STREET FETTER LANE E.C.

DETAIL ELEVATION FOR PART OF THE QUADRANT—MR. R. NORMAN SHAW, R.A., ARCHITECT.



THE BUILDER, MAY 8, 1904

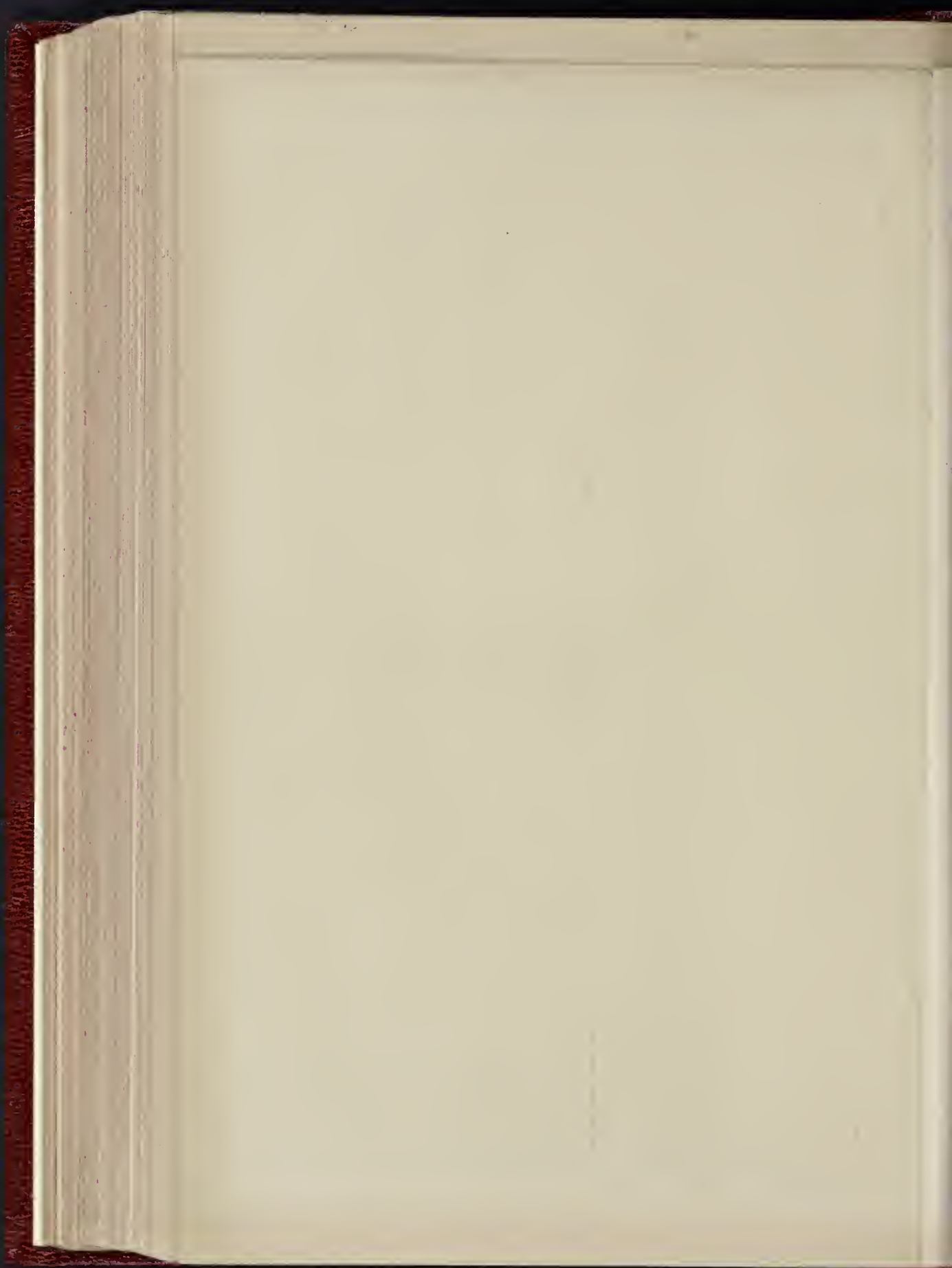


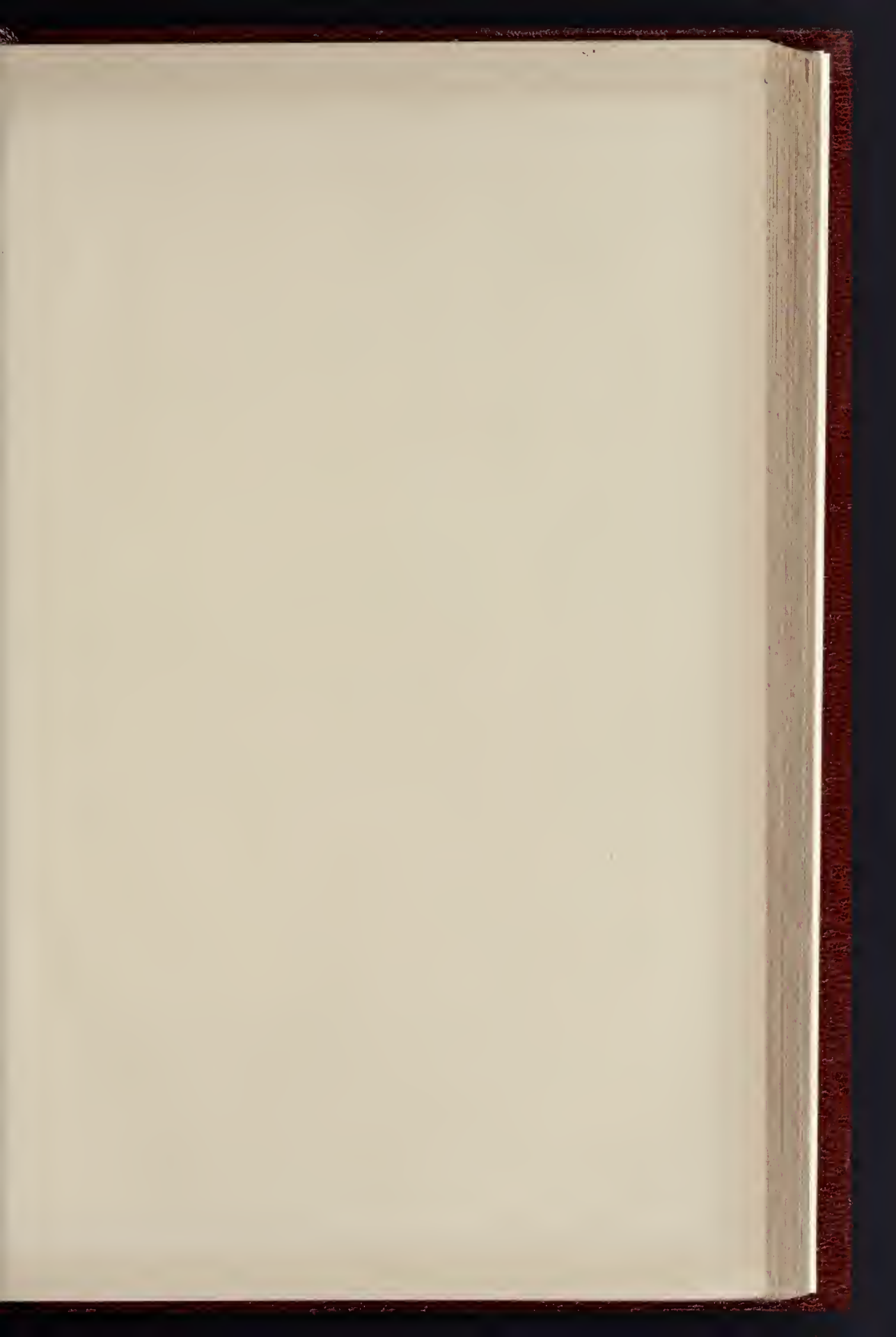


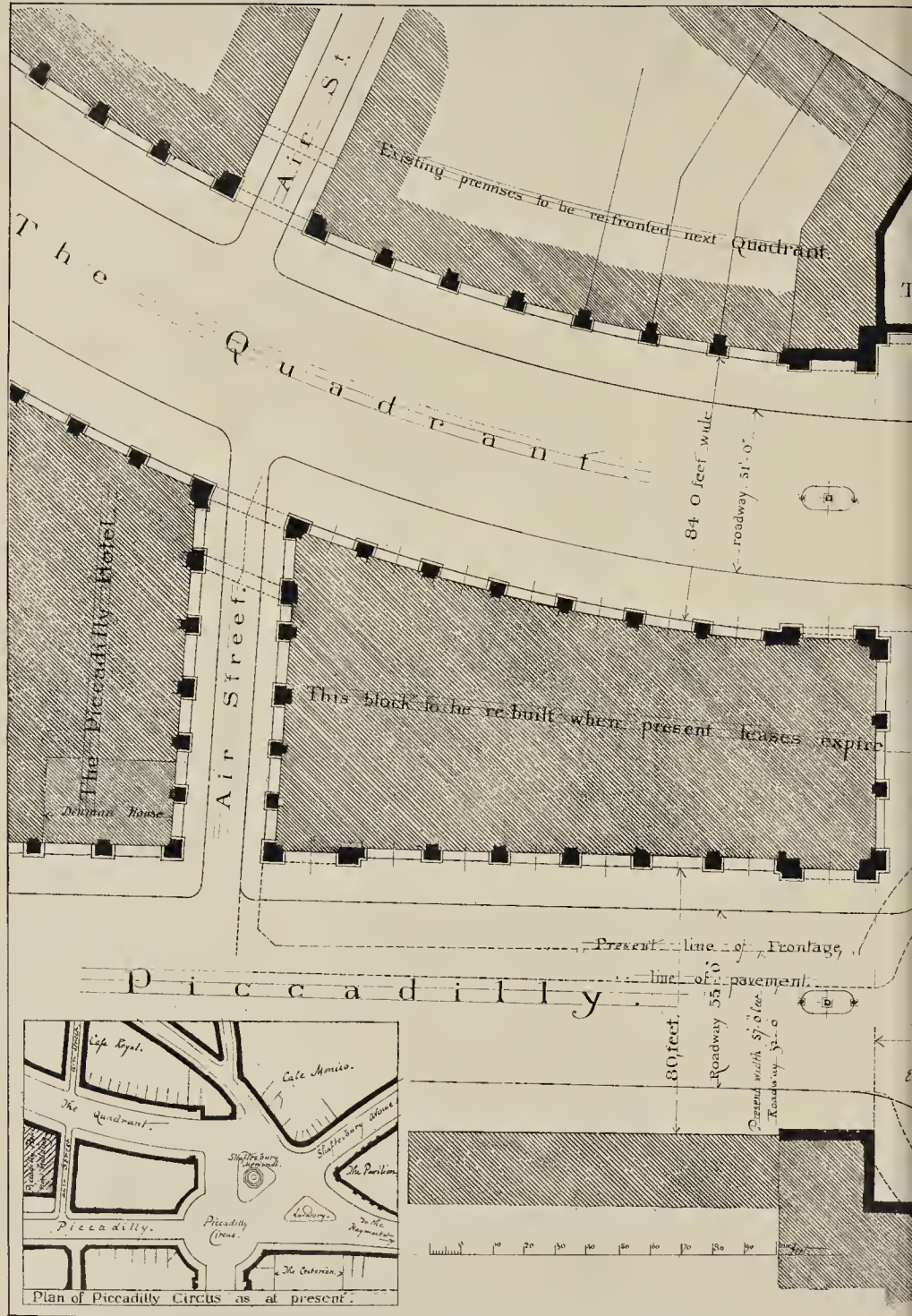
THE QUADRANT, REGENT STREET

Now being Re-erected from Designs prepared for the Office of Woods, as Mr. B. Nisbet, Architect, U.S.

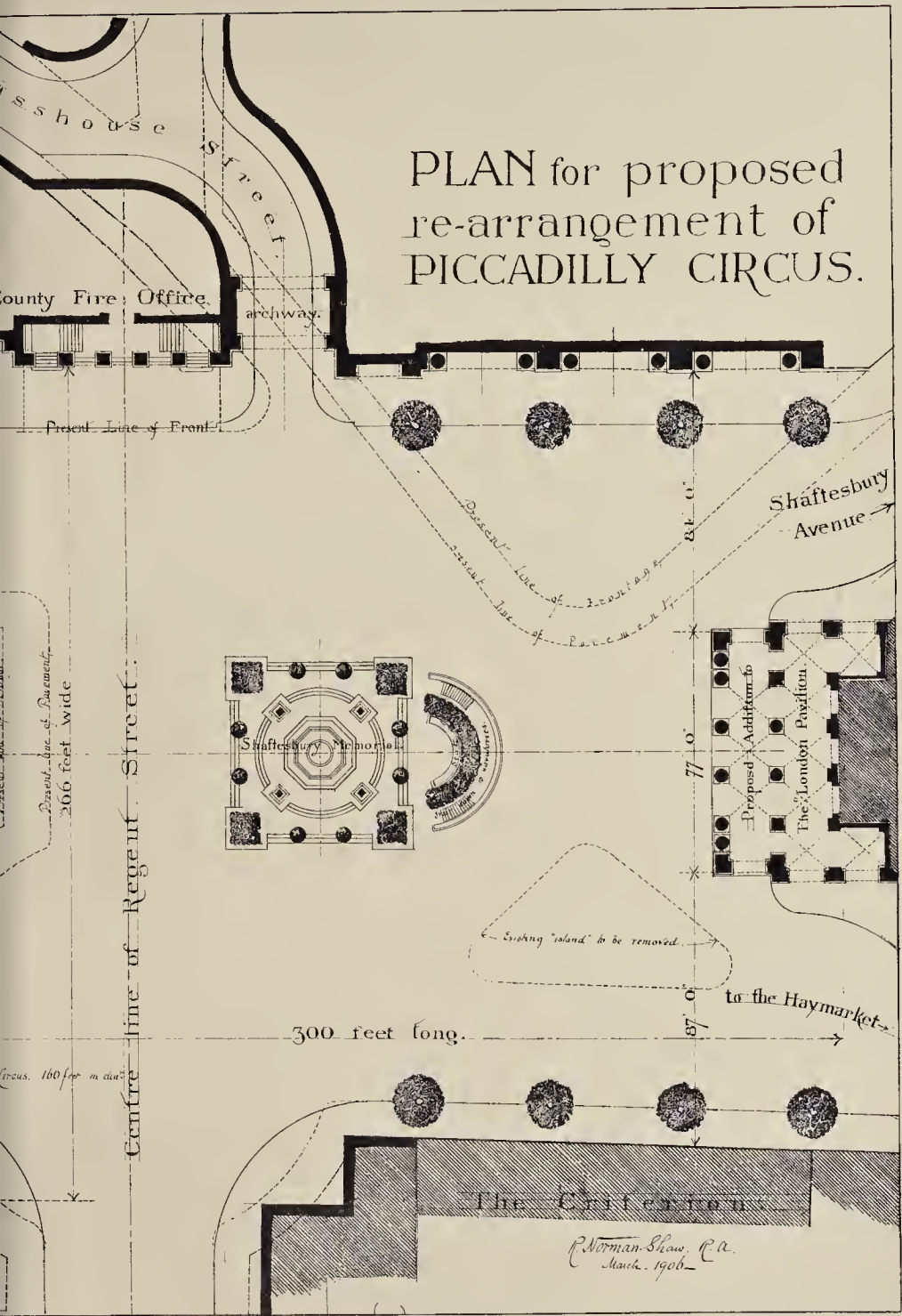
C. W. E. 1850





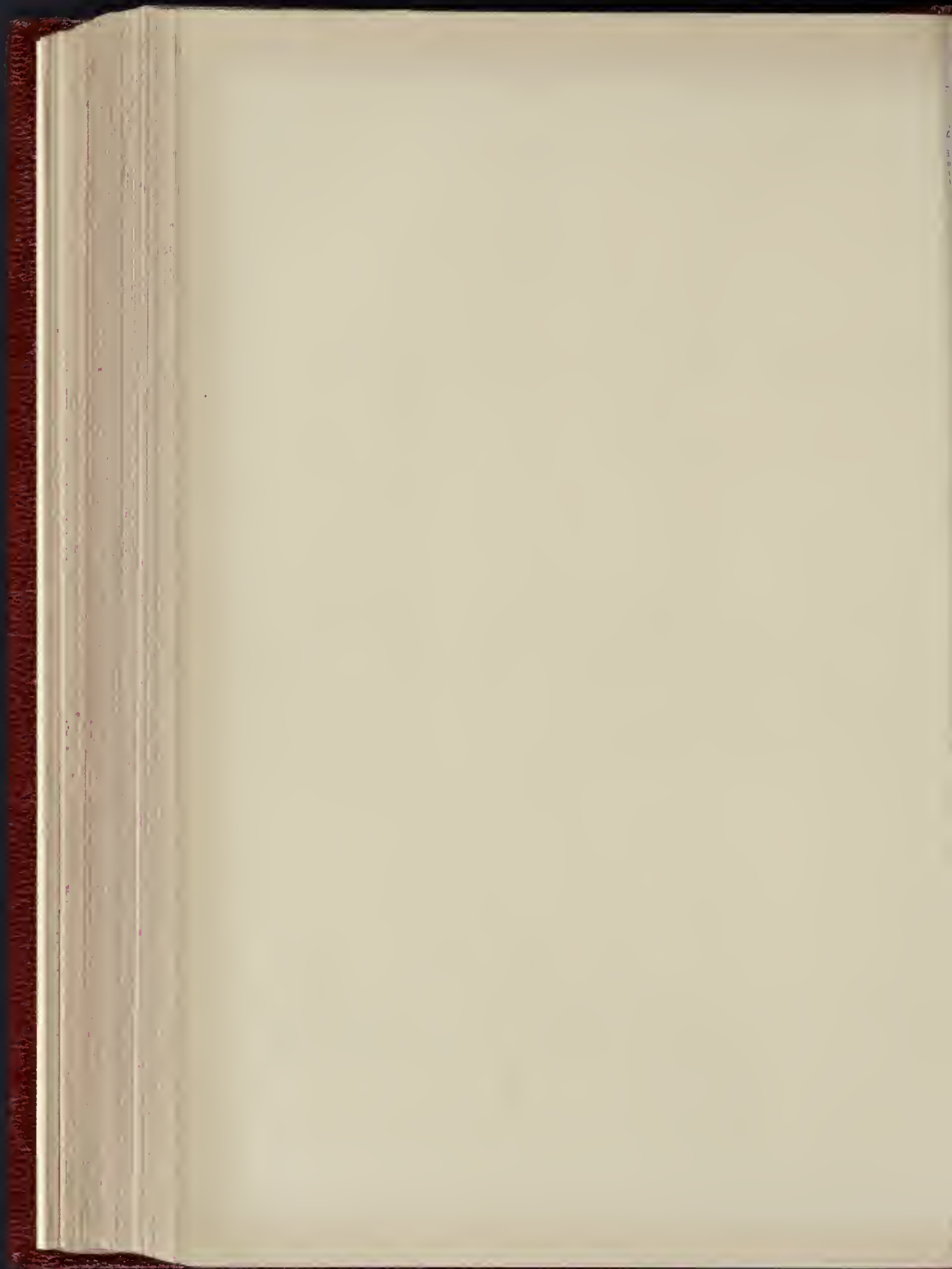


PLAN for proposed re-arrangement of PICCADILLY CIRCUS.



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

RE-ARRANGEMENT OF PICCADILLY CIRCUS.
BY MR. R. NORMAN SHAW, R.A.



COURT OF COMMON COUNCIL.

A MEETING of the City Corporation was held by the Guildhall on Thursday last week, the Lord Mayor presiding.

Street Improvement.—The Improvements and Finance Committee reporting on the references to opening up and improving means of communication in the Parish of St. Bartholomew's—Great and the immediate neighbourhood, also as to the desirability of extending proposed improved means of communication through Fore-street, stated that, on account of the large cost that would be involved, they are still unable to advise that Parliamentary or other action should be taken to acquire property for the purpose of such improvements.

Engineer's Report.—The same Committee omitted the Engineer's Report on the works executed by the Public Health Department during the year 1905.

Windsor-circus Garden.—It was agreed, on the recommendation of the Streets Committee, to close the outer pathway of this garden, and to let it park up at an estimated cost of £20.

Payment of Quantity Surveyors.—A letter was received from the Honorary Secretary of the Quantity Surveyors' Association, forwarding a copy of a scale of charges for payment of quantity surveyors in connexion with public works on an organ in the practice-room of the Guildhall school of Music, at a cost not exceeding £1,000. The Council of the City's cash, such amount to include unusual alterations and all other incidental expenses.

New Organ.—The Music Committee were authorised to give directions for the erection of an organ in the practice-room of the Guildhall school of Music, at a cost not exceeding £1,000. The Council of the City's cash, such amount to include unusual alterations and all other incidental expenses.

The Central Markets.—The Central Markets Committee asked for authority to retain the services of Mr. A. Watson, M.Inst.C.E., to make a thorough examination and full report on the iron and steel work of the structures and structures of the London Central Markets.—The Court agreed.

Competitions.

BARNSELY ELEMENTARY SCHOOL.—In the competition for the elementary school in Bacon-road, Barnsley, the assessor, Mr. W. S. Braithwaite, of Leeds, has made his award as follows:—1st premium, 30*l.*; Mr. E. W. Dyson, C.E.; 2nd premium, 20*l.*; Mr. A. Wilby; 3rd premium, 10*l.*; Mr. E. W. Dyson, C.E. The Education Committee have selected Mr. Dyson's design to be carried out.

GREENWICH BRANCH LIBRARY.—The Libraries Committee of Greenwich Borough Council reported, on Monday, the receipt of communication from Mr. A. W. S. Cross, R.I.B.A., the assessor of the designs submitted for the branch library, asking that, on account of the exceptionally large number of designs submitted for adjudication, and of the amount of work devolving upon him, an addition be made to his fee of 50 guineas. The Committee felt bound to admit that the number of designs submitted (172) exceeded their anticipations. The number on a previous occasion was eleven, and the work falling upon the assessor had therefore been very much greater than had been expected. It was also to be borne in mind that the assessor, in addition to advising the Council as to the several designs meriting the premiums offered, wrote a report criticising each of the 172 designs, and this was highly appreciated, not only by the Committee, but also by the competing architects, many of whom had expressed their appreciation of the manner in which the Council carried out the competition. Further, the assessor advised the Committee as to the site, and upon questions arising in connexion with the proposal to pull down the existing buildings, and as the most suitable general scheme for the branch library. Altogether, in consideration of the extra services performed by Mr. Cross in connexion with the competition, the Committee had decided (subject to the usual action) to offer him 15 guineas in addition to the fee of 50 guineas already paid him.

ALTAR-RAILS, CODFORD ST. PETER, WILTS.—The altar-rails of English oak, have just been dedicated in Codford St. Peter Church, Wilts, in memory of the late Miss Charlotte Anderson, that parish. They are of a Jacobean balustrade pattern, and were designed by Mr. H. A. Bernard, of London.

BOOKS RECEIVED.

PRACTICAL PAINTER'S WORK. Edited by Paul N. Hasluck. (Cassell & Co.)

CHINESE ART. By Stephen W. Bushell.

Vol. II. (H.M. Stationery Office.)

THE NEW GUIDE TO BRISTOL AND CLIFTON.

Edited by James Baker, F.R.Hist.S. (J. Baker & Son, Clifton.)

Correspondence.

THE DUST PROBLEM—SOME PRACTICAL PROPOSALS.

SIR,—The inconvenience and the dangers which have been endured this Easter as a result of the manner in which our roads are made are only a foretaste of what will be suffered by the general public during the summer months. The well-being of the population, therefore, demands that very immediate and practical steps should be taken to encourage the local authorities to build the main roads of this country of dustless materials.

Unless the State takes some active steps to encourage the local authorities in the construction of dustless roads there is no doubt that very little progress will be made in this matter.

The Roads Improvement Association are approaching the President of the Local Government Board on the question. They have asked Mr. John Burns to receive a deputation which, among other things, will urge—

(1) That the Local Government Board prepare a return of the steps that have so far been taken by Highway Authorities to construct roads of dustless materials.

(2) That the Engineering Inspectors of the Board investigate these experiments and issue a report for the guidance of Local Authorities dealing with the results so far secured, and giving such guidelines as may be possible as to methods of construction, degree of dustlessness required, durability of materials, and comparative cost.

(3) That the Local Authorities be encouraged to contribute towards the cost of certain experiments with dustless materials about to be made by the Association, and that the Local Government Board appoint a representative to act upon the Committee which has charge of these experiments.

(4) That the Local Government Board represent to the Chancellor of the Exchequer and the Government the desirability of giving effect to the recommendation of the Royal Commission on Local Taxation (Lord Balfour's Commission)—a recommendation subsequently endorsed by the Departmental Committee on Highways appointed by the Board—that a further contribution of One Million sterling should be made annually towards the cost of the maintenance of main roads, and that that grant should be accompanied by conditions calculated to secure efficient maintenance.

(5) That the Board promote legislation empowering County Authorities to fix a minimum width for all trunk roads.

In its attempts to deal with the dust problem on the above practical lines the Association venture to ask for your powerful support.

W. REES JEFFREYS,

Honorary Secretary Roads Improvement Association.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION PAPER ON FERRO-CONCRETE.

SIR,—Two distinct statements were made in the copy of Mr. Bylander's paper which was sent to me.

(1) "It is advisable to use as few bars as possible, in order to simplify the construction."

(2) "The moments on each side of the neutral axis must be equal, and therefore $R_c \times D_c = R_s \times D_s$, and $R_s \times D_s = \frac{M_b}{2}$."

These statements appear to have been either deleted or corrected in the paper as published in the *Builder* of April 21st. I hope you will find space for this explanation of the reason for my remarks, as they appear somewhat unnecessary when read in connexion with the paper as published.

CHARLES F. MARSH.
* * We were not able to print more than a résumé of Mr. Bylander's paper, and we did not notice Mr. Marsh's allusion to the parts omitted.—Ed.

SAN FRANCISCO BUILDINGS.

SIR,—In my letter of last week, which you so kindly inserted, I aimed at brevity at the expense of being sufficiently explicit.

The "Mint" at San Francisco is a building of some forty or more years of age, and consequently has no iron or steel framework and relies solely upon its walls for stability.

Of course, subsequent accounts proved that other buildings escaped with more or less damage.

JOHN J. ROBSON, M.Inst.C.E.

* * This seems to show that stone-built buildings of a really solid structure may sustain earthquake shock successfully, though the general evidence points to ferro-concrete as the most reliable.—Ed.

General Building News.

CHURCH, ASHTEAD.—The new church of St. George at Ashted was consecrated by the Bishop of Dorset (Dr. Boutflower) recently. The building has been erected by Messrs. J. Dorey & Co., Ltd., from the plans of Sir Arthur Blomfield & Sons, at a total cost of about 3,413*l.* The church will consist, when completed by the addition of the south aisle and vestries, of a nave 25 ft. wide with accommodation for 228 persons, two aisles each 12 ft. 7½ in. in width, each accommodating about fifty persons, the length of nave and aisles being 60 ft. The chancel is 32 ft. in length, and has an arch on either side, that on the north leading into a transept capable of seating forty persons and that on the south opening into an organ chamber, below which is situated the choir vestry, with the clergy vestry to the east of it. At the west end is provided a baptistry, below which is the heating-chamber, from which the church is warmed by a low-pressure system of hot water executed by Messrs. R. Crittall & Co. The church is built of red brick, both inside and out. At the east end above the altar is a polished green Devonshire marble retable but the wall and supports on corbels. The roofs are executed in deal and are covered with local hand-made tiles, the bell flèche being covered with oak shingles. The floors generally are laid with pitch-pine blocks, the chancel being laid with Rusts vitreous mosaic to the architects' design. The church is ventilated by iron casements by Messrs. R. E. Pearse & Co., which for fresh air being given by Tolins built into the sills of the aisle windows. The church is lit with gas, the fittings being supplied from the architects' design by Messrs. Hart, Son, Peard, & Co.

PRIMITIVE METHODIST CHURCH, STRETTON.—The foundation-stone of a new Primitive Methodist church was recently laid at Stretton. The building is situated at the north corner of Watling-street and Cross-street, and the total cost will be about 1,300*l.*, and Mr. W. Scott Deakin, of Shrewsbury, is the architect. The materials used are red brick with stone dressings, and red tile roof. The interior will be of pitch pine in the roof and pews, with wood block floor and oak rostrum. Seating accommodation will be provided for about 300. Mr. T. Speke, of Church Stretton, is the builder.

FARNHAM GRAMMAR SCHOOL.—The Archbishop of Canterbury has just opened the new grammar school. The new building is of red brick, with tiled roof, and, with the headmaster's house, which is included, is 160 ft. long and 45 ft. wide. The principal entrance is by an oak door, which opens into a vestibule, from which a hall, with black and white marble tiles, is gained through swing doors. Beyond the cloak-room on the left is an art room. On the other side of the building is a laboratory. The whole of the fittings have been designed by Professor Armstrong, and have been supplied by the Bennett Furnishing Company. On the ground floor there is also a dining-hall, which will enable ninety boys to take their mid-day meal at the school. From the hall a stone staircase, with balusters and panelling of British oak, leads to the upper floor. Leading from this are four classrooms, each with a movable class partition, so that they may be thrown into the big school. On the landing is another classroom, which will be used as a boarders' common room, and beyond, over the headmasters' quarters, are two dormitories, accommodating from twenty to twenty-five boys. One will be for junior and the other for senior boys, but for the latter including an assistant master's cubicle. Crowning the roof of the school is a bell turret, with oak columns and copper-covered dome and weather vane. Away from the main building is a manual instruction-room, and adjoining are latrines, etc. The architects were Messrs. Jarvis & Richards, London, architects to the Surrey Education Committee, the contractors being Messrs. Crosby & Co., of Farnham. The total cost, inclusive of site, furnishing, etc., will, we understand, be about 13,000*l.*

Y.M.C.A. BUILDING, LEEDS.—New premises for the Leeds Young Men's Christian Association are being erected at the junction of Albion-place and Albion-street, Leeds, from the designs of W. H. Thory. The building will consist of five floors, including the basement. The basement will contain a gymnasium, about 20 ft. high, with the necessary dressing and other rooms. There will also be a still-room and cycle store, as well as showrooms connected with the shops above. The ground floor is to comprise an entrance-hall and lounge, with various staircases, as well as five shops and several offices. The lecture-hall, with gallery equal to accommodating 450 persons, will be on the first floor, and will be available for public meetings, chamber concerts, or other purposes. A reception-room, with buffet, reading-room, lavatories, and offices, will also be on this floor. The second floor will be devoted to the library, meeting, writing, and committee-rooms, and provides access to the gallery of the lecture-hall, whilst on the floor above will be found

classrooms, photographic and work rooms, and the caretaker's apartments.

INSTRUMENT FOR THE BLIND, SHEFFIELD.—Mr. S. Roberts, M.P., opened the new West-street premises of the Sheffield Blind Institution on the 20th ult. The original building was erected from plans prepared by Messrs. Gibbs & Flockton about twenty years ago at a cost of about 3,500l. Owing to the widening of West-street by the Corporation, 10 ft. of the original building was required, which necessitated the taking down and rebuilding on the new frontage line. The new erection now covers the site enclosed by West-street, Carver-street, West-street-lane, and Holly-lane. The new front is in the Renaissance style, freely treated, the other elevations being carried out to suit the existing building. The contract has been executed by Messrs. Daniel O'Neill & Son, from plans prepared by Mr. Edmund Winder, architect, at a cost of 4,610l. The premises consist of two lock-up saleshops, with cellaring, in addition to the Institution, and comprise the following:—Ground floor: Two lock-up saleshops, large retail shop, warehouse, basket-makers' department, good side main entrance, small yard, spacious hall, and stone staircase up to the top of building, also iron emergency staircase. First floor:—Caretaker's house, committee room, dining-room, meeting-room, and workmen's workroom. Second floor: Two large workshops, store warehouse, foremen's office, and store. Third floor: Brush-making department and stores. The buildings are lighted by electric light. The basement consists of large, lofty, and well-lighted cellaring.

LIBRARY, ABERYSTWYTH.—The new buildings, situate in Alfred-place, were opened recently by Mrs. Vaughan Davies. The building was designed by Mr. Walter G. Payton, Birmingham. The ground floor is divided into a reading-room, with papers on stands, the library, reference library, and a private room for the librarian, which can also be used for committee meetings. The buildings have been erected by Messrs. Edwards Bros., with Mr. Savage as clerk of the works.

LIBRARY, WEST BROMWICH.—The foundation-stone of a new public free library, adjoining the existing library premises in High-street, West Bromwich, was laid on the 27th ult. The architect is Mr. S. J. Holliday.

CONVALESCENT HOME, HUNSTANTON.—The Hunstanton Convalescent Home for the accommodation of children, the foundation-stone of which was laid on the 26th ult., faces south and west; the general design harmonises with the present buildings. The main entrance leads immediately to the centre of the block of the new wards, and a corridor gives direct access to the girls' and boys' sides. Separate staircases are provided near the garden doors. The kitchen and offices are placed centrally, and with top light and ventilation to the former. The architect is Mr. A. P. MacAlister, of Cambridge; Messrs. G. Clark & Sons, of Cambridge, are the contractors.

SCOTTISH TEMPERANCE LIFE ASSURANCE COMPANY BUILDINGS, BELFAST.—The new building which has been erected by the Scottish Temperance Life Assurance Company, Ltd., at the corner of Donegall-square South and Bedford-street was opened on the 27th ult. The new building is designed in the Scottish Baronial style, and the architect was Mr. Henry Seaver. The outer walls are built of sandstone from the Ballochmye quarries, Scotland, and the main piers are of dark green Swedish granite, and the roof is covered with green Welsh slates. At the entrance from Donegall-square South the walls are covered with Italian marble, and the floor inlaid with Roman mosaic. Access to the different floors is obtained by means of two electric hoists which run side by side. The company will occupy a suite of offices on the ground floor—fitted up with polished teakwood panelling, counters, etc. The staircase is of cut-stone from Robin Hood quarries, Yorkshire. Almost the whole of the top floor has been taken by a group of Masonic lodges. The building has been heated throughout by Messrs. Musgrave, Ltd., on the low-pressure system, with radiators in all the ninety rooms. The electric lighting is taken from the Corporation mains, and the installation was carried out by Messrs. W. Coates & Son, Ltd. Mr. John Woodside, A.M.I.E.E., was the consulting engineer for this portion of the work. All the corridors, which are paved with mosaic, are fireproof, and each suite of offices is provided with a strong room, situated in the round turret, which are a feature on the main elevation. At the rear a warehouse has been erected. Messrs. James Henry & Son were the contractors for the entire work. Messrs. John Dowling & Son, Queen-street, had charge of the plumbing contract; the hoists and enclosures were erected by Messrs. A. & R. Stevens, Glasgow; mosaic and terrazzo flooring was laid by Messrs. Ebner & Co., London; the lead lighting was carried out by Messrs. Ward & Partners, Belfast; Messrs. Shaw & Co. had charge of the wall tiling; Messrs. Purdy & Millard, Belfast, were contractors for the lining of marble in entrance-hall; Messrs. Milner & Co., Ltd., built all the fireproof

doors; and Messrs. Henry Hope & Son constructed all the steel window casements.

A CONCRETE DOME in Granolithic Stone Company have just shipped off, in numbered sections, a ferro-concrete dome made for Sir Aston Webb's new Law Courts at Hong-Kong. The dome has a base diameter of 50 ft., and a rise of 37 ft. to the lantern base, thence to the pinnacle of the lantern 19 ft. The stones going to make this dome are prepared in curved segments, having a surface varying from 6 ft. 6 in. by 2 ft. 5 in. to about 18 in. at the top. Their average thickness may be put at 1½ in. They are all rebated and checked at the joints, so as to interlock into each other, and with raised dovetailed flanges. The roll covers are shaped to the detail drawing and are also rebated for interlocking into the raised flanges. Round the dome base is a circular gutter in granolithic. Besides the dome there are the pediment roofs, which were treated in a similar manner, only that the stones or tiles are straight. We had an opportunity of seeing a part of the work before it was shipped; it makes a very light dome, and the use of ferro-concrete in this manner promises an opportunity of forming a dome with a weather-proof structural exterior which will be independent of the requirement of less durable materials for covering it.

Sanitary and Engineering News.

SEWERAGE SCHEME, PLYMOUTH.—The Plymouth main drainage scheme is, with the linking up of the first section of the old sewers of the borough with the new system, practically completed. Except the linking up now in progress, the whole of the main drainage work has been carried out under the personal supervision of Mr. H. Victor Prigg, as resident engineer for Messrs. Mansergh. The cost of the whole of the work will not fall far short of 300,000l. There were eight contracts. No. 1 contract, which related entirely to the drainage of the Avenue at Laira, was carried out by Mr. Laug, of Liskeard, and No. 2 contract, for the supply of pumps and engines at Laira, was executed by the Campbell Gas Engine Company, Halifax. No. 3 contract, for the outfall at Rusty Anchor, was entrusted to Messrs. Pethick Bros. and No. 4 contract, for the storage tanks at West Hoe, and the main intercepting sewers and its branches, was undertaken by Mr. Abram Kellett, of London. Mr. Laug also undertook No. 5 contract, for the Western low-level district; Messrs. Shiellbear & Sons No. 6 contract, for the storm-water outfall and sewer along the foreshore at West Hoe; Messrs. Neal, Ltd., No. 7 contract, for the storm sewer at Cattedown, and sections at Laira and St. Jude's; and Messrs. S. Pearson & Son No. 8 contract, for the reconstruction of the Rusty Anchor outfall. By agreement with the Corporation Messrs. Mansergh have undertaken the supervision and management of the new drainage system for the first two years.

TRANSFORMER STATION, STONE NEWINGTON.—A new transformer station has been erected by the Stoke Newington Corporation in Church-street. The building was designed by the Borough Surveyor (Mr. W. F. Loveday), and the station equipment was supplied by Messrs. Talbot & Stevenson, and erected under the supervision of the Borough Electrical Engineer (Mr. S. Hann) and Mr. A. R. Ashmore. The total cost was over 18,000l.

BLACKFRIARS BRIDGE.—If the Bill for the widening of Blackfriars Bridge passes into law, it is proposed to enlarge the steps and construct a causeway at the lower side of the bridge on the Surrey side, the steps on the upper side being absorbed in the widening. A letter to this effect from the City Surveyor was before the Thames Conservancy at their meeting on the 30th ult., and the proposals were approved, subject to the condition that the causeway extended to low-water mark, and that the old stairs were not removed until the new ones were opened for use.

Foreign.

NOTES FROM PARIS.—On the 27th ult. was inaugurated the statue of Benjamin Franklin presented to Paris by Mr. John Hayes. The sculptor is Mr. J. Boyle, who has represented Franklin seated, on a pedestal designed by an American architect, Mr. Knight, and decorated with bas-reliefs representing the reception of Franklin by Louis XVI., and the signing of the articles of peace between England and the United States. The Musée des Arts Décoratifs has opened the first of its temporary loan exhibitions. The present one includes various examples of XVIIIth century art lent by M. Doisteau, and the collections of M. Franck and of M. Gosson. The Ecole des Beaux-Arts will open in a few days a collection of the works of Fantin-Latour. There is also to be opened

shortly, at the Georges Petit Gallery, an exhibition of the works of Gustave Moreau. The "N. 2 Sud" line of the Metropolitan has been opened to the public. It goes to Passy by the Arc de L'Étoile, to the Place d'Italie, and proceeds by the quarters of Grenelle, Necker, Montparnasse and Salpêtrière. From Passy it crosses the river on a fine bridge, and at the Rue de Vaugirard enters a tunnel, reappearing on a viaduct as far as the Place d'Italie. Subsequently it will be prolonged, by way of the Gare d'Orléans, as far as the Place de la Nation, crossing the Seine again on a steel bridge. One can then make the complete circuit of Paris for the modest sum of 2½d. first class, and 1½d. second class.

A GREAT HYDRO-ELECTRIC POWER SCHEME FOR INDIA.—An important work which it is proposed to execute in Kashmir, is the establishment of a hydro electric power station on the Jehlam river. The available supply of power is very large, and it is stated that the works will be able to supply current at such prices as to reduce the cost of power to less than one-half that of steam power. Among other directions in which the projectors of the scheme hope to utilise the power generated are: the operation of an electric railway, 200 miles long, to connect Abbottabad and Srinagar; the provision of motive power for a fleet of large electric dredgers to be used for flood prevention and reclamation works; the supply of power to textile factories, local tramways, light railways, engineering works, and mines; and the supply of current for lighting purposes and driving pumps in the large military cantonments of Northern India. The project is an ambitious one, and if carried out will probably be the largest of its kind in the world.

LABOUR AND HOUSING QUESTIONS IN STOCKHOLM.—Mr. Consul Magretson, in his annual report, states that according to some recent statistics the number of workmen employed by the city authorities of Stockholm varies from about 2,500 in the winter to 2,900 or 3,000 in the summer. During 1904 the average yearly wages were as follows:—Ground labourers, 58l. 10s.; blasters, 73l. 18s. 1d.; stonecutters, 61l. 8s. 10d.; masons, 73l. 31s. 4d.; carpenters, 66l. 15s. 6d.; bricklayers, 71l. 5s. 6d.; suitors and plumbers, 72l. 5s. 6d. Through an agreement made between the city authorities and their workmen, which first came into operation in September, 1905, wages have already risen, and the corresponding figures for the present year (1906) are expected to show a considerable increase. The wages per hour for the town workpeople have ranged from about 4½d. to 8d., the average being between 6½d. and 6½d. While the city authorities have been obliged to make allowance for the increased cost of living, private employers of labour have, of course, been obliged to pay still more. Brick carriers, who receive 10½d. per hour, and masons and carpenters, who earn 11s. 1d. to 16s. 8d. a day, are by no means uncommon, and it is pointed out that if the workpeople have not a comfortable existence it is not the fault of their wages, but of the present enormously high house rents and the ever-increasing prices demanded for the necessaries of life in Stockholm. The rents of labourers' houses in 1903 were for one room and a kitchen from 13s. 6d. to 14l. 13s. 4d., and for two rooms about a kitchen, 20l. 13s. a year; the houses in question being in the property of the city and the tenants the town workmen. Private owners' houses were still dearer. The average rent for one room and a kitchen in Stockholm in 1905 was 16l. 6s. 11d. But accommodation for people in general is also very expensive. Flats, of which the city mostly consists, if they are good now come to 33l. a room. In a city of only this size (Stockholm contains at present about 330,000 inhabitants) such rents are very remarkable. It must, however, be admitted that better-class flats here are exceedingly well built, and often beautifully fitted up—double stone stairs (one of them often of marble), parquet floors, and sleekly finished and quite common features in them. With such demands for elegance buildings cannot be done economically. The "own home" movement is going on steadily outside the city, but is said to be unfavourably influenced by the new zone tariff.

EXPORTS OF WOOD FROM SWEDEN.—According to the annual report of Mr. Consul Magretson, the beginning of the year 1905 hopes were entertained at Stockholm that the prices, which then ruled low, might fall no further, and during the course of the season these hopes were justified, except as regards redwood deals. In their case the demands did not correspond with the supplies, and the third and fourth qualities of 3 in. by 9 in. redwood from the middle and East Norland went as low as 7l. 3s. and 6s., respectively. For other kinds of wood an improvement in prices took place at the end of summer or beginning of autumn—a time when prices often show signs of weakness, whereas in 1905 they manifested a tendency to rise. This was chiefly due to orders received from Germany. Even before the shipping season was at an end buyers there paid for

delivery during 1906 10s. more per standard for battens and white and redwood boards, these being the goods most in demand in the German markets. The strong impetus thus given by these buyers soon showed its effects in other quarters. As a result the importers from various other countries began to send in their orders. At this time Scotch firms bought what they needed for immediate use, whereas other firms in the United Kingdom appeared at first disinclined to pay the prices charged by the Swedish exporters. The approaching season is looked forward to with much hope. According to the report of the Swedish Saw Mill and Wood Exporters' Association the export of deals, battens, and boards, planned and unplanned, from the whole of Sweden was:—

Year.	Quantity.	Standards.
1901	903,787	
1902	1,004,666	
1903	1,039,462	
1904	915,390	
1905	973,076	

THE REBUILDING OF BALTIMORE.—Mr. Fraser, British Consul, reporting on the trade, commerce, and navigation of the States of Maryland, Virginia, West Virginia, and Kentucky for the year 1905 makes the following observations:—“Too great praise cannot be given to the people of Baltimore for the energy they have shown in the rebuilding of the city after the great conflagration of February 7, 8, and 9, 1904. It was estimated that the damage to that occasion amounted to 25,000,000, and in the past twenty-two months the former buildings have been replaced to a great extent by some of a more substantial character, with a great improvement architecturally. Advantage has been taken to widen and straighten the streets in the burnt areas of the city, but much has yet to be done in laying down the roadways which are in some cases in bad condition. This will no doubt soon be done, as it is intended to spend about 1,000,000 (5,000,000 dol.) for paving purposes. It is observed that most of the bank buildings and those of other financial institutions have not been rebuilt by the high structures they formerly had, but by buildings of from two to three stories, as the experience of the fire proved that the latter were not so liable to destruction. Ferro-concrete, or concrete reinforced with steel, has entered largely into the erection of buildings in Baltimore, with, it seems, considerable satisfaction. The concrete used is usually composed of one part best quality Portland cement, two and a half parts clean sharp sand, and five parts 1½ in. stone, either granite or trap rock. The walls of a building are made by packing the concrete in wooden boxes while the material is in a plastic state. In these boxes have been placed vertical and horizontal pieces of steel, and when the cement has set the walls become very strong; the same general method is used in the construction of floors, ceilings, roofs, etc., and it is claimed that as the metal is perfectly embedded in the concrete it is absolutely protected from atmospheric action and against intense heat. An interesting test of its strength was made a few weeks ago in a building in course of construction. A weight of 25,400 lb. was placed on a sq. ft. of the second floor and on a slab of concrete 4½ in. thick, the slab being supported on a beam 8 in. by 8 in. This weight was allowed to remain for twenty-four hours, and after it had been removed the beam only showed a deflection of ¼ in. The cleaning of buildings of the effects of the fire by the use of steam and high pressure water has been used to a considerable extent, and it certainly has been very efficacious. It is said, however, that it has the effect of opening the face of the material treated and makes it more liable to the reception of deposits of smoke, etc., and also to decay. Perhaps it may be said that the fire was “a blessing in disguise,” for it has certainly stirred up the authorities to making some very much-needed improvements, such as the construction of sewers at a cost of 2,000,000 (10,000,000 dol.).

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. W. DUNCAN TUCKER, timber merchant and builder (Bristol), has formed his business into a private limited liability company, in conjunction with his two sons. The style of the firm in future will be “Wm. Duncan Tucker & Sons, Ltd.,” the management remaining the same as before.

INTERNATIONAL ASSOCIATION FOR TESTING MATERIALS.—This Association, which holds its congresses about every three years in industrial centres in various countries, will meet this year in the Academy of Science at Brussels, from September 3 to 8. The programme of excursions includes visits to the Harbour Works at Brussels and at Antwerp, the Steel Works of the John

Cockerill Company at Seraing, the Arsenal at Mechlin, and the Harbour Works at Zeelbrugge. Among the papers to be read will be one on the “Industries of Belgium,” by Baron E. de Laveleye and M. Camerman. It is expected that a considerable number of members and delegates from this country will be present at the Congress. Mr. J. E. Stead, F.R.S., Middlesbrough, is the English Secretary of this Institution.

THE NEW COUNTY HALL.—A Select Committee of the House of Commons, under the presidency of Mr. Bilton, have considered the London County Buildings Bill. This is the measure promoted by the London County Council, for the purpose of obtaining power to acquire a site in Lambeth fronting the Thames on the down-stream side of Westminster Bridge, and erect on it a county hall and offices. Only two opponents—the Lambeth Borough Council and Messrs. Holloway Brothers—appeared before the Committee. The Hon. J. D. Fitzgerald, K.C., with whom Mr. Vasey Knox, opened the case for the London County Council. He said the present county hall and offices were inherited from the Metropolitan Board of Works, and were wholly inadequate. As the business of the Council kept increasing fresh buildings had to be acquired. The state of the County Hall, which the Bill was spread over seven buildings, and the staff of the Controller was in three buildings. Obviously that was an intolerable position. It was productive of delay, considerable inconvenience, and increased cost. Several sites had been considered, and the present one had the advantage of providing the largest area at the smallest cost. The site was close to the Houses of Parliament and the public offices, and was easily accessible from all parts of London. Including the amount of foreshore which was to be taken for the purpose of forming an embankment in front of the new buildings, the area of the site was five and four-fifths acres. At present the officials of the London County Council numbered 1,909. The Committee approved the bill.

FIRE TESTS WITH STEEL SHUTTERS.—Messrs. Arthur L. Gibson & Co. write that they do not think our paragraph (page 473) on the tests of their shutters by the British Fire Prevention Committee conveys a correct impression. Our remarks were entirely based on the Official Report of the Committee, but we did not mention that the single shutter had been classed as “Fully Protective—Class A” and the double shutter as “Fully Protective—Class B” because the statement was not included in the published Report; it would be better if the classification made by the Committee were included in these cases. Into several other points mentioned by Messrs. Gibson we have not space to go, but we fully recognise that their single shutter is a better protection than most other single doors; only our conclusion from the Report is that a double shutter is much preferable, and that the single one is only a partial protective.

COMPANY OF PLUMBERS.—At the meeting of the Quarterly Court of the Plumbers' Company at the Guildhall last week it was reported that steps were being taken in Leeds to obtain statutory powers in strengthening the position of the authorities in regard to the registration of plumbers. In a report on the same subject from Hull, Mr. Gilbert Whyatt, Borough Engineer, Grimsby, referred to the King's Speech, promising that something should be done to codify and extend the Public Health Acts, and stated that a local authority had no powers to make by-laws for plumbing work in a house, and a plumber might put in almost anything he pleased, so far as by-laws were concerned. In a report from Birmingham, Mr. E. Antony Lees, Secretary of the Birmingham Water Department, stated that the movement for the national registration of plumbers was started in Birmingham in 1890. The initiatory stage had been passed by allowing sufficient time for those practicing the trade to become registered. The public now recognised the importance of the movement from a sanitary point of view, and the registration of plumbers should be taken up by the new Government. In a report from Norwich, remarks by the Mayor supported this opinion, and reference was made to plumbing work being undertaken by such firms as Whiteley and the Hutches' Stores, and others, emphasising the necessity for apprenticeship and training of the men who had actually to execute the work.

INCORPORATED CHURCH BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday, the 26th ult., at 7, Dean's-yard, Westminster, the Rev. Canon G. E. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Hasbury, S. Margaret, near Halesowen, Wores., 1500; Miskin, S. Barnabus, near Llantaisant, Glam., 1000; Thornham, S. John, near Manchester, 1000; for the first portion, and Forest Gate, S. Edmund, Essex., 250, making in all 2750; and towards the plugging or otherwise improving the accommodation in the churches at Buncton, All Saints, Sussex, 150; Dauntsey, S. James, near Chippenham, 250; Ivychurch, S. George, near Folkestone, 750; Upleadon, S. Mary, Glos., 150; Llantwit Major, S. Iltyd,

near Cardiff, 250, making in all 750, and Wakefield, S. John, 750, in lieu of a former grant of 600. A grant was also made from the special Mission Buildings Fund towards building the Mission Church of S. Paul, Camelsdale, near Haslemere, Sussex, 200. The following grants were also paid for works completed:—Alwinton, S. Andrew, near Peterborough, 200; Stonebridge, S. Michael and All Angels, Middlesex, 700; Hilton, S. Mary Magdalen, Hants., 150, on account of a grant of 260; Field Dalling, S. Andrew, near Holt, Norfolk, 100, on account of a grant of 300, and Barnes, S. Mary, Surrey, 750, on account of a grant of 1000. In addition to this, the sum of 5600, was paid towards the repairs of thirty-eight churches from Trust Funds held by the Society. The Annual General Court of the Society will be held at the Church House, Dean's-yard, Westminster, on Thursday, May 17, at 3 p.m., when the chair will be taken by the Archbishop of Canterbury, President of the Society.

COMMITTEE OF INDUSTRIAL EDUCATION.—The Committee appointed by the recent Conference at the Guildhall met at the House of Commons on the 26th ult., Dr. T. J. Macnamara, M.P., in the chair. Reports on education and apprenticeship in the printing machine managers' trade, by Mr. W. H. Howes, also on apprenticeship in New Zealand, were discussed. The Committee also considered information on the co-operation of employers in the technical training of apprentices, furnished by Mr. A. S. Biggart, of Glasgow. Dr. Crawford gave particulars of the conduct of trade classes at the Glasgow and West of Scotland Technical College under committees of management, consisting of the employers and workmen, and the governors of the college, and the system of grants made by the Scotch Education Department. Sir Henry Hibbert, Chairman of the Lancashire Education Committee, stated that similar arrangements for the conduct of trade classes in Lancashire had been adopted with extremely successful results, and the authorities carried with them the full support and co-operation of the masters and men in the trades concerned. He urged the necessity for more systematic apprenticeship. Sir Horace Plunkett said that the Department of Agriculture and Technical Instruction for Ireland were endeavouring to arrange for the more harmonious co-operation of the trade unions, the employers, and the technical instruction authorities. Communications regarding apprenticeship were received from the trade unions of carpenters and joiners, boiler-makers and iron and steel slip-builders, operative house and ship decorators, boot and shoe operatives, and the Scottish Typographical Association.

GUYVER'S HOGE MEMORIAL.—The Works Committee of the Marylebone Borough Council have agreed to allot a site in Langham-place for the proposed memorial of the late Mr. Quintin Hoge, who, after the closing of the Polytechnic (1831-81) as a place of scientific entertainment, took over the buildings for a young men's Christian Institute. The statue will be sculptured by Mr. G. J. Frampton, R.A.

WHITECHAPEL ART GALLERY.—Under the presidency of Earl Carrington and his co-adjutors Canon Barnett, Mr. Mead, and Mr. W. M. Webb (of the Selborne Society) a novel kind of instructive exhibition will be held in Whitechapel Art Gallery in the course of July. One section of the exhibits will exemplify building material and appliances; another section will comprise models to show the planting of streets and open spaces, as well as of children's playgrounds and gardens, railway embankments, town and suburban gardens, and so on. It is also intended to exhibit plans for the improvement of some areas in London, to illustrate domestic life in foreign cities, and to show specimens of plants that might still be cultivated in London, together with vivaria, aquaria, and bee-hives.

ENDICLIFE HALL, SHEFFIELD.—At the invitation of Mr. C. B. Flockton (of Messrs. Gibbs & Flockton, architects) a meeting was held a few days ago in Cutlers' Hall of those who are interested in the preservation of Endcliffe Hall, and what is left of the grounds. Since the death of Sir John Brown, who erected the Hall in 1863-5, the property, upon which he expended 100,000, was bought by a local syndicate for entertainments, receptions, etc., but as the venture did not prosper they decided to dispose of the estate for building purposes, and a large portion of the land has already been sold. As Chairman of the meeting, Mr. S. J. Robinson, Master Cutler, stated that the existing property, 5 acres, could be purchased for 10,000, and that it had been proposed to convert it into a country club. Mr. Flockton said the place could be improved at a small outlay and that the income now about 7850 per annum, could be greatly increased. The meeting passed a resolution in favour of the purchase and nominated a committee for the formation of a small limited company in that behalf. We may add that the land which has been sold, with the exception of the portion which faces Endcliffe Woods, realised 2,000,000 per acre, whilst the portion facing the

Woods realised 1,500l.; in 1885-96 the Corporation bought an aggregate of 73 acres of Endcliffe Woods and the adjoining property for a total sum of 19,000l. as a place of public recreation and resort, and they have since enlarged the pleasure grounds with a further plot of 6 acres at Whiteley Woods.

GOVERNMENT CONTRACTS.—In the Parliamentary Papers Mr. Keir Hardie asks the Secretary to the Treasury whether there are any granite or macadam contracts with Messrs. Mowlem & Co., contractors, and if so, whether the fair wages clause is in force in the granite quarries of the firm at Guernsey from which the material is obtained.—In reply, Mr. McKenna states that the Government have contracts with the firm. In the case of granite paving and macadam the fair wages resolution is attached to the contract. In the case of granite macadam ordered for the roads in the royal parks in and around London the fair wages clause has not hitherto been attached, but arrangements will be made for this to be done in the future. Messrs. Mowlem pay the current rate of wages for the district in their quarries in Guernsey.

ARBITRATOR.—The arbitrator's award has just been received in the dispute, recently heard at Plymouth, between Mr. Henry Kerswill, contractor, of Plymouth, and the Secretary of State for War, in reference to the building of barracks and recreation block for the Royal Artillery at Plymouth Citadel. Mr. Kerswill's case was that he had been made to do a quantity of work not set out in the contract, and that, and other work, which, it was contended, might be said to be in the quantities, but was not fairly or properly and adequately described therein. The claim amounted to about 9,000l. Mr. Kerswill's tender was for 22,844l. Mr. A. R. Stenning, sitting as arbitrator; Mr. H. Holman Gregory and Mr. B. Murphy (nominated by Watts, Ward & Anthony) acted for claimant, and Mr. S. A. T. Rowlett and Mr. Micklethwait represented the Secretary of State for War. The case was heard at Plymouth on March 1 and 2, and subsequently adjourned to London. The arbitrator awards Mr. Kerswill 3,017l. 4s. 8d., and directs each party to pay his own costs of the petition of right, reference, and arbitration, and that the War Office pay the arbitrator's costs of the award, amounting to 219l. 3s.

MANCHESTER BUILDING TRADES EXHIBITION.—A building trades exhibition was opened recently in the St. James's Hall, Manchester. The exhibition has attracted a large number of exhibitors, with the result that the goods displayed are greatly varied. A central stall is occupied by the Manchester School of Technology, with a display of materials used in connexion with sanitation and a selection of drawings from the engineering, surveying, sanitary inspection, and plumbers' work sections. In the gallery is a selection of architectural drawings. Mr. J. H. Woodhouse, President of the Manchester Society of Architects, took the chair at the opening of the exhibition, and Alderman Sir James Hoy performed the formal opening ceremony. The exhibition closes on May 5.

MEMORIAL CROSS, SOUTH CROYDON.—A memorial cross has just been erected in St. Peter's churchyard, South Croydon, to the memory of the late Rev. John White. It takes the form of an old style Runic cross, 7 ft. in height, standing on a massive die and base, with bevelled kerbing surrounding the grave. The whole is in red Cheshire stone, and the design and execution are the work of Messrs. G. Maile & Son, of London.

MEMORIAL TABLET, WINCHESTER CATHEDRAL.—Dr. Warre recently unveiled in Winchester Cathedral a memorial tablet to the late Canon Huntingford, D.C.L. The tablet was designed by Mr. C. E. Kempe to fit into the stone panelling, being executed in simple characters upon a groundwork of gilded copper and green marble.

MINERALS OF SOUTHERN NIGERIA.—There have just been presented to both Houses of Parliament reports on the mineral survey of Southern Nigeria for 1903-4 and 1904-5 by Professor Wyndham Dunstan, F.R.S., Director of the Imperial Institute, who states, *inter alia*, that limestone of excellent quality for the manufacture of mortar and cement has been discovered, a matter of the greatest importance to the Protectorate, especially as some of the limestone occurs in the river banks and could, therefore, be readily transported. Between Awi and Odukpani sedimentary rocks were met with, as on the Kwa and Akpa Iyefe rivers. They consisted of sandstones, shales, and limestones, but the limestones which appeared to be available for burning for lime were only a few feet in thickness. Limestones suitable for burning and for building stones were found in the neighbourhood of Eki quarry, near Vwet. The limestone was not very satisfactory, but sandstone suitable for building purposes was met with, and on the opposite side of the river an excellent face of granite was uncovered. The minerals collected included limestones containing fossils. The results of the analyses showed that several produce excellent lime, suitable for building purposes.

CHEAP HOUSES NEAR SHEFFIELD.—Dr. Alexander Anderson, medical officer of health for Wortley Rural District Council, commenting on the housing question in his annual report, points to cottages erected just outside the Sheffield boundary as an illustration of the best class of cottage of a cheap type. These houses were sold for 150l. They are built in blocks of four, the front walls being of stone with ashlar dressings, and the other walls of brick. They face a street 36 ft. in width, and the distance from the back of the house to the outer wall of the plot is 35 ft., there being an open space at the rear free of building of about 500 sq. ft. Each block has a central passage, 3 ft. 6 in. wide, for access to the rear, and built over so as to afford larger bedrooms to the houses adjacent. In the basement is a cellar for coal and provisions, on the ground floor are two rooms each 12 ft. square, on the first floor are two bedrooms, and above them an attic bedroom. There is a waste water closet, but no bath. The space at the rear is occupied with a small garden, and the paths and footways are asphalted. All have gas and water laid on. They let at 6s. 9d. per week, free of rates, in the neighbourhood of the Wortley. Other houses, built in similar style, but provided with bath (hot and cold water) and scullery, have been sold for 178l.

HOUSEHOLD FIRE PRECAUTIONS.—Under this title a most useful sheet has been published by Messrs. Unwin Bros., consisting of suggestions for guarding against fire in private houses, and for the immediate proceedings to be taken if a fire breaks out, drawn up by Captain Sheau, consulting fire-brigade engineer. The sheet is sold at 6d., and if studied and acted on, it will be a sixpence very well laid out.

BESSEMER MEMORIAL FUND.—The Memorial Committee, of which Sir Wm. H. Preece and Sir J. Wolfe Barry are the Chairman and Vice-Chairman, have framed their scheme which had been postponed pending the final report of the departmental committee to inquire into the working of the Royal College of Science and the Royal School of Mines. They recommend that the Sir Henry Bessemer memorial fund should be applied to (1) the endowment of open international scholarships for post-graduate practical work, to be of such value and to be awarded "under such conditions that they will be regarded by students of any nation as a prize worth striving for, and as an incentive to the highest scientific attainment," and, with the exception of those allocated to certain approved British institutions, to be tenable in any part of the Empire, in the United States, and in Europe; (2) the equipment of mining and metallurgical memorial laboratories in the Royal School of Mines at South Kensington as the centre of the memorial, the land and cost of the new buildings and maintenance of the school being provided from Government and other sources; and (3) the erection of a statue of Bessemer in the new Royal School of Mines, S.W.

TRANSVAAL MAGNETITE CEMENT.—About two years ago an extensive deposit of magnetite was opened out in the Transvaal, at a point between Kaapmuiden and Malalane stations on the Johannesburg Delagoa Bay Railway, and about 90 miles distant from Delagoa Bay. The deposits are located in a range of hills which run parallel with the main railway, and the area covered by the formation is roughly about 8 miles long by 1½ miles wide. As a rule the magnetite exists in aggregated veins of varied thickness, in many places being more than 100 ft. in width; but the central hills near Salt Creek appear to be one vast deposit of about 2,000 ft. long by 200 ft. wide, and upwards of 300 ft. high. At this particular point it is estimated that the deposit of magnetite exceeds 1,000,000 tons. The magnetite is equal to the best quality obtained in Greece; it is pure white, and breaks with a conchoidal fracture. It is hard and fine grained, resembling unglazed porcelain in texture, and is unusually pure, being fractionally free from lime, alumine, and iron, while the proportion of silica is almost a minimum. The nature of the deposit is such that the whole of the hills can be quarried at a very low cost, and the necessary fuel for calcination is readily obtainable.

Capital and Labour.

RULES FOR THE PLASTERING TRADE.—We are glad to be able to state that a new code of working rules has been agreed upon between the London Master Builders' Association and the London District of the National Association of Operative Plasterers. We are informed that the rules will be printed and circulated in the course of a few days.

BUILDING TRADE CONCILIATION.—The scheme for closer union between master builders and operatives in England, which had its origin in the Yorkshire Federation of Master Builders, has now become an accomplished fact. It is a scheme having as its primary object the avoidance of disputes and lock-outs, and the bringing about of a better feeling between master and operative. The parties to the agreement are

the National Association of Master Builders (which is federated, through the Yorkshire Association, the Bradford Master Builders' Association), the Amalgamated Society of the General Union, and the Associated Societies of Carpenters and Joiners, the London and Manchester Societies of Bricklayers, and the National Society of Stone Masons. In whatever district the masters and the operatives have an association a local Conciliation Board is to be formed with a view to settling any trouble or misunderstanding that may arise from time to time, and in case of the parties not being able to come to an amicable settlement the matter in dispute is to be brought before the Northern Centre Board, and if necessary the National Board. The pleasing feature of the arrangement is that work in the meantime is going on. The first meeting of the Bradford Conciliation Board, which consists of six representatives on each side, took place recently at the Building Trades and Stone Exchange, Bradford, when the following officers were appointed for the coming year.—Mr. T. E. Taylor, Chairman; Mr. W. C. Harclaire, Vice-Chairman; Mr. Albert Hammond and Mr. J. H. Hopkins, Joint Secretaries.—*Yorkshire Observer*.

Legal.

THE ACTON ANCIENT LIGHT DISPUTE.

The hearing of the case of Kine v. Jolly commenced in the House of Lords before the Lord Chancellor and Lords James of Hereford, Robertson, and Atkinson, on the 3rd inst., on the defendant's appeal from the judgment of the Court of Appeal from a decision of Mr. Justice Kekewich in the Chancery Division. (The case was reported in the issue of the *Builder* of July 23 and 30, August 6, December 17 and 24, 1904.)

The action was brought by the plaintiff, Mrs. Sarah Kine, the owner of a house and premises known as "Woodthorpe," Acton-road, Acton, against the defendant, Dr. Jolly, the owner of neighbouring premises, for a mandatory injunction, and alternatively of damages in respect of the alleged obstruction of the ancient lights of the plaintiff. It appeared that the ground floor of the plaintiff's house, which was built about twenty-two years ago, had on the west side two windows, lighting respectively the drawing-room and a smaller sitting-room, and a door with glass panels, and a window or fanlight over it lighting the entrance-hall. The defendant began to build his house about the latter part of 1902. The plaintiff alleged that in spite of remonstrances made on her behalf, the defendant had erected a high building so near to the plaintiff's windows, glazed panels, and fanlight, as to materially obstruct the light entering the said dwelling-house, and so interfere with her use and enjoyment of the premises. The case had been twice before Mr. Justice Kekewich. On the first occasion he granted the plaintiff a mandatory injunction, which was before the House of Lords in the *Colls* case. On appeal from that decision of his lordship to the Court of Appeal it was admitted on behalf of the plaintiff that the judgment could not stand as it was, and by consent the lord judge's order was discharged, and the case sent back to him for a re-trial. The plaintiff took place before the lord judge in July, 1904, and on August 2 he delivered a considered judgment. He then came to the conclusion that although there had been interference by the defendant's building with the light of the plaintiff's drawing-room, he could not, in accordance with the rule laid down by the House of Lords in the *Colls* case, deem the obstruction of light to that room to be actionable. He also held that taken alone there had been no actionable obstruction of the light coming to the plaintiff's hall by reason of the defendant's building. The great cause of complaint was as to the obstruction of light to what had been called the morning-room in the plaintiff's house, and with regard to that he came to the conclusion that the obstruction of light to that room was a nuisance within the meaning of the authorities on the subject. His lordship thought that he must treat the obstruction as to the morning-room plus the obstruction of light to the hall and should grant a costs of this action. From this decision the defendant appealed to the Court of Appeal, when Lords Justices Vaughan Williams and Cozens-Hardy held that applying the principle laid down by the House of Lords in the *Colls* case to the findings of fact of Mr. Justice Kekewich there was a good cause of action by the plaintiff. They differed, however, from Mr. Justice Kekewich in thinking that the remedy ought to be damages and not a mandatory injunction. Lord Justice Romer, however, dissented, being of opinion

that by applying the law to the facts as found by Mr. Justice Kekewich, the plaintiff had failed to prove that the defendant had committed a nuisance. By a majority of the court, therefore, the judgment of Mr. Justice Kekewich was varied by the order for a mandatory injunction being discharged and an inquiry as to damages being directed—hence the present appeal.

Mr. Hughes, K.C., and Mr. Vernon appeared for the appellant, and Mr. P. Ogden Lawrence, K.C., and Mr. Cann for the respondent.

The arguments of counsel were proceeding when we went to press.

NEWCASTLE ANCIENT LIGHT CASE.

In the Court of Appeal, composed of the Lord Chief Justice and Lords Justices Vaughan Williams and Stirling, on the 1st inst., the hearing was resumed of the case of Cowper and Steel, Coulson, & Co., Ltd., v. Milburn and others on the plaintiffs' appeal from an injunction of Mr. Justice Buckley in the Chancery Division. There is also a cross appeal by the defendants from that part of his lordship's judgment refusing the defendants an inquiry as to damages. (The case was reported in the *Builder* of June 18, 1904, and March 25, 1905.)

In this case Cowper, the freeholder, and the plaintiff company, the lessees of Dean Inn, No. 20, Dean-street, Newcastle-on-Tyne, brought the action against the defendants for an injunction to restrain them, their servants and agents, from continuing the erection of certain buildings of moderate height, and they had been accepted by the plaintiffs' ancient lights as the same were enjoyed previous to the removal of the buildings formerly standing on the site of the defendants' premises. Until comparatively recently on the west side of Dean-street there were certain buildings of moderate height, and they had been accepted by the defendants had erected buildings far exceeding the height of the old buildings. The defence was a denial of liability, and in the result Mr. Justice Buckley held that there had been no nuisance on the part of the defendants and dismissed the action with costs. From this decision the plaintiffs appealed. At the conclusion of the arguments of counsel on March 21, 1905, the Lord Chief Justice said he was of opinion that there must be a report made by someone who would report to the Court whether there had been an obstruction of the lights, assuming the old windows in the plaintiffs' building were still there, and when that had been received the Court would give judgment on the appeal.

Mr. Ralph Neville, K.C., Mr. Astbury, K.C., and Mr. Mangham appeared for the appellants (the plaintiffs); and Mr. Warrington, K.C., Mr. Buckmaster, K.C., and Mr. O'Leigh Clare for the respondents (the defendants).

At the sitting of the Court Mr. Astbury said he had seen a copy of Mr. Chadwyck Healey's report on the matter, and having regard to what appeared in that report, he had nothing further to say on behalf of the plaintiffs.

The Lord Chief Justice, in giving judgment on the plaintiffs' appeal, said that as the finding of Mr. Chadwyck Healey was to the effect that, even taking the plaintiffs' lights as they existed before 1877, the defendants' building would not have obstructed those lights, having regard to the use of the neighbourhood, he (the Lord Chief Justice) was of opinion that Mr. Justice Buckley had proceeded on a right basis. The consequence was that the appeal would be dismissed and the action dismissed with costs.

The Lords Justices concurred.

Mr. Warrington then proceeded to open the cross appeal of the defendants. He said that during the course of the proceedings the plaintiffs had applied for an interim injunction, and on January 11, 1904, an order was made, whereby upon the plaintiffs giving the usual undertaking in damages the defendants undertook until judgment not to further build so as to interfere with the plaintiffs' lights. Early in May, 1904, the Colls case was decided in the House of Lords, and on May 3 the plaintiffs applied to Mr. Justice Buckley to be relieved of their undertaking in damages. The interim injunction stood from January 11, 1904, to May 3, 1904. On June 14 the action was tried before Mr. Justice Buckley, and when his lordship gave judgment for the defendant he was asked but refused to grant the usual inquiry as to damages. He (counsel) now asked their lordships to say that there should be an inquiry as to damages.

Mr. Astbury, on behalf of the plaintiffs, asked their lordships not to disturb the order of the learned judge. He said the action was set down for trial on February 18, and the case was in the paper ready for trial early in March. On March 12 Mr. Justice Buckley intimated that he would rather not try the case until the House of Lords had delivered judgment in the Colls case. Both sides agreed to that. The moment judgment was given in the Colls case plaintiffs applied to vary the undertaking as to damages so that it should not be said that they had given a wider undertaking than was justified by reason of the Colls case. He asked their

lordships to affirm the discretion Mr. Justice Buckley had exercised in the matter.

In the result their lordships held that there must be an inquiry as to damages, and therefore allowed the cross appeal.

NUISANCE FROM SEWAGE WORKS: ALLEGED STATUTORY PROTECTION UNDER THE PUBLIC HEALTH ACT.

The hearing of the case of the Attorney-General v. the Dorchester Corporation was commenced in the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Cozens-Hardy, on the 24th ult., on the appeal of the defendants from a judgment of Mr. Justice Kekewich in the Chancery Division.

This was an action by the Attorney-General at the relation of Mr. E. R. Talbot and by Mr. Talbot against the defendant Corporation, in which the Attorney-General claimed an injunction to restrain the defendants from so maintaining and carrying on certain sewage works as to cause a public nuisance, and from conveying or permitting to be conveyed, untreated or improperly treated sewage from the works into the river Frome in alleged contravention of sect. 17 of the Public Health Act, 1875. The plaintiff, Mr. Talbot, also claimed an injunction to restrain the defendants from carrying on the works so as to cause a private nuisance to him as owner and occupier of property in close proximity to the works, and damages.

The short facts of the case were as follows:—The works in question were constructed on a site containing 19½ acres of land, of which 3 acres were within the borough boundaries and the remainder was outside the borough. The 3 acres were acquired by the Corporation for the purpose of sewage disposal works in 1884 under a provisional order made under the Public Health Act, 1875, and duly confirmed, giving the Corporation compulsory powers for the acquisition of the land. The works contemplated when the 3 acres were acquired were never actually carried out, but in 1899 the Corporation decided upon the construction of sewage disposal works upon a site consisting of the 3 acres in question and 7 acres of adjoining land outside the borough boundaries, the latter being part of the 19½ acres forming the site of the works ultimately constructed and complained of in the present action. The Corporation acquired the 7 acres without obtaining compulsory powers.

The works upon which the Corporation determined in 1899 were to be for the treatment of the sewage on the International system. The Corporation applied to the Local Government Board for their sanction to the raising of a loan for the purposes of the works, and on December 7, 1899, the Board issued an order allowing the construction of the works described in the notice given by the defendants, but subject to the following modification, viz.—That the works should be in accordance with a plan sealed with the official seal of the Local Government Board, and marked "Dorchester Sewerage Plan Showing Works Outside Municipal Boundary," and which had been deposited in the office of the Local Government Board, a duplicate of such plan, sealed and marked, being deposited at the office of the Town Council of the Borough of Dorchester. The Board, on December 30, 1899, gave their sanction to the raising of loans to the amount of 17,000l. by the Corporation for the purposes of the proposed works. In 1900 the borough boundaries were extended by a provisional order made by the Local Government Board under the Local Government Act, 1888, and the order was duly confirmed and came into operation on November 9, 1900. The added area did not include any portion of the site of the sewage works.

In 1900 the Corporation resolved to abandon the International system of treatment of the sewage and to adopt the bacterial or septic system, and requested the Local Government Board to hold a local inquiry on the matter. On December 4, 1901, the Local Government Board, by letter, approved of the proposed alteration in the system of sewage disposal, subject, however, to the Town Council acquiring such an additional area of land as was necessary to provide an area of not less than 10 acres for the irrigation of the effluent, and they decided to comply with the application for sanction to a loan of 3,000l. The Corporation then applied to the Local Government Board for a provisional order giving them compulsory powers to acquire additional land for the works, and on April 10, 1902, the provisional order was made and subsequently confirmed. Some time prior to May 6, 1902, the Corporation applied to the Local Government Board for their sanction to the raising of a further loan of 7,500l. for the purposes of the sewage disposal works. The Local Government Board, after an inquiry, allowed the construction of the works described in the notice, subject to the following modification, viz.—"The portion of the land coloured green on the plan which lies to the north of the line marked A B C on the plan shall, by excavation or otherwise, be so lowered or prepared that the surface of such portion shall not in any part thereof be at a greater elevation than the height of

173-00 ft. above ordnance datum. The plan referred to is a plan which has been sealed with the official seal of the Local Government Board and marked "Borough of Dorchester Sewerage Disposal Works," and which has been deposited in the office of the Local Government Board, a duplicate of such plan, sealed and marked in like manner, being deposited in the office of the Town Council of the Borough of Dorchester."

Shortly after this order, which was made on September 15, 1902, the Board sanctioned the raising of the proposed loan of 7,500l. On February 25, 1903, a local inquiry was held into an application by the Corporation for sanction to a further loan of 2,550l. of which 1,600l. was required for the purchase of the additional 9½ acres under the provisional order of 1902, and the rest for the purchase of certain other land to the west of the works through which the outfall sewer was to be carried, and these loans were sanctioned in March and June, 1903, and the works were opened in March, 1904. In the main, the works constructed were in accordance with the plan and specifications which were before the Board when the letter of December 4, 1901, was written and the order of September, 1902, was issued, but certain modifications and alterations had been made afterwards. Before the defendants' sewage works were constructed the sewage of the borough had been discharged in a crude state into the river Frome at a point a little higher up the river than the point of discharge of the outfall sewer in question. Mr. Talbot's house and ground at the nearest point was about 600 ft. from the centre of the sprinkles distributing the sewage over the secondary filter beds. The plaintiff alleged that there had been negligence on the defendants' part, both in the construction of the works and in the method of working them. Mr. Justice Kekewich held that the existence of a nuisance had been proved, and that such nuisance was due to the sewage brought by the defendants to their works. He found, however, on the evidence, that there was no proof that the defendants had been guilty of negligence, he being satisfied that the defendants had done their best to construct the works according to competent advice, and having constructed them, to make them operate efficiently so far as circumstances permitted. His lordship, on the question of nuisance, granted declarations in the language of the claim for injunctions and injunctions in like terms, and directed a reference for the purpose of assessing the damages (if any) Mr. Talbot had suffered. With regard to the claim under sect. 17 of the Public Health Act, 1875, he made a declaration to the effect that the defendants had conveyed sewage and filthy water into the river Frome, but as regarded that he declined to grant an injunction, being satisfied that the effluent was now open to no objection on that ground. His lordship further ordered the defendants to pay the costs of the action, and suspended the operations of the injunctions and the inquiry as to damages pending the present appeal.

Mr. Danckwerts, K.C., Mr. Stewart Smith, K.C., and Mr. C. H. Sargent appeared for the appellants; and Mr. P. Ogden Lawrence, K.C., Mr. Macmorran, K.C., and Mr. Longstaffe for the respondents.

Mr. Danckwerts, on behalf of the appellants, said the appeal mainly turned upon a point of law. Mr. Justice Kekewich had found, in effect, that there had been no negligence in the construction of the works or in the user of them after construction. He had even gone further, and said he was satisfied that the Corporation had done everything that could be suggested to keep the beds as free from objection as possible. Defendants' case was that the nuisance which had occurred was inevitable from such works as these, and the effect of it was that, having regard to the local extension order, people must put up with the result. Where the Legislature authorized a local authority to do a particular thing, and the authority by doing that particular thing did cause mischief, the authority, being guilty of no negligence in exercising the power given them by the Legislature, no action, he submitted, would lie against them, either by an individual or by the Crown through the Attorney-General.

In the result, their lordships affirmed the decision of Mr. Justice Kekewich, holding that the defendants could not plead immunity from an action for nuisance.

The appeal was accordingly dismissed with costs.

TARMAC ROAD PAVING: PROCEEDINGS AGAINST THE BRIGHTON CORPORATION.

The hearing of the case of the King v. the Mayor and Corporation of Brighton concluded in a Divisional Court of King's Bench, consisting of the Lord Chief Justice and Justices Ridley and Darling on the 30th ult. In this case the defendants appeared to show cause why a writ of *certiorari* should not issue to remove into the Court orders or resolutions made by the Council of the borough in July and August, 1905, whereby it was ordered that the treasurer of the borough

should pay to the Public Works Committee two sums of 2,500, and 500, upon the grounds that the expenditure was unnecessary and illegal, and that the Corporation had no jurisdiction to make such orders.

Sir Robt. Finlay, K.C., Mr. J. Eldon Banks, K.C., and Mr. E. E. Humphreys appeared for the Corporation to show cause against the rule. Mr. Montague Lush, K.C., Mr. Ernest Pollock, K.C., and Mr. Casson appeared in support of the rule; while Mr. Dunkels represented the Public Works Committee.

Sir R. Finlay, in opening the case, said he appeared to show cause against a rule nisi for a writ of certiorari granted to quash orders on the Borough Treasurer, one for 2,500, and the other for 500, for certain tarmac works on the Madeira-road at Brighton. The Corporation were said to be acting *ultra vires* in laying this road with tarmac for the purpose of motor competition speed trials. The fact, however, was that the laying of this road with tarmac was, as he should show upon the affidavit, a most excellent way of paving the road. It was perfectly true that the immediate occasion of adopting this form of road paving was that an automobile competition was in view, but it was also the fact that the question of paving this road with tarmac had been brought before the Corporation many years before; that it was an excellent and economical way of paving the road; and that in adopting this process the Corporation were acting strictly within their powers as the highway authority.

The learned counsel then read an affidavit made by Mr. F. T. Wilson, Chairman of the Works Committee, who stated that the object of the Corporation in paving the road with tarmac was to produce the best possible surface for motor speed trials and to effect an improvement to the Madeira-road for the benefit of all classes of persons and of all descriptions of traffic using the road. In his opinion the carriage traffic on the road was greater than when the new paving was laid, and there had been a very marked increase in the pedestrian traffic, while the continuation of the footpath on the south side which was included in the contract, had proved a great attraction. The almost entire absence of dust and mud and the rapidity with which the surface dried after rain caused the road to be especially agreeable to invalids.

The Lord Chief Justice said he supposed there was nothing illegal in a Corporation encouraging motor trials on their roads.

Sir R. Finlay said there was not, and that the trials were very beneficial to the town.

The Lord Chief Justice: Tar macadam in order to stop dust is being tried everywhere.

Sir R. Finlay: Yes, and such a roadway is of enormous advantage. There is no dust and it is much more healthy.

The learned counsel then read an affidavit by Mr. May, the former Borough Surveyor of Brighton, in which he said that as far back as 1897 he made a report to the Works Committee recommending the experiment of laying Madeira-road with tar macadam.

The Lord Chief Justice said he thought that when the rule was asked for it was suggested that the tarmac was put down solely to get the automobile meeting.

Mr. Lush said that that was so, and would be proved.

Sir R. Finlay said it was impossible to come to that conclusion. If it had not been done *bona fide* the Mayor and Corporation would have to pay the cost. He then read an affidavit by Mr. Weller, the present Borough Surveyor, to the effect that as against the first cost of laying the tarmac road there must be set off the saving in the cost of repairs and watering, due to its substitution for ordinary macadam. He estimated the cost of necessary repairs to the tarmac at 50 per cent, less than to ordinary macadam roads. Further, the tarmac road did not require watering, and he estimated the saving in that respect at 84. per annum.

After further affidavits had been read, the Lord Chief Justice said he thought it would be extremely difficult for the Corporation to justify expending money on a public highway simply to have motor trials.

Mr. Justice Darling: During which it could not be used as a highway.

Sir R. Finlay said that the tarmac road would be there and last ten or fourteen years, with all the advantages related in the affidavits. He submitted that if this was a form of paving elected *bona fide* in the exercise of their discretion as the highway authority, it did not matter that the immediate occasion which called their attention to the desirability of laying it was this proposed automobile competition. He contended it was established that the Corporation acted perfectly *bona fide* and well within their powers.

Mr. Dunkels, on behalf of the Public Works Committee, adopted the argument of Sir R. Finlay.

Mr. Lush, in support of the rule, submitted that the Corporation had not expended this money acting within their powers at all, but in

excess of their powers. That Court, he submitted, sat as a Court of Appeal against any wasteful expenditure in such a case; indeed, the only way of surcharging a Corporation was by coming to that Court. His two contentions were, first, that the Corporation had in fact exceeded their powers, and, secondly, if they had not exceeded their powers there had been a wasteful expenditure, and the Court had power to consider if that was so, and to quash the orders for payment if they found it was. What had been done here by the Corporation was not in the exercise of their powers as a Corporation, but as an Urban Authority under the Public Health Act. The Act protected a Corporation from being interfered with by auditors, but left it to the Court to say whether it was wasteful or not. It was clear that the Court had the right to over-ride wasteful expenditure. The case was of supreme importance, because if the contention of the Corporation was sound there was no power in any auditor or tribunal to prevent the most wasteful extravagance on the roads. The Corporation were only authorised to repair the roads as occasion might require, and they must show reasonable ground for saying the occasion required the spending of money for the repair of the road. The Corporation had to show that the time had come when the road needed repair, and they did not pretend that was so, even in their own affidavits.

At the conclusion of the arguments of counsel the Lord Chief Justice, in giving judgment, said the case was one of great importance because the Court was asked to quash an order for the payment of a considerable sum of money. Speaking for himself, if there had been evidence to show that the Corporation were acting *bona fide* under their statutory powers, he thought the case of "West street" v. the London and North-Western Railway" showed that the expenditure ought not to be reviewed, although there might be cases where the expenditure was so unreasonable as to be *ultra vires*. It was not disputed that the section under which the Corporation purported to act was sect. 149 of the Public Health Act, 1875, which empowered the authority to alter and repair streets "as occasion might require." He was of opinion that the beginning and end of the matter was the desire of the Automobile Club to hold their meeting at Brighton and the desire of the Corporation that the meeting should be held there. He came to the conclusion that the Corporation desired to have the automobile trials at Brighton, and that that desire was the only motive which prompted them to make the expenditure complained of. The fact that the motion for a rule was not made until December was not sufficient to enable the Court to say that the order ought not to be quashed.

Justices Ridley and Darling concurred, and the rule was accordingly made absolute.

Patents of the Week.

APPLICATIONS PUBLISHED.*

172A of 1905.—A. BRUCE: *Siphon Cisterns*. This relates to a siphon cistern, and is characterised by a siphon having an inner tube and an outer tube, the inner tube having a lateral branch provided with a valve which can be operated by the pull cord, and the outer tube having at its upper end an air-tight connection which automatically, by means of a float and lever arrangement connected to the valve spindle, said valve having preferably a pipe connexion, which is led out at the roof or elsewhere.

6,848 of 1905.—W. JAMESON: *Machines for Clamping together Pieces of Wood or other Material*.

This relates to a machine for clamping wood or other material, and consists in the arrangement of a presser bar worked by a crank and connecting rod through a lever having a fixed or immovable fulcrum, and the work of which is measured by the strength of a spring to which it is attached.

6,953 of 1905.—F. S. FIELDS and E. S. FIELDS: *Geysers or Apparatus for Rapidly Heating Water*.

This relates to a geyser or water heater comprising inner and outer sheet metal cylinders, plain, corrugated, or indented, concentric with each other, and producing a narrow or annular space between them, a plate closing in the upper end of the inner tube within the said depending tube forming a flue, a conical and cylindrical baffle, hollow or solid, suspended below and around the lower ends of the tube and flue, and with or without water-way connexions, and means for conveying the water into and out of the geyser.

10,719 of 1905.—A. FULLERTON: *A Machine for Moulding Artificial Stone or Concrete Blocks or Slabs*.

This relates to a machine for moulding artificial stone or concrete blocks or slabs, consisting of the moulding-box, provided with hopper and rear

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

opening for the introduction of the concrete matter and means for forcing it into the moulding-box aforesaid, a hinged cover lid designed to be raised at will in order to introduce a coating of coloured material or the like, lowered or locked in position by clamping devices, a movable bottom capable of being raised by the intervention of rotatable screws or by means of a piston and rod actuated by steam hydraulic or other means.

11,996 of 1905.—H. MACFARLANE: *A Method of Manufacturing Sheet Steel or Iron in Imitation of Earthenware Tiles or Bricks*.

This relates to a method of manufacturing enamelled sheet-steel or iron in imitation of earthenware tiles or bricks. The metal sheets are first grooved or marked so as to represent tiles or bricks, and this grooving or marking is accomplished by means of suitable dies, stamps, rolls, or the like. After the plates have been suitably grooved or marked they are then cleaned and enamelled in the usual manner.

14,508 of 1905.—M. J. ADAMS: *Baths*.

This consists in forming a bath with a slope in such a way that a satisfactory wash can be got with little water, because one end will be comparatively deep, and this end the bather will use. There is also formed a lavatory support upon the bath, discharging the waste of the same by the bath waste, and, where desired, one set of taps is caused to feed the bath and lavatory, and in some cases the water passes through the lavatory itself to the bath.

14,603 of 1905.—G. B. SMITH, JUNR.: *Transit and Lake Covered Structures*.

This relates to a transit shed having its roof formed in telescopic sections, which may be rolled or slid one within another to uncover part of the shed, and having fitted in conjunction therewith an overhead Goliath or other crane or cranes for removing goods through the opening or openings formed in the roof.

18,537 of 1905.—J. BRETHERTON: *Bricks, Blocks, and Tiles for Buildings*.

This relates to bricks, blocks, and building tiles of glass, constructed in such a manner that when they are laid or put together in the ordinary process of building construction all the mortar and cemented joints between the bricks are entirely covered by suitably shaped interlocking or engaging ledges or projections and recesses formed on the face surface of each of the bricks. The above-mentioned interlocking or engaging parts are so constructed as to come into contact with each other when the bricks or body portions of the bricks are separated by the mortar or other binding cement, consequently all the mortar or cement joints between the bricks are covered, and water or rain is prevented from soaking into and penetrating the mortar or cement, and in consequence pointing or repointing of the joints between the bricks is entirely done away with and rendered unnecessary.

22,727 of 1905.—C. TIMME: *Flooring Slab for Laying Directly on Masonry*.

This relates to a flooring slab for direct application to masonry by means of mortar or other adhesive material, consisting of an artificial stone mass with wooden facing and an intermediate isolating layer provided between the wooden and stone layers, held together in the usual manner by elastic connecting members, of an isolating mass, which is compressed between the layers and remains elastic and soft even on the upper surfaces, and follows all movements of the wood due to contraction or warping, and therefore presses tightly everywhere against the wood.

675 of 1906.—W. MANLEY: *Lavatory Basins, Baths, and the like*.

This relates to lavatory basins, baths, and the like, and consists in providing a lavatory basin superposed above the bath at the foot and mounted in a frame fitted upon the edge of the bath. The basin is provided with a supply of hot and cold water, which may be conveniently admitted through a geyser, or it may be admitted through hot and cold taps provided upon the basin. The outlet from the basin, when the basin is used, may be closed by a plug, the waste water from the basin flows through the trap, the tap under the basin being turned off or shut, while, when the bath is required, the water flows through the basin by taking out the plug and turning on the tap. It will be understood that when the bath is required the water flows through the tap underneath the basin, thus filling the bath.

1,111 of 1906.—L. PIRSOUL: *Manufacture of Tiles and the like*.

This relates to a method of manufacturing glass and tiles or the like with attachment projections, and consists in forming the tile or the like in a suitable mould and introducing into the still plastic or fluid mass in the mould a die provided with recesses, for the purpose of producing corresponding projections in the back of the mass when solidified. If desired, deforming or undercutting said projections and finally filling up the back with sand or other material.

PATENTS.—Continued on page 506.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv; Contracts, iv, vi, viii, x.; Public Appointments, xix.; Auction Sales, xxvii.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

Competitions.

* **JULY 2.—LIVERPOOL SCHOOL.**—The Liverpool Education Committee invite plans and designs for architects for new secondary school for girls at Aintree Vale. Applications for conditions of competition (with particulars of premiums offered, etc.) should be made to the Town Clerk, Municipal Offices, Liverpool, with deposit of £1. 1s. Plans to be submitted not later than July 2.

NO DATE.—AYSGARTH.—VILLAGE INSTITUTE.—Village Institute at Aysgarth, Wensleydale. Plans are invited from architects, for a village institute, to cost not more than 600*l*. Particulars from Mr. F. S. Graham, Aysgarth.

Contracts.

BUILDING.

MAY 7.—BRIDBIDGE.—DISPENSARY.—Banbridge Guardians invite tenders for the erection of a dispensary and dispensary residence for the use of the medical officer of the Crossgar Dispensary District, in the townland of Crossgar, according to the plans and specifications prepared by Mr. W. W. Larnor, architect. Sealed tenders, addressed "To the President Chairman, on the special form obtainable from Mr. W. W. Larnor, 10, Union Clerk, Poor Law Office, Workhouse, Banbridge, Ireland, and containing the names and addresses of two solvent sureties, will be received up to 12 o'clock noon on May 7.

MAY 7.—CROOKS.—KITCHENS, ETC.—Erection of eight kitchens and bedrooms at property, 1 to 15, Carson-road, Crooks. Plans and specifications at Mr. F. W. Stephenson's, Drogheda, Spitzhill. Tenders to be in on Monday, May 7, to Mr. F. W. Stephenson, Drogheda, Wellington, Rotherham.

MAY 7.—ELGIN.—HOUSE.—The mason, carpenter, plasterer, slater, plumber, and painter work of a dwelling-house to be erected in High-street, Elgin. Plans and specifications with Mr. James Jamieson, architect, 77, High-street, Elgin, and estimates lodged with him, on or before May 7.

MAY 7.—KINGUSSIE.—VILLA.—New villa to be erected on West-terrace, Kingussie. Plans and specifications may be seen with the architect, Mr. J. G. Cooper, 22, Commercial-street, Halifax, to whom tenders are to be delivered, not later than 5 p.m.

MAY 7.—LEMPHMAN.—COTTAGE.—Mason, carpenter, plasterer, slater, painter, and glazier work of a plumber, slater, painter, and glazier work of a cottage to be erected near Lumphman Station. Plans and specifications may be seen with Mr. Andrew Fraser, Rosedale Cottage, Lumphman, Town Clerk, Lumphman, up to and including May 7.

MAY 7.—SOUTHAMPTON.—WAREHOUSE.—The Southampton Harbour Board invite tenders for certain alterations and additions to warehouse of their own, to be seen upon application to Mr. E. Cooper Poole, A.M.I.C.E., Engineer to the Board, and bills of quantities and form of tender obtained upon payment of 1*l*. Sealed tenders, addressed to office of Mr. J. E. Pailthorpe, Clerk to the Board, Harbour Board Offices, Town Quay, Southampton, not later than noon on May 7.

MAY 8.—STONN.—HOUSES, ETC.—The erection of five houses and stores at Sidal for the Economic Stores. Quantities from Messrs. Richard Horsfall & Son, architects, 22a, Commercial-street, Halifax, to whom tenders are to be delivered, not later than 5 p.m.

MAY 9.—LINCOLN.—SCHOOL, CHAPEL.—Wesleyan school chapel, West-ward, Lincoln. Bills of quantities from the architects, Messrs. Green, Knowles, & Russell, to Adelphi Bank Chambers, South John-street, Liverpool, upon the deposit of 1*l*. Tenders to be delivered to the Rev. E. J. Brailsford, 11, Westward, not later than 12 o'clock on May 9.

MAY 9.—MAYNOR.—RETORT HOUSE.—The Directors of the Shotley Bridge and Consett District Gas Company invite tenders for the brickwork, masonry, and ironwork of a retort house, with gas slating, etc., required in the extension of their retort house at Shotley Bridge. Plans and specifications may be seen at the Gas Office, Shotley Bridge. Tenders to be sent to Mr. M. Richley, Secretary Gas Office, Shotley Bridge, not later than May 9.

MAY 9.—WESTERHOPE SCHOOL.—Northumberland C.C. Education Committee invite tenders for erecting a new school, to accommodate 320 scholars, at Westerhope, near Newcastle-on-Tyne. Name and address to Mr. C. Williams, Secretary to the Education Committee, Pearl-buildings, Newcastle-on-Tyne, not later than May 9, together with a deposit of 2*l*. 2*s*. Plans of school, and tenders, endorsed "Tender for Westerhope School," must be forwarded to the Secretary not later than noon on May 30.

MAY 9.—WHITBURN.—SCHOOLS.—The Glamorgan C.C. Education Committee invite tenders for the following works:—(1) Erection of infants' school and alteration of present buildings at the Heath; (2) Council School, Whiteburn; (3) erection of a new mixed and infant school; (4) Godre'sraig, near Ystalyfera; (5) erection of a new temporary cookery-room at the

Budmor Council School. Plans, etc., of work No. 1, may be seen, and copies of the bill of quantities obtained, at offices of Mr. T. Mansel Franklon, Clerk of the C.C. Offices, according to the following addresses: Cardiff, Bill of work No. 2 may be seen, and copies of the bill of quantities obtained, at the Pontnadrave Police station, and at offices of Clerk. Plans of work No. 3 may be seen, and copies of specification obtained, at the school, and from Clerk. Sealed tenders (made out on the form supplied) are to be delivered to the Clerk, together with the full names and addresses of two substantial sureties, not later than May 9, marked outside, "Tender for Heath School," or "Tender for Godre'sraig School," etc., as the case may be.

MAY 10.—MORAY.—TOWERING HOUSE.—Towering House, crozier, and alterations of boiler-house, boiler setting, etc., at the Albert Mills, Morley, for the Albert Mills Company. All tenders to be delivered at the office of the Company, Princess-street, Morley, before 4 p.m. on May 10. Messrs. T. A. Butler & S. B. Birds, architects, Queen-street, Morley, and at localities.

MAY 10.—NEWBURN.—CHAPEL.—The mason, carpenter, slater, lath and plaster, plumber and painter and glazier works to be done in connexion with the rebuilding of the chapel, Newburn, according to the plans and specifications to be seen with the Rev. J. S. Lout, The Manse, Forerain; also copies to be seen with Mr. John Robertson, architect, 10, North-street, Newburn. Tenders to be lodged on or before May 10.

MAY 11.—ABERNATHY.—CHAPEL.—Rebuilding Bethesda Welsh Independent Chapel, Abernathy, Aberdare for the trustees. Plans and specifications to be seen at office of Mr. T. Roderick, architect, Ashbrook House, Clifton-street, Aberdare. Endorsed tenders to be sent to Mr. J. Barclay, 10, Windsor-terrace, Aberdare, not later than May 11.

MAY 11.—POTTERTON.—STEADING.—Mason, carpenter, and slater works of new steading at Gandy Park, Bellevue (Mr. Alexander Davidson, tenant). Plans and specifications may be seen with Messrs. Cochran & Macpherson, advocates, 152, Union-street, Aberdeen; or in the hands of the tenant; and offers will be received by Messrs. Cochran & Macpherson up to May 11.

MAY 11.—TAUNTON.—SCHOOL.—The Governors of Taunton School, Taunton, invite tenders for the erection of a new classroom, wing, and corridors, and also a new corridor to connect this extension with the new chapel. Plans, etc., seen, and bills of quantities obtained, at the offices of Mr. F. W. Roberts, architect and surveyor, 2, Commercial-street, Taunton. All tenders must be delivered by or before the first post on May 11.

MAY 12.—BELFAST.—SHOPS AND OFFICES.—The Arthur Smart Development Company, Ltd., invite tenders for the erection of a new, large block of buildings, comprising shops and offices, at Arthur-quay, Arthur-street, and Waterloo-street, South Belfast. Bills of quantities may be obtained from Mr. S. C. Hunter, Scottish Provident-buildings, on payment of a deposit of 2*l*. 2*s*. Plans and specification may be seen at office of Messrs. Blackwood & Juxy, M.B.I.A., architects, 41, Donegal-place, Belfast. Sealed and endorsed tenders to be lodged with architects on or before 10 o'clock on May 12.

MAY 12.—BOKRUTH.—BANKING PREMISES.—The erection of banking premises at Poury-street, Bodruth, and shop premises adjoining same, for Messrs. Barclay & Co., Ltd. The drawings and specifications may be seen by appointment at the offices of the architect, Mr. O. Caldwell, F.R.I.B.A., architect and surveyor, Victoria-square, Princesse. Sealed tenders, endorsed "Tenders for Bank," to be sent to the architect on or before May 12.

MAY 14.—DUBLIN.—ELECTRICITY SUBSTATION.—Dublin Electric Lighting Committee invite tenders for the erection of an electricity substation at Fairview, Dublin. Plans, etc., prepared by the City Architect, may be inspected daily (except on Saturdays) at his office, Municipal-buildings, Cork-hill, Dublin, between the hours of 11 a.m. and 4 p.m. Forms, etc., may be obtained at the office of the City Treasurer, Municipal-buildings, Cork-hill, Dublin, on payment of 2*l*. Tenders, unless addressed to the "Chairman, Electric Lighting Committee," and endorsed, "Tender for Electricity Sub-station, Fairview," to be lodged at the Electric Lighting Committee's Office, 3, Cork-hill, Dublin, not later than 4 o'clock on May 14.

MAY 14.—MARLBOROUGH.—SCHOOL.—Derbyshire Education Committee invite tenders for the erection of a new school, Marlborough, Honor, to accommodate about 216 boys. Drawings, etc., at the office of the Architect to the Committee, St. Mary's-gate, Derby. Form of tender, etc., can be obtained at the architect's office, upon payment of 1*l*. 2*s*. Sealed tenders, in envelopes provided for the purpose, endorsed "Tender for New Council School, Marlboro," must be delivered to Mr. George H. Wilsons, A.R.I.B.A., Architect to the Committee, County Education Office, St. Mary's-gate, Derby, not later than 5 p.m., May 14.

MAY 14.—NANTYFRELON.—CHURCH.—The erection of a new English Calvinistic Methodist church at Nantylfrelon, near Maesteg. Plans and specification may be seen, and quantities obtained, at the offices of Mr. Arthur Lloyd Thomas, A.M.I.C.E., architect and engineer, Church-street chambers, Pontypridd.

Sealed and endorsed tenders to be sent to Mr. D. E. Watkins, 24, Humphrey-street, Nantylfrelon, on or before May 14.

MAY 15.—DUNSTON.—LATRINES, ETC.—Durham County Education Authority invite tenders for new latrines, asphaltting, etc., at Dunston Council school. Plans, etc., may be seen at the architect's office, where quantities may be obtained. Sealed, endorsed tenders to be delivered to Mr. W. Rushworth, F.R.I.B.A., Architect, County Education Offices, Durham, not later than May 15.

MAY 15.—SHEFFIELD.—SHEFFIELD HEALTH COMMITTEE.—The Sheffield Health Committee invite tenders from the following trades for work required in connexion with the erection of tenements on sect. 2 of the Crofts Area:—(1) Excavator, bricklayer, and mason; (2) carpenter and joiner; (3) slater; (4) plasterer; (5) plumber and glazier; (6) painter. Specifications and plans may be seen, and quantities obtained, at the office of Mr. Charles F. Wake, C.E., City Surveyor, Town Hall, Sheffield, on payment of 1*l*. 1*s*. Tenders, endorsed "Crofts Dwellings," are to be sent in not later than 9 a.m. on May 15, and addressed to "The Chairman and Members of the Health Committee, City Surveyor's Office, Town Hall, Sheffield."

MAY 16.—HULL.—GREENHOUSE.—Hull Parks and Gardens Committee of the Hull Corporation invite tenders for the erection of greenhouse, which they propose to erect in the East Park, Holderness road. Drawings and specification may be seen at the office of Mr. Joseph H. Hirst, City Architect, 15, Westgate, Hull. Tenders, sealed, and endorsed "Tender for Greenhouse, East Park," are to be addressed to the Chairman of the Parks and Burial Committee, and delivered to the Town Clerk's Office, Hull, before 10 a.m., on May 16.

MAY 16.—KILMONEY.—ALTERATION TO CHAPEL.—Alterations and general renovation of Brynhafydd C.M. Chapel, Kilmoney. Plans and specifications to be seen with Mr. Benjamin Jones, 29, Plantation-street, Rhymney, to whom tenders are to be delivered on or before May 16, sealed, and endorsed "Tender for Chapel." Mr. R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy.

* **MAY 16.—TOOTING.—FIRE-RESISTING WORKS, ETC.**—Fire-resisting works, etc., to a stone building at Fountain Fever Hospital, Tooting, S.W., for the Metropolitan Asylum Board. Drawings, specifications, conditions of contract, and form of tender to be seen at office of the Board, Embankment, E.C.4, on and after May 7, and can be obtained on payment of a deposit of 1*l*. Tenders to be addressed as noted on the form, to be delivered Board's office not later than 10 a.m., May 16.

MAY 17.—WALMERSTEAD.—SCHOOL.—Lancashire Education Committee invite tenders for the enlargement and improvement of the Turn-Firth Lane Council School, Walmerstead-cum-Sharlow. Plans may be seen at the Council Office, Ramsbottom, and bills of quantities obtained at the office of the County Architect, Mr. Henry Little, 16, Ribblesdale-road, Preston, by payment of a deposit of 1*l*. Tenders must be delivered before 12 o'clock noon on May 17, sealed and endorsed, to Mr. W. Dilworth, Arden House, Summersdale, near Manchester.

MAY 17.—BAXWELL.—GRAY'S STRAITS, ETC.—The erection of the grand stand, horse stalls, cattle and sheep pens, show and cart horse rings, band stand, three registered turnstiles with barriers and pay-boxes, four tents for chess exhibits, committee, secretary, and ladies, erecting necessary jumps and preparing ground for, and clearing up after, show, etc., in connexion with the annual show to be held on August 15, at Baxwell. Full particulars may be obtained from the Hon. Secretary, Mr. A. S. E. Sedzwick, 6, Magdalen-buildings, Weston-super-Mare. All tenders must be received by May 18.

* **MAY 18.—BUXTON.—BUILDINGS.**—The Vicar and Committee of St. Paul's, West Buxton, invite tenders for pulling down the existing temporary iron buildings and erecting on the site fronting to Alardee-street, Buxton:—(1) A new parochial hall; (2) gymnasium and classrooms; (3) caretaker's house. Drawings and specifications may be seen at the offices of Mr. C. E. Hewitt, architect, 21, Olding-street, Westminster, from whom also bills of quantities may be obtained, after May 8, on deposit of 5*l*. Sealed tenders, on the forms supplied, before 12 noon, addressed to the architect, May 18.

MAY 22.—CLAYTON.—ANDREWS ON HACE AND STRIBES AS REFRESHMENT-ROOMS, ETC.—Adaptation of Springfield House and stables as refreshment-rooms, superintendent's and gardener's quarters, bolby, erection of conveniences for men, etc., at Springfield Park, Clayton, N.E., for the L.C.C. Drawings, specifications, form of tender, etc., to be obtained from Architects' Department, 15, Pall-mall East, S.W., on payment of cash at the County Hall, Springfield gardens, S.W., of 10*s*. 6*d*. Tenders to be delivered at County Hall, endorsed "Tender for Adaptation of Springfield House, etc.," and addressed to the Clerk, Springfield gardens, S.W., not later than 10 a.m., May 22.

MAY 22.—EGG BUCKLAND.—LODGE.—Plymouth Corporation invite tenders for the erection and completion of a lodge, etc., at the New Cornley, Egg Buckland. Plans and specification can be seen, and forms of tender and bills of quantities obtained, on deposit of 2*l*, in cash. Sealed tenders, accompanied by a fully priced-out bill of quantities, to be delivered at the offices of Mr. James Paton, Borough

Engineer and Surveyor, Borough Engineer's Office, Municipal Offices, not later than 5 p.m. on May 22.

May 23.—DENBY.—SCHOOL.—The Denby Education Committee invite tenders for the erection of a new school on the Nottingham-road. Plans, etc., may be seen, and schedules of quantities may be obtained, on application to Mr. Arthur Eaton, architect, St. James's-street, Denby, on and after Monday, May 7. The sum of 11. 1s. will be charged for the schedule of quantities. Tenders, on the form supplied, together with the priced schedule of quantities, must be delivered at the Education Office, Beckel-street, Denby, before 12 o'clock noon on May 23, endorsed "Tender for New School on Nottingham-road."

May 23.—HYTHE.—NEW COUNCIL SCHOOL.—To accommodate 250 infants for the Kent Education Committee. Drawings and specification may be inspected at the office of the architect, Mr. A. Brouley, Radnor-chambers, Folkestone. Names of those desiring to tender to be sent to the architect before noon on May 11, with deposit of 11. Tenders, on form supplied, to Mr. R. Lougreaux, 11, Chertown-place, Folkestone, before noon, May 25.

May 26.—POULTON.—NEW SCHOOLS.—For the Walsley U.D.C. Education Committee, in accordance with drawings and specifications prepared by Mr. Joseph Hoff, architect, 9, Albert-square, Manchester. Copies of bills of quantities and general conditions, with form of tender, may be obtained from Architect's office, on and after May 15, on depositing 11. 1s. Sealed tenders, endorsed "Tender for Poulton School," by post not later than May 26.

No DATE.—GUILDFORD.—ALTERATIONS, ETC., TO PREMISES.—Alterations and repairs to premises in the Walnut Tree Close-road, Guildford. Bills of quantities may be obtained on application to Mr. K. Goodham Nye, P.A.S.I., architect and surveyor, Jenner-road, Guildford.

No DATE.—PENTRECHWYTH.—REBUILDING.—Rebuilding the Rising Sun, Pentrechwyth, near Swansea, for Mr. E. Evans Bevan, Neath. Plans and specification may be seen, and bills of quantities may be obtained, upon application to Mr. J. Cook Rees, architect and surveyor, Church-place, Neath.

No DATE.—RAPID.—VILLAS.—For building six villas at Rapid. Contractors wishing to tender to submit to send their names to office of Mr. John H. James, M.S.A., architect, 18, Quay-street, Cardiff, where plans can be seen and quantities obtained upon paying deposit of 21. 2s.

No DATE.—REDBRIDGE.—VIARAGE.—The erection of a new vicarage at Redbride, Wensleydale. Names to the architects, Messrs. Bland & Bow, North Park-road, Harrogate, and quantities will be forwarded when ready.

No DATE.—TROTTER.—NEW SCHOOL for the Staffordshire Education Committee. Names to be sent by May 16 to Mr. Graham Ballour, Director of Education, Stafford, at whose office drawings and specifications can be seen. Quantities supplied on deposit of 11.

No DATE.—WIMBORNE.—VILLAS.—The erection of a pair of villas at Wimborne. Plans and specification may be seen at the offices of Mr. Charles Munckton, surveyor, Wimborne.

ENGINEERING, IRON, AND STEEL.

May 8.—BOMBAY.—BRIDGEWORK.—Bombay, Baroda, and Central India Railway Company Directors invite up to noon on May 8, tenders for the supply of steel and cast-iron bridgework. Tenders must be made on a form, copies of which, with specification, can be obtained at the offices of Mr. T. W. Wood, Secretary, Gloucester House, Bishopsgate-street, Wilton, London, E.C., on payment of 21s. each (which will not be returned).

May 9.—INDIA.—IRON BARS.—The East India Railway Company invite tenders for the supply and delivery of wrought-iron bars, as per specification to be seen at the company's office. Tenders are to be sent to Mr. C. W. Young, Secretary, Nicholas-lane, London, E.C., marked "Tender for Wrought-iron Bars," not later than 12 o'clock noon on May 9. For each specification a fee of 15s. is charged, which cannot, under any circumstances, be returned.

May 9.—MIDDLEWICH.—WATER MAIN.—Middlewich U.D.C. invite tenders for the supply of about twelve miles of 6-in. cast-iron socket and spigot water pipes, also for 8-in. valves and automatic air valves. Further particulars and specification can be obtained on application by letter to Mr. Frederick W. Stocks, Engineer, Town Hall, Middlewich. Sealed tenders, endorsed "Water Main," to be delivered to Mr. C. F. Lawrence, Clerk to the Council, Town Hall, Middlewich, on or before May 9, at 9 a.m.

May 10.—GREENHILL.—TANK.—The District Committee of the Middle Ward of the county of Lanark invite tenders for providing and erecting a steel tank at Greenhill, and in laying cast-iron pipes and carrying out relative works. Plans may be seen and copies of the specification and schedule obtained at the office of Messrs. J. A. Leslie and Co., Engineers & Reid, (C.E., 72a, George-street, Edinburgh, on payment of 11. Tenders, endorsed "Tender for Greenhill Tank," must be lodged with Mr. W. E. Whyte, District Clerk, District Offices, Hamilton, not later than first post on May 10.

May 10.—SOUTHAMPTON.—BATTERY, ETC.—Southampton Corporation invite tenders for supplying and fixing at their electric light works:—(1) storage battery; (2) chain grate mechanical stoker. Forms of tender, etc., may be obtained upon application to Mr. H. F. Street, Borough Electrical Engineer, Electricity Supply Station, District Offices, Southampton. Sealed and separate tenders, properly endorsed, must be delivered at the Town Clerk's office before 2 p.m. on May 10.

May 11.—FOURBURGH.—CONVENIENCES.—Edinburgh Corporation invite tenders for the construction of a new convenience at Tollcross, Schedules, etc., from the Borough Engineer. Sealed tenders, marked "Tender for Tollcross Convenience," must be lodged with Mr. Thomas Hunter, W.S., Town Clerk, City-chambers, Edinburgh, not later than May 11.

May 12.—HULL.—LAYING.—The Corporation invite tenders for the carriage of pipes for trench laying, and jointing of about 14 miles of 30-in. water main. Form, etc., may be obtained of Mr. F. J.

Bancroft, City Water and Gas Engineer, Alfred Gelder-street, Hull, on payment of 11. Cheques and postal orders to be made payable to Mr. T. G. O'Brien, City Treasurer, Hull, on and after Monday, May 7. Tender for Laying 30-in. Main," are to be addressed to the Chairman of the Water and Gas Committee, and delivered at the Town Clerk's office not later than May 12.

May 12.—HULL.—PIPS.—Hull Water and Gas Department of the Corporation invite tenders for about 1,250 tons of 30-in. cast-iron pipes and special castings, Forms, etc., may be obtained from Mr. F. J. Bancroft, City Water and Gas Engineer, Alfred Gelder-street, Hull, on payment of 11. Cheques and postal orders to be made payable to Mr. T. G. O'Brien, City Treasurer, Hull, on and after Monday, May 7. Tender for 30-in. Pipes and Specials," are to be addressed to the Chairman of the Water and Gas Committee, and delivered at the Town Clerk's office not later than May 12.

May 12.—STOKE.—PLANT.—Stoke-upon-Trent. Electricity Committee invite tenders for the supply and delivery of:—Contract 13, steam dynamo (single-acting engine); contract 14, condensing plant (surface); contract 15, blowers and balancers. Forms, etc., from Mr. P. J. S. Fiddeman, Borough Electrical Engineer, on payment of a deposit of two guineas for each contract. Tenders to be sent to and addressed to "The Electricity Committee, Stoke-upon-Trent, Stoke-upon-Trent, not later than May 12, and endorsed "Tender for..."

May 14.—HARLEY.—DESTRUCTOR WORKS, ETC.—Harley Corporation invite tenders for (1) destructor works (clinker-crushing plant); (2) mortar mill; (3) steam engine; (4) alternating current motor. All the above are for hiring terms per annum, with option of purchase by the Corporation. Forms, etc., from Mr. J. Lobley, Borough Engineer, Harley. Sealed and endorsed tenders to be sent in before Monday night, May 14.

May 14.—MANCHESTER.—REFRIGERATING MACHINERY.—The Markets Committee invite tenders for the extension of the refrigerating machinery and plant at Smithfield Market. Specification and form of tender may be obtained on application at the City Surveyor's Office, Town Hall, Manchester, on payment to the City Treasurer of two guineas. All cheques and postal orders are to be made payable to the order of "The Corporation of Manchester." Tenders, enclosed in the official envelope and addressed to the Chairman of the Market Committee, to be delivered at the City Surveyor's office not later than noon on May 14.

May 15.—AMPHILL.—WATER SUPPLY.—Amphill U.D.C. invite tenders for (a) the supply, delivery, and laying of about 7 miles of 6 in., 4 in., and 3 in. cast-iron water mains, with sludge valves, valves, air valves, and water-level indicator; (b) the construction of engine and producer house and brick softening tanks at Copthill, and a 150,000 gallons capacity storage reservoir in Amphill Park; (c) the supply, delivery, and erection of suction gas plants, gas engines, air compressors, surface pumps, softening plant, and well, with air-lifting pumping plant, at Copthill. Forms, etc., may be seen on and after May 3 next at the offices of the engineers, Messrs. W. R. & W. Phillips, Luton, Beds, from whom copies of same can be obtained on payment of two guineas for each of a, b, and c, and of a half which sum will be returned on receipt of a *bona fide* tender. Sealed tenders, on the prescribed form, and endorsed "Amphill Waterworks," contract (a), (b), or (c), as the case may be, to be addressed to Mr. Alfred T. Trethewey, Clerk to the Council, U.D.C. Offices, Amphill, Bedfordshire, and delivered on or before May 15.

May 15.—DUFFDOWN.—PIPING.—The piping and cementing works in connexion with the purification scheme to be carried out near the Malt Kiln Burn, Burn of Duffdown, specifications and quantities may be seen with Mr. Donald McKay, Burgh Surveyor, Dufftown, who will meet intending offerors on the grounds, on May 12, from 10 a.m. till 1 p.m.; and sealed tenders will be received by the Town Clerk, on or before May 15.

May 15.—INDIA.—RAILS, ETC.—South India Railway Company, Ltd., invite tenders for the supply of:—(1) Steel rails (41½ and 50 lbs.), 1742 tons, and flatpates for the same, 25 tons; (2) cast-iron pot sleepers, 1750 tons; (3) tie bars, gibs, and cotlers, 139 tons; (4) fish-bolts, spikes, and bearing plates, 98 tons; (5) iron wire fencing and steel poles, 32 tons; (6) general stores, comprising hardware, iron, steel, metals, oils and colours, leather and rubber goods, electric stores, and sundries; (7) locomotive stores, comprising copper and steel plates, tires, axles, springs, and brass and steel tubes; (8) stationery, comprising books, paper, envelopes, ink, and sundries. Forms, etc., may be obtained at the company's offices on and after Monday, April 30. Tenders, addressed to the company, marked "Tender for Rails," or as the case may be, must be left with Mr. Henry W. Nolman, Managing Director, Company's Offices, 25, Abchurch-lane, London, E.C., not later than 12 o'clock noon of May 15. A charge, which will not be returned, will be made of 20s. for each copy of specifications Nos. 1, 2, and 6, and of 10s. for each copy of the other specifications. Drawings may be obtained at the office of Sir George B. Bruce, 3, Victoria-street, Westminster, on payment of 5s. per sheet.

May 15.—SOUTHAMPTON.—STEEL PALING.—The Board of Directors of the Southern Railway Company, Ltd., invite tenders for unclimbable steel paling, as per specification and drawing, which may be seen at the office of the company. The charge for the specification is one guinea each, which will not be returned. Tenders must be sent in, addressed to the Secretary, Mr. Edw. Z. Thornton, 15, Queen Anne's-lane, London, E.C., tenders enclosed in a cover marked "Tender for Steel Paling," not later than 12 o'clock noon on May 15.

May 15.—WHARFPOOT.—SEA BATHS.—The U.D.C. invite tenders from persons who are prepared to carry the construction of baths in accordance with plans and specifications prepared by Messrs. Kay, Parry, & Ross, civil engineers and architects, 65, Dawson-street, Dublin. Bills of quantities, plans, and specifications, have been prepared by Messrs. Beckett & Medcalf, quantity surveyors,

and copies can be obtained at the offices of the architects on payment of a sum of 11. Tenders, enclosed in sealed envelopes, marked "Tender for Sea Baths," and addressed to the Chairman of the Council, must be delivered at office of Mr. Bernard McKernan, Clerk to the Council, Town Hall, Warrenton-street, Dublin, on or before May 15.

May 16.—SALFORD.—PIPS.—Salford Corporation invite tenders for cast-iron pipes, etc., at the sewage works. Forms of tender, etc., at the Borough Engineer's Office, Town Hall, Salford. Tenders for cast-iron Pipes, etc., for Sewage Works," are to be addressed to the Chairman of the River Committee, must be delivered to Mr. L. C. Evans, Town Clerk, Town Hall, Salford, not later than 12 noon on May 16.

May 19.—ATHY.—WATERWORKS.—The U.D.C. of Athy (Co. Kildare) invite tenders for the execution of the following contracts:—Contract No. 1, constructing reservoir and intake works, and carting and laying about ten and three-quarter miles of 6-in. to 3-in. cast-iron pipes, valves, etc.; contract No. 2, supplying and delivering in Athy about 670 tons of 6-in. to 3-in. cast-iron pipes; contract No. 3, supplying and delivering in Athy the requisite valves, hydrants, etc. Plans and specifications can be seen at the Town Hall, Athy, or at the office of the Engineer to the Council, Mr. Valentine Kilbride, 4, Dame-street, Dublin, or at the office of the Engineer, Mr. James F. Rodde, A.M.I.C.E., 9, Bridge-street, Westminster, S.W., from whom copies of the specification may be obtained on payment of 11. for each contract. Sealed tenders to be delivered to Mr. J. A. Lawler, Clerk to the U.D.C. Board-room, Athy; Valentine Kilbride, Solicitor for the U.D.C., 5, Dame-street, Dublin, not later than May 19.

May 23.—LITH.—COAL HOIST.—The Commissioners for the Harbour and Docks of Louth invite designs and specifications for a new hydraulic coal hoist, capable of lifting and tipping 2000 tons of coal in 20 tons at a height of 61 ft. above the level of the quay, complete with cradle stool, anti-brakeage gear, and all appliances. A plan of the site, together with information as to the requirements, the conditions of contract, and other particulars, may be seen on application to the engineer, Peter Whyte, City Engineer, Louth. Names of those desiring to tender are to be delivered to Mr. Victor A. Noel Paton, Clerk to the Commissioners, 31, Molville-street, Edinburgh, on or before May 23.

MISCELLANEOUS.

May 7.—BRADFORD.—STOOLS.—Bradford Education Committee invite tenders for the supply of ninety-four stools, drawings of which may be seen on application in the Stores Department at Education Office, City Engineer's Office, Bradford. Tenders to be delivered to Mr. Tho. Garbutt, Secretary, Education Office, Manor-road, Bradford, not later than 12 noon on May 7.

May 7.—BRISTOL.—FITTING UP.—Bristol Corporation invite tenders for fitting-up the City Analyst's office at No. 13, Prince-street. A copy of the specification can be obtained on application to Mr. Peter Addey, City Valuer, Council House, Bristol. Tenders must be delivered at the Council House, Bristol, not later than May 7, addressed to the Town Clerk, and endorsed "Tender for Fitting-up City Analyst's Office."

May 7.—LLANDUDNO.—FEEDER CABLE.—Llandudno District Council invite tenders for the supply and delivery of 1,221 yds. 25 triple concentric feeder cable, paper insulated. Forms of tenders may be had on application to Mr. Harold Morton, Electrical Engineer, Electricity Works, Llandudno. Tenders to be lodged with Mr. Alfred Conolly, Clerk to the Council, Town Hall, Llandudno, on or before May 7, endorsed "Tender for Feeder."

May 7.—WENLOCK.—HAULING.—Wenlock Borough Council invite tenders for the hauling of stone and material for the widening of the Preston Road Railway stations on to the main and district roads in the Wenlock district, as required. The contractor is to be responsible for denoutrage. Price per ton to be fixed, also price per ton for single horse, man, and cart, and price per hour for single horse, one man, and cart. Sealed tenders, endorsed "Wenlock Hauling," must reach office of Mr. F. H. Potts, Town Clerk's Office, Much Wenlock, Salop, on or before May 7.

May 8.—BIRMINGHAM.—ELECTRICAL APPARATUS.—Various sizes of electrical motors required by the Electric Supply Committee of the Corporation. Forms of tenders may be obtained at the office of the Engineer, Mr. R. A. Chattock, M.I.E.E., 14, Dale-end, Birmingham. Before obtaining the general conditions and specification it will be necessary to deposit the sum of 11. 1s. Tenders will be sent in under seal addressed to the City Electrical Engineer, at the Electric Supply Department, Dale-end, Birmingham, and endorsed on the outside, "Tender for Electric Motors," not later than 12 o'clock noon, May 8.

May 8.—FINSBURY.—JURRAH WOOD PAVING.—Finsbury Borough Council are prepared to receive alternative tenders for paving the carriageways of City-road, Finsbury-square, Finsbury-paving, and Clerkenwell-road (north side) with 3-in. by 4-in. by 9-in. Jarrah wood blocks, or 3-in. by 3-in. by 9-in. Jarrah wood blocks. The specification can be seen, and forms of tenders obtained, at the Borough Surveyor's Office, Finsbury Town Hall, Rosebery-avenue, any day (except Saturday), between 10 a.m. and 5 p.m., on deposit of 11. 1s. Tenders, endorsed "Wendwood Paving," to be delivered to Mr. George Whitehead Preston, Town Clerk, Finsbury Town Hall, Rosebery-avenue, E.C., not later than 12 noon on May 8.

May 9.—TWICKENHAM.—FIRE ESCAPE.—Twickenham U.D.C. invite tenders for the supply of a combined four-wheel hose carriage and telescopic fire escape. Further particulars may be obtained on application to Mr. Fred W. Pearce, F.S.I., Surveyor to the Council, Town Hall, Twickenham. Sealed tenders, endorsed "Tender for Fire Escape," to be delivered to Mr. H. J. J. Joseph Saunders, Clerk to the Council, Town Hall, Twickenham, not later than 12 o'clock noon on May 9.

May 10.—DRESDEN.—LARCH POSTS AND RAILS.—Larch posts and rails to be delivered to Messrs. Hoynes and Ballater. Schedules of quantities, etc., may be

had on application to Mr. John Milne, District Surveyor, Aboyn, and sealed offers will be received by the District Clerk, Mr. John Murray, 22, Bridge-street, Aberdeen, up to 3 p.m. on May 10.

May 10.—LEITH GRADING.—FLOOR.—Leith Harbour and Docks Commissioners invite tenders for laying a granolithic floor in sheds at Albert Dock, Leith. Specification, form of tender, etc., on application at the office of Peter Whyte, M.Inst.C.E., Superintendent of the Harbour and Docks, Tower-place, Leith. Tenders are to be delivered to Mr. Peter Whyte, District Clerk to the Commission, 31, Melville-street, Edinburgh, on or before May 13.

May 11.—EDINBURGH.—CARTS.—Edinburgh Cleaning Department invite tenders for the supply of six street watering carts capable of containing about 400 gallons. Further particulars may be had from the Inspector of Cleansing, 351, High-street. Offers, marked "Watering Carts," to be lodged with the Town Clerk not later than May 11.

May 14.—EDINBURGH.—ARC LAMP POSTS.—Edinburgh Corporation invite tenders for arc lamp posts. The specification, form of tender, and drawings can be obtained from the Electrical Engineer, Dewar-place, Edinburgh, on payment of a deposit of 2s. Tenders, on the prescribed form, enclosed in sealed envelopes, and endorsed on the outside "Tender for Arc Lamp Posts," are to be delivered to the Town Clerk, City Chambers, Edinburgh, not later than May 14.

May 14.—HAMBLEDON.—CARTAGE.—Hambledon R.D.C. invite tenders for the supply of road materials, also for carting, in the district of various roads in the district. Forms may be obtained of the Surveyor to the Council, Mr. Samuel H. Hays, 10, Broad-road, Bramley. Sealed tenders, endorsed "Tender for Road Materials," must be sent to Mr. Ferdinand Smallpiece, Clerk to the Council, 15, High-street, Guildford, on or before May 14.

May 14.—KINGSTON.—KINGSTON GUARDIANS invite tenders for the supply of 20,000 ft. best Swedish board ends, first quality, square edge, to be delivered at the Workhouse, Kingston-on-Thames. Forms and tenders must reach Mr. Jas. Edgel, solicitor, Clerk to the Guardians, Kingston-on-Thames, not later than May 13, marked "Tender for Wood."

May 14.—LEAMINGTON.—GAS DYNAMO.—Leek U.D.C. invite tenders for one gas dynamo. Form etc., can be obtained from Mr. R. M. Carr, A.M.I.E.E., Electrical Engineer, Electricity Works, Leek, on payment of a deposit of 1s. Sealed tenders, endorsed "Tender for Gas Dynamo," must be addressed to the Chairman of the Electricity Committee, must be delivered at the Town Hall, Leek, not later than 12 o'clock noon on May 15.

May 15.—BRISTOL.—RIVER WORK.—Bristol Sanitary and Improvement Committee invite tenders for the widening, straightening, and deepening of the bed or channel of a part of the River Frome, lying under a street called the Broad Weir. The specification and drawings may be seen at the office of the City Engineer, 65, Queen-square, and a copy of the instructions is deposited at the office of the clerk for 3s. Tenders must be delivered not later than 11 a.m. on May 15.

May 15.—STOCKTON.—LEADING STONE.—Stockton R.D.C. invite tenders for leading stone and other materials for the roads in their district. Full particulars and forms of tender may be obtained on application to Mr. W. Burton, Highway Surveyor, Billingham, Stockton-on-Tees, and tenders, endorsed "Tender for Leading," must be sent to Mr. T. H. Falser, Clerk, Stockton-on-Tees, not later than 12 noon on May 15.

May 16.—SALFORD.—FILTER TILES.—Salford Corporation invite tenders for about 3,500 sq. yds. of hard sand similar to the sample, which may be seen at the Salford Sewage Works. Forms of tender and particulars may be obtained at the Borough Engineer's Office, Town Hall, Salford. The specification of "Filter Tiles," addressed to the Chairman of the River Commission, must be delivered to Mr. L. C. Evans, Town Clerk, Town Hall, Salford, not later than 12 noon on May 16.

May 16.—SALFORD.—GAS COMMITTEE invite tenders for the supply and erection of a station meter (50,000 cubic ft. per hour capacity) at their Bloom-street Works. Form of tender, etc., obtained for tender a charge of 1s. will be made) on application to Mr. William W. Woodward, engineer, Gas Offices, Bloom-street, Salford. Sealed tenders, endorsed "Tender for Meter," addressed to the Chairman of the Gas Committee, Town Hall, Salford, to be delivered to Mr. C. Evans, Town Clerk, Town Hall, Salford, not later than 3 p.m. on May 16.

May 16.—STOW.—CARTING.—East Stow R.D.C. invite tenders for carting road materials in the several parishes of the East Stow Rural District during the ensuing year. Forms of tender can be obtained of Mr. Gordon, Surveyor, Stowmarket. Tenders to be sent in by 4 p.m. on May 16. Mr. R. E. Wilkes, Clerk to the Council, Stowmarket, in envelopes which will be provided for the purpose.

May 16.—TORQUAY.—FIRE ESCAPE.—Torquay Corporation invite tenders for the supply of one telescopic fire escape on pair-horse carriage, with chemical engine combined, one four-wheeled one horse horse cart, and sundry other appliances. Forms of tender and particulars may be obtained on application to the Chief Officer of the Torquay Fire Brigade. Sealed tenders, endorsed "Tender for Fire Appliances," addressed to Mr. S. C. Chapman, Assoc. M.Inst.C.E., Town Hall, Torquay, must be delivered not later than 9.30 a.m. on May 16.

May 18.—BERMUDOS.—CONDENSER AND COOLING TOWER, ETC.—Bermudosey Borough Council invite tenders for the supply of (a) a condenser and cooling tower, etc.; (b) a low condenser and cooling tower, etc. Forms of tender may also be inspected at the office of the Borough Electrical Engineer, Mr. W. E. J. Heenan, M.I.E.E., Spa-road, S.E. Specification and form of tender to be delivered to the Town Clerk, not later than 4 p.m. on May 18.

must be delivered to Mr. Fredk. Ryall, Town Clerk, Town Hall, Spa-road, S.E., not later than 4 p.m. on May 18.

May 23.—BEDFORD.—CABLES.—Bedford Electricity Department invite tenders for the supply of high and low tension cables over a period of twelve months. Specification, etc., from Mr. R. W. L. Phillips, A.M.I.E.E., Borough Electrical Engineer, Guildwell-road, Bedford, accompanied by a deposit of 1l. 1s. Tenders to be delivered on or before noon, May 23.

May 25.—NEW SOUTH WALES.—WIRE NETTING.—4,000 miles galvanised wire netting required for New South Wales Government. Conditions of contract, and forms of tender (which are returnable up to 12 noon on May 25) may be obtained of the Agent-General for New South Wales, 125, Cannon-street, London, E.C.; and Mr. C. W. Darley, M.Inst.C.E., consulting engineer, 9, Victoria-street, Westminster, S.W.

NO DATE.—GIRSEY.—CLEANING OUT RIVER.—Cleaning out of part of the River Ban, at Girsey, near Lincoln. Particulars can be obtained from Mr. Crisp, Girsey Manor, near Lincoln, and detailed estimates to be sent in to Mr. H. B. Melville, Estates Office, Warrington.

NO DATE.—LEITH.—ELECTRIC INSTALLATION.—Leith Council invite tenders for the installation of electric light, wiring, and fittings required at the new poorhouse, Leith. Application to be made to Mr. James Miles, Clerk to the Council, 45, Charlotte-street, Leith. Forms of tender, with deposit of 2l. 2s.

NO DATE.—THORNTON.—BOWLING-GREEN.—Relaying of the bowling-green behind the Great Northern Hotel (tram terminus), Thornton. Particulars may be obtained from Mr. Rogers, Caledonia Brewery, Bradford.

PAINTING, etc.

May 7.—KINGSTOWN, IRELAND.—PAINTING.—The U.D.C. of Kingstown invite tenders for painting the Victoria shelter in People's Park, band-stand, on East Pier, railings, and chains on Victoria Beach, Queen's-road, etc.; also the shelter on East Pier, hydraulic indicators, etc. Full particulars and specifications can be procured from the Town Surveyor, at his office, Town Hall, Kingstown. Tenders will be received by Mr. M. A. Manning, Town Clerk, up to 4 p.m. on May 7.

May 8.—ROCHDALE.—PAINTING.—The Rochdale Corporation invite tenders for painting the seats, etc., in Broadfield Park. Specifications may be obtained at the office of the Borough Surveyor, Town Hall, and further particulars from the Park Superintendent. Tenders, endorsed "Painting at Broadfield Park," to be delivered to the office of Mr. W. H. Hick-Town Clerk, Town Hall, Rochdale, not later than 9 a.m. on May 8.

May 16.—SWANLEY, KENT.—SCHOOL.—Cleaning and painting works at White Oak School, Swanley, Kent, for the Metropolitan Asylums Board. Specification, condition of contract, and form of tender may be inspected at the Board's office, Embankment, E.C., on and after May 7, and can be obtained on deposit of 1s. Tenders, to be addressed as noted on form, to be delivered at the Board's office not later than 10 a.m. May 16.

May 16.—CARDIFF.—PAINTING.—Cardiff Corporation invite tenders for the painting of the cab shelters. Further particulars may be obtained from the Head Constable, Chief Police Station, Cardiff. Tenders, endorsed "Painting Cab Shelters," must be delivered to Mr. J. L. Wheatley, Town Clerk, Town Hall, Cardiff, before May 22.

ROADS, SANITARY AND WATER WORKS.

May 7.—HALIFAX.—STREET WORKS.—Halifax Highways Committee invite tenders for the execution of private paving works in Eldon-terrace, Elm-Timber-street, and Baltic-street, and three back streets and six cross streets adjoining Beckenham-place. Forms, etc., on application to Mr. James Pollard & Tingle, 31, Old Quay-street, Town Hall, Halifax, upon payment of the sum of 1l. Tenders, properly endorsed, must be sent to Mr. Keighley Walton, Town Clerk, on or before May 7.

May 7.—ST. IVES.—TAR MACADAM.—Ives Corporation invite tenders for laying down about 640 yds. of tar macadam. Specifications and particulars can be seen at the Town Clerk's Office, St. Ives. Sealed tenders, endorsed "Tender for Tar Macadam," to be sent by post, not later than May 7.

May 8.—WARRINGTON.—PAVING.—Warrington Electricity and Tramways Committee invite tenders for the maintenance of the paving on the tramway track for a period of six months. Specification and form of tender on application to Mr. F. W. L. Mathias, A.M.I.E.E., Borough Electrical and Tramway Engineer, Hawley, Warrington. Tenders, addressed to "The Chairman of the Electricity and Tramways Committee, Town Hall, Warrington," must be sealed with wax, and endorsed "Tender for Paving," and delivered not later than 12 o'clock noon, on May 8.

May 8.—LONDON.—ROAD WORKS.—Cardiff Corporation invite tenders for forming, metalling, paving, kerbing, and channelling the under-mentioned streets at Roath, Splott, and Canton, viz.—Kimberley-road, Kingsway-lane, Elm-street, Elmley-lane, Harrismith-road, Harrismith-lane West, Harrismith-lane East, Naicking-road, Roath Branch-lane East, Roath Brook-lane, Walker-road, Warrington-lane, University-lane, Elm-street, Coventry-street, Coventry-lane, Habersham-lane, and Brunsvick-street. Separate tenders are required for—(1) Forming and metalling the Carriage-ways; (2) paving, kerbing, and channelling the footways. Forms of tender obtained at the office of Mr. W. Harpur, M.Inst.C.E., City Engineer. Sealed tenders, endorsed "Tenders for Private Street Works," are to be delivered to the office of Mr. A. L. Wheatley, Town Clerk, Town Hall, Cardiff, on or before May 9.

May 9.—FULHAM.—ROADMARKING.—The Fulham Borough Council invite tenders for making up car-pavement on Grosvenor-road, Fulham. Plans and specifications may be seen and information obtained from Mr. Francis Wood, Borough Surveyor, Town

Hall, Fulham, S.W. Tenders to Town Clerk, Town Hall, Fulham, before 7 p.m. May 9.

May 9.—GLASGOW.—STREET WORKS.—The Corporation of Glasgow invite offers for (1) excavations and mason work, also cast-iron pillars and steel beams; (2) wright work; (3) slater work; (4) plumber work; (5) plaster work; and (6) the work in connection with buildings proposed to be erected in Hope-street, Forth, etc., on application at the office of Public Works, City-chambers, 64, Cochrane-street. Sealed offers, marked outside "Offer for Hope-street," must be lodged with Mr. A. W. Miles, Town Clerk, City-chambers, Glasgow, not later than May 9, at 10 a.m.

May 10.—COWDEN.—TAR MACADAMISING.—Cowden U.D.C. invite tenders for tar macadamising Market-street and portion of Bowes-street (about 2,600 sq. yds.) within their district. Plans and specifications may be seen, and form of tender, at the offices of Mr. Robert Grieves, Surveyor to the Council, Seaford-street, Waterloo, Blyth. Sealed tenders, endorsed "Tender for Street Work," must be delivered not later than 4 p.m. on May 10.

May 10.—HACKNEY.—ROADS.—Hackney Borough Council invite tenders for the kerbing, channelling, paving, making-up, etc. of Rock-road, Clapton Park. The general conditions of contract and the specification and plan and sections may be inspected, and copies of the bill of quantities, and form of tender obtained on application to Mr. Norman Scorgie, M.Inst.C.E., Borough Engineer and Surveyor, and on payment of the sum of 1l. 1s. Tenders, sealed and endorsed "Rock-road," must be delivered at the Town Hall, Hackney, N.E., not later than 5 p.m. on May 10.

May 10.—MIRFIELD.—SEWAGE TANKS, ETC.—Concrete sewage tanks and filter beds, etc., at Hopton Mills, Mirfield. Plans and specifications may be seen, and bills of quantities obtained, at Dewsbury Offices, of Messrs. John Kirk & Sons, architects, from May 3 to May 10, on which latter day tenders are to be delivered before 3 o'clock p.m.

May 11.—CORK.—PAVING.—Cork County Borough Council invite tenders for paving with compressed forms, etc., from the City Engineer's Office, Municipal Buildings, from 10 to 4 o'clock daily. Sealed tenders may be lodged at office of Mr. McCarthy, Town Clerk, Municipal Buildings, up to 1 o'clock p.m. on May 11, endorsed "Tender for Paving with Compressed Forms." The concrete bed will be laid and prepared to receive the asphaltic bed in the Corporation.

May 13.—ACTON.—NEW SEWERS.—The Acton U.D.C. invite tenders for construction of three and three-quarter miles of sewers, varying from 6 in. to 6 ft. in diameter, 22 acres of filter beds and works connected therewith. Instructions for tender and form of tender, with the form of contract and schedules annexed, can be obtained, and drawings inspected, at the office of Sir Alex. Burn & Sons, 3, Great George-street, Westminster, on payment of 2l. Tenders, enclosed in sealed cover, and addressed in manner provided in the instructions, for tender, must be received at the office of the Clerk to the Acton U.D.C., 282, High-street, Acton, before May 14.

May 14.—CINDERBUSH.—OUTFALL WORKS.—The R.D.C. of East Dean and United Parishes invite tenders for alterations and additions to the South Outfall Works. Plans, etc., may be seen, and other particulars obtained, on application at the office of Mr. Wm. Whitehouse, Surveyor, Surveyors' Office, Belle Vue-road, Cinderford. Tenders to be sent to Mr. M. E. Carter, Clerk to the Council, Newham, Glos., on or before May 14, not later than 10 a.m.

May 14.—ENFIELD.—SEWAGE DISPOSAL.—The Enfield U.D.C. invite tenders for the construction of an addition to existing engine-house, a tank, No. 4 filters, the supply and erection of engines and centrifugal pumps in duplicate, the laying out of land, together with all necessary canal works, etc., at sewage disposal works at Enfield, Middlesex. Drawings and specifications may be seen and on after April 30 at the offices of the Engineers, Messrs. Pollard & Tingle, 31, Old Quay-street, Manchester, and at the Council offices. Form of tenders obtained only from Clerk to Council upon deposit of 5l. Bills of quantities can only be obtained on application to the Council's office of the form of tender. Sealed tenders, addressed to the Chairman of Council, endorsed "Sewage Disposal," to be delivered at the Council's offices before 4 p.m. on May 14.

May 14.—HANLEY.—SEWERS AND ROADS, ETC.—Hanley Corporation invite tenders for—(1) Sewers for the diversion of mine water, Etruria Canal Bridge to Bell's Mill Pool; (2) two 10-in. centrifugal pumps for the sewage works; (3) Private street improvement works: Contract No. 354, Waterloo-street; contract No. 355, Commercial-road; contract No. 356, Back-street; contract No. 357, Passages off Albert-street; contract No. 358, Back Steadman-street; contract No. 359, Back Bucknall-road North; contract No. 370, Back Mulberry-street; contract No. 371, Back Bucknall-road South; contract No. 372, Back Homer-street West; contract No. 373, Back Homer-street East; contract No. 374, Back Seymour-street; contract No. 375, Back Jasper-street. Forms, etc., may be obtained on application at the office of Mr. Joseph Lobley, Borough Engineer and Surveyor, Town Hall, Hanley. Separate sealed and endorsed tenders must be sent before Monday night, May 14.

May 14.—MORLEY.—PIPE SEWER.—Morley Highways Committee invite tenders for the laying of about 1,000 lin. yds. of 15-in. earthenware pipe sewer in West-gate and Beaman Green, within the borough. Specifications, etc., obtained, and plans may be seen, at the office of Mr. W. E. Putman, Assoc. M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Morley. Sealed and endorsed "Wide-lane Sewer," to be delivered at the Town Clerk's Office, Town Hall, Morley, not later than 10 a.m. on May 14.

May 21.—CAYN.—SEWERAGE, ETC.—Cavan (Ireland) Board of Guardians, at their meeting on May 22, will consider tenders for providing new closets and large cistern, and carrying out the new system of sewers on the Workhouse premises, in accordance with the specification and plans prepared by Mr. Thomas O'Brien. The names and addresses

of two solvent surties to be given. Tenders to be sent by post, prepaid and registered, and to bear the Cavan postmark, not later than May 21. Joseph D. Grier, Clerk of Union.

May 23.—LADYBANK.—SEWERAGE.—Ladybank Town Council invite tenders for the construction of sewerage and drainage works, comprising the laying of freelay pipes, the building of manholes, flushers, septic tanks, bacteria filter beds, and other relative works. Drawings may be seen and form, etc., obtained, after Wednesday, May 9, from Messrs. Bruce, Proudfoot, & Macrae, C.E., Cupar, upon payment of 2l. 2s. Contractors who have obtained a copy of the specification and schedule will be shown the proposed line of sewers, etc., on Monday, May 14, starting from Ladybank Station at 11 o'clock a.m. The tender must be delivered in a sealed cover to Mr. J. L. Anderson, Town Clerk, Cupar, and marked "Ladybank Sewerage," by 10 o'clock on the morning of May 23.

No DATE.—HONISTON.—SCAVENGING, etc.—For scavenging and sanitary services at Honiston Militia Camp. Apply to the Officer Commanding, Army Service Corps, Higher Barracks, Exeter, from whom terms of tender and all information can be obtained.

STONE, MATERIALS, AND STORES.

May 9.—WINSFORD.—STONE.—Winsford U.D.C. invite tenders for the supply and delivery of stone for roads during the period ending March 31, 1907, as follows:—800 tons, more or less, of granite macadam, broken to pass a 1½-in. gauge; 60 tons, more or less, clean granite chippings, broken to pass 3-in. gauge, 40 tons, more or less, granite chippings, broken to pass 3-in gauge; 40 tons, more or less, 4-in. granite cubes or sets. To be delivered free on either of the Council's wharves below Winsford Bridge, as may be directed, or alternately on the Council's Dockyard wharf above the bridge. Forms of tender and further particulars may be obtained from Mr. James Wilkinson, surveyor, Winsford. Sealed tenders, marked "Road Stone," to be delivered to Mr. John H. Cooke, Clerk, District Council Offices, Winsford, not later than 9 a.m. May 9, and samples of the materials proposed to be supplied must be delivered at the same time to the Surveyor's offices.

May 9.—HAWARDEN.—STONES.—Hawarden R.D.C. invite tenders for the supply of road stones for the maintenance of roads within the district for the year ending March 31, 1907. The stones to be broken so as to pass through 1½ in. to 2 in. gauges, of equal quality, free from dirt, and delivered, as required, at the following stations—Hope Village, Buckley Junction, Buckley (old station), Hawarden, Knowle-lane, and Watkinson's sidings (Wrexham, Mold, and Connah's Quay Railway), Kinnerton, Broughton Hall, Sandycroft, Queen's Ferry (L. and N.W. Railway), and Rossett (G.W. Railway). Tenders are also invited for the carting of stones from the various stations, quarries, and gravel pits. Forms of tender, etc., may be had on application to the District Surveyor, Mr. Wm. Newton, Drury, Buckley, Chester. Sealed tenders to be delivered on or before May 9 to Mr. Hugh G. Roberts, Clerk of the Council, Council Offices, Broughton, near Chester, endorsed, "Tender for Materials" or "Cartage."

May 10.—MELFORD.—ANNUAL CONTRACTS.—Melford R.D.C. invite tenders for the supply of the under-mentioned materials, etc., as may be required during the year ending March 31, 1907.—Broken granite; glazed sanitary drain-pipes, 4 in. to 42 in. diameter; blue Staffordshire bricks and kerbs; York stone kerb, Portland cement, granite concrete flags; flints; chalk; road grates and frames; team labour; tools; steam rolling. Forms of tender and other information may be obtained from Mr. Wm. Carver, C.E., Surveyor, 3, Melford-road, Sudbury, Suffolk. Sealed tenders to be sent in not later than May 10, addressed to Mr. H. C. Canham, Clerk, 66, Priarostreet, Sudbury, Suffolk.

May 14.—ROMFORD.—ROAD MATERIAL.—Romford R.D.C. invite tenders for the supply of 800 tons of best quality blue Guernsey granite, broken to 2 in. cube, and 20 tons of best quality blue Guernsey granite, broken to 1½ in. cube; also 400 tons of Rhenish basalt stone, broken to 2 in. cube. Specification and form of tender may be obtained from Mr. George Lawwood, Highways Surveyor, Victoria chambers, Romford. Sealed tenders, endorsed "Tender for Granite, etc.," together with samples of granite and stone proposed to be supplied, which must be sent carriage paid, to Mr. William Smith, Clerk to the Council, 15, North-street, Romford, on or before May 14.

May 15.—STOCKTON.—WHINSTONE AND SLAG.—Stockton R.D.C. invite tenders for the supply of broken and unbroken whinstone and slag for the current year. Specifications and forms of tender may be obtained on application to Mr. W. Burton, Highway Surveyor, Billingham, Stockton-on-Tees, and tenders, marked "Tenders for Materials," must be sent to Mr. T. H. Faber, Clerk, Stockton-on-Tees, not later than 12 noon, on May 15.

May 19.—HOLYLAND NETHER.—ROAD MATERIALS.—Holyland Nether U.D.C. invite tenders for the supply and delivery of the following road materials for the year ending March 31, 1907.—Unbroken slag; broken slag; granite; blue limestone; tar macadam; whinstone; also for brooms, picks, shovels, etc. The Council are also prepared to receive tenders for carting. Form, etc., may be obtained on application to Mr. H. G. Keywood, surveyor, Town Hall, Holyland Nether, near Barnsley. Sealed tenders, endorsed "Tender for—" addressed to the Chairman of the Highways Committee, must be delivered not later than May 19.

May 21.—STEVENAGE.—GRANITE.—Stevenage U.D.C. invite tenders for the supply of 1,000 tons (more or less, as may be required) of 1½ in. to 2 in., 1½ in. to 1½ in., and 1 in. to 1½ in. broken Guernsey, Leicester, or other granite for the repair of the roads in the district to be delivered at Stevenage Railway Station and sidings (G.N.R.) as and when required up to March 31 next. Sealed tenders, endorsed "Tender for Granite," accompanied by samples, must be delivered to Mr. Wm. Onslow, Town Clerk, to the Council U.D.C. Offices, Stevenage, not later than 4 o'clock on May 21.

May 22.—SCUNTHORPE.—GRANITE.—Scunthorpe U.D.C. invite tenders for the supply of granite, 1½ in. and 1½ in. gauge, and slag, 1½ in. and 2 in. gauge, and slag screenings, free to Scunthorpe or Gunhouse stations of the Great Central Railway, to be forwarded to either station, and in such quantities as may from time to time be ordered by the Council. Probable quantities, granite, 800 tons; slag, 1,100 tons; and slag screenings, 20 tons. Particulars to be obtained from Mr. W. F. Bickford, Surveyor to the Council. Tenders, with samples, to be sent in not later than 6 o'clock in the evening of May 22, to Mr. Frank C. Heit, Clerk, at the Council's Offices, No. 2, Trafford-street, Scunthorpe.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*ROAD FOREMAN	old Const P.W. Department	250l., etc.	May 14
*ASSISTANT SURVEYOR	Hanley Corporation	150l.	May 21
*JNR. DRAUGHTSMAN (ESTATES AND VALUATION DEPT.)	London County Council	Not stated	No date

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*FREEHOLD BUILDING ESTATE, ALDERSHOT—At the Mart	Driver, Jones, & Co.	May 8
*SURPLUS PLANT AND STOCK, TOTTENHAM—At Works, Haddonfield, Tottenham	Fuller, Horsey, Sons, & Cassell	do.
*BUILDING MATERIALS, GROSVENOR ESTATE, W.—On the Premises	White, Berry, & Taylor	do.
*DEALS, BATTENS, Etc.—Great Hall, Winchester House, Old Broad street, E.C.	Churchill & Sim	May 9
*FREEHOLD BUILDING LAND, NEW SOUTHGATE, Etc.—Orange Tree, New Southgate	W. Maurice-Jones	May 17
*FREEHOLD BUILDING PLOTS, EPPING, ESSEX—At the "Cock Hotel," Epping	Douglas Young & Co.	May 16
*FREEHOLD BUILDING SITE, STRATFORD—At the Mart	Fuller, Horsey, Sons, & Cassell	May 23
*FREEHOLD BUILDING ESTATE (PARK ROYAL), WILLESDEN—At the Mart	Dabeham, Tewson, & Co.	do.
*BUILDING SITE, WEBBER STREET, OXFORD STREET, W.—At the Mart	Garrett, White, & Poland	do.
*BUILDING LEASE, MARSHALL STREET, SOHO, W.—At the Mart	Garrett, White, & Poland	do.
*CONTRACTOR'S PLANT AND MACHINERY, SOUTHAMPTON—Depot, Southampton	Fuller, Horsey, Sons, & Cassell	May 23
*FREEHOLD ESTATE, CRAYFORD, KENT—At the Mart	Douglas Young & Co.	do.
*FREEHOLD BUILDING LAND, THORNTON HEATH—At the Mart	Annin, Watney & Sons	May 24
*FREEHOLD ESTATE, SUNBURY-ON-THAMES—At the Mart	Buckland & Sons	May 26
*SHOP PROPERTY, OXFORD-ST., MANCHESTER—Thatched House Hotel, Manchester	Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.	May 29
*FREEHOLD CEMENT WORKS, DOVERCOURT—At the Mart	Dabeham, Tewson, & Co.	do.
*FREEHOLD BUILDING ESTATE, FELTHAM, MIDDLESEX—On the Estate	Mr. Woods	May 30

PATENTS.—Continued from page 502.

1,210 of 1906.—R. WAKE: Fastening for Doors and the like.

This relates to a fastening for doors and the like, consisting of a bar or bolt of any suitable shape and section, having one or more slots in it, which are designed to fit over or on to lugs or clips fastened in any suitable manner to the door or the like or its frame, said clips being bevelled or sloped and engaging with the ends of the said slots, which are also sloped for the purpose of drawing the bar or bolt and the lugs tightly together to lock the door, the edge of the bar or bolt alongside the said slots being of such a shape, and fitting in the said clip, as to form a pivot or hinge for the bar or bolt, which can be thrust up to release the said bevelled or sloped parts, and can then be turned on the clips away from the door, leaving it free to be opened, said clips and bar being always in engagement with each other.

2,214 of 1905.—M. FAWCETT: A Coupl for Chimneys, Ventilating Shafts, and the like.

This relates to the construction of cowls for chimneys, ventilating shafts, and the like, consisting of a lower truncated cone part inclined upwards and inwards, provided with projecting V-shaped ribs extending inwards and supporting a cover disposed on the upper side and flat on the underside, leaving lateral passages for the

ingress and egress of wind across the mouth of the chimney.

14,709 of 1905.—G. H. WALDEN: An Asphaltic Cement.

This relates to an asphaltic cement manufactured by mixing 10 grains of mass, 2 grains of coal, 4 grains of shale, and 10 grains of freclay, or any other quantity of these materials in the same proportions, intimately together, drying this mixture well over a slow fire, grinding it into a fine powder, adding to this powdered mixture the necessary quantity of gas-tar, and stirring and mixing the whole together so as to form a paste, which is ready for use, to cover stone, wood, or brickwork.

21,527 of 1905.—F. MELLAUN: Method of Producing Openings in Concrete or like Pavement.

This relates to a method of producing holes or channels in concrete pavement, by applying compressed air chisels in such a manner that the holes or channels, even when of small size, present sharply outlined sections and plain sides, and that destruction of the concrete over a larger surface than is necessary is avoided.

1,325 of 1906.—A. A. V. POULSEN: Preservation of Wood.

This consists in the method of preserving wood consisting in loosely applying to its surface or

driving into it pieces or nails of a metal which, under the action of the atmospheric or other moisture, will be transformed into a soluble metallic salt which will soak into the wood.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 19.—By COOPER & PRECE (at Ross), Marlow, Hereford.—"Trebandy Farm," 197 a.	£2,850
April 20.—By E. J. CARTER (at Tunbridge Wells).	
Goudhurst, Kent.—"Pleasant Pl." and 18 acres, 1, p.	2,600
April 23.—By H. M. & G. BARRIS.	
Halstead, Essex.—20, North-st. (s.), with off-licence, 1, v. 6l. 14s. 4d.	100
Wickham St. Paul's, Essex.—A freehold off-licensed beer-house, with blacksmith's shop, y. 5l.	105
Bulmer, Essex.—Freehold off-licensed beer-house and shop, y. 9l.	200
Two freehold cottages, v. 10l. 8s.	100
Little Veldham, Essex.—Cottage and shop, with off-licence; also a cottage, y. 6l. 13s.	235
By BRAD & CARP.	
Hyde Park—28, Oxford-ter., u. t. 24 yrs., g. r. 9l., y. r. 100l.	850
By MAPLE & CO.	
Hampstead.—20, Kemplay-rd., 1, y. 55l.	800

By J. & R. KEMP & CO.
 Wandsworth—15 and 17, Ferrier-st., ut.
 73 yrs., g.r. 104, w.r. 82. 8s.
 8 and 7, Edgely-st., ut. 73 yrs., g.r. 104, w.r.
 82. 7s.
 Finsbury—18, Finsbury-market (s.), l. y. 407.
 Finsbury-market, f.g.r. 8, l. 10s. reversion in
 24 years.
 Peckham—Blenheim-gr., f.g.r. 127, 10s., reversion
 in 464 yrs.
 Woolwich, Kent.—33, Church-st. (s.), l. y. 284.
 159, Brookway, ut. 84 yrs., g.r. 84, 15s.,
 40 and 408, Woolwich-road, ut. 84 yrs.,
 g.r. 64, 15s., w.r. 42, 18s.
 Camden Town—140, Camden-st., ut. 312 yrs.,
 g.r. 52, p.

By JENKINS, SONS, & CO.
 Brockley—7, Wickham-rd., ut. 52½ yrs., g.r. 71,
 e.r. 55.
 159, Brookway, ut. 84 yrs., g.r. 84, 15s.,
 e.r. 40.
 Forest Hill—Fair View, Canonie-rd., ut. 6
 95 yrs., g.r. 88, s.r. 352.

By MARY & PRINCE
 Clapham—45, Park Hill, l. p.
 April 24.—By H. J. BROMLEY
 Thornton Heath—3, Osborne-rd., l. p.

By DEBBAN, TAYSON, & CO.
 Balls Pond—22, and 54, Stanley-rd., ut. 4
 451 yrs., g.r. 111, 5s., y.r. 902.
 By GARRETT, WHITE, & POLAND.
 Oxford-street—7, Dering-st. (business premises),
 corporation lease, g.r. 2, 5s., line 157, 15s.,
 w.r. 114, 8s.

By J. W. JONES
 South Kensington—51, Cathcart-rd., ut.
 42½ yrs., g.r. 134, e.r. 80.
 By NORMAN & SON.
 Leytonstone—11, Highbury, ut. 58 yrs.,
 g.r. 64, 10s., y.r. 367.

By OGILBY, MARKS, & DALEY
 Tottenham Court-road—N. Hotel, also 11 to
 15, Bayley-st., ut. 54 and 48½ yrs., y.r.
 6201, with goodwill.
 Highbury—12, Highbury Newnham, ut. 102
 yrs., g.r. 157, e.r. 1004.

By RUTTERS.
 Ash, etc. Kent.—Portions of "Pettings" Farm
 Estate, 125 a. 2 r. 23 p. 4. (in lots).

By FRASER, WATSON, & CO.
 Highbury—4, Avenell-rd., ut. 72 yrs., g.r.
 71, 10s., e.r. 422.
 Crouch End—102, Park-rd., ut. 47 yrs., g.r.
 71, 8s., w.r. 102, 4s.

By LEE & FAIR (at Slough).
 Parish Royal Bucks.—Main rd., an enclosure
 of building land, 24 acres, c.
 By BOYTON, SONS, & CO. (at Fulham).
 Fulham—10, Mitchendon-rd., ut. 87 yrs., g.r.
 71, y.r. 4011.

By J. C. PLATT (at Hammersmith).
 Hammersmith—5, Bridge-av., ut. 36 yrs., g.r.
 51, 5s., e.r. 422.
 7, Luxembourg-rd., l. e.r. 894.

April 25.—By OSLEY & SON.
 Gunnersbury—10, Thorney Hedge-rd., l.
 e.r. 434.
 By E. H. HENRY.
 Battersea—2, 4, 8, 12 to 23 (even), Inglew-
 rd., ut. 72 yrs., g.r. 83, 4s. 6d., w.r. 453, 8s.

By M. C. RICHARDSON.
 Kilburn—23, Willesdon-la. (s.), ut. 87½ yrs.,
 g.r. 14, 14s., e.r. 652.
 By TYLER & CO.
 Paddington—7, Barnsley-rd., ut. 58½ yrs.,
 g.r. 107, 5s., e.r. 84.

By DOUGLAS YOUNG & CO.
 Wandsworth—11, "Ray's" Coal
 Wharfedale, area 10,200 ft., ut. 12 yrs., e.r. 604,
 y.r. 6007.
 Kilburn—13 to 23 (odd), Bresby-rd., ut. 78 yrs.,
 g.r. 454, w.r. 434, 8s.
 Shepherd's Bush—278, Uxbridge-rd., l.,
 y.r. 604.
 Chelsea—423, King's Rd. (s.), l. y. 351.
 11, Oakley-rd., ut. 47 yrs., g.r. 67, y.r. 454.
 Tottenham—112 and 128, Park-la. (s.), l.,
 y.r. 664.
 130 and 132, Park-la. f. y.r. 806.
 Clapham—23 and 25, Clarence-st., ut. 55 yrs.,
 g.r. 144, w.r. 1044.

By DYER, SON, & HILDON.
 Finchley—1, 3, 5, and 7, Torrington-pk., ut.
 59½ yrs., g.r. 24, e.r. 185.
 21, Torrington-pk., ut. 59½ yrs., g.r. 111,
 y.r. 761.
 New Southgate—230 to 286 (even), High-rd. (s.),
 l. y. 2501.
 9, and 94, and 96, Palace Oates-rd., l.
 y.r. 694.
 "Anonbury" (at Oxted)-rtd., ut. 42½ yrs.,
 g.r. 84, 8s.
 Forest-gate—27, New-st. (s.), ut. 57 yrs.,
 g.r. 59, y.r. 106.
 Hestonham—70 and 72, Lee-rd., ut. 62 yrs.,
 g.r. 241, e.r. 1352.

By A. BURTENSHAW & SON (at Hallsbam).
 Oadestry—2, 4, and 1, 3 p. l.
 Hurstwood allotment fields, 12 a. 2 r. 16 p.
 April 25.—By SEDGWICK, SON, & WALL (at
 Pinner).
 Pinner—Palmer-la., etc., 24 freehold holding
 plots.

April 23.—By H. J. BLISS & SONS.
 Victoria Park—123, Grove-rd., ut. 38 yrs., g.r.
 81, y.r. 428.
 By O. G. STURMER & CO.
 Kentish Town—Vickers-rd., l.g. rents 351, 10s.,
 ut. 80 yrs., g.r. 84, 10s.
 St. Pancras—125, Drummond-st., ut. 193 yrs.,
 g.r. 151, y.r. 407.
 Paddington—77, Chippenham-mews, ut. 57
 yrs., g.r. 34, 10s., e.r. 302.

By E. J. OHEARDS.
 Camberwell—35, Shepherd's-lane (s.), f. p.,
 Flooden-rd., "Clifton Lodge," ut. 48 yrs., g.r.
 122, y.r. 707.
 By E. HOZSWORBE.
 Forest Hill—1, 3, and 5, Sunderland-rd. (s.),
 ut. 104 yrs., g.r. 87, 14s.

By C. C. & T. MOORE.
 Mile End—Jupp's-rd., l.g.r. 250, 10s., ut. 42
 yrs., g.r. 407.
 1 to 7, Jupp's-rd., ut. 42 yrs., g.r. nil,
 w.r. 131, 8s.
 8 and 9, Jupp's-rd., ut. 42 yrs., g.r. nil,
 w.r. 111, 18s.

By NEWBOS, SHERREN, & EDWARDS.
 17, 21, 23, and 26, Whitman-rd., ut. 42 yrs.,
 g.r. nil, w.r. 109, 4s.
 15, Whitman-rd., l. y.r. 232, 13s.
 Longleadow-rd., f.g.r. 35, reversion in 72 yrs.
 By NEWBOS & EDWARDS.
 Deptford—19, Reculver-rd. (s.), ut. 89½ yrs.,
 g.r. 64, y.r. 407.

Islington—1 and 3, Henshall-st. (s.), ut. 15
 yrs., g.r. nil.
 Finsbury Park—17, Woodstock-rd., ut. 81 yrs.,
 g.r. 81, 10s., e.r. 447.
 Stoke Newington—4, 8, 9, and 12, Fellon-rd.,
 ut. 37 yrs., g.r. 232, 8s., y.r. 1406.
 Hackney—42, Bodney-rd., ut. 62½ yrs., g.r.
 81, 10s., y.r. 807.

Haringey—519, Green-ls. (s.), ut. 89 yrs., g.r.
 154, y.r. 801.
 Crouch End—0, Park-av. south, ut. 93 yrs.,
 g.r. 88, e.r. 461.
 By RETNEY, SON, & SONS.
 Oxford-street—9, Queen-st., area 580 sq. ft., p.
 Kentish Town—82, Carlton-rd., ut. 44½ yrs.,
 g.r. 61, y.r. 341.
 Tottenham Court-road—1, Whitman-rd., ut. 22½
 yrs., g.r. 322, w.r. 115, 14s.

By STIMSON & SON.
 Chelsea—Cheyne-row, f.g.r. 351, reversion in
 31 yrs.
 Lawrence-st., f. Lord Palmerston's h., l.g.
 84, reversion in 31 yrs.
 Lawrence-st., f.g.r. 194, reversion in 31 yrs.

Kingston, Surrey—4, Beaufort-rd., ut. 63½ yrs.,
 g.r. 71, 10s., y.r. 697.
 38, Beaufort-rd., ut. 75 yrs., g.r. 71, 10s., y.r.
 804.
 1, Passat-rd., l. y.r. 804.
 7 and 9, Passat-rd., ut. 82½ yrs., g.r. 157,
 y.r. 1027, 10s.

11, Overcross, l. y. 451.
 Ditchford, Gower-st. (s.), f. p. 404.
 Overhill-rd., "Campfield," and 1 a. f. p.
 Camberwell—10, 11, 12, and 16, McDo well-rd.,
 ut. 69½ yrs., g.r. 84, y.r. 1442.
 Shepherd's Bush—27, Cavendish-rd., l. y. 404.
 Whitechapel—8 and 9, Union-st., f. w.r.
 122, 4s.

3 to 8, Mulberry-st., l. w.r. 351.
 By ERYAY HEVIERES (at Birmingham).
 Small Heath, Worcester—117, Green-ls., area
 1,887 yds., f. p.

April 27.—By C. RAWLEY, CROSS, & CO.
 Kensington—65, Holland-rd., l. e.r. 1007.
 By C. W. DAVENANT & SON.
 Islington—14, 18, and 20, Crossvevor-st., l. e.
 811.
 Holloway—1, 3, and 5, Ringcroft-st., ut. 38 yrs.,
 g.r. nil, y.r. 101.
 King's Cross—25, Argyle-av., ut. 38½ yrs.,
 g.r. 104, y.r. 502.

By PROTHEROE & MORRIS.
 Leyton—Crawley-rd., a block of building land,
 f. p.

By FRASER, WATSON, & CO.
 Leytonstone—35, Mornlington-rd., f. p.

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; p. for rent; f. for freehold; c. for copyhold; r. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; n.s. for unexpired term; p.a. for per annum; y.s. for years; l.a. lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; crs. for crescent; av. for avenue; g.h.s. for gardens; yd. for yard; gr. for grove; h.h. for beer-house; p.h. for public-house; o. for office; a. for shops; ct. for court.

MEETINGS.

SATURDAY, MAY 5.

Royal Institution.—Professor C. Wallstein on "English Furniture in the XVIIIth century."—11, 9 p.m.
 Edinburgh Architectural Association.—Visit to Newcastle Abbey, Dalkeith, N.B.
 Northern Architects' Association.—Excursion meeting. Members to assemble at 3 p.m., in the portico of the Central Station, Newcastle, and proceed to the New High Level Bridge. After inspecting the works, the new dining-rooms in Scotland-rows, and the new drawing offices at Elswick Works will be visited.

Municipal and County Engineers' Association.—Eastern District meeting, Newmarket, 11 a.m.

MONDAY, MAY 7.

Royal Institute of British Architects.—Annual general meeting.
 Society of Engineers.—Mr. David Sommerville, B.A., M.D., on "The Chemistry and Bacteriology of Potable Waters."—7.30 p.m.
 Society of Arts (Central Lecture).—Mr. A. Maskell on "Ivory."—11.15 p.m.

TUESDAY, MAY 8.
 Institute of Sanitary Engineers (Students' Lectures).—Dr. J. Priestley on "Sanitary Law."—11, 7 p.m.
 Society of Arts (Applied Art Section).—Mr. Sherard Cowper-Coles on "Damascening, and the Inlaying and Ornamenting of Metallic Surfaces."—8 p.m.

WEDNESDAY, MAY 9.
 Royal Sanitary Institute.—The Institute Dinners, Langham Hotel, Portland-place, W. 7 p.m.
 Society of Arts.—Professor T. Oliver on "Bridge Building by means of Cast-iron, including remarks upon Compressed Air illness."—8 p.m.

THURSDAY, MAY 10.
 Royal Institution.—The Rev. J. P. Mahaffy on "The Expansion of Old Greek Literature by Recent Discoveries."—8 p.m.
 Carpenters' Hall, London-Wall (Lectures on Carpentry and Joinery).—Mr. J. Bartlett on "Shoring, Timber Framing, and Floors."—7.30 p.m.
 Institution of Electrical Engineers.—Adjourned discussion on paper by Mr. L. Andrews, Member, on "Long Flame Arc Lamps."—8 p.m.

FRIDAY, MAY 11.
 Royal Institution.—Professor J. H. Poynting on "Some Astronomical Consequences of the Pressure of Light."—9 p.m.
 Junior Institution of Engineers.—Mr. Adam Hunter on "The Structural Design of Factories."—8 p.m.
 Association of Engineers-in-Charge.—Annual meeting.
 8 p.m.

SATURDAY, MAY 12.
 Royal Institution.—Professor C. Waldstein on "English Furniture in the XVIIIth century."—11.15 p.m.
 Edinburgh Architectural Association.—Associates' morning visit to St. Andrew Steel Works.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 10s. per annum (25 numbers) FREE OF POST. Remittances payable to J. MORRAN should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.
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PRICES CURRENT OF MATERIALS.

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

	BLICKS, &c.	
Hard Sticks	1 8 0	per 1000 alongside, in river.
Picked Stocks	1 5 0	"
Facings	2 15 0	" delivered.
Flettons	1 6 0	" at railway depot.
Best Wire Cuts	1 12 0	"
Best Freshmen Bed	3 12 0	"
Best Bed Pressed	5 0 0	"
Bunton Facing	5 0 0	"
Best Blue Pressed	3 15 0	"
Do. Bullnose	4 0 0	"
Best Stourbridge	3 14 0	"
Fire Bricks	3 14 0	"
Best Glazed Bricks		
Best White and Ivory Glazed Stretchers	12 0 0	"
Headers	11 0 0	"
Quoins, Bullnose and Flats	16 0 0	"
Double Stretchers	18 0 0	"
Double Headers	16 0 0	"
One Side and two Ends	19 0 0	"
Two Sides and one End	20 0 0	"
Spilys, Chamfered, Squints	20 0 0	"
Best Dipped Salt Glazed Stretchers and Header	12 0 0	"
Quoins, Bullnose, and Flats	14 0 0	"
Double Stretchers	15 0 0	"
Double Headers	14 0 0	"
One Side and two Ends	15 0 0	"
End	15 0 0	"
Spilys, Chamfered, Squints	14 0 0	"
Second Quality White and Dipped Salt Glazed	2 0 0	less than best.
Thames and Pit Sand	6 9 per yard, delivered.	
Times Ballast	5 3	
Best Portland Cement	25 0 per ton.	
Best Ground Blue Lime	19 0	
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.		
Grey Stone Lime	.....	11s. 0d. per yard, delivered, 27s. 0d. per ton at riv. dep't.
STONE.		
BATH STONE—delivered on road wag-	s. d.	
ons, Paddington Depot.		1 6½ per ft. cube.
Do. do. delivered on road wag-		
ons Elms Depot.		1 8½ " "
PORTLAND STONE (20 ft. average)—		
Brown Whitebed, delivered on		
wagons, Paddington Depot.		2 1 " "
Elms Depot, or Pimlico Wharf.		
White Basebed, delivered on road		
wagons, Paddington Depot.		2 2½ " "
Elms Depot, or Pimlico Wharf.		

STONE (continued).

Table listing stone products such as Ancaster in blocks, Beer, Greenhill, Darley Dale in blocks, Red Corsehill, Closeburn Red Freestone, Bed Mansfield, York Stone—Robt Hood Quality, Scappled random blocks, 6 in. sawn two sides landing to sizes, 40 ft. super, in. rubbed two sides, ditto, ditto, 2 6, in. sawn two sides slabs (random sizes), 0 11 1/2, in. to 2 1/2 in. sawn one side slabs (random sizes), 0 7 1/2, in. to 2 in. ditto, ditto 0 6.

SLATES.

Table listing slates: 20x10 best blue Bangor 13 2 6 per 1000 of 1200 at r. d., 20x12, 20x10 first quality, 13 0 0, 20x12, 13 15 0, 16x8, 7 5 0, 20x10 best blue Portmadoc, 12 12 6, 16x8, 6 12 6, 20x10 best Eureka un-fading green, 15 17 6, 20x12, 18 7 6, 18x10, 13 5 0, 16x8, 10 5 0, 20x10 permanent green, 11 12 6, 18x10, 9 12 6, 16x8, 6 12 6.

TILES.

Table listing tiles: Best plain red roofing tiles, 42 0 per 1000 at rly. depot, Hip and Valley tiles, 3 7 per doz., Best Broseley tiles, 50 0 per 1000, Do. Ornamental tiles, 52 6, Hip and Valley tiles, 4 0 per doz., Best Raddon red, brown, or brinded do. (Edwards), 57 6 per 1000, Do. Ornamental do., 60 0, Hip tiles, 4 0 per doz., Valley tiles, 8 0, Best Red or Mottled Staffordshire do. (Peaks), 51 9 per 1000, Do. Ornamental do., 54 6, Hip tiles, 4 1 per doz., Valley tiles, 3 8, Best "Rosemary" brand plain tiles, 48 0 per 1000, Best Ornamental tiles, 50 0, Hip tiles, 4 0 per doz., Valley tiles, 3 8, Best "Hartley" brand plain tiles, sand-faced, 50 0 per 1000, Do pressed, 47 6, Do. Ornamental do., 50 0, Hip tiles, 4 0 per doz., Valley tiles, 3 6.

WOOD.

Table listing wood products: BUILDING WOOD. Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in., 13 10 0, 15 0 0, Deals: best 3 by 9, 13 0 0, 14 0 0, Battens: best 2 1/2 in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in., 11 0 0, 12 0 0, Battens: best 2 1/2 by 6 and 3 by 6, 10 0 0, 11 0 0, Deals: seconds, 1 0, 0 less than best, Battens: seconds, 0 10 0, 2 in. by 4 in. and 2 in. by 6 in., 9 0 0, 10 0 0, 2 in. by 4 1/2 in. and 2 in. by 5 in., 8 10 0, 9 10 0, Foreign Sawm Boards—1 in. and 1 1/2 in. by 7 in., 0 10 0 more than battens, 1 0 0, (Under 3 in., usual trade extra.) Fir timber: best middling Danzig or Memel (average specification), 4 10 0, 5 0 0, Seconds, 4 0 0, 4 10 0, Small timber (6 in. to 10 in.), 3 12 6, 3 15 0, Small timber (6 in. to 8 in.), 3 0 0, 3 10 0, Swedish balks, 2 10 0, 3 0 0, Pitch-pine timber (30 ft. average), 4 0 0, 4 15 0. JOISERS' WOOD. At per standard. White Sea: first yellow deals, 3 in. by 11 in., 24 0 0, 25 0 0, 3 in. by 9 in., 22 0 0, 23 0 0, Battens, 2 1/2 in. and 3 in. by 7 in., 16 10 0, 18 0 0, Second yellow deals, 3 in. by 11 in., 18 10 0, 20 0 0, 3 in. by 9 in., 17 10 0, 19 0 0, Battens, 2 1/2 in. and 3 in. by 7 in., 13 10 0, 14 10 0.

WOOD (continued).

Table listing wood products: JOISERS' WOOD (continued). At per standard. White Sea: Third yellow deals, 3 in. by 11 in. and 9 in., 13 10 0, 15 0 0, Battens, 2 1/2 in. and 3 in. by 7 in., 11 0 0, 12 0 0, Petersburg: first yellow deals, 3 in. by 11 in., 21 0 0, 22 10 0, Do. 3 in. by 9 in., 18 0 0, 19 10 0, Battens, 13 10 0, 15 0 0, Second yellow deals, 3 in. by 11 in., 17 0 0, 18 0 0, Battens, 11 0 0, 12 10 0, Third yellow deals, 3 in. by 11 in., 13 0 0, 14 0 0, Do. 3 in. by 9 in., 12 10 0, 14 0 0, Battens, 10 0 0, 11 0 0, White Sea and Petersburg—First white deals, 3 in. by 11 in., 14 10 0, 15 10 0, Battens, 11 0 0, 12 0 0, Second white deals, 3 in. by 11 in., 13 10 0, 14 10 0, 3 in. by 9 in., 12 10 0, 13 10 0, Battens, 10 0 0, 11 0 0, Pitch-pine: deals, 18 0 0, 21 0 0, Under 2 in. thick extra, 0 10 0, 1 0 0, Yellow Pine—First, regular sizes, 44 0 0 upwards, Oddments, 32 0 0, 33 0 0, Second, regular sizes, 33 0 0, Yellow Pine oddments, 28 0 0, Kauri Pine—Planks, per ft. cube, 0 3 6, 0 5 0, Large, per ft. cube, 0 3 0, 0 3 6, Small, 0 2 6, 0 2 9, Wainscot Oak Logs, per ft. cube, 0 5 6, 0 6 0, Dry Wainscot Oak, per ft. super, 0 8 1/2, 0 9 1/2, 1/2 in. do. do, 0 7, Dry Mahogany—Hoard, per ft. super, as inch, 0 9, 0 1 0, Selected, Figury, per ft. super, as inch, 0 1 6, 0 2 6, Dry Walnut, American, per ft. super, as inch, 0 10, 0 1 0, Teak, per load, 17 0 0, 22 0 0, American Whitewood Planks, per ft. cube, 0 4 0, 0 5 0, Prepared Flooring, etc.—1 in. by 7 in. yellow, planed and shot, 0 13 6, 0 17 6, 1 in. by 7 in. yellow, planed and matched, 0 14 0, 0 18 0, 1 1/2 in. by 7 in. yellow, planed and matched, 0 16 0, 0 1 0, 1 in. by 7 in. white, planed and shot, 0 12 0, 0 14 6, 1 in. by 7 in. white, planed and matched, 0 12 6, 0 15 0, 1 1/2 in. by 7 in. white, planed and matched, 0 15 0, 0 16 6, 3/4 in. by 7 in. yellow, matched and beaded or V-jointed ends, 0 11 0, 0 13 6, 1 in. by 7 in., 0 14 0, 0 18 0, 3/4 in. by 7 in. white, 0 10 0, 0 11 6, 1 in. by 7 in., 0 12 9, 0 15 0, 6 in. at 6d. to 9d. per square less than 7 in., Per square.

JOISTS, GIRDES, &c.

Table listing joists and girders: BOLLER STEEL JOISTS, ordinary, £ s. d. £ s. d. sections, 7 6 0, 7 10 0, Compound girders, ordinary sections, 9 0 0, 10 0 0, Steel Compound Stanchions, 12 0 0, 13 0 0, Angles, Tees, and Channels, many sections, 9 0 0, 10 0 0, Flitch Plates, 9 0 0, 10 0 0, Cast Iron Columns and Stanchions including ordinary patterns, 7 10 0, 8 10 0. METALS. Per ton, in London. Iron—Common Bars, £ s. d. £ s. d. Staffordshire, 8 0 0, 8 10 0, merchant quality, 8 10 0, 9 0 0, Staffordshire "Marked Bars", 10 10 0, 9 0 0, Mild Steel Bars, 8 15 0, 9 0 0, Hoop Iron, best price, 9 5 0, 9 10 0, Galvanised, 17 0 0, ("And upwards, according to size and gauge.) Sheet Iron Black—Ordinary sizes to 20 g., 9 10 0, 10 0 0, " 24 g., 10 10 0, " 26 g., 12 0 0, Sheet Iron, Galvanised, flat, ordinary quality—Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g., 14 0 0, Ordinary sizes to 22 g. and 24 g., 14 10 0, " 26 g., 15 0 0, Sheet Iron, Galvanised, flat, best quality—Ordinary sizes to 20 g., 17 0 0, " 22 g. and 24 g., 17 10 0, " 26 g., 19 0 0, Galvanised Corrugated Sheet—Ordinary sizes 6 ft. to 8 ft. 20 g., 14 0 0, " 22 g. and 24 g., 14 10 0, " 26 g., 15 15 0, Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker, 11 10 0, Best Soft Steel Sheets, 22 g. & 24 g., 12 10 0, " 26 g., 14 10 0, Cut Nails, 3 in. to 6 in., 9 10 0, 9 15 0, (Under 3 in., usual trade extra.)

LEAD, &c.

Table listing lead and other materials: LEAD, &c. Per ton, in London. LEAD—Sheet, English, 3 lb. and up, £ s. d. £ s. d. Pipe in coils, 19 5 0, Soil pipe, 21 10 0, Compo pipe, 21 10 0, Zinc—Sheet—Vieille Montagne, ton, 32 0 0, Silesian, 31 15 0, COPPER—Strong Sheet, per lb., 0 1 0, Thin, 0 1 1, Copper nails, 0 0 11, BRASS—Strong Sheet, 0 0 11, Thin, 0 1 0.

LEAD, &c. (continued).

Table listing lead products: Tin—English Ingots, per lb., £ s. d. £ s. d. 0 1 9, Solders—Flumbers', 0 0 8 1/2, Trimmers, 0 0 10 1/2, Blowpipe, 0 0 11 1/2.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

Table listing English sheet glass: 15 oz. thirds, 2 1/2 d. per ft. delivered, 13d., 21 oz. thirds, 3 1/2 d., 26 oz. thirds, 4 1/2 d., 32 oz. thirds, 5 1/2 d., Fluted Sheet, 15 oz., 3 1/2 d., fourths, 4 1/2 d., 21 oz., 4 1/2 d., 32 oz., 5 1/2 d.

ENGLISH BOLLED PLATE IN CRATES OF STOCK SIZES.

Table listing English bolled plate: Bartley's, 2d. per ft. delivered, 2 1/2 d., Figured and Oxford Bolled, 2 1/2 d., "Oceanic" Glass, white, 4d., Do. "tinted", 5 1/2 d.

OILS, &c.

Table listing oils: Raw Linseed Oil in pipes, per gallon, £ s. d. 0 2 0, " " in drums, 0 2 3, Boiled " in pipes, 0 2 3, " in barrels, 0 2 3, " in drums, 0 2 5, Turpentine in barrels, 0 3 11, " in drums, 0 4 1, Genuine Ground English White Lead, per ton, 22 10 0, Red Lead, Dry, 21 10 0, Best Linseed Oil Putty, per cwt., 0 7 0, Stockholm Tar, per barrel, 1 12 0.

VARNISHES, &c.

Table listing varnishes: Fine Pale Oak Varnish, £ s. d. 0 8 0, Pale Copal Oak, 0 10 0, Superior Pale Blue Oak, 0 10 0, Fine Extra Hard Church Oak, 0 10 0, Superior Hard-drying Oak, for seats of Churches, 0 14 0, Fine Elastic Carriage, 0 12 6, Superior Pale Elastic Carriage, 0 15 0, Fine Pale Maple, 0 16 0, Finest Pale Durable Copal, 0 15 0, Extra Pale French Oil, 1 1 0, Eggshell Flattening Varnish, 0 15 0, White Copal Enamel, 1 4 0, Extra Pale Paper, 0 10 0, Best Japan Gold Size, 0 10 0, Best Black Japan, 0 16 0, Oak and Mahogany Stain, 0 16 0, Brunswick Black, 0 9 0, Berlin Black, 0 6 0, Knotting, 0 10 0, French and Brush Polish, 0 10 0.

PUBLISHER'S NOTICES.

Pub. No. 6112, Gerrard. Telegrams, "The Builder, London." THE INDEX (with TITLE-PAGE) for VOLUME LXXXIX (July to December, 1906) was given as a supplement with the issue of January 18th. CLOTH CASES for binding the Numbers are now ready, price 6d. each. READING CASES (Cloth), with Strips, price 8d. each. THE EIGHTY-NINTH VOLUME "The Builder" (bound), price Twelve Shillings and Sixpence. SUBSCRIBERS' VOLUMES sent to the Office, will be bound at a cost of 3s. 6d. each. CHARGES FOR ADVERTISEMENTS. COMPANIES' CONTRACTS AND NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROCEEDINGS OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ADVICES, &c. Six lines or under (about thirty words) (8d. each). Each additional line (about ten words) (1s. 0d.). SITUATIONS VACANT, PARTNERSHIPS, APPOINTMENTS, TRADE AND GENERAL ADVERTISEMENTS. Six lines (about fifty words) or under (2s. 6d. each). Each additional line (about ten words) (6d. each). Terms for series of Trade advertisements, and for front page and other special positions, on application to the Publisher. SITUATIONS WANTED (Single-handed—Labour only). Four lines (about thirty words) or under (2s. 6d. each). Each additional line (about ten words) (6d. each). PREPARATION IS ABSOLUTELY NECESSARY. * * Stamps must not be sent, but all sums should be remitted by Postal Orders, payable to J. MORRAN, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C. Advertisements for the current week's issue are received up to THREE o'clock p.m. on FRIDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on the day. Those intended for the Quotable Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS OR ORDERS TO DISCONTINUE THEM must reach the Office before TEN o'clock on WEDNESDAY MORNING. The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., sent to the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISEMENTS IN "THE BUILDER" may have Envelopes addressed to the Office, Catherine Street, Covent Garden, W.C., free of charge. Letters will be forwarded if addressed envelopes are sent together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication. N.B.—The Reply Boxes are not intended for trade letters, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

AN EDITION PRINTED ON THIN PAPER, FOR FOREIGN AND COLONIAL CIRCULATION, IS ISSUED EVERY WEEK. READING CASES { By post (carefully packed) 1s.

TO CORRESPONDENTS

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

We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, for or of models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

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

Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it, if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles for publication unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other commercial matters to the advertiser; and those to THE PUBLISHER, and not to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 4 P.M. on Thursdays, 1 N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is stated, nor any list in which the lowest tender is under 100L, unless in some exceptional cases and for special reasons.

* Denotes accepted. † Denotes provisionally accepted.

BLACKHEATH.—For erection of dwelling-house in Orchard-od, for Mr. A. B. Bacon, Mr. E. W. Leeson, architect, 49, Princes-street, Manchester. — Kennard Bros.* .. £1,500

BOURNEMOUTH.—For making up roads, Winton (one Glen-road, and Beescombe (part of parade), for the Corporation, Mr. F. W. Lacey, Borough Engineer and Surveyor, Municipal Offices, Bournemouth.— J. Corbin, Orington, Stourval-road, Poole-down, Bournemouth* .. £239 1 7

BRIGHTON.—For erecting new nursing cottages at the Redden School, near Brighton. Messrs. J. W. Simpson & Co., Brighton, architects, 3, Verulam-buildings, Grey's Inn, W.C.C. — Field & Co. £3,378 Rowland Bros. £2,739 N. A. Hawkins & Co. Cooper & Sons 2,678 London Lyett & Sons 2,614 C. G. King 2,615 Sittin & Eversted 2,504 Barnes & Son 2,608 Norman & Burt 2,600 Parnes & Sons 2,793 Potter Bros. 2,520

BROMLEY.—For house, Durham-avenue, Bromley Kent, for Mr. G. S. Cooper, Messrs. S. and W. Storker, architects, 90 and 91, Queen-street, Chapside, E.C. Quantities by Mr. W. James Pamphill, 21, Finsbury-pavement, E.C. — R. A. Low* .. £1,880 C. King 2,040 T. Crossley & Son. 1,883 F. G. Minter 2,007 L. Evans* .. 1,795 H. B. Clarke, 10, Park-street, London, E.C. 1,720 R. G. Arnold & Son 1,875 W. W. Harris & Co. 1,747 T. Grady 1,932 J. Watt 1,475 F. P. Duthoit. 1,895

BURNHAM (Somerset).—For the erection of new shops and saleroom, Alford-street, for Messrs. J. H. Palmer & Sons, Mr. C. Hiscock, architect, Burnham — H. B. Chapp 2,650 Glead Bros. 2,510 F. L. Roberts 616 W. Lylliam 500

CAMELFORD.—For the extension of school buildings, for the Governors of Camelford Secondary Schools. Mr. W. J. Jenkins, architect, Bodmin. — Messrs. Lobb & Worth, Camelford* .. £871

COVENTRY.—For erection of new foundry buildings, Poteshill, for Messrs. Webster & Bennett, machine tool makers, Messrs. Tait & Herbert, architects, Leicester and Coventry. — Steelwork: Needham & Lowe, Leicester* £2,050 Builders' Work: Exors. of C. Garlick, Coventry* .. 800

DARVEL.—For sewerage and sewage purification, works for the Town Council of the Burgh of Darvel, Ayrshire. Mr. P. Campbell Bart, C.E., 134, St. Vincent-street, Glasgow. — Bell & Barr. £4,488 6 7 W. Lawson, Glasgow, Contractor. 4,402 19 0 C. Clarkson & Co. Kilmarnock* £4,070 0 0 Co. 4,413 7 6

DOVERCOURT.—For erecting two blocks of semi-detached residences, Stour View Estate. Mr. H. S. Walling, F.S.A., architect, Kingsway House, Dovercourt and Ipswich. — T. Parkington & Sons £1,000 E. Sanders* .. £1,290 W. H. Blonfield .. 1,750 Down & Sage, Har. H. J. Linzell .. 1,678 wirt and Dover. — Miller, Sons, & Co. 1,391 court* .. 1,220

EXETER.—For construction of permanent way and paving, etc., for five-eighths of a mile, for the Corporation, Mr. T. Moulding, City Engineer and Surveyor, Municipal Offices, Southleigh West, Exeter. — E. Ireland, Morecambe. £5,323

EXETER.—For constructing two additional bays at the end of the Heavies, for the Corporation, Mr. T. Moulding, City Engineer and Surveyor, Municipal Offices, Southleigh West, Exeter. — Westcott, Austin, & White, Exeter £1,473

GORLESTON.—For erecting a free library, for Great Yarmouth Town Council. Mr. J. W. Cockbill, Borough Surveyor, Town Hall, Great Yarmouth. — J. F. Pestell .. £2,600 J. D. Harman .. £2,440 C. C. J. Caffey .. 2,565 L. G. Haddingham 2,436 Moore & Son. 2,540 A. Gannas 2,427 G. T. Flaxman .. 2,490 G. W. Beech 2,345 Carter & Wright. 2,473 B. G. Berley, Yar. J. Eastoe .. 2,447 mouth* .. 2,335

GRIMSBY.—For construction of attics, Corporation Electricity Works. Mr. H. Gilbert Whyatt, A.M.I.C.E., Borough Engineer. — D. Seamer £237 15 0 W. Gilbert .. £181 7 6 Hewins & Sons .. 12,368 H. Ludfield & Son 184 10 6 head .. 229 10 0 J. A. Thomas, H. Hodson .. 203 17 0 127, Heneage- J. Hogg .. 195 15 0 street* .. 181 0 9

HANDSWORTH.—For making Sibley-road, for the Urban District Council. Mr. H. Richardson, Surveyor, Handsword. — S. Wood .. £570 0 [A. Cooper, Bir- Curral, Lewis, & Minton]* .. £497 0 Martin, Ltd. 528 16

KINGSTON-UPON-THAMES.—For erecting new school buildings for boys and girls in the Richmond-road, Mr. K. W. Roper, architect, 3, Adam-street, Adolph, W.C. — Webb & Grimsdale £14,999 Parsons & Towns. J. Long & Son .. 12,368 H. Ludfield & Son 10,773 W. H. Hyde .. 11,756 Wisdom Bros. 10,776 J. W. Brooking .. 11,756 W. Johnson & Co., Indian, Ltd. 11,675 E. A. B. W. J. Renshaw .. 11,500 F. & G. Foster .. 10,695 Matlocks & Parsons 11,493 J. Appleby & Sons 10,660 Rows & Co., Ltd. 11,473 J. M. Patrick .. 10,654 E. Stratford .. 11,367 M. W. Lee & Co. J. Bureca & Sons .. 11,359 Ltd. 10,635 A. Faulks .. 11,269 Higgs & Outhwaite 10,627 Cropley Bros., Ltd. 11,167 F. Hawley & W. Smith & Sons .. 11,125 J. Garrett & Son .. 10,520 J. C. & H. Woyler .. 11,088 S. Page & Son .. 10,349 J. Shellbourne & Co. 11,077 T. J. Hawkins & J. Casse .. 11,064 Co., Ltd. 10,375 Myall & Upson .. 11,050 G. E. Wallis & Sabey & Son, Ltd. 10,993 Sons, Ltd. 10,260 S. B. Barker .. 10,957 F. G. Lawrence, W. J. Dickens .. 10,891 Opposite Rail- way Station, Ltd. 10,887 Kingston-upon-Thames* .. 10,237

LEYTON.—For erection of car sheds, for Leyton Urban District Council. — W. Manders, Leyton .. £12,178 0 0 Dorman, Long, & Co., Ltd. of Middlesbrough (for the supply of iron and steel work in roof trusses, etc)* .. 2,732 16 3

LINCOLN.—For erecting a new pavilion in connexion with the Infectious Diseases Hospital, Longuey-road, for the Corporation, Mr. R. A. MacBair, M.J.C.E., City Surveyor, Silver-street, Lincoln. — W. Halkes .. £2,350 0 C. Taylor .. £2,185 0 W. Wright & Son .. 2,292 0 L. Austen & Son 2,150 12 0 P. Scarborough 2,198 18 H. S. & W. Close* 2,119 0 [All of Lincoln.]

LONDON.—For the supply of Fletton bricks, for the Bermondsey Borough Council. — Wakley Bros. & Co., 74, Bide'side* .. £1 4 6; 900.

LONDON.—For heating apparatus, Fulham Palace-road, for the London County Council. — F. W. Brock .. £475 12 7 J. Yetton & Co. £263 15 0 G. Davis .. 325 0 0 E. Bradley 259 0 0 Stevens & Sons 290 0 0 J. Richmond & British Engine- building Co., Ltd. A. Macintosh & Sons, Ltd. 213 5 0 Ltd. 285 0 0 Palowkar & R. H. & J. Pear- son, Ltd. 270 0 0 Queen-street, Chapside* .. 230 0 0

(The estimate of the architect (Education) comparable with these tenders is £281.)

LONDON.—For heating apparatus, Gallewall-road, Bermondsey, for the London County Council. — C. Kite & Co., 2135 0 0 Bolton, Fane, & Co. £90 0 0 Sons, Ltd. 103 10 0 J. Yetton & Co. 86 10 0 G. & E. Bradley 103 0 0 F. W. Brock .. 85 15 11 Wimpell Bros. & Row .. 97 10 0 Stevens & Sons- Palowkar & Sons, 94 8 0 work Bridge- Sons, 94 8 0 work Bridge- (The estimate of the architect (Education) comparable with these tenders is £72.)

LONDON.—For cleaning and painting work at the North-Western Fever Hospital, Law-road, N.W., for the Metropolitan Asylums Board. Mr. W. K. Hatch, Engineer-in-Chief. — J. F. Penn .. £2,894 18 10 J. Walker & F. Bush .. 2,595 0 0 Son .. £1,656 0 0 J. J. Richards 2,374 14 3 W. J. Sims & Co. Hale & Co. 2,172 0 0 M. McArthur .. 1,638 1 4 W. Mills .. 1,599 0 0 B. Barrett & Power .. 2,100 0 0 Greenhill & W. Johnson & Co., Ltd. 1,995 0 0 L. V. 1,546 0 0 A. Herdler & Co. 1,930 5 7 A. H. Ines .. 1,370 0 0 E. Proctor & Son .. 1,910 0 0 A. Porter .. 1,334 0 0 W. Reason .. 1,749 0 0 J. Arundel Sabey & Son, Ltd. 1,735 0 0 Exors. of, R. W. Weston, South- road, Broad- & Co. 1,708 10 5 ford* .. 1,033 11 4

LONDON.—For erecting sub-fire-station, Plumstead, for the London County Council. — C. Wall, Ltd. £8,900 Kerridge & Shaw .. £8,180 E. Lawrance & Sons 8,676 Leslie & Co., Ltd. 8,159 P. Minter .. 5,654 Holloway Bros. Kirk & Randall .. 8,338 (London), Ltd. 7,930 Spencer, Santo, & F. & H. F. Higgs, Co., Ltd. 3,328 Station Works, H. Lovatt, Ltd. 8,287 Longholloway H. L. Holloway .. 8,200 Junction, S.E.* .. 7,894

LONG-BENTON.—For 390 lineal yds. of pipe sewer, etc., Eastfield-road, for Tynemouth Rural District Council. Mr. A. S. Dinning, Surveyor, 21, Ellison-place, Newcastle-upon-Tyne. — E. Edgar, Whitley Bay .. £142 1 0

LONG GROVE.—For installation of electric lighting and power, Long Grove Asylum, for the London County Council. — E. D. Triswell .. £25,117 0 0 W. Mackie & Co. 19,127 0 0 W. Dubell .. 17,027 1 0 G. Hartland, Bowden, & Co. 16,814 0 0 J. O. Grant & Taylor .. 16,586 0 0 Edinburgh's Electricity Corpora- tion, Ltd. 16,550 0 0 T. G. Bond & Freeman .. 16,542 0 0 K. A. Glover & Co., Ltd. 16,500 0 0 W. H. Arundell .. 15,200 0 0 W. G. Heath & Co. 16,000 0 0 Strode & Co. 15,973 0 0 T. Hiscock .. 15,935 15 6 Bailey, Grundy, & Barrett .. 15,750 10 0 Strange & Son, Ltd. 15,654 0 0 G. N. Haden & Son .. 15,427 0 0 Hooper, Neary, & Co. 14,976 0 0 Dargus, Grindis, & Co. 14,448 0 0 S. S. Cosens .. 14,217 0 0 J. E. Capogietti & Co. 14,000 0 0 H. A. Jackson & Co. 13,400 0 0 T. Chapman & Makovski .. 13,383 0 0 T. Chapman & Curwen .. 13,880 0 0 Sweet Bros. 13,655 9 7 T. Potter & Sons, Ltd. 12,936 0 0 Army & Navy Auxiliary Stores .. 12,880 0 0 W. Fryer & Co. 12,760 0 0 W. T. Furse .. 12,750 0 0 W. Wain .. 12,675 0 0 Cox Walkers .. 12,582 0 0 Bevan & Sons, Ltd. 12,495 0 0 R. Cort & Sons, Ltd. 12,436 0 0 Jackson Bros. 12,223 0 0 Broully, Batstone, & Kirk .. 11,690 0 0 Lea & Warren, London and Ketter- ing* .. 11,200 0 0

(New alternative tender.)

LONG GROVE.—For locks, Long Grove Asylum for the London County Council. — Chubb & Sons, Ltd. £3,975 0 0 J. Gibbons, Wolverhampton* .. 1,993 13 4 Hobbs, Hart, & Co. 1,236 0 0 C. G. Smith & Co. 1,546 12 6

MERTHYR.—For additions to the "Dorothy" for Mr. A. L. Evans, Mr. T. E. Rees, architect, Gernaut, The Walk, Merthyr Tydfil. — R. Lloyd .. £152 17 9 G. H. Jones .. 530 0 0 W. F. Clarke .. 239 0 0 J. Jenkins .. 239 0 0 Car d i f f, W. Skinner .. 218 0 0 Merthyr* .. 143 0 0 T. Davies & Co. 176 10 0

MOLD.—For alterations to Bethesda C.M. Chapel, Messrs. R. Davies & Son, architects, Bangor. — B. Williams .. £769 J. Mayers & Son .. 536 R. Peters .. 584 T. Foulkes .. 496 M. S. Rogers .. 563 T. Roberts, Mold* .. 449

NEWARK.—For erecting a pair of residences and shop, Barbeygate, Messrs. Saunders & Saunders, architects and engineers, Imperial Chambers, Newark. — W. Smith .. £580 G. Henderson .. £506 C. Baines .. 545 H. Hirst .. 497 G. Brown & Son .. 529 F. W. Crossland* .. 496 G. E. Dobney .. 529 [All of Newark.]

NEWARK.—For renewals, repairs, and alterations to properties belonging to the St. Leonard's property, Messrs. Sheppard & Loekton, architects and surveyors, Baragat, Newark. — G. Brown & Son £1,295 0 0 F. W. Cross .. £1,687 14 5 C. Baines .. 1,220 0 0 H. Hirst .. 1,580 0 0 W. Smith, Newark* .. 1,130 0 0 T. H. Harrier 1,325 0 0 C. Williamson 1,325 0 0

NEWHAVEN.—For erecting new Council offices and fire-station in Fort-road, for the Urban District Council. Mr. F. J. Rayner, architect, 34, Meeching-road, Newhaven. — Potter Bros. £2,658 0 0 T. Rich .. £1,800 0 0 Rowland Bros. 1,840 0 0 M. Woolger .. 1,793 0 0 H. Lindfield & Sons .. 1,848 0 0 Brighton-road, Newhaven .. 1,757 16 0 R. Cook & Sons 1,800 0 0

NORMAN'S RIDING.—For enlargement of advanced infirmary hospital, for Blaydon, Ryton, and Whickham Joint Hospital Committee. Mr. J. B. Renton, Architect, Council Offices, Whickham, R.S.O. Quantities by Architect. — Bruce & Still .. £7,714 0 0 Humphreys, Ltd. £2,732 0 0 Spiers & Co. 3,450 0 0 Bolton & Paul .. 2,697 0 0 Glazer, Lee, & Co. 3,417 0 0 W. Harbrow .. 2,665 0 0 Darlington Corp. F. Smith & Co. 2,593 0 0 Construction Co., Ltd. 3,195 0 0 Alnwick Foundry W. Bain & Co. 3,160 0 0 and Engineering Co., Ltd. (Alnwick) 2,423 J. McManus .. 3,115 0 0 T. J. Bawkins & Co. 2,849 5 0

NORMAN'S RIDING.—For foundations, plumbing, drainage, etc., in connexion with the enlargement of the advanced infirmary hospital, for Blaydon, Ryton, and Whickham Joint Hospital Committee. Mr. J. B. Renton, Architect, Council Offices, Whickham, R.S.O. Quantities by Architect. — F. W. Jefferson £1,900 0 0 W. G. Atm- strong .. 1,898 3 8 L. Bentley 1,995 0 0 J. Archibald, Gateshead* .. 1,648 0 0 E. R. Davison 1,977 0 0 A. Teuch .. 1,973 12 5

PENZANCE.—For building a villa, for Mr. R. T. Harvey. Mr. H. Maddern, architect, 13, Clarence-street, Penzance.—

R. Walters	£190 14	J. E. Hooken, Drift,	
C. M. Richards	100 0	R.S.O.*	£170 0
J. Bodinar	185 0		
F. Harvey	£348 10	C. Tregenza, Mouse-	
R. McLary	319 0	hole, Penzance*	£284 18
J. Weeks	206 0		

PUDSEY.—For additions to Priestley Mills, for Mr. Samuel Cordingley. Mr. W. R. Nunn, architect and engineer, Market-street, Bingley.—

Masons: J. Thornton & Son, Thackley ..	£410 12 6
Joiners: Wilkinson & Sanderson, Pudsey ..	180 0 0
Slater: W. Thornton, Bingley	65 0 0
Plasterer: W. Shaw, Pudsey	28 14 0
Plumber: J. Scarth, Pudsey	39 5 6

SHILDON (Durham).—For road-works, for Shildon and East Thackley Urban District Council. Mr. M. Turnbull, Surveyor, Shildon.—

All Saints'-road.	
W. Burdon, Shildon*	£123 0 5
Bouch'-street.	
J. Moore*	111 15 0
Rock Revolver-road (Scars'-street in South-street).	
J. Moore*	22 16 0

SOUTHALL.—For the new secondary schools, for the Middlesex County Council, providing for 250 mixed scholars, together with two laboratories, balance-room, dining hall, assembly hall, artroom, lecture-room, library, principals' and common-rooms, and cloak and changing-rooms. A separate block comprises the cookery and manual training centres and caretaker's quarters. The enclosure of the playing fields, 4 acres in extent, is included in the contract. Mr. H. G. Crothall, Architect to the Education Committee.—

Amount allowed in Tender for M.T. and Cookery Centres and Caretaker's Apartments.		
J. Stewart	£13,429	£2,378 0 0
K. G. Minter	12,369	2,056 0 0
W. J. Dickes	12,070	1,907 0 0
Ward & Son	12,027	2,115 0 0
W. Lawrence & Son	11,844	1,900 0 0
Mattock & Parsons	11,834	2,600 0 0
Fessnidge & Son	11,823	2,041 0 0
Treasure & Son	11,806	2,041 12 3
W. Brown	11,786	2,026 0 0
Fairhead & Son	11,658	1,984 0 0
Wisdom Bros.	11,625	1,954 0 0
W. J. Renshaw	11,599	1,949 0 0
A. & B. Hanson	11,598	1,995 0 0
H. Knight & Son	11,434	1,990 0 0
D. D. Heath	11,420	1,994 0 0
J. Dorey & Co.*	11,125	1,905 0 0

* Recommended for acceptance.

STANLEY.—For forming private streets at South Moor, for the Urban District Council. Mr. J. Routledge, Surveyor, Council Offices, Stanley.—

P. Duff	£1,938 10 9	Johnson & G. E. Simpson	1,004 12 4	Strong	£909 0 6
T. Johnson	945 0 0	R. C. Birley			
J. McLaren	915 5 1	Stanley*			867 3 4

STAPLETON.—For erecting a stone bridge over the Flish Burn, at The Flish, near Greenhill, for the Longtown Rural District Council. Mr. J. Murray, Surveyor, Kirklington.—

Messrs. J. Scott & Sons, Newcastleton, N.B.* 2178 7 9

SWINDON.—For the erection of dwelling-houses and shops, fronting Commercial-road and Curtis-street, Swindon, for Mr. L. L. Morse, M.P., The Croft, Swindon, Messrs. Read & Osborne, architects, Regent Circus, Swindon.—

Tydemans Bros. 23,875 0 0	R. Chanter ..	£2,900 0 0
R. J. Leighfield 3,050 0 0	G. J. Norman*	2,785 4 6
A. J. Colborne 2,919 10 0		

[All of Swindon.]

TUPSFLEY.—For the erection of a pair of semi-detached villas on the Highfield estate, for Mr. A. Peeres, Messrs. Groom & Bettington, architects and surveyors, Palace-chambers, King-street, Hereford.—

E. J. Davies	£925 0	W. Powell	£836 0
R. L. Friend	907 10	C. Cooke	830 0
Davies & Co.	876 0	J. T. Jones*	770 0

[All of Hereford.]

TEDDINGTON.—For new elementary school to accommodate 300 children, with cookery and manual training centres, committee-room, and caretaker's house, for the Middlesex County Council. Mr. H. G. Crothall, Architect to the Education Committee.—

C. F. Kearley	£12,996 0 0	Tender in Amount for Cookery and M.T. Centres.
Mattock & Parsons	12,975 0 0	£1,812 0 0
J. Ward & Son	12,519 5 6	1,700 0 0
Messum & Sons	12,475 0 0	1,800 0 0
Patman & Pothor		1,792 0 0
ingham	12,423 0 0	1,720 0 0
W. Blackburn	12,250 0 0	1,700 0 0
Fessnidge & Son	12,124 0 0	1,808 0 0
D. D. Heath	12,104 0 0	1,800 0 0
Treasure & Son	12,086 0 0	1,776 17 7
A. & B. Hanson	11,993 0 0	1,770 0 0
F. G. Minter	11,990 0 0	1,743 0 0
W. J. Renshaw	11,893 0 0	1,650 0 0
W. Lawrence & Sons	11,874 0 0	1,674 0 0
A. Fairhead & Son	11,823 0 0	1,698 0 0
J. Barker & Co.	11,759 0 0	1,623 15 0
Wisdom Bros.	11,642 0 0	1,690 0 0
J. Dorey & Co., Ltd.	11,606 0 0	1,690 0 0
Gough & Co.	11,539 0 0	1,700 0 0
Knight, Henry, & Son*	10,987 0 0	1,574 0 0

WALMER.—For the erection of cottages and stabling, for Mr. W. R. Davies. Messrs. Fry & Miller, architects, 22, Cannon-street, Dover. Quantities by architects:—

A. W. Thompson	£1,539 12 0	W. Bromley	£1,482 8 0
J. E. Turner	1,537 12 11	T. T. Dennis	1,439 0 0
J. W. Sandcraft	1,531 0 0	Walmer*	1,337 0 0
R. & G. Brisby	1,505 0 0		

WALMER.—For the erection of bungalow on Walmer beach, for Mr. J. Martini. Messrs. Fry & Miller, architects, 22, Cannon-street, Dover.—

J. E. Turner

£690

WALTHAMSTOW.—For erecting Ednburgh-road Council School, for the Education Committee. Mr. H. Prosser, Architect, Education Office, High-street, Walthamstow. Quantities by Mr. G. T. G. Wright, 3, Great Winchester-street, E.C.2.—

H. Lovatt, Ltd.	£7,384	R. & E. Evans	£6,880
Rowe & Co.	7,258	W. Lawrence & Son	6,583
J. McKay	7,069	J. Chessum & Sons	6,250
Sands & Burley	6,900	G. E. Wallis & Sons	6,574
Patman & Pothor		Appley & Sons	6,570
ingham	6,793	A. G. Crisp	5,530
F. & A. Willmott	6,776	Hammond & Son	6,487
Kilby & Gayford	6,720	J. & J. Dean	6,412
W. J. Maddison	6,669	H. Kulgit & Son	6,397
F. J. Coxhead	6,619	Rowley Bros.	6,334
Folland & Brand	6,600		

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The Builder.

VOL. XC.—No. 3301.

MAY 12, 1906.

ILLUSTRATIONS.

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"Ardenrun," Godstone, Surrey.....	Mr. Ernest Newton, Architect.
Three Groups for Hyde Park Corner.....	Mr. Gustav Natorp, Sculptor.
"Youth's Dream of Joy".....	Miss Esther M. Moore, Sculptor.

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The Royal Academy.



AS far as the paintings are concerned, we fear it is impossible to call this a remarkable year at the Royal Academy. The sculpture, which we usually consider

separately, has apparently the best of it, as has usually been the case for some years back, and there can be little question that Sir W. Richmond's Gladstone monument in the Lecture Room is the most important work of the year. Mr. Sargent's portrait group of four professors of the Johns Hopkins University at Baltimore, hung in the position in Gallery IV, which has been for some years devoted to his large portrait groups, is of course a fine thing, in which the difficulty of treating pictorially four figures in black professional robes is surmounted with great skill; but it is not, as a picture, by any means equal in effect to some of its predecessors. The place of honour at the top of the large room is given to Mr. Abbey's painting of "Columbus in the New World," he and some of his followers kneeling, like good Catholics, to plant their standard on the new soil. The picture strikes us as having been painted as a decorative picture; there is a background of rather wooden-looking flamingoes all flying in level lines across the picture, which reminds one of the background of sloped red spears in the

far more dramatic picture of Gloster and Lady Anne; but these decorative birds are puzzling to the eye, and at first sight look like a number of red flags strung up one cannot tell how: it is an unrestful picture, and does not convince one of the reality of the scene. A prominent place is given, in Gallery VIII, at the centre of the vista, to another work which must be classed as a decorative picture, inasmuch as it is painted in a flat style which is one remove from realism; this is Mr. Brangwyn's "A Venetian Funeral," a work of much greater power than Mr. Abbey's, but which, owing to its flat treatment and crowding together of detail, is almost a puzzle to the eye at first; it is only after some consideration that it resolves itself into a boatload of figures in the foreground and a many-coloured but indistinct crowd of boats and figures in the sunlit perspective of the canal beyond. It is a very remarkable painting, full of vigour both of design and colour, but too confused to be satisfactory to the eye. Among other pictures of ambitious scale and aim, Mr. Christie's "The Secret—Decorative panel," in Gallery X, a very large upright composition of three ladies in dresses of brilliant hues beneath a mass of tree, is not decorative in the sense in which the last two works named may be called so; it is in fact almost realistic in character, though it has a claim to decorative character as a matter of forcible colour and agreeable composition; we cannot however feel that its interest is in any sense commensurate with the wall-space it occupies. Mr.

Draper's "Day and the Dawnstar," in Gallery VIII, as an allegorical composition, one might like better if he had not quoted for it two lines of Tennyson which suggest something far more intense and more full of beauty than we can find in these figures, and he is not the only artist this year whose poetical quotations are too much for his pictures. Sir L. Alma-Tadema's "Ask Me No More" is in a pictorial sense one of the most beautiful and successful of his Hellenic rhapsodies of draped figures and marble, and violet sea beyond; a man and woman are seated on a marble seat on a terrace, he kissing her hand, she turning her head away; the figures are finely contrasted, the delicate harmony of the draperies is perfect; but, though the head of the female figure is charming, there is nothing in her expression to answer to the deep feeling of the five noble and pathetic lines quoted from "The Princess," and one is brought up by the feeling of the inadequacy of the picture, with all its technical beauty, to express the idea of the poet. Mr. J. W. Waterhouse, in a picture hung a few feet from this, is another painter who takes a great subject and falls below it; his "Danaides" is a group of quiet maidens, mediæval rather than Greek, beautiful and harmonious in their colouring and grouping, perfunctorily pouring water into a curiously designed brass vessel from which it quite obviously runs out before their eyes; they are all quite calm and unconcerned, their terrible sentence produces no effect on their feelings; they are only playing

at being Danaïdes. It is a very pleasing picture, but it is absurd to take a great antique legend as a subject and reduce it to prettiness. Mr. Hacker's "The Hours," in Gallery V., is an allegorical group more on a level with its subject, and finely composed in line, though the central figure is somewhat affected in pose and expression. By one of the dramatic contrasts which the Academy has in store for us, this allegory is overhung by an immense portrait group of a family engaged in getting into a large motor-car which fills the whole canvas; thus are we hurried from poetry to prose; one would have thought we had enough of motor-cars in the streets, without bringing a life-size one into the Academy. Realism of another kind is shown in Mr. G. Henry's fine picture, "The Blue Gown" (Gallery III.), where a lady in a blue dress and with a finely-painted and expressive head stands in the centre of the picture against a background of dark panelling; various accessory objects are all painted with brilliancy and effect; the whole is an arrangement of figure and accessories so as to produce a striking pictorial effect. We have already noticed Mr. Henry's fine picture, "The Hourglass," in the New Gallery; equally a painter's picture, a work showing an artist's sense of composition and colour, without pretending to any meaning beyond that. We do not say this is the highest theory of painting; but it is far more satisfying than a picture with a professedly poetic aim which it fails to rise to.

Among smaller pictures in which figures are the principal subject the exhibition has brought out a new painter of no little power, Mr. Frank Craig, whose picture, "The Heretic," has been bought for the Chantrey Bequest, a choice which will not be disputed. This is a small picture crowded with figures in medieval costumes, in which every separate face is a study in character; and that of the young woman who is the heretic, and who seems to be catching sight with dismay of the preparations for her doom, is a most remarkable effort in concentrated force of expression. All the details are very carefully executed, and the artist has made a position for himself, if his future productions are on the same level of intelligence and conscientious execution. Among other works on a comparatively small scale that are worth special notice are Mr. Young Hunter's "A Song Without Words," in which the figure of the lady in crimson dress curtsying to her lover is admirably realised; Mr. Sims's very pretty fancy of children in "The Land of Nod," a sort of dream picture of children on their way to bed; and Mr. A. Fahey's "The Conception of the Cross," which explains itself better than it can be explained in words, and is a rather remarkable little picture both for composition, colour, and mystical significance. Mr. Collier's lady seated in brilliant array before a fire, to the title "Indeed, indeed, Repentance oft I swore," is one of the pictures in which the expression is hardly equivalent to the subject. Mr. Tuke, in "Pearls," has taken to painting female nudes instead of his former favourite subject of youths bathing, and we hardly like his girls as well as

boys. Mr. Melton Fisher's "La Belle au Bois Dormant," a nude figure asleep in a wood, has beauty and poetic significance, and Mr. Mount Loudan's lady about to bathe in a garden pond—

"Oh world, as God has made it!
All is beauty."

is a really beautiful work which might have been more advantageously hung.

It is curious how little is seen now of what used to be called "Historical Painting." Mr. Seymour Lucas's "Burning of Luther's Works outside Old St. Paul's" represents the old style of picture of this class; a kind of portrayal of facts which appeals to the popular mind, but we cannot find it very interesting. There are two Napoléon pictures, one as poor and commonplace as the other is fine and real; the latter is Mr. Crofts's "Near La Belle Alliance at Dawn, June 18, 1815"; one of the best things of the kind he has done. Napoléon is seated on his white horse with his back to the spectator, but his profile is seen as he addresses questions to the same peasant looped to the stirrup of a dragoon whom we have seen in a former picture by the same artist. The contrast between Napoléon's stern and searching face and the profile of the terrified peasant, cap in hand, struggling to satisfy the imperious emperor, is admirable; the emperor's staff and some of the soldiers occupy the foreground; in the distance is the line of camp fire of the allies. The picture is a distinct success, and adds one more to Mr. Crofts's remarkable series of military paintings.

Then we have the type of pictures representing real life of the humbler class, in which Mr. La Thangue and Mr. Stanhope Forbes are predominant. Mr. Forbes's principal picture, "Preparing for Regatta Day" by repairing one of the flags, is simply a study of figures characteristic of a seafaring neighbourhood; a piece of the prose of real life, very well painted but not much of a composition. His smaller work, "Evening in the Village," a seaside village, is more of a picture. Mr. La Thangue makes his rustic scenes subservient to studies of the effect of sunlight; his "Carting Bracken" is a powerful and brilliant work in this way, remarkable also for a donkey admirably foreshortened; a better piece of drawing could not well be seen. His two scenes in Liguria, in Gallery XI., are perhaps even better in the treatment of sunlight; his portrait of a child sitting in a hammock is hardly a success, and seems as dull and heavy in effect as the others are brilliant.

There are a number of good portraits this year, among which Mr. Oulless's of the Master of Clare College is one of the most powerful and lifelike of the class of portraits which aim simply at portraiture without any special pictorial effect; the head is splendidly painted both in regard to colour and force of expression. Mr. Herkomer's "Mrs. Leopold Albu" is a fine example of the class of what may be called sumptuous portraits, painted to be effective in a large gallery, and is a noble and dignified work. So is the President's seated portrait of "The Duchess of Northumberland," a little hard perhaps, but most learnedly drawn, and with all the rich details and accessories painted with the

most conscientious elaboration. Among other portraits in the large room may be mentioned Mr. Bacon's original and effective portrait of "Lady Gelder," though the strong red background does not altogether improve it; a charming if rather sketchy half-length of a very pretty girl, by Mr. Sargent; and Mr. Shannon's broadly executed and effective group of "Mrs. Herbert Sears and her Daughters."

Landscape is comparatively speaking strong this year. Sir E. Waterlow's landscapes are always notable for their careful composition, but his "Dorsetshire Uplands" is particularly excellent in this respect, and in the beauty of the distance and the fine sweep of line of the foreground hill. Mr. Peter Graham, in "Morning," has got something new out of his old subject of seaweed-covered rocks and a restless sea; it is far less hackneyed in colour than some of his works of this class (which had come to resemble each other rather too much), and the effect of the morning light catching the upper surface of the rocks is very powerfully given. The two landscapes which stand out from the rest to our thinking, are Mr. Annonier's "The Top of the Common," in Gallery IV., and Mr. David Farquharson's "Eventide" in the next Gallery. These show the power and breadth of treatment which are characteristic of the best French landscape. The failing of English landscape, in comparison, in spite of much beauty to be found in it, is to be too pretty, and too neglectful of composition. In this sense Mr. D. Farquharson's larger picture, "Birnam Woods," though it may count as a more important or at any rate more ambitious work than "Eventide," is not equal to the latter; there is just a touch of scenic effect in it from which "Eventide" and Mr. Annonier's landscape are entirely free. Mr. Clausen's small landscape "A Winter Morning" is a remarkable piece of realism without being realistic.

We have only mentioned here the prominent works which go to make the general character of the exhibition. We may be able to refer to other more or less interesting pictures on another occasion.

ARCHITECTURE AT THE PARIS SALON.

THE change of atmosphere from the architectural room at the Royal Academy to the architectural galleries at the Salon is curious. On the one hand there is a far greater thoroughness of illustration of work in the way of complete and large-scale plans, such as the Royal Academy would give no space for; on the other hand the collection has so little relation to the architectural practice of the day. At the Academy nearly all the drawings represent buildings executed or intended to be executed; at the Salon, out of 240 exhibits (it must be remembered that each number covers all the drawings, perhaps a dozen or more, representing one subject) we could only recognise twenty-five as representing actual commissions, and even in some of these it is left doubtful whether it is an executed building or only a *concours*. The title of one work, "Un Château-d'Eau en

Espagne." might be applied to a good many others which have the proverbial character of "châteaux en Espagne." Not all of these are uninteresting; some of them contain ideas which are suggestive; for instance, M. Boileau's immense set of drawings for "Une Eglise Catholique pour une Grande Ville" is a rather remarkable study for a cathedral of Gothic type and composition with classic detail; an idea which might bear fruit. Other schemes have an Oriental magnificence of conception which suggests the Arabian Nights; indeed, their authors seem rather inclined to suggest sites in "the exhaustless East," by way of an excuse for a riot of architectural imagination. "Un Gare Maritime en Asia Mineur," for instance; who can set realistic bounds to a scheme under such a title? No special locality is suggested; the whole historic seaboard of Asia Minor, with all its romantic associations, is at your service. Railway stations seem indeed to set the French architectural fantasy going; we have "Projet de Gare Maritime entre Kadikeni et Scutari"—here a locality is given, but the wings of fancy are not thereby clipped; and "Une Gare Maritime sur le Bosphore." Evidently the development of railways in the East is expected to proceed on a gigantic scale. Akin to these is a scheme by M. Ebrard for a "Monument à la Mer," which shows a seaport where the sides of the high cliffs at the back of the port have been shaved down to a vertical face on which are developed friezes and bas-reliefs and great panels with inscriptions, all relating to the sea and its glories; really rather a fine idea, but who shall realise it in these days of economics? A pretty idea too is that of M. Thiers, "Ensemble décoratif au Confluent des Deux Fleuves," where the meeting of the waters is solemnised by the erection of a great stone or marble exedra with ranges of stepped seats in a concave curve, interrupted at intervals by rows of clipped trees, a combination of architecture and greenery: it might serve for the background of a river regatta on a very grand scale. The incident of the meeting of two rivers seems to have an attraction for the French artistic mind; the junction of the Rhone and the Saône has inspired, to our recollection, not a few decorative pictures; and this is a similar celebration in architectural form.

The learned restoration of some antique monument, expressed in a series of sumptuous drawings, which usually forms the *pièce de résistance* of the architectural gallery, is wanting this year; the nearest thing of the kind is M. Le Tourneau's set of drawings of the Church of St. Demetrius at Salonica, which gives the complete plans and sections, with some large pencil drawings of the various interesting and curious capitals, a large coloured drawing of a mosaic, and a bold water-colour view of a corner of the church, showing the effect of the time-worn coloured marbles in the spandrels of the nave arcade, and the short columns of the triforium gallery, with the pierced marble balustrade between. The largest space occupied by any one exhibit is this year, for a wonder, claimed for an actual building, M. Godefroy's "Préfecture de la Haute

Vienne" (the catalogue does not state in what town), which fills a whole bay with a splendid set of drawings, the cost of producing which must have taken a good piece out of the architect's commission. This is a large collection of buildings, the two principal blocks of which, one of them a richly-treated set of state apartments, the other a plainer business block, stand at different angles, and are hinged, as it were, by a circular building with a decorative tower. The large circular-headed portal of which, in the perspective view, forms a terrible warning of the bad effect of arched openings on a circular plan. Except for this, the boldly-executed view, in sharply foreshortened perspective, of the principal block, with its coupled columns, lofty flight of steps, and flanking sculptures, has a very fine effect; the interiors are handsome rooms, though the detail is of an ultra-modern French neo-classic which we love not, and the grand staircase is all built in the form of arch, rather flat three-centred, which the French architects seem to be fond of in their Hôtel de Ville interiors, and which we think one of the least beautiful forms. Another important public building illustrated is M. Malgras-Delmas' theatre at Calais; the principal front is rather rampant with ornament, especially in the attic; it has an order in coupled columns, not close together, but leaving space between for a niche and a statue below and a circular medallion with a bust above, which has a fine and rich effect. The long flank is treated in a more sober style, and the whole building is a creditable one. We should mention also M. Payen's "Préfecture d'Agen," a quietly treated classical building surrounding three sides of a quadrangle, the fourth side having a columned gateway in the centre, connected with the wings by a lofty grille. This is a very simple piece of architecture with hardly any decoration, but it is dignified and suited to its purpose. The plan, it may be observed, does not entirely agree with the perspective view.

There are two or three public improvement schemes of some interest. M. Deverin exhibits his sketch for the improvement of the Palais Royal, the point of which is that the *place* requires to be opened out more fully by a public road instead of being entered merely by *guichets*; he proposes to drive a new road through from west to east, passing a little south of the Banque de France, which is to be extended and brought south to the road line; the entrance of the new road on the *place* to be marked by new angle pavilions to the existing buildings, and the *place* between the Conseil d'Etat and the Direction des Beaux-Arts laid out with an ornamental pond and fountain. It appears to present a very sensible and desirable public improvement. So, as far as we can judge, is M. Rémaury's scheme for providing a public garden and promenade for Rouen, by laying out the "Île Lacroix," at present (according to the statement on his drawing) partly occupied by dilapidated house property, and connecting it by sufficient bridges with the town on the banks; but do the "vieilles mesures" referred to include any of the picturesque old houses of Rouen? If so, there may be two ideas

on the subject. A less practical and more extravagant scheme is that of M. Coutan's for "Le Parlement, par rapport à la Place de la Concorde." He proposes to do away with the Pont de la Concorde, and to continue the Place de la Concorde across the river its full width, only leaving a large oval opening in the centre over the river—in other words, making what are really two bridges instead of one, only that they are not treated so as to convey that impression. Opposite this extended Place de la Concorde the two Houses are to be combined in a great building presenting a vast colonnade, concave on plan, facing the *place*; so far this is a fine idea, but it is spoiled by the immense and ill-designed centre feature, which completely crushes the colonnade. Otherwise, the general idea is worth consideration, though we do not suppose there is the least probability of its being seriously entertained.

Two or three of the recent competition designs for the Rothschild Foundation of artisans' dwellings are among the exhibits, including the selected set by M. Rey, of which we published illustrations in our issue of October 14, 1905, and which, besides being in the main very well planned, form a really admirable illustration of the treatment of buildings of this class so as to give them a pleasing appearance with due regard to economy. M. Rey does not do this, as is too often done, by getting in as many commonplace features of detail as possible—bits of ornament, keystones, etc.; he has done it by shaping necessary features, such as balustrades, pierced ventilated openings, etc., in a manner at once pleasing and practical. Some of the other plans show how much behindhand the French architects still are in their notions of hygienic planning. In an otherwise well-planned set we see the water-closet in each tenement opening direct out of the very small kitchen, and only to be reached by going through the kitchen; it is amusing, in connexion with such a plan, to read in the catalogue "projet des habitations salubres et économiques!"

There is not much to be seen of modern church architecture, but there is one rather remarkable building, shown in a coloured perspective without plan, M. Gosset's "Basilique Sainte-Clothilde, à Reims," a modern Byzantine church, described as "Monument du Centenaire de la conversion des Francs, 496—1896," which we should have taken to be merely one of the numerous "projets," but for a little photograph stuck in the corner of the mount, and obviously taken from the actual building, which appears to stand in the fields outside the town. This is a church on a Greek cross plan with a central dome and semi-domes over the transepts; it represents that form of Byzantine architecture in which lofty narrow windows are carried right up to the exterior springing of the dome, the extrados of their arches forming a serrated line of finish round the base of the dome. The portals at the west front are grouped under a great pointed arch, the extrados of which gives the line of the leaded roof over the nave. As a modern adaptation of Byzantine principles it is a rather remarkable production. There are some interesting drawings of church restoration. Among these is a set of

drawings by M. Deverin (the author of the Palais Royal plan already mentioned) of the restoration of the Church of "Saint-Jouin-de-Marnes (Deux-Sèvres)." This is shown in a very complete set of drawings illustrating, in perspective as well as in geometrical drawings, each aspect of the church as it was before restoration and as it is now—or as it is intended to be, for it is not positively stated that the restoration has been actually carried out, though we conclude that it has. Though the church was considerably dilapidated, it seems to have been in a sufficiently complete state to leave little to conjecture in the restoration; the most important alteration is that the cloister walk on the north of the nave had been built upon with a utilitarian building with square windows and a lean-to roof against the nave; this has been removed and the cloister restored. There are two curious points in the architecture of the church; one is the projection of large flying buttresses from the end walls of the south transept, apparently with the object of getting a walk past this end of the transept without having any wall-buttresses cutting into it; the other is, that this same transept is finished at the top by machicolations and a battlemented parapet, like a castle, a feature which is ancient, existing nearly intact in the pre-restoration drawing, but does not appear in the corresponding part of the north transept. M. Haubold exhibits a fine perspective section of the proposed restoration of the Abbey Church of Fontevault, with its stone arched principals and domical roofing; it is satisfactory to observe that M. Haubold does not propose to rebuild the arched principals in a circular arch, as an architect of the "Monuments Historiques" has, we believe, restored them at Périgueux, on the plea that the original builders would have built them circular if they had had more constructive skill in masonry. M. Coile exhibits some fine illustrative drawings of Saint-Julien-le-Pauvre, showing the construction in a perspective-section. A design for a proposed Synagogue at San Francisco is exhibited by M. Lansburgh; whether an actual commission is not apparent; it is a clever design in a nondescript style which may be intended as a revival of ancient Jewish architecture, but is not very convincing.

Among the designs for private houses there are some of those dreadful things, all points and elbows of roofing, which French architects (or many of them) seem to regard as peculiarly picturesque and suited to rural scenery; as if the country were a quarter from which all architectural repose and simplicity were to be banished. M. Gérard exhibits what seems to be his notion of an ideal villa, the home of happiness—"c'est là que je voudrais vivre, aimer, aimer et mourir," he quotes in the catalogue. The plan has an idea, no doubt; it has an unequal-sided octagon as a centre hall, from the longer sides of which branch out, cross fashion, the principal salon on the right, the dining-room on the left, the kitchen department at the back, and a "salon d'été" in front, next the garden, to which there are entrances from two of the smaller faces of the octagon. So far it is

a very nice scheme, but the architectural treatment, with its *bizarre* details and the hideous spiked timber roof over the centre, is enough to make an Englishman's hair stand on end. M. Polart's "Hôtel Particulier," a corner house in the Avenue des Ternes, Paris, though there is not much to be said for its external architecture either (except that it is tolerably inoffensive), is very interesting in its plan. It is apparently built for a client of aesthetic tastes. The drawing-room and dining-room are on each side of the entrance-passage, which leads straight through a large roof-lighted central hall of Greek cross plan, and with Moorish stalactite pendentives (rather out of keeping with the rest of the architecture), at the further side of which, up a broad flight of steps, is a wide opening giving access to a "Salon de Repos" on the higher level, out of which in turn opens the library to the right, and a vestibule with a garden entrance to the left; the point of all this is that the Salon de Repos, as is noted on the plan, can be used as the stage of a theatre when desired; the large hall forming the auditorium, and the library and garden vestibule furnishing all the necessary convenience for green-room and entrance of actors. It is apparently a house where there is no "family," as the upper floors shows only two bedrooms, larger and smaller, planned with the accessories of "toilette" and bathroom on the most liberal scale; altogether an interesting study of a house-plan of a special and unusual type. Another interesting plan is that attached to one of the four elevations for "Habitations Bourgeoises et Maisons à Rapport à Tourcoing," by MM. Bourgeois, *père et fils*. The street fronts are not worth much architecturally, but the plan of one of them, that of a narrow street house running far back, is admirably managed. The small entrance lobby gives access to one end of a small hall in the shape of a parallelogram with the corners cut off; in these four canted angles are doors to salon and bureau in front, and dining-room and offices at the further sides; while on the long sides two large arches open to the stairs on one side and smoking-room (between salon and dining-room) on the other side: for in a French house, where cigarettes rule more than cigars, it is not considered necessary to shut off the "funoir" from the sitting-rooms so religiously as would be required in an English house. Beyond the Salle-à-manger and opening from it is a long room marked "Salle de Famille," with a large window looking on the garden. We have nothing to learn from the French in house architecture on a small scale, as far as exterior treatment is concerned; but there are very good suggestions in their house plans for the union of compactness with variety and novelty. The only two examples we noticed where the treatment of small houses fell in at all with English ideas of the picturesque were M. Danis's "Habitation d'Été à Plombières," built on the side of a steep slope with a lofty basement wall of random masonry rising from the lower level; and M. Lefort's "Villa à Larcouest," a seashore house treated with the same kind of random masonry and with very simple detail, its high-pitched roofs contrasting effectively with the square thatched

stable building near it; it looks quite the type of a seashore house.

Those who like to look at fine and elaborate illustrative drawings of ancient work will find plenty of them, executed on a scale and with a finish to which we are little accustomed in England. On the other hand, in small sketches of a picturesque type English architects' work is for the most part superior to French; they have a lighter touch and more sense of effect. But we have not dwelt particularly on the numerous illustrations of ancient work, except in a few instances, having been more desirous to notice work bearing on modern architectural practice.

NOTES.

In reference to the statements which have appeared in the Press as to the condition of the foundations of Exeter Cathedral, we understand that, acting on the advice of the Cathedral surveyor, the Chapter decided to have a thorough examination made of the foundations of the south tower, in which for the last fifty years, and probably for a much longer period, there has been a crack. This crack was dealt with by Sir Gilbert Scott when the Cathedral was under restoration in the seventies. It has not increased nor spread, but nevertheless the Chapter thought it prudent to order a thorough examination of the foundations. This is not yet completed, but, so far as it has gone, it has not caused any anxiety as to the state of the foundations.

Applied Geology VALUABLE as adequate knowledge of geology is to the architect and the civil engineer, it is to be feared that insufficient attention is devoted in technical colleges and schools to the teaching of the science in a manner calculated to impress its practical bearing upon the minds of students other than those who propose to make mining in some form the object of their future career. The architect especially ought to possess a good working knowledge of geology if he is to be in a position to deal confidently with the varied problems encountered in constructive work, and particularly in connexion with foundations. Similarly, the civil engineer will frequently find familiarity with the nature of rock structures to be a valuable safeguard against costly errors, and the surveyor will derive much assistance in delineating external land forms if he possesses an intelligent understanding of what lies beneath the surface. We do not mean to imply that the study of geology is neglected altogether in architectural and engineering courses of instruction, but rather that the practical aspects of the subject have not received quite so much attention as they merit, and that abstract principles taught are insufficiently illustrated by actual cases showing the benefits obtained by their application and the failures following their neglect.

The proceedings of the Select Electric Supply Committee of the House of Commons which is considering the Loudon County Council Electric Supply Bill are being followed with the

greatest interest by electricians. The County Council point out that they have already a very large generating-station at Greenwich admirably situated so far as facilities for coal conveyance and water for condensing purposes are concerned. They also propose building another large power-station at Battersea. As they will shortly be supplying power to over 300 miles of tramway lines they will be able to have a sufficiently diversified load to make certain of a high "load factor." They do not propose entering into competition with any of the present trading companies or municipalities, so far at least as distributing electricity retail is concerned. They are asking, however, for power to revise the prices charged by authorised distributors every five years, provided that the Board of Trade find on inquiry that the prices are too high. This clause has apparently excited strong opposition not only from the trading companies chiefly concerned, but also from many borough councils. The prices the Council propose to charge are very much smaller than present prices, and there is no doubt that an unlimited supply of cheap power would be a great boon to London. In particular it would give rise to many new industries, and would ameliorate the conditions under which many labourers have to work. On the other hand, it will be a hardship to many of the able engineers who have shown how electricity can be supplied in bulk to have to compete with a municipality which is able to borrow money at such a low rate of interest and has benefited so largely by their pioneer work. Apart from the question of the ethics of municipal trading, we think that the County Council have made out a strong *prima facie* case for their Bill. We shall follow the proceedings of the Committee with interest.

The Powers of Corporations. An instructive case for Corporations to consider is that of *The King v. Mayor, etc., of Brighton*, in which certain orders and regulations made by the Borough Council were brought before the Court for review. The Corporation had voted and expended two sums of 2,500*l.* and 550*l.* respectively on laying the Madeira-road, Brighton, with tarmac at a time when an automobile competition was in contemplation; and the road was, in fact, used for this purpose. It was contended that they had acted *ultra vires*, and that the expenditure was wasteful and unnecessary, and that the ratepayers were therefore not liable. The Corporation, on the other hand, contended that they were acting within their powers under sect. 149 of the Public Health Act, 1875, and *bona fide* for the public good. Sect. 149 gives the local authority power to make up the streets "as occasion may require," but the Court in this case came to the conclusion that the Corporation had undertaken the work not in the interest of the road, there being no evidence that it required repair, but with the sole object of preparing for the automobile races and having the competition held there, and, acting under sect. 141 of the Municipal Corporations Act, 1882, the Court disallowed the order for the payment of the above sums from

the borough funds. This decision should be carefully studied by local authorities, as there is a tendency to expend the ratepayers' money on objects not to the interests of the ratepayers of the district, though *bona fide* to attain other ends, and it is well that the authorities should bear in mind the limits of their statutory powers.

Nuisance in Sewage Disposal.

THE case of the Attorney-General v. Corporation of Dorchester, commented upon by us, August 5, 1905, has been carried to the Court of Appeal. The action was brought by the Attorney-General at the relation of the owner and occupier of a certain dwelling-house to restrain the defendant corporation from committing a nuisance in carrying out sewage works for the treatment and disposal of the sewage of Dorchester. The defendants contended that the works were carried on under statutory authority, and that therefore no action would lie. The nuisance appears to have been the discharge of sewage not properly treated into a certain river, in breach of sect. 17 of the Public Health Act, 1875. It appeared that pressure had been brought to bear upon the corporation by the Local Government Board to establish an extended drainage system, and eventually a Provisional Order had been drawn up and confirmed by Act of Parliament, under which the corporation were to carry out certain works for the disposal of the sewage which had been approved by the Local Government Board, and this Order contained a proviso that if the corporation did not proceed with the works with due diligence, then the requirements of the Order might be enforced by the Local Government Board, under sect. 299 of the Public Health Act, 1875. The Court held that the effect of this Provisional Order was simply to apply the machinery provided by the Public Health Act, 1875, but did not prevent the application of sect. 27 of that Act, which provides that in the disposal of sewage no nuisance must be created. A subsidiary point raised was that the Attorney-General could not sue, because no public right was threatened, but this point was overruled on the authority of *Attorney-General v. Cockermouth Local Board*.

Caissons in Bridge Building.

AN illustration of one direction in which the work of professions, apparently having nothing in common, may proceed side by side with the utmost advantage, is afforded by the use of caissons in bridge building, tunnelling, and subaqueous operations generally. Engineers have pointed the way by which physical difficulties may be overcome, and physiologists, working with them hand in hand, have shown how operations conducted under conditions inimical to the human economy may be performed with safety to the workmen employed. In a particularly instructive paper read before the Society of Arts on Wednesday, Professor Thomas Oliver, M.D., of Newcastle-on-Tyne, considered the question of compressed-air disease in the light of personal experience gained during structural alterations to one bridge, and the construction of the new *hump-level* bridge at Newcastle, and compared some of his

conclusions with observations made in connexion with the execution of various important works in Great Britain, on the Continent, and in the United States. The paper is one that should be read and preserved for future reference by every civil engineer, contractor, foreman, and workman engaged in work where the use of caissons is necessary. In it will be found a clear exposition of the precautions best calculated to secure immunity from the special disease considered, and the best methods of treating those by whom it has been contracted. Of the various conditions to be observed, the most important are a plentiful supply of pure air to the working chamber, and very gradual relaxation of pressure in the air lock. Engineers may be glad to learn, on the authority of Professor Oliver, that if plenty of pure air is supplied to the men, and the shifts are not too long, work in compressed air could be carried on at greater depths and under higher pressures than have hitherto been attempted, so that if necessary engineering operations of even greater difficulty could be undertaken and carried to a successful issue, without prejudicing the health and safety of the workmen engaged therein.

Bacterial Tank Operations.

AT the commencement of his paper, read before the Civil and Mechanical Engineers' Society last week, Dr. W. Owen Travis quoted some remarkable extracts from the patent specification of Dr. Müller, of Berlin. This document, dated December 11, 1878—seventeen years before the introduction of the septic tank—accurately describes the essential character of biological sewage purification as practised in the present day, so far as concerns the capacity of the tank in relation to the daily flow of sewage, the formation and influence of scum, the production of septic gases, and the existence of sludge in the tank and filters, as well as the necessity for sludge removal from both these receptacles. Moreover, nine years before the commencement of experiments in Massachusetts, and fourteen years before those at Barking, Dr. Müller recognised the necessity for zoetic nitrification on well-aerated filter-beds composed of coke breeze, sand, and kindred substances. As Dr. Rideal remarked in the discussion of the paper, this is truly a wonderful find. The main object of the communication of Dr. Travis was to describe in detail the results obtained with the hydrolytic tank in operation at the Hampton sewage works. As the meeting showed last week, the general subject is one which distinctly encourages discussion, but the experiments at Hampton appear to emphasise the importance of a systematic withdrawal of sludge, of submitting the liquid to the attractive influence of suitable surfaces, and of protecting the suspended and depositable solids from the agitation effects of gases generated. They appear to prove also that by such treatment 90 per cent. of the solids in suspension, a large proportion of the solids in solution, and about 60 per cent. of the albuminoid nitrogen can be eliminated from the sewage in an area little larger than that required for the settlement of chemically precipitated sewage.

Steam Turbines. WHILE there is not the least indication at present that a genuine gas turbine will ever become a practical reality, or that turbine locomotives are likely to displace the existing type of engine, there is abundant evidence that in many directions the steam turbine is pursuing its victorious career with undiminished energy. In illustration of this point Mr. Parsons remarked on Friday last week, at the Royal Institution, that to-day 2,000,000 horse-power of turbines are at work on land, and 800,000 horse-power at work on, or being built for work on, sea, as compared with 65,000 horse-power on land and 25,000 horse-power on sea six years ago. Of course, the conditions under which the steam turbine can be adopted with economy have always to be borne in mind, yet subject to due consideration of this point we feel sure there are many places where such motors could be applied advantageously in substitution for reciprocating engines as part of the mechanical equipment of public and other buildings designed by architects.

Smoke from Engines. An important point to railway companies was raised in the case London County Council v. Great Eastern Railway Company. A summons had been taken out against the railway company in respect of one of their engines which had emitted a dark smoke. The magistrate had found that the engine was properly constructed, and that the coal was a good hard steam coal, the normal locomotive coal used in the district, and that there was no negligence in the management of the engine, but the Council contended that the company were bound to use a particular Welsh coal, which would have caused less smoke. In certain districts the company were under obligation to use this special coal by express agreement, but it is far more costly. The Divisional Court held that the magistrate had rightly dismissed the summons. They considered sect. 114 of the Railways Clauses Consolidation Act, 1845, and sect. 19 of the Regulation of Railways Act, 1868, and held that the effect of these sections was not to compel a company to use the best possible coal.

War Office, Pall Mall. It is anticipated that the executive staff will migrate to Whitehall in two or three months' time. Their present quarters consist of a group of four distinct buildings. The principal house, having a forecourt, was formerly occupied by the Ordnance and Transport Departments, for whom William Atkinson either rebuilt or greatly altered, before 1839, what had been the Albion Hotel, a "subscription house," and, it appears, the successor of the Union Club established in 1801. The members of the Union Club took over Cumberland House, which was originally built for King George III.'s brother Edward, Duke of York, and was afterwards inhabited by another brother, Henry, Duke of Cumberland. The design of Cumberland House is ascribed to Matthew Brettingham. Next, west, is the block built by Pennethorne, and illustrated in the *Builder* of August 16, 1851. For that block Pennethorne pulled down the east wing of (old) Schomberg

House, whereof the middle portion and the west wing form the third of the four buildings mentioned. For the fourth we turn eastwards, passing by the courtyard, to what was at one time Buckingham House, which Soane built in 1794, for the Marquis of Buckingham, upon the site of a house built by R. Furze Brettingham. Old Schomberg House was erected at the close of the XVIIIth century for the third and last Duke of Schomberg; Peter Berchett painted the staircase. John Astley, artist, sub-divided the house into three, set up a bas-relief of Painting over the middle portico, and built a studio on the roof. Contemporary with Astley was Gainsborough, who lived in the west wing from 1777 until he died in 1788. Cosway, R.A., miniature painter, tenanted the middle portion after Astley's death; the Polygraphic Club succeeded Cosway; sixty years ago the house was occupied by Harding & Co., silk-mercers (east wing), and Payne & Foss, dealers in old books. No. 78, now known as Schomberg House, is a grace and favour residence appertaining to the Crown.

Hampton Court Palace: The Great Staircase. DURING the past five or six months some artists have been employed upon the restoration of the paintings upon the walls and ceiling of the King's, or Great, staircase in Hampton Court Palace, and in carrying out sundry repairs there under the superintendence of H.M.'s Office of Works. The more important part of their work has consisted of the careful cleaning and revarnishing of the paintings executed by Antonio Verrio, the Neapolitan, whom Charles II. invited to this country and employed in a similar capacity at Windsor. The Hampton Court paintings delineate Jupiter, Juno, with gods and goddesses, Apollo and the Muses, and kindred subjects. Pope had them in mind when in the fourth epistle of his "Moral Essays" he satirised the abuse of riches, and, descending upon false taste in the arts, wrote:—

"On painted ceilings you devoutly stare,
Where sprawl the Saints of Verrio or Laguerre
On gilded clouds in fair expansion lie,
And bring all Paradise before your eye."

All the paint has been stripped off the oak panelling at the foot of the staircase; the woodwork was found to be in a good state of preservation, its great age notwithstanding.

Doulton Pottery at the New Dudley Gallery. THE New Dudley Gallery is in Piccadilly, at the bottom of Bond-street, and at the present time Messrs. Doulton are holding an exhibition of pottery there. The exhibition is remarkable for the effects that have been obtained by the use of crystalline glazes on pottery of various shapes and sizes. The effect is obtained in the firing with very beautiful results; the colour and the crystalline pattern are both accidental, it being impossible, apparently, to predict either. The shape of the vessels is kept severely plain, the better to show the gossamer-like pattern of the crystals, some having the effect of powdered flowers, others of butterflies; the colours, too, are very soft and beautiful. Another class of exhibits of interest is a pottery of a wonderful red colour, some

of them having pictures of figures in black upon them. There is a good deal of Japanese influence evidenced in the form of many of the pieces shown, an influence which has been all to the good in English pottery of recent years. Examples of the "Nouveau Art" shapes and patterns are distinctly less in evidence than formerly, though the ill-effect still remains here and there in pieces lacking any other claim to distinction. Clever miniature busts in white porcelain of Sir Henry Irving and Miss Ellen Terry are shown, as well as exhibits reminiscent of Copenhagen ware.

Dowdeswell Galleries. On Monday last an exhibition of water-colour landscapes painted in Sussex, by Mr. Fred Stratton, was opened at the Dowdeswell Galleries. Mr. Stratton's work shows a good deal of individuality, his colour is good, and, where necessary, he spares no labour to obtain the effect desired. It is perhaps a pity that all of the drawings are mounted and framed in gold—for the sake of uniformity it is supposed—as in several instances the expense of gold next the picture spoils the otherwise successful colour effect. There is much to be said in favour of the old-fashioned white mount for water-colours. Both "After the Storm" and "Village Homes" suffer from the framing; the former, as well as others in the room, has a pastel-like effect, probably due to overmuch stippling on very rough paper. "Village Homes" and "Summer Moonlight" are clever drawings of moonlight effects. "After the Storm" is a good piece of composition with wind-swept clouds, a characteristic also of "The End of the Day." Sunlight and shadow are well rendered in "Returning to the Meadows," and the coolness of a fresh spring morning in "An Early Spring Day." "In the Meadows" is a good study of cattle. Other drawings show typical Sussex scenery which is as beautiful in its way as any of the home counties.

The Leicester Galleries. At the Leicester Galleries there is a collection of pictures of the Thames by Mr. Mortimer Menpes; of which the largest, "Streatley Mill" (50), is the best; and "Wallingford" (51), with its picturesque stone bridge, is well treated, and very like the place; but this class of scenery does not suit Mr. Menpes so well as Eastern and Japanese subjects, they seem a little heavily treated and want the true Thames atmosphere. In "Boulter's Lock (Ascot Sunday)" (52) he has got, in this crowd of boats with gaily-dressed passengers, just the kind of subject that suits him—a medley of brilliant colours, and the picture is very effective. Among the others we like "The Red Lion, Henley" (34); "Clifton Hampden" (30); "The White Hart Hotel, Dorehester" (20); and "The Mill at Abingdon" (12). In another room is a collection of water-colour landscapes by Mr. Mark Fisher. A good many of these are from the neighbourhood of Antibes, which have a great deal of local character. Among the other subjects "The Thames at Bourne End" (29); "A Sluice" (30); "The Rick-yard" (9); "A Cool Spot" (67), a pond with trees

overhanging; and one, No. 75, without a title, show the qualities of light and atmosphere which we are accustomed to associate with this artist's work, the last-named especially; but we prefer his treatment of landscape in oil painting to these water-colours.

At the Modern Gallery there is an exhibition of Irish landscapes by Mr. Alexander Williams. It is an exceptionally large collection for the work of one man, and contains some very charming sketches. In most cases we like the grey, rainy effects best, for instance "The evening beam that smiles the clouds away" (22) is a lovely representation of a soft grey sky with faint golden sunshine breaking through the clouds, giving one a pleasant impression of the lamp atmosphere of Ireland. The artist's attempts at sunlight, however, are not so successful; the sun shines to the extent that there are shadows, but yet there is no feeling of warmth or brightness. There are several pictures of flat bog or common in which the treatment of the heather and bracken is very satisfactory; for example, "A Roscommon Moor" (150) and "Glenariff Glen, Co. Kerry" (129) are very effective paintings of heather. We do not always like the treatment of water; in "The Upper Lake of Clonee, Kenmare Bay" (68), and in some of the other paintings, the water is rather heavy, though in a few of the sketches it has been treated better. However, it is in sky effects that Mr. Williams really succeeds; all his skies are beautifully soft and clear, and there are many fine cloud effects. Though his painting can not perhaps be called masterly, it is at all events decidedly pleasing.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, Sir John Taylor, Vice-President, in the chair.

The Chairman moved that the President and members of the Council for the current session do retain office until the conclusion of the Seventh International Congress of Architects to be held in July, and that, in order to give legal effect to this resolution, the provisions of by-law 50 affected thereby be temporarily suspended.

The motion was agreed to. The annual general meeting was then held, and the Report of the Council for the official year 1905-1906 was adopted. From the Report we take the following paragraphs:—

Obituary.—The losses by death have been as follows:—Fellows—William Gibbs Bartlett, Hyman Henry Collins, Colonel John Eaton, Charles Forster Hayward, Zephaniah King, Thomas Edward Knightley, John George Luff, Robert Alexander Bryden, Henry Pollard Seddon, Alfred Waterhouse, James Weir, Joseph Wood; Retired Fellow—Charles Henry Howell; Associates—William Goldsmith, Richard Groom, Charles Grayson Maynard, Hedley John Price, William Moss Settle, Robert Phillips Whellock; Hon. Corr. Members—Charles Lucas, Conte Giuseppe Sacconi.

Membership.—The following tabular statement shows the present subscribing membership of the Institute, compared with that at the two preceding quinquennial periods:—

Year.	Fellows.	Associates.	Hon. Members.	Total.
1887	402	880	35	1,317
1904	621	1,028	46	1,695
1906	719	1,177	46	1,942

During the official year since the last annual

general meeting ninety-one Fellows have been elected, sixty-six Associates, and three Honorary Associates.

Examinations.—The progressive examinations were held in June and November, 1905. The preliminary was held in London, Belfast, Birmingham, Bristol, Cardiff, Glasgow, Leeds, Manchester, and Newcastle-on-Tyne; the intermediate in London, Bristol, Glasgow, Leeds, Manchester, and Newcastle-on-Tyne. The final and special examinations were held in London, and special examinations for colonial candidates were held in Durhan and Sydney, when two candidates were examined and passed. The results are shown in the following tabulated form:—

	Ex-empted.	Exam. insed.	Passed.	Rele-gated.	Total.
Preliminary Ex-amination	110	355	245	110	465
Intermediate Ex-amination	2	238	153	135	290
Final and Special Examinations	—	171	66	98	171

The total number of candidates was 926. The number of probationers now stands at 2,507, and of students at 757. The Council again have occasion to regret that so large a number of students remain on the list without proceeding to the final examination. The authority given to the Institute of Architects of New South Wales, to exempt properly-qualified candidates from the preliminary examination of the Royal Institute, has been extended to the Royal Victorian Institute of Architects. The special examination for colonial candidates will be held this year in Toronto and Melbourne. The statutory examinations, qualifying for candidature as District Surveyor in London and for candidature as Building Surveyor under local authorities were held in London in October. Certificates of competency to act as District Surveyors in London have been granted to Albert Anthony Fillary, Edgar Walsh Knight, Edwin Palsler, Harry Tom Boden Spencer, and Alexander Lionel Woodward; and a certificate of competency to act as Building Surveyor under local authorities to William John Stainton.

Annual Dinner.—This year the annual dinner will be replaced by the farewell banquet of the Seventh International Congress, on Saturday, July 21.

Institute Premises.—At a general meeting held on January 8 the Council were instructed to enter into negotiations concerning a site for new Institute premises, and to report to a general meeting. The Council, therefore, continued negotiations begun by the President concerning the purchase of the freehold garden site between Nos. 11 and 13, Portland-place. Owing, however, to the impossibility of settling questions of ancient lights in a satisfactory manner, the Council have been obliged reluctantly to abandon the project.

The London Building Act.—As mentioned in the last annual Report, the London County Council abandoned their Bill for amending the Building Act with the exception of the clauses relating to the prevention of fire, which they submitted as a separate Amendment Bill. This was opposed by the Institute, which was represented by counsel, Mr. Penhroke Stephens, K.C., and Mr. H. Courthope-Munroe. The Bill, as amended, ultimately passed as the London Building Acts (Amendment) Act, 1905. With regard to the heavy expenditure in connexion with this matter, the Council have passed a resolution to the effect that, in view of the large outlay incurred in opposing a Bill in Parliament, grave consideration should be exercised before again embarking on such an undertaking.

New County Hall for London.—The Council, feeling it to be a matter of vital importance that the County Hall which the London County Council propose to erect on the south side of the Thames, at a cost of 1,000,000, should be a building worthy of the greatest city in the world, addressed, last July, a letter to the London County Council, in which they offered the assistance of the Institute in their efforts to secure a design for such a building. The Establishment Committee of the London County Council, having intimated their desire to receive the suggestions of the Institute, the Council, after obtaining the report of a special Committee on the subject, have advised them to institute a combined open

and invited competition, to be judged by a jury of assessors.

Habon to Strand.—The recommendations made in the Report of the Royal Commission on London Traffic led the Council again to approach the London County Council with a view to the remodelling of the line of frontage on the north side of the Strand between the churches of St. Mary-le-Strand and St. Clement Danes. The London County Council again declined to reconsider their determination; but, subsequently, owing to a renewed agitation in the Press and elsewhere, the Council once more laid their views on the subject before the London County Council.

London County Council By-laws with Respect to Drains.—With reference to the new London County Council by-laws as to drains, the Council much regret that that authority have declined to accept the suggestions made by the Council of the Institute for modification of the stringent requirements as to drawings to be supplied.

Board of Architectural Education.—The Board of Architectural Education, in pursuance of their scheme, have appointed members to visit the various schools of architecture and report on their working. Such reports have been made with reference to the architectural schools of Liverpool University, University College (London), King's College (London), and the Architectural Association Day School; and the Board propose in due course to grant their certificates, under certain conditions, to students who have satisfactorily completed the various courses conducted by those bodies. The Board have had under consideration a proposal from the University of Liverpool for conferring degrees in architecture, and have made certain recommendations thereon.

Registration.—The Registration Committee, as existing at the time of the issue of the last annual Report, drafted a Bill and issued a report. The Registration Committee, as constituted after the elections in June last year, appointed a Sub-Committee "to take evidence for and against the principle of registration, and to suggest the course of procedure to be adopted at the general meeting when the present scheme of registration comes up for discussion." The Sub-Committee sat almost weekly for the purpose set forth in the reference, and took the evidence of twenty-four witnesses from London and the provinces. The Registration Committee, after having all the evidence before them, submitted a report to the general body at a special general meeting, held on Tuesday, April 3, and the resolutions then proposed were adopted unanimously.

Joint-Committee on Reinforced Concrete.—At the request of the Science Standing Committee, the Council issued invitations to various bodies to appoint representatives on a Joint-Committee to draw up rules for the guidance of architects in the use of reinforced concrete. The Committee has been constituted as follows:—Chairman—Sir Henry Tanner; representing the Royal Institute of British Architects—Messrs. T. Walmisley, William Dunn, Max Clarke, H. D. Searles Wood (Hon. Secretary to Committee); District Surveyors' Association—Messrs. T. H. Watson, E. Dru Drury; Institute of Builders—Messrs. Benjamin I. Greenwood, Frank May; Incorporated Association of Municipal and County Engineers—Messrs. A. E. Collins, J. W. Cockrill; War Office—Colonel C. B. Mayne, Major E. M. Paul, R.E.; other Members—Professor W. C. Unwin, Charles F. Marsh.

Fellowship.—As the Fellowship will be closed after the end of 1906 to all candidates who are not already Associates or have passed the examinations qualifying for Association, the Council, in compliance with the instructions of the general body of the Institute given at the business meeting of February 29, 1904, sent a circular letter to the Allied Societies, in which they suggested that architects of high standing in the various provinces who were not members of the Institute should be approached with a view to their joining. A great number of candidates both from London and the provinces came forward, and those whom the Council found eligible from their work and position were nominated for membership. Twenty-eight candidates were nominated for election at the business meeting of March 5, of whom six were Associates. A poll was

demanding by private members of the Institute, and resulted in the rejection of the twenty-two non-Associate candidates. As most of these non-elected candidates are by their age and position precluded from sitting for an examination, they are thus debarred from membership. The Council cannot but regard such a result as unjust to candidates and most detrimental to the interests of the Institute. At the general meeting of March 5, when the result of the poll was declared, a resolution was passed appointing a Committee of the Institute to consider the form of voting papers, the method of election of Fellows, and other matters connected therewith, including any revision of the by-laws on the subject if necessary, and to report to a general meeting as soon as possible.

Appointments, &c.—Sir Aston Webb, R.A., has been appointed to represent the Institute on the Court of Sheffield University. Sir William Emerson has been reappointed for a further term of three years to represent the Institute on the Court of the Liverpool University. Messrs T. W. Cutler and C. H. Outley have consented to represent the Institute at the Royal Sanitary Congress to be held in Britol in July. It has been decided that one of the Vice-Presidents of the Institute shall be *ex officio* a member of the Council of the Architects' Benevolent Society. Sir Aston Webb having retired from the competition for the Carnegie Foundation, "The Palace of Peace," at The Hague, Mr. H. T. Hare has been invited by The Hague Committee to represent Great Britain in his stead. The President is the other British representative.

Donations, Bequests, &c.—A sum of 775*l.* 18*s.* 10*d.*, bequeathed to the Institute for charitable purposes on the death of a Miss Moore, who was to enjoy the income during her life, has now come into the possession of the Institute. Since the issue of the last annual Report the Council have made the following grants:—The Cretan Exploration Fund, 25 guineas; the Artists' Benevolent Fund, 20 guineas; the Edinburgh Architectural Association, towards the funds of the Exhibition of Mr. Goodyear's Architectural Refinements, 10 guineas; Architects' Benevolent Society, 20 guineas; British School at Athens, 20 guineas; Architectural Association, 100*l.*; Royal Architectural Museum, 20 guineas.

Seventh International Congress.—The Council have the pleasure to inform members that satisfactory progress is being made in the organisation of the Congress. The total membership up to date, only counting those from whom subscriptions have been received, is 672, of whom 188 are ladies. As it is yet nearly three months before the Congress, the Executive Committee regard this as a sign that the movement will be largely supported. The Council, however, would urge members who have not yet joined, but intend to do so, to send their donations or subscriptions at once, as the work of organisation is enormously facilitated by a knowledge of probable numbers. The general outline of the proceedings has been issued to members in the form of a circular letter. Over 20,000 of these circulars have been sent to architects at home and abroad. The response from foreign countries is most encouraging. In addition to the grant of 500*l.* mentioned in last year's Report, the Council have decided to give an invitation garden party to the Congress at the Royal Botanic Society's Gardens. The Society of Architects has generously made a donation of 100*l.* to the Congress funds, and the Architectural Association one of 25 guineas. The Council venture to express the hope that all members of the Institute will join the Congress, even though they may not be able to be present, and thus enable the Executive Committee to carry through their task in a manner befitting the dignity of our country and our national art of architecture.

Competitions.—The following have been the President's appointments to assessorships during the official year:—

Bangor	Free Library	Mr. Philip C. Thicknesse.
Bristol	Church	Mr. W. J. Tapper.
Cheesnut	Library	Mr. James S. Gibson.
Greenwich	Library	Mr. A. W. S. Cross.
Hackney	Library	Mr. John W. Simpson.
Handsworth	Church	Mr. W. J. Tapper.
Hastings	Hospital	Mr. Edwin T. Hall.
Johannesburg	Technical Insti-	Mr. Thomas E. Collcutt.

Lytham	Schools	Professor Beresford Pite.
Newquay	Church	Sir Charles Nicholson.
Perth	City Hall	Mr. John J. Burnet, A.R.S.A.
Plymouth	Schools	Mr. H. Dare Bryan.
Rochester	Technical Insti-	Mr. Frank T. Baggalute.
St. Marylebone	Western Oph-	Mr. Edwin T. Hall.
Stockport	Schools	Mr. Leonard Stokes.
Stowmarket	Schools	Mr. Maurice B. Adams.

Finance.—In presenting the statement of income and expenditure, the Council regret that the balance to the good is not as large as it has been in recent years. A glance, however, at the extraordinary expenditure of 785*l.* 5*s.* 8*d.* in connexion with the Institute's opposition to the London Building Acts (Amendment) Bill, 1905, and of 318*l.* 15*s.* 6*d.* in connexion with the drafting of the Architects' Enrolment Bill, will show that this diminution is due to abnormal circumstances, and not to any lack of financial prosperity. On the contrary, the Council regard it as a proof of prosperity that the Institute has been able to meet these enormous charges and still show an excess of income over expenditure. As a natural consequence, however, there has been no addition to the amount of the invested capital of the Institute, which still remains, as at the time of issue of the last annual Report, at 18,000*l.*

The Report includes the Reports of the various Committees:—

During the session the Art Standing Committee held four meetings, and have had under consideration the following subjects:—New County Hall for the London County Council, Clock Tower (St. George's circus), Wood Pediments and Dome (Somerset House), Strand Improvement Scheme, Restoration of Nottingham Castle, Charing Cross Station Roof, Location of Peace Palace. The erection of a new County Hall by the London County Council was regarded by the Committee as a favourable opportunity to endeavour to secure the best architectural talent of the country being employed upon its design, and the Committee recommended the Institute Council to suggest to the London County Council the desirability of securing this result, and offering to assist them in any steps which they might take to obtain it. The removal of the Obelisk standing at St. George's-circus, S.E., and the substitution of a clock tower was considered by the Committee a very undesirable proceeding; but the matter was brought before the Art Committee at too late a date for any effective steps to be taken to retain the Obelisk. Since the date of the former correspondence with H.M. Office of Works with respect to the wood dome and pediments of Somerset House, and the suggestion of the Committee that these should be carried out in stone so as to give them a permanent character, the Committee have to report that a further communication has been received from H.M. Office of Works that it was undesirable at the present time, on the score of cost, to ask Parliament to sanction such a large expenditure as this would entail, and the Committee, in acknowledging this letter, expressed the hope that it might be possible to effect this improvement in the future. The line of frontage on the north side of the Strand between St. Clement Danes and St. Mary-le-Strand Churches was again considered by the Committee, and the Council of the Institute were asked to make a representation to the London County Council that it was desirable to set back the eastern end of this frontage so as to obtain a wider street at that end, and secure a better view of St. Clement Danes Church than would be obtained by the proposals of the London County Council; more especially as the Royal Commission on Traffic has also made recommendations dealing with the widths of streets in the central parts of London, which recommendations are similar to those of this Committee. The Committee referred to this matter in last year's Report. The matter of the restoration of Nottingham Castle was very carefully considered, and representations have been made to the Town Council of Nottingham, that if any works are necessary to be done to this structure they should be carried out under the supervision of an architect experienced in dealing with historical buildings, and who might safely be trusted to preserve their best features. The Town Clerk of Nottingham

has replied that if any works are to be done a competent architect will be consulted. The proposals of the engineers dealing with the Charing Cross Station roof were very courteously laid by them before the Committee, and Mr. Flockhart kindly undertook to make some sketch suggestions dealing with the ends of the side walls, which it was considered very desirable should be treated in an architectural manner, and also the wind screen, formed of steel and glass, suggested between these end walls at the Embankment end. These suggestions have been forwarded to the engineers, with a strong recommendation of the Committee that, if possible, the railway company should adopt them, and a conference has taken place between Sir Benjamin Baker, K.C.B., and Mr. Tempest on behalf of the company and the Art Committee.

The Literature Standing Committee report that the Committee, having referred to them "the matter of revising the lists of books recommended to probationers and students in the Royal Institute of British Architects' calendar with a view to making suggestions thereon to the Board of Examiners," have appointed a small sub-committee, whose recommendations have been considered on several occasions, and the Committee hope shortly to be in a position to make useful suggestions to the Board of Examiners. The Librarian reports to the Committee as follows:—

"During the twelve months ending on March 31 of the present year 211 volumes and thirty-two pamphlets have been added to the Library of the Royal Institute, exclusive of periodicals, reports, and transactions of societies, and parts of works issued in serial form. The number of works presented to the Reference Library was sixty-two volumes and twenty-one pamphlets. The works purchased comprise 116 volumes, out of which sixty-four volumes were added to the Loan Library. There were also thirty-two volumes presented to the Loan Library. The attendance of readers in the Reference Library numbered 5,521 (last year, 5,577). The number of works issued on loan was 3,486 (last year, 3,405). The number of books issued through the post was 121 (last year, ninety-eight). The number of tickets issued for admission to the Library, other than to members of the Institute or to students and probationers, was 131."

The Practice Standing Committee report that the Council referred to the Committee the revision of the phraseology of the Institute scale of charges, particularly with regard to the question of the ownership of drawings. The Committee are still engaged in the consideration of this matter. Inquiries and references to the Committee upon points of professional etiquette, disputes under building contracts, charges for architects' services, and similar matters have considerably increased, and the time of the Committee has been much occupied with their consideration. With regard to those dealing with architects' charges, however, the Committee, with a view to limiting the interruption of their ordinary work, have asked the Council to consider the advisability of appointing a Special Committee to deal with such matters, to whom they could be referred as a tribunal, under a scale of charges.

The Science Standing Committee have drawn up a short description of the tests to be applied to Portland cement for insertion in specifications where only small quantities of cement are to be used. The inquiry into the present method of applying Dr. Angus Smith's solution and other preparations for protecting iron has been carried on, and a series of experiments with iron drain-pipes treated with different preparations is now being conducted. A Joint Committee, representing the Royal Institute of British Architects, the Royal Engineers, the Institute of Builders, the District Surveyors' Association, the Association of Municipal Engineers, and several engineers, has been formed to draw up a series of suggestions for the use of reinforced concrete, as has been done in other countries, and the Committee are now collecting information. Some experiments have been made by Messrs. Cubitt on reinforced concrete beams. Members of the Science Committee attended when the beams were in the process of formation; the experiments are not yet completed. The Committee have reverted on the draft specification for structural steel drawn up by the Standard Committee. The Committee have also been represented on the Standard Committee dealing with the subject of cast-iron pipes for heating and ventilating. The

Committee have revised the list of books on science subjects recommended to probationers and students preparing for the examinations. The Brickwork Tests Reports have been published, and the work forms a valuable book of reference.

Messrs. Perks and Webb were reappointed as Auditors for the ensuing year of office, and the present Statutory Board of Examiners under the London Building Act, 1894, and other Acts of Parliament, was re-appointed, with the addition of Messrs. W. Hilton Nash and W. Henry White.

THE ARCHITECTURAL ASSOCIATION : FENESTRATION.

The following is the conclusion of Mr. Walter Cave's paper on "Fenestration," read at the last ordinary meeting of the Architectural Association, as mentioned last week:—

The Italian Renaissance.

Before we proceed to follow the treatment of windows in the great period of the English Renaissance, it will help us to glance for a moment at the architecture of the country in which this great revolution was proceeding. Throughout Italy, during the XVth century, vast palaces were being built by a people full of character and imbued with a love for the fine arts based on the rich inheritance of Imperial Rome, each city or state developing an individual style which reflected the life of the people. It is quite impossible here to enter fully into the various differences of these famous buildings, and two examples must suffice to illustrate our subject.

Florence and Venice.

The palaces at Florence are distinguished by their bold, massive character and the extreme plainness of the lower story. Taking, as an instance, the Ricardi Palace (1430), we find that up to a height of 11 metres from the ground there are, excepting the doorways, only very small rectangular barred openings, and the real window treatment does not begin till the first floor. The desire for protection is obvious in this arrangement, and the architect (Michelozzo) seized the opportunity of contrasting a massive rusticated lower stage with a double row of delicate and refined windows above. The design of these semi-circular-headed windows, divided by slender shafts under a single arch, retains many details of the mediæval Tuscan style, and helps to link the chain of tradition with Rome. The proportion of window-opening to wall-surface is interesting, and works out at about one of window to thirteen of wall, and gives a remarkable sense of solidity.

The Strozzi Palace, where the design is very similar, gives a proportion of one in twenty-one.

These examples may be compared with the Vendramini Palace at Venice, built by Lombardo in 1461, fifty years after the Ricardi Palace of Florence. Here the difference in the general treatment is particularly marked in the number and arrangement of the windows. Individually the double lights beneath a single semi-circular arch are much the same, but, instead of being isolated openings pierced in the great mass of stone, they are connected throughout the front by pillars and pilasters and a wealth of ornament, which gives an impression of lightness and grace entirely absent from the stern, forbidding façades of the Early Florentine builders. The proportion here of window to wall is one to three.

These two instances will be sufficient for the purpose of illustrating the effect of local conditions on fenestration.

The Florentine palaces were built in narrow streets, and liable to sudden attacks, hence the protective lower story and the principal rooms on the first floor. They were also built, as a rule, round a spacious courtyard, from which a great deal of light was obtained, so it was unnecessary to have a multiplication of windows towards the streets. Again, they were built on a solid foundation of rock.

The Venetian palaces were built facing waterways, and unexpected attacks were improbable. Thus we rarely find that absence of windows on the lower story, and the general plan did not, as a rule, include a central court. Thus the principal windows faced the canals, and, as the foundation was a matter of great difficulty and expense, the

spreading out of the plan (except in the very largest buildings) was avoided, and the great proportion of opening to solid wall diminished the weight, and was a very important and determining factor in the design of the fenestration.

Again, in Florence, the whole family, including married sons and daughters, lived in the palace, which, in those turbulent times at the end of the XVth century were practically fortresses, and the civic life of a free and factious Republic is represented by the heavy walls and narrow windows of Florentine dwelling-places, while a more sumptuous and secure mode of life finds expression in the graceful buildings with their many balconied windows which overhang the Grand Canal of Venice, exactly fitted to an oligarchy sure of its own authority and loved of its people, and representing the centre of European commerce.

The introduction into England not only of a foreign style but of foreign workmen has been so well described by Mr. Blomfield and Mr. Gotch and other writers on the Renaissance that it is quite unnecessary to enter into it here, and every student of architectural history is familiar with the wonderful revolution in design which is inseparably connected with the name of Inigo Jones.

The English Renaissance.

The Banqueting House in Whitehall, finished in 1622, marks the beginning of a new era in English architecture. As has been pointed out, one of the characteristics of the great Tudor buildings was a long and low proportion produced by strongly-marked horizontal lines of windows with no studied architectural effect. But in the fragment of the palace in Whitehall we are face to face with a great, and successful, attempt to create a building, full of the subtle proportions and use of purely architectural forms which Inigo Jones had studied in Italy under the influence of the great architects of the Renaissance.

The window treatment is of exceptional interest. The proportion of voids and solids is well balanced, and works out at about one to three and three-quarters—that is to say, only slightly less window space than in the Vendramini Palace at Venice. But the façade of the Banqueting House gives a far greater sense of dignity and strength on account of the plainer treatment of the wall surfaces between the windows, only broken by the columns and pilasters without the panelling and more restless ornament of the Venetian example.

The proportions of the windows themselves work out at rather under two squares in height, which is somewhat wider than is usual in most of the Italian square-headed lights, which are generally about twice as high as their width—for example, the Palazzo Zecca at Venice, the Palazzo Uggiogioni at Florence, and the Palazzo and Villa Farnese at Rome, to which latter building it bears some resemblance.

The fenestration has been criticised as giving an effect of two stories to a building, which, in reality, was one lofty room. But the Banqueting Hall was only a part of an immense scheme in which, if it had been completed, this fragment would have balanced another wing of the same proportion, but containing two floors of state apartments.

The great difficulty of adapting this new architecture to the requirements of the day was felt from the first. A style of building which depended for its effect on well-judged proportion and a systematic arrangement of windows presented immense difficulties to the architects of the late Tudor buildings, whose art was, to all intents and purposes, unconscious, and in no way scientific. But architecture had suddenly become a science as well as an art—a science of proportion, and a knowledge of the great buildings in Italy was essential for those who embarked on the new undertaking. The older English tradition of planning survived for a much longer period, but the attempt to combine it with the hard-and-fast rules of classical architecture eventually produced the main features of the Italian house plan.

Change in the Planning of Buildings.

In most of the great domestic buildings in England of the Tudor period the

essentially English characteristic was the plan, and following as a natural result with an indigenous style, the internal arrangements found an expression on the outside—in short, the buildings were designed from the inside to the outside. But, with this new and wonderful architecture borrowed from a distant country, this was reversed, and too often everything was sacrificed to the proportion and treatment of the façade. Thus we find English country-houses following in all respects the villas and palaces of Italy—buildings designed by Italians for Italy, which were in many ways quite unsuitable for our northern climate.

Philibert de l'Orme.

One of the most thoughtful and capable of the French architects of the Early Renaissance has left behind him in his writings a strong protest against the indiscriminate use of Italian forms in the buildings of his time. Philibert de l'Orme, in his book on Architecture, published in Paris in 1567, gives advice to his readers, which is more than ever applicable at the present day. He says:—"The ornaments and decorations of façades should be appropriate and correspond with the interior of the building; the divisions of halls and rooms and the openings of windows and casements should not produce a repulsive effect on the exterior of the building." By this I understand him to mean that, though the building should be designed from the inside, it is necessary to have a very distinct and well-balanced scheme for the exterior. "Truly," he continues, "it is far more honourable and useful to know how to plan a habitation well, and render it healthy, than how to cover it with embellishments without reason." Although it is open to question whether De l'Orme really grasped the true spirit of classical architecture, as Mr. Blomfield says in his essay on this architect, the feelings which prompted the above extract from his writings were those of a man with the courage of his opinions in the face of the vast change in ideas with which, perhaps unconsciously, he was not altogether in sympathy.

These defects are chiefly noticeable in the more ambitious buildings of the XVIIIth century, but in the more modest domestic work we find evidence of the growth of a distinctly English adaptation of the Renaissance, and the window treatment of the quiet red-brick fronts, which are to be found almost everywhere, is altogether satisfactory in its proportion and its sense of fitness for its purpose.

The effect of this revolution in architecture on the fenestration of our English buildings was very marked; for a long time the mullion and transom was still used, and with good effect—for instance, at the Ashmolean at Oxford and Wolvesey Palace at Winchester. But the sash-window, divided by the heavy bars, became the accepted type to the purist, and the difficulties of the adaptation of the Roman architecture produced much defective lighting of interiors.

Such defects as the inevitably dark windows under the vast porticoes at Prior Park, near Bath, and Amesbury Abbey, Wiltshire, were inseparable from the use of a huge order, magnificent though the effect might be from the outside. The use of a colossal order running up the entire height of a façade would be dignified enough in itself if there was only one lofty room inside the full height of the building, but when there are several floors to be lit, either the windows become out of proportion with the order, or, if the windows are treated on the same colossal scale, they must be cut up by the floors which cross them, producing anything but a pleasing effect from the inside and outside. This is the inevitable result of the neglect of true principles, and the adoption, without knowledge, of a style of architecture out of harmony with practical requirement. And the Mansion House, and, later still, the Royal Institution in Alhambra-street (already referred to) show the difficulties of these ambitious attempts.

The use of blank windows to produce symmetry in a design cannot well be defended, though adopted in many fine architectural compositions.

Again, with a regular range of windows in small houses, it is inevitable that, without the greatest skill in planning, some rooms must be too dark and some too light.



Fig. 6. Batemans, Burwash.

Wren, Hampton Court.

To return to a more detailed account of the window treatment of the XVIIth and XVIIIth centuries, I propose to take two typical and familiar buildings as representing the leading tendencies of those times, and to give a short analysis of their fenestration. After the Banqueting House in Whitehall, which clearly marks the introduction of an entirely new element in design (in 1622), I propose next to take the east, or garden, front of Hampton Court, begun by Wren in 1689.

The internal arrangement is at once seen from the elevation; the ground-floor rooms are not of first-rate importance; and the windows are subordinated to the great range of state chambers on the first floor, the "piano nobile" of the Italian palaces. These lofty windows have a proportion which is extremely dignified, and the divisions of the sash-bars work out at 20 in. high to 14 in. wide. The window-openings, 13 ft. high to 5 ft. wide—a far narrower proportion than is usual in Italy, and one that Wren was particularly fond of (as, for instance, in the orangery at Kensington Palace, where the end-square windows are 5 ft. wide by 13 ft. 6 in. high)—roughly speaking, two and a half times the width.

The circular windows give a most interesting note to the façades at Hampton Court, and the division of the bars is most ingenious; above the secondary cornice the windows are practically square, and the sash-bar divisions of the same proportion, but on a much smaller scale than those below.

It would seem that Wren's idea was to produce an effect of height, and at the same time to indicate the relative importance of the rooms within. The circular windows in the Fountain Court are much more elaborately treated, and are really windows of small rooms; but on the external faces of the façades these small rooms do not always exist, and some of the windows are dummies, and only occur at intervals to help the whole design and to break up the wide spaces above the window-heads of the state chambers

occupied by the deep-coved ceilings inside. At Greenwich Hospital Wren has combined the circular and rectangular form in one composition with a very pleasing result.

One of the great difficulties of dealing with a classic order on a lofty façade is that the columns and entablature become so large as to be unmanageable unless the upper-floor windows are put above the cornice, and if these are not treated as dormers behind a parapet, the windows are liable to be too small, or, if of the proper size to light the rooms, they ruin the whole proportion. Wren has avoided this by introducing a complete order only as a central incident in the design and subordinated it to the main crowning cornice and balustrade, which gives ample room for the upper-floor windows.

It is by expedients of this description that Wren showed his originality and his mastery over the forms of Renaissance architecture. His power of adapting it to his requirements made it a living art in his hands, and one that was essentially English. His early training, as Mr. Blomfield points out, was rather French than Italian, but throughout his career and his various styles his strong individuality is clearly apparent. His work shows more independence of the accepted architectural forms than any of his contemporaries, but it is noticeable that, as his life and work advanced, he approached more nearly to the Italian manner, as exemplified by Inigo Jones.

The Horse Guards and Home Office.

The next example, which is instructive as illustrating a different form of window, is the Horse Guards, in Whitehall. We find here that the whole composition is more broken up than is usual in a Palladian design by the varied heights and planes of different parts of the building. The main part of the building was designed by Kent, in 1742, with the exception of the attic story on each angle of the central part and the clock turret, which were added by Vardy some ten years after his death.

The composite windows under a single semi-circular arch are here used with considerable effect, and give the necessary importance to the larger rooms on the first floor, while the second floor is entirely subordinated, and the window-openings kept as plain as possible. These rooms are really treated as a mezzanine floor, and it is interesting to compare the arrangement with the Home Office on the south side of the parade ground, also probably by Kent, where the mezzanine windows are omitted in the front, and only show on the ends. The result is that a fine solid-wall effect is produced with a complete entablature, but, at the sacrifice of the interior lighting to these rooms, this is again repeated on the floors above.

This plan of disguising the real arrangement of the interior can never be considered as satisfactory, and an angle view, where both faces can be seen simultaneously, gives an unpleasant sensation of something wrong and the feeling that the interior has been sacrificed to the exterior.

In the main façade of the Horse Guards the eye is at once satisfied, but on the end wings the same defect is seen, and the frieze and architrave of the cornice have to be stopped short on the return ends to allow for the windows on the mezzanine floors.

The proportions of the windows themselves are interesting, and their relative value to the solid wall surface represents one to three and a half, or rather more window than Inigo Jones' Banqueting Hall, and rather less than the Vendramini Palace at Venice. But from the greater variety of the shape of the openings the effect produced is very different. The combination of small and large windows is evidently intended to emphasise certain rooms, and in the whole of the fenestration of the Horse Guards and the Home Office Kent made an attempt to give an effect of size to buildings which did not really contain any fine rooms, and, though he certainly produced a very pleasing building, the fact that the exterior does not give a true

indication of the internal arrangements, as Mr. Bloufield says, savours of affectation.

I began this paper by saying that the subject of fenestration was practically a history of architecture, and with this last period of the English Renaissance the history of architecture as a living art can be said to cease. All XIXth-century architecture was a series of revivals, producing little or nothing that was new, and adding no fresh chapter to our subject.

We have seen that in all the great periods architecture was indicative of the life and manners of the people. The Egyptians were a theocratic race, and their temples and courts were closed in, with the chief ornamentation inside, and dimly lit to suit their religious mysteries. The Greeks were typically republican, and their chief effects were reserved for the exterior where all might see. The Romans, true monarchists, built princely palaces, and the plans of their buildings show a degree of luxury and refinement never approached before or since. The Italians of the Renaissance erected palaces which were typical of the life of the time, and in the Gothic Period of our own country the great monastic buildings were just as truly characteristic of the life of the people.

Sincerity in Architecture.

In all these great epochs one great principle governed the buildings—namely, they were sincerely designed to suit their purpose as the first consideration. The art may be said to have been an unconscious one—it strove after no effects which were not legitimate, and, though the growth of each detail may be traced backwards to a foundation on something gone before, it was only adopted to suit a requirement of the day, and became inseparably a part of the style. With the facility of travel, the spread of knowledge, and rise of individualism, foreign elements in design appeared, which were at first imperfectly assimilated, and, as we have seen, in later times produced insincerity in architecture. Thus one of the great principles was violated, and the lesson to be learnt from the study of our subject to-night is, I think, briefly this:—

Let the plan of a building be fully considered and designed from the first with due regard not only for the requirements but for the exterior, and let the window treatment bear on the exterior its proper relation to the internal arrangements. If the plan is faithfully designed to meet the given conditions it must of necessity reflect the life and habits of those for whom it is intended, and if the window treatment is also faithfully designed to suit the rooms, the result will be *sincerity* in the fenestration."

Mr. Edward Warren said that the paper was scholarly, lucid, and most interesting. The subject of fenestration was one of the most important subjects for an architect, because the windows of a building had almost more to do with the general effect of a façade than any other feature. There were more windows than doors, and second to the roof there could hardly be a feature which had a greater effect upon the external presentation of a design than the windows. Mr. Cave had taken them a long distance—from Egypt 3,000 years ago to the present day—and there was no question but that the history of windows was a history which was peculiarly interesting, not only to the architect, but to everyone who considered philosophically the subject of building, because it was the history of the gradual striving for and appreciation of light in dwellings. That connected other things. The desire for light inside a building might seem natural enough, but it was not so in primitive states of civilisation, when people could not read and did not write or draw, and did not do much that required light in a building; but as the spread of learning grew there was a spread chronologically for an increased desire for window light. Another reason for windows was the decrease of defensive buildings; in any system of military arrangement which had to depend on its walls for defence against enemies the windows must be reduced to the least possible area, but it was not only military buildings—castles, etc.—where the early windows were reduced to a minimum, it was seen in the ecclesiastical buildings, too. He had asked himself why that was so, and the answer was

easy in regard to the early structures, because the ecclesiastical buildings, as well as the fortresses, were fortresses as well as sanctuaries. The earliest churches in this country were essentially fortresses, but in some, as in some of the Norman churches in England, the windows were larger than they were at a succeeding period—say, sixty years later, when the defensive need, it would have been thought, would have diminished rather than increased; the round-topped Norman windows were wider than the succeeding lancet ones. One thing to account for the smallness of early windows in Europe was that European architecture came from the East, and the windows were adopted at first without discrimination, and that would account for the extreme smallness of the early windows. It was interesting to observe that in the north-west of Europe, in England and France, as architecture progressed and perfected itself, from the XIIIth century upwards, the windows gradually increased in size and in beauty of treatment, and, one might say, in conscious acceptance of the importance of an architectural feature. At first the building was regarded without much thought as to the windows; they were put where they were wanted, and were not much cared about; but in XIIIth century buildings the window was accepted as a most important feature, and led to the subdivision of a building. In the bays of a church, for instance, the adjustment of windows frequently influenced the disposition of the bays and columns and the whole effect of arcuation and arrangement. As the process of widening windows grew with the method of fine tracery and as the windows expanded, the arcades expanded also, and later on arcades were provided of such great width that it was found necessary to have the three-centred or four-centred arch to accommodate the window required; the window reacted on the whole architecture. A remark Mr. Cave made in regard to columnar architecture, *i.e.*, that it was, architecturally, almost incompatible with the arrangement of windows, one agreed with in the main, but not entirely. The main reason for the failure in England and the North of Europe generally in the acceptance of the Roman method of colonnaded façades interspersed with windows was because it had been invariably accompanied by a horizontal course—a string course, running behind and apparently through the columns. As he had said, in the East generally the allowance of window was small on account of the intense sunlight, and that was observable as one travelled in Europe south. In Spain the amount of window necessary was extremely small for ecclesiastical buildings, but the Gothic architecture of Spain, adopted almost entirely from France, was at first adopted wholly, until the people found they did not want the amount of window

space, and churches designed on the French plan had two-thirds of the windows blocked up with brick or stone and only small openings were left. At Barcelona he saw an extraordinary effect one October in the cathedral where almost all the windows were blocked. High up, in the clearstory on the south side, however, one window was left unblocked, and it was in such a position that the sun worked round to it by twelve o'clock, when a shaft of light came in and struck upon the high altar and the gilded retable. The effect was wonderful, the shaft of light being as clear and sharp as a sword-blade. He also remembered a little church in Spain in which there were no windows at all; when the door was open there was light enough, but at other times it was pitch dark, and no doubt the desire for the effect of mystery was responsible for this. As to vertical light, we could not light our buildings up with open circles in the roof, owing to rain and snow, but we have in England a system of vertical lighting which had been well known for 150 years. In a great many Georgian buildings there was a skylight treatment, and in some earlier buildings in the time of Charles the same treatment was adopted. In the Georgian domes the light was nearly vertical, and the effect most valuable, as the steady light was the unimpeded light. As to windows in towers, bell-towers were outside the usual rules which would guide the position and proportion of most windows. The principal windows in bell-towers were not intended for light, but for the emission of sound, and that had something to do with the Campanile of Siena Cathedral, with the windows increasing in number upwards. In the Magdalen tower at Oxford the great windows on the four sides which formed the upper stage were enormous compared with the very small windows to be found on the lower stages, but they were not windows for the admission of light, but for the emission of sound. That was typical of a common arrangement in bell-towers in England since the middle of the XIVth century; the topmost windows were made as beautiful as possible, but they were not for the admission of light. One did not often have to build towers in which the emission of sound was the chief point, but occasionally one had to do so, not only in churches, but in other buildings, and then one rejoiced in seeing a window formed without any glass and with deep shadows produced by louvres. Mr. Cave was interesting on the subject of the development of tracery through the desire for stained glass, and probably the XIVth century desire for stained glass had more influence on the form of tracery than anything else, for the defensive period of building had passed, and there was no reason why people should not have



Fig. 7. South Wrawall.

larger windows, and the desire for larger windows was increased by the increased production, in larger pieces, of glass. One thing which struck him was that in England we had not paid much attention to the evolution of a feature which in other countries—most northern countries of Europe—had attracted considerable attention, i.e., the dormer window. Since the end of the XVth century the dormer had been a plain affair on the whole, though there were dormer windows charming and elaborate in a sense, but, generally speaking, in England up to the end of the XVIIIth century the dormer was soberly and plainly treated as a mere adjunct of practical utility in the roof; but in France and Belgium, Holland and Germany, the dormer was always, from the XVth century upwards, used with great affectation, and had been very much elaborated—too much sometimes. For instance, in the façades of the Louvre the dormer windows were so extraordinarily complicated that they seemed to leave very little roof between them, and that was an unpleasant result. As an instance of charming dormers, soberly treated, he knew nothing more satisfactory than those on the bridge gallery at Chenonceaux by Philibert de l'Orme, who seemed there partly to have carried out his own advice, but which he did not do in his design for the Louvre, which was intensely complicated. In England, in the colonies, and in the United States there was more or less an intense desire for the sash window. He did not profess to have much enthusiasm for the sash window. It had certain advantages, but compared with contemporary casements, especially in France, it suffered from a lack of dignity. Take the instance of some of the older sashes, and compare them with the contemporary casements of France—the fact that the casement was on one plane was to give it greater dignity and a more distinguished effect. There was something bourgeois about the sash window, and it seemed to lack distinction, and his instinct was to avoid it, although he had occasionally to adopt it, as other architects had. One objection to it was that when the window was open one part of the sash covered the other part, and it was rather curious that, although we got the sash from Holland, in modern buildings in that country it was now never seen, although it was so in old buildings. Mr. Cave said that blank window panels were indefensible, but with that he joined issue. If one had a series of panels for fenestration, it was allowable to have blank panels for the sake of balance. If one made a sham window, as was done in the days of the window-tax, that was deliberate falsification; but to put a blank panel for the sake of architectural effect where one did not want a window, and to balance the live window, seemed perfectly allowable. But, after all, in discussions of this kind one only got to the conclusion that if one did the thing well one succeeded, but if one did not succeed one had better not to do it at all.

Mr. Alan Potter seconded the vote of thanks.

The Chairman then put the motion, which was carried heartily, and Mr. Cave briefly replied.

Annual Excursion.

The Chairman said that it had been decided to select Stamford as the headquarters for the annual excursion this year. The meeting then terminated.

SURVEYORS' INSTITUTION JUNIOR MEETINGS.—At the meeting held at the Surveyors' Institution on Monday, May 7, a paper was read by Mr. Cyril H. Donne upon the "Fiscal Burdens on the Land and Taxation of Site Values," and there was a very large attendance. The members of the Law Students' Debating Society were invited to attend the meeting, and the Society was well represented. The paper was followed by a keen discussion in which members both of the Law Students' Society and of the Surveyors' Institution took part. The reader of the paper replied to the criticisms and the chairman (Mr. J. H. Sabin) addressed the meeting. At the conclusion of the evening a special vote of thanks in appreciation of his services was accorded to Mr. Sydney A. Smith, the retiring hon. sec. At the annual general meeting held prior to the ordinary meeting Mr. C. H. Dinwiddie was appointed to succeed Mr. Smith as hon. sec. The dinner will be held on May 16.

GREEK AND ROMAN ANTIQUITIES AT THE BRITISH MUSEUM.

The third general meeting of the Society for the Promotion of Hellenic Studies was held at the rooms of the Society of Antiquaries, Burlington House, on Tuesday, when Mr. Cecil Smith gave an account of the recent acquisitions in the department of Greek and Roman antiquities at the British Museum.

Mr. Smith said he had felt for many years that the public had perhaps hardly adequate means of knowing what were the acquisitions to his department of the British Museum. After all, the public had to provide the money, and they really ought to know. Consequently, since his appointment as keeper of the department he had adopted two plans to give better information. First, he had arranged that a series of cases in one of the rooms should be reserved for recent acquisitions. They remained there for one year, and were then incorporated with their classes. Secondly, he thought those who took a special interest should have the opportunity of knowing of the recent acquisitions, and the authorities of their Society allowed him that opportunity that night. If it was approved, he proposed to give an account annually of what he had acquired during the preceding year. Of course, in the objects he was going to show them only a portion of what had been acquired was represented. As a matter of fact, since he had been in office, for the best part of three years, he had thought it better to include the most important of those objects which had come to them in the preceding two years. It was possible that some people might think the collection was but a small amount to acquire in three years, and as a matter of fact the department had been subjected to criticism in the Press lately; but if the public only knew how extremely inadequate their funds were, he was sure they would be lenient. Most people would think, seeing that Greek and Roman antiquities had in the last few years become more and more scarce and more costly, and that the competition, especially from America, had been growing keener, that the British Museum would be allowed a larger grant than used to be the case. On the contrary, the amount he had to spend for his department was more than one-third less than it was fifteen years ago. People might suppose that searching for antiquities was an amusing and pleasant occupation, and so it was, but the difficulty was the inadequacy of the funds. He did not know how this was to be remedied. Of course, there was the National Art Collections Fund, but that Fund could not spend 40,000£. every year, and probably the "Rokeby Velasquez" would cripple them for many years to come. At the present time there was a large collection of objects which it would be a great disaster to lose, but which could not possibly be purchased with the funds at the disposal, and if any members of the Society had any means of influencing millionaires to provide him with 10,000£. a year he could promise them that no important works of art would leave the country in the way of Greek and Roman antiquities. Mr. Smith then proceeded to illustrate some of the recent acquisitions to his department by means of lantern slides. Dealing first with vases, he described a painted vase seen in fragments twenty years ago in Asia Minor by Professor Ramsey. Two years ago he acquired it, and it was absolutely unique in character; it dated probably about the middle of the VIIth century B.C. A second vase was representative of the dedication of the flute-player; another one had painted black figures on a white ground of Peleus grasping Thetis, and two of the peculiar transformations of Thetis had been painted; and another represented a sacrifice to Athena. A further vase of Athenian workmanship, acquired in Thessaly, represented a scene unique of its kind, and was probably of the VIIth century B.C. It depicted a renal-looking lady sitting on a throne and holding a sceptre, and she was being approached by a figure undoubtedly that of Dionysus. There was an Eros with a box of jewels, and another with a sash, and on the other side one of the winged divinities. It was the ordinary type representing the marriage vow. The only other example they had of the wedding of Dionysus was of the scene which took place

in the festival of flowers at Athens. Mr. Smith next showed two ivory plaques, which he said a few years ago would have been said to be Etruscan, but which were undoubtedly Ionic. The plaques represent a lion attacking a goat. Ivories were extremely rare and very difficult to get hold of. They had acquired three ivory statues, one representing two boys quarrelling, the second depicted a boy tired out, and the third, which showed a boy in a graceful attitude under a tree, was probably from a group. Coming to the recent acquisitions of gems, one represented a nude figure, probably of Apollo, which was to be attributed to the IVth century B.C.; another was a girl of Eros, and a third was a figure of Aphrodite at Paphos. Of Greek gold-work, which was extremely rare, they had two specimens. One was a gold diadem with a frieze, and two victims seated beside the column. The second was a band with a central knot. Of terracotta they had acquired two statuettes, known as Tanagras, but personally he did not think that such statues could have been made by the provincial people at Tanagra. Another statue was a seated Madonna, and in the back was inscribed the name of the maker. Then they had three Aphrodites of the kind generally found in Asia Minor, and the entire contents of a girl's tomb. The arms of the girl's figure in the tomb were movable, and he believed that this was done so that the figure could be dressed. The inference was that the statue represented the dead girl herself. In marbles Mr. Smith first described a stele head taken from one of the funeral monuments, and then a little statuette of a woman, whose breasts were pierced and whose body was really a reservoir. He believed that this must have been used to produce miracles, and the only other example of such a thing he knew was the Leclercq statue. They had also acquired a marble relief of a well-known type—that of a warrior leaning in rather a sad way on his spear. The explanation was known from another one in the British Museum, which showed that it was a monument erected to commemorate warriors who had fallen in battle. The details in this relief were extremely well rendered. Of bronzes they had acquired a statue which was perhaps hardly one for the department, and which came from Badajoz, in Spain. It certainly, however, had a great deal which suggested the Greek style when translated to a region like Spain. Then they had an Apollo of the regular VIth century archaic style, and the arm of a woman holding a little Eros by the wing. This latter was presented by the Egypt Exploration Fund. They had also a bust of Artemis; an ape carrying a lantern, and probably meant to depict a quail-catcher; an ape as a jug-handle, and other similar statuettes, which belonged to the Alexandrian school of grotesques. One of the finest objects they had acquired was what was described as a Paramythian mirror. The Paramythian bronzes had been known for the last century, and ten of them were in the British Museum. The one they had now acquired was not a mirror, but had had a pendant to it. They had been presented by Mrs. Hawkins with a statuette of Hermes, probably produced 400 B.C., and with a helmet found at Paramythia. One of the best archaic bronzes they had come across was that of a man riding a horse, which he thought dated from the first half of the VIth century B.C., and bronzes of that date were extremely rare. In conclusion, Mr. Smith described the two half columns of the Treasury of Atreus at Mycenae presented by the Marquis of Sligo. This showed a downward tapering, which had become familiar by the excavations of Mr. Evans at Knossos. Views were shown of the restoration of the capitols and of the restoration of the whole doorway.

ELECTION OF AN ARCHITECT TO THE CORPORATION OF THE CITY OF LONDON.—Mr. H. P. Monkton, architect and surveyor, has been elected a member of the City Corporation. He represents the Ward of Walbrook.

MANCHESTER CHURCHES BILL.—The Lord Chairman of Committees has reported that the opposition to this Bill has been withdrawn. The Bill authorises the closing and demolition of the Churches of St. Peter, Mosley-street, St. Simon and Jude, Granby-row, and St. Martin, Oldham-road.

THE LATE MR. THOMAS GARNER.

The following article has been sent to us by a pupil of the late Mr. Garner. Some information not given here relating to the work and life of the deceased gentleman will be found on another page:—

The sad and unexpected death of Mr. Thomas Garner, which took place on the last day of April, at his beautiful old house, Fritwell Manor, in Oxfordshire, has brought to a close the career of a distinguished architect whose unflinching industry, conspicuous talent, and single-minded devotion to his art merit something more than the passing notice which they have so far received.

Born in 1839, at Wasperston Hill, in Warwickshire, and reared amidst the old-fashioned and simple surroundings of a remote rural district, Thomas Garner imbibed the natural hearty country instincts which became a part of his nature, and were never blunted or diminished during many years of residence in London, and before the long-hoped-for return to the country was realised by his establishment in the fine Jacobean manor-house at Fritwell. To his country education he owed the love of riding and the excellent horsemanship which he retained to the last.

Mr. Garner was articled to Sir Gilbert Scott at the early age of seventeen, and served, with the energy and enthusiasm that never left him, as one of the many pupils of that gentleman. Amongst his contemporaries in Sir Gilbert's office many have risen to distinction; we may instance Mr. T. G. Jackson, R.A.; Mr. Micklethwaite, architect in charge of Westminster Abbey; and Mr. Somers Clark, who has the care of St. Paul's Cathedral. Mr. G. F. Bodley, R.A., whose partner he was destined to become, just preceded him at Scott's office, but a warm friendship was soon established between the senior and junior. On the completion of his articles Mr. Garner returned to Warwickshire, and was responsible, in his first few years of practice, for various works on his own account or as representative of Sir Gilbert Scott. Mr. Garner returned to London about the year 1868 to assist his friend Mr. Bodley, who was rapidly coming into, and who found himself somewhat overburdened with work.

The assistance soon grew into the partnership, which was to last for over twenty-five years, and which ceased by the friendly dissolution of a friendly bond about the year 1897. For a time the collaboration of the partners was actual and close, but, as work increased upon their hands, it became their habit to individualise, each partner assuming the entire and separate responsibility for definite work. The earlier period of close collaboration produced some remarkably successful results, none, perhaps, more notable than the fine churches of the Holy Angels at Hear Cross, Staffordshire, and of St. Augustine at Pendlebury, near Manchester. The succeeding period of dual practice under partnership allotted most of the civil or domestic work entrusted to the firm to the almost undivided initiation and control of the junior partner, while his senior devoted himself more especially to ecclesiastical work and to decoration. Mr. Garner was almost entirely responsible for the design and supervision of much of the firm's work at Oxford, such as St. Swithin's Quadrangle at Magdalen and the Tower at Christ Church, and entirely so for the President's lodgings at Magdalen. He designed, while his partner was busy with other work, Hewell Grange, Lord Windsor's Worcestershire mansion, with all its elaborate and costly details, the well-known reredos in St. Paul's Cathedral, and several sepulchral monuments, such as those of the Bishops of Ely, Lincoln, and Chichester, and that of Canon Liddon.

Of his work subsequent to the dissolution of partnership it is sufficient to mention Yarnston Manor, Oxon., the Slipper Chapel at Houghton le Dale, Moreton House, Hampstead, the Empire Hotel at Buxton, and the crowning work of his arduous life, the beautiful chancel of Downside Abbey, near Bath, beneath whose roof his body now reposes. Mr. Garner was of a shy and modest disposition, and less known to his contemporaries than his most unusual abilities, scholarship, and attainments would have allowed a less retiring character to remain.

As an instance, however, of contemporary estimation we may state, upon the best

possible authority, that when Mr. Bentley, stricken by the fatal paralytic stroke, was asked by Cardinal Vaughan what architect he would choose to carry on his work in Westminster Cathedral, he answered "Garner, for he is a man of genius."

Mr. Garner was an admirable and rapid draughtsman and an untiring student. He will long be remembered by his friends for his warm heart, his ardent enthusiasm, his minute and scholarly knowledge, and his unceasing energy. His book upon English Domestic Architecture chiefly of the Tudor Period will be published by Mr. E. T. Batsford, but the first of six parts is not likely to appear for some months.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

An eastern counties district meeting of the Association of Municipal and County Engineers was held at the Town Hall, Newmarket, on Saturday last week. The meeting was the first of the present season, and brought together a large gathering of members. Mr. A. E. Collins, of Norwich, President, was in the chair, and there were also present Messrs. W. Weaver (London), Norman Scorgie (Hackney), T. W. A. Hayward (Battersea), J. P. Norrington (London), J. J. Jenkins (Finchley), E. J. Silcock (Leeds), J. Julien (Cambridge), J. W. Walshaw (Peterborough), A. M. Foulter (Manchester), R. S. Scott (Bishop's Stortford), A. T. Blood (Hitchin), A. Gladwell (Eton), W. R. Locke (Hemel Hempstead), and others.

Mr. C. E. Griffiths, Chairman of the Urban District Council, offered the members of the Association a hearty welcome to Newmarket, and expressed the opinion that the meetings of the Association must be of the greatest benefit not only to the towns visited, but to the members of the Association.

The President, in acknowledging the welcome extended to the Association, said it was a record to have two meetings in East Anglia in one year.

Mr. Norman Scorgie (Hackney) proposed the re-election of Mr. J. W. Cockrill (Great Yarmouth) as Hon. Secretary for the Eastern Counties District, which was seconded by Mr. A. T. Blood (Hitchin) and adopted. Mr. Cockrill briefly acknowledged his re-election.

Municipal Work at Newmarket.

Mr. W. Metcalf, Assoc.M.Inst.C.E., surveyor, read a paper on "Municipal Work at Newmarket." He said the town was formerly governed by a local board of health, consisting of twelve members, which was formed in 1850, with an area of 540 acres.

In September, 1885, the urban district was, by an order of the Local Government Board, extended by an area of 5,640 acres, divided into five wards, with three members for each ward, or a total of fifteen members. This extension became necessary in consequence of building operations just outside the fringe of the old urban boundary in the rural district of Newmarket, which necessitated works of sewerage, paving, lighting, etc. These advantages were not obtained, owing to the rural authority having in view its ultimate inclusion in the Newmarket urban area. Several attempts were made to include only the built-up portion on the outskirts, but the Local Government Board insisted on the whole of the parish of Exning being included in the extension, and it had now an area equal to many large towns.

The present population was 11,500 and the rateable value 79,417.

The Council's indebtedness up to March 31, 1905, was 83,745*l.*, and the average general district rate for the last few years had been 4*s.* in the pound. A special rate of 4*d.* in the pound was levied on the old urban area, producing about 750*l.* per annum; this was for the repayment of old loans under the order of the Local Government Board.

Although thirty years ago the town was visited with an epidemic of small-pox, it had since been remarkably free from the various infectious diseases; in 1903, however, small-pox was introduced in the centre of the town, but prompt isolation and other measures were immediately taken with the

result that no spread took place. This he regarded as satisfactory, seeing that they had a large floating population during the racing season.

The death rate of 1905 was a remarkably low one, being only 9 per thousand.

The total average death rate for the past five years had been 12*·*05 per thousand, and the average zymotic 1*·*55 during the same period.

In the years 1891 to 1893 a very large number of the footpaths were laid down with artificial paving, 2 in. thick Victoria stone, for which loans were obtained for a period of twenty years; the cost was 5*s.* 6*d.* per super. yard laid complete.

At the present time there were twenty-four miles of district roads dedicated to and repaired by the authority. Leicestershire broken granite was chiefly used, with a small quantity of local chalk flints for the outside district. The cost of granite averages about 11*s.* 6*d.* per ton delivered at the station. The railway carriage was accountable for about half this sum, and consequently the heavy cost necessitated a sparing use of the material.

During recent years several streets 36 ft. wide had been made up under sect. 150 of the Public Health Act, 1875, the cost per lineal of frontage, including sewerage, being from 11*s.* to 13*s.*; the kerbs were 10 in. by 4 in. blue Pennant, channelling 12 in. by 3 in.

One street, with moderate traffic only, was made up nine years ago with limestone tar macadam on a rough cement concrete foundation, eight to one, 6 in. thick; the tar macadam was 4 in. thick, in two layers, the bottom layer 2½ in. gauge, and the topping 1 in. The cost per foot frontage was 6*s.* 8*d.*, exclusive of sewerage, this being a general charge on the rates. For streets of moderate traffic this kind of material was, in the author's opinion, both economical and in every way satisfactory; during frosty weather, however, it required more attention in sanding, but this was more than compensated for by the minimum of scavenging required, no mud being created in winter, and very little watering necessary during the summer.

The district was supplied with water by the Newmarket Waterworks Company from the chalk, and, although somewhat hard, was regarded as very pure.

A weekly collection of house refuse was made by the Council's carts, and in the more densely populated parts of the town more frequent visits were made; the total quantity collected per annum was about 2,000 tons. Trade refuse was not collected by the Council.

Two private fire brigades existed in the town—the Volunteer and the Trainers and Owners. These were now being taken over by the Council and reorganised. Additional fire-hydrants were being fixed for the better protection of the town, and a fire-escape and other appliances were under consideration. A good pressure of water was available, the head being about 200 ft. in the centre of the town.

In the year 1875 Mr. Baldwin Latham, M.Inst.C.E., designed and submitted a scheme of sewerage and water supply for the old local board area, having its sewage outfall a little lower down the valley than the present sewage farm. The sewerage scheme was revised and carried out by the late Mr. John Francis Clark, of Newmarket, having its outfall on 9 acres of land, the site of the present works, the area of the land which could be irrigated being about 5½ acres, and this continued in operation until the urban district was extended in the year 1885, when it became necessary for the authority to consider the question of a comprehensive system of sewerage and sewage disposal for the whole of the district.

Mr. F. Beesley was appointed engineer for the scheme, and was instructed to prepare another to include the provision of a refuse destructor, and a pumping scheme became necessary. After careful consideration, the Council decided to enlarge the present sewage farm, and a Provisional Order was sought to acquire an additional 4 acres of land from the Jockey Club; this was obtained, and a further 4 acres taken by agreement, making the total area of the Newmarket outfall site 17 acres. The sewage

was collected and conveyed to this site, which was a distance of about a mile below the town, reaching the works at a level of 67.50 O.D. Commencing at the outfall, a culvert 4 ft. internal diameter, for night storage, was constructed, having a capacity of 30,000 gallons, from this point up to the centre of the town; the main sewer was 18 in. in diameter. The tributary sewers were of glazed, socketed pipes, and varied in size from 15 in. to 7 in., and comprised about fifteen miles.

All the new sewers were laid in straight lines at self-cleansing gradients, with man-holes at changes of direction and at all junctions, generally not more than about 100 yds. apart, the foul sewers being laid on a bed of cement concrete, and wherever practicable tested with water test, the old sewers being retained as far as possible, and utilised for storm water diverted to the natural main water-course.

The house drains, hitherto connected to old sewers, were disconnected and joined up to the new sewers, taking the drain back to the building as far as necessary to make a good connexion, owing to the difference in the levels. This disconnecting trap was always put in new drains, and where practicable a chamber was built for purposes of access to the trap.

The ground at Exning was waterlogged, and much difficulty was experienced in laying these sewers. The ejector station in particular was a very costly item, on account of continuous pumping.

The sewage was delivered from the rising main into the screening chambers, which were in duplicate, where it passed through a 1-in., $\frac{1}{2}$ -in., and $\frac{1}{4}$ -in. mesh screen, and from thence into the upper main carrier. Every week the sludge which collected in these chambers was lagooned to a depth of about 3 in. on well-drained land, the Council using a portion for manuring the crops, the surplus being easily disposed of to farmers at 1s. per load at the farm. The coarse beds, which were ten in number, were filled from the upper main carrier by means of Messrs. Adams & Co.'s automatic filling apparatus, the sewage flowing along grips formed in the surface of the filling, which was a hard clinker obtained from gas-works. The beds averaged 4 ft. depth of material, and a fall of 6 in. was given in floor towards the outlet.

The under-drains were formed of 4-in. agricultural pipes. The sewage was held up in these beds by means of timed siphons for a period of two hours, when it was discharged on to the fine beds, where it was again held up for two hours in a similar way. The filling of the fine beds was coke breeze, and the average depth 4 ft., the beds having a fall and under-drained in the same manner as the coarse beds. The effluent was discharged into the lower main carrier, from which it run over the land.

The Newmarket beds were constructed of cement-concrete, six to one chiefly, and faced with cement-concrete blocks, two to one, facing $\frac{3}{4}$ -in. thick of $\frac{1}{4}$ -in. granite chips, the backing six to one, properly bonded together; the blocks were 14 in. long by 7 in. and 6 in. thick. Local gravel was used for the concrete, which cost about 6s. per cubic yard delivered on the site.

The Exning beds were constructed of cement-concrete six to one throughout, faced with blue Staffordshire bricks and coped with blue Staffordshire hull-nosed coping.

The crops grown were chiefly for the Council's horses, and included mangel-wurzel, kohlrabi, sainfoin, lucerne, and oats, in the usual rotation. Any surplus beyond the requirements of the Council was sold to farmers and trainers at the usual market rates. The land had not been recently under-drained, although some of the old drains still exist, and were working; but the Local Government Board considered that the under-draining was not necessary at present, and therefore the work originally proposed was not carried out. At Exning no under-drains exist, and therefore they were not troubled with any effluent discharge into the stream.

The buildings comprised an engine-house, containing 15 h.p. horizontal engines in duplicate, working under a steam pressure of 90 lb. per square inch, having a steam cylinder 10 in. diameter and 20 in. stroke,

fly-wheels 7 ft. in diameter; each engine drives a 10-in. centrifugal pump, capable of raising 1,600 gallons of sewage per minute a height of 23 ft.

There were two steam air-compressors, one provided for raising the sewage at the Exning outfall, two miles away, by means of 200-gallon ejectors. The compressors were horizontal, high-speed, non-condensing air-cylinders, water jacketed, air inlet and outlet valves of the Corliss type; they worked under a steam pressure of 120 lb. per square inch, and raised the sewage a height of 35 ft.

The external walls of all the buildings were of heather-pressed bricks, the engine-house having a salt-glazed brick dado internally. The destructor-house, which was 46 ft. by 45 ft., contained a two-cell refuse-destructor by Messrs. Manlove, Alliott, & Co., with a Babcock & Wilcox water-tube boiler between; a Cornish boiler, 16 ft. long, 4 ft. 6 in. diameter, was also provided for stand-by purposes. The building was made large enough for an extension of two more cells. The chimney-shaft was 120 ft. high above ground level, octagonal in shape, with a circular fire-brick lining to a height of 70 ft., and rested on a foundation of concrete 20 ft. by 20 ft. by 10 ft. thick.

Stores, offices, and three workmen's cottages were also provided. The cost of the whole of the works was 81,500l. Mr. F. Sanderson-Robins, Assoc. M. Inst. C.E., carried out the duties of resident engineer.

The bacteria beds at both outfalls were carried out by administration under the author's supervision, assisted by Mr. W. J. Tait (now Surveyor of Sudbury).

The President said the Association was indebted to Mr. Metcalf for a paper full of most valuable details. The ratable value of 7l. per head of population was very high, and was about double that of the city of Norwich. As a result of their low assessment, the rates of Norwich seemed very high, whereas they were reasonable, and about the same per head as Newmarket. The town was to be congratulated on its very favourable health statistics. A death rate of only 12 per thousand for five years was very satisfactory, and one very few towns could approach. With regard to tar macadam, it was only good for medium traffic; it was no good for very heavy or very light traffic. He wished to know whether the Local Government Board insisted upon the provision of intercepting-traps on the house drains, or whether it was done of their own volition.

Mr. T. W. A. Hayward (Battersea) proposed a hearty vote of thanks to Mr. Metcalf for his paper. He congratulated Newmarket on the splendid health statistics. He did not remember seeing a lower death rate in any other town. With reference to tar macadam roadways, his opinion was that the roadways of the future would be made of that material. He could not agree with the President as to its unsuitability for very light or heavy traffic. He had one road which had been made for two years, and was subjected to some of the heaviest traffic in London, and to-day it was as good as when put down. He had also streets with very light traffic, which were also as good as when made. He hoped that the President, if he had not experience of tar macadam for very light and very heavy traffic, would be converted that day fortnight.

Mr. A. M. Fowler (Manchester) said that tar macadam roads as made at Scarborough and Buxton gave most excellent results. He did not think there was any better mode of road-making than tar macadam when done in a scientific manner.

Mr. Norman Scorgie (Hackney) agreed with the President as to tar macadam. If granite would not stand the heavy wear of London traffic, he did not think that a mixture of slag and tar would do so. He hoped the members when they visited Battersea a fortnight hence would be converted to a greater extent than he was when he was there some months ago. He must admit that some of the roads were very good, but others had a scabby appearance.

Mr. E. J. Silcock (Leeds) thought the sewage scheme more expensive than was necessary. In a town like Newmarket, with a high ratable value, perhaps the Council

were justified in going to an expenditure higher than would be justifiable in a town of lower ratable value, but they must bear in mind that it was the population, and not the ratable value, which made the sewage. The dry weather flow appeared to be about 300,000 gallons a day, and the total area of the beds was 7,110 sq. yds., which seemed unduly large. Having regard to the fact that the sewage had to be pumped, and these beds were each 4 ft. deep, he was of opinion that equally good results could have been obtained by placing the beds one on top of the other, 8 ft. deep, and working them continuously, instead of as contact beds. If that had been done, 2,000 yds. of beds would be sufficient, which would have been equivalent to 4,000 yds., as against 7,000 yds. in the present works. The cost would then have been considerably less. At the time these works were made the Local Government Board were very severe in their requirements, particularly as to contact beds. He must say that the position taken up by the Local Government Board had been largely justified by the results. Contact beds required a large area, because the quantity of water which could pass through was limited by the capacity of the bed itself, and they were compelled to provide a certain time for the contact, otherwise purification did not take place. With filters they could deal with a larger quantity, and the same result could be obtained, because they were able to run them at a much higher speed than contact beds. Then there was the sludging up of contact beds, which was a very important item to bear in mind. Making a deduction on a high scale for the destructor, it left the cost of the sewage works at 75,000l., or about 6l. per head of the population, which was a very high figure.

Mr. Jenkins (Finchley) pointed out that, as they were pumping water from a similar strata to that on which the sewage works were placed, there might be a risk of contamination of the water supply. He did not know whether the chalk was sufficiently solid to prevent any connexion between them.

Mr. Gladwell (Eton) also thought the cost of the sewage works as excessive. The area of the coarse beds he regarded as sufficient for a population of over 19,000 persons. He also agreed that continuous filters would have been better than contact beds. But probably where these works were designed contact beds were more popular than filters. With regard to main roads, he said the local authorities up and down the country were suffering from a very bad attack of county councils, and, so far as he was concerned, he would like to see their wings clipped considerably, and greater responsibilities and duties placed upon the local authorities, who were quite as capable of looking after this work as county councils were for them.

The vote of thanks was passed, and Mr. Metcalf briefly replied to the discussion.

Councillor Shepherd, Chairman of the Sewage Committee, said they were pioneers in this method of sewage purification, and the Local Government Board forced them to spend more money than they would have to do if they were carrying out the works to-day.

Mr. O. E. Griffiths, Chairman of the Council, entertained the members to luncheon at the Victoria Hotel, and the afternoon was devoted to visits to the electricity works, the sewage disposal works, and the water-works. On returning to Newmarket Mr. Metcalf entertained the members to tea at the Town Hall.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment, in the place of Mr. A. E. Powell, resigned, of Mr. W. H. Draper, as sanitary inspector in the Metropolitan Borough of Finsbury, as from April 5, and the appointment of Miss A. M. Dick as sanitary inspector in the City of Westminster, as from March 4. The Local Government Board has sanctioned increases in the salaries of sanitary inspectors as follows:—Metropolitan Borough of Hamstead; Mrs. Fisher, Mr. P. A. Heath, Mr. J. Grimsey, and Mr. F. H. Hudson; Metropolitan Borough of Lewisham; the salaries of Messrs. R. White, E. T. Pidwell, B. A. Knappett, J. Dalry, J. A. K. Cooper, H. King, and H. L. Hyde on reaching the present maximum of 180l. a year to be increased by annual increments of 5l. to a maximum of 260l. a year each.

THE ROYAL SANITARY INSTITUTE.

THE DUKE OF NORTHUMBERLAND presided on Wednesday evening at the Langham Hotel over the annual dinner of this Institute. Amongst those also present were Colonel J. Lane Notter (Chairman of the Council), Messrs. Evan Spicer (Chairman London County Council), Sir Alex. Binnie, Messrs. H. F. Hepburn and A. Wynter Blyth, Sir F. Sharp Powell, Bart., M.P., Sir R. Melville Beachcroft (Chairman, Metropolitan Water Board), Messrs. E. T. Hall, J. Osborne Smith, T. W. Aldwinckle, A. Saxon Snell, A. J. Martin, E. White Wallis (Secretary), etc.

In proposing the health of the King, the Chairman referred to the fact that His Majesty had consented to be President of the forthcoming International Congress on School Hygiene.

The toast of "The Navy, Army, and Auxiliary Forces" having been honoured, Sir R. M. Beachcroft, in proposing "The Houses of Parliament," said he supposed the reason he was asked to propose the toast was that he belonged to a municipal body, which was not exactly the real thing, but was almost the real thing. During the last twenty years there had been a remarkable advance in those laws which dealt with sanitation. Parliament had dealt during that period with questions of the housing of the working classes, the food laws, the protection of children, and the building laws; and much had been done to improve the health of their great cities. So much so, indeed, that the only two rates which had gone down were the birth rate and the death rate.

Sir F. S. Powell, M.P., in reply, said he believed the present Parliament was fully alive to the objects of the Sanitary Institute, and they had many Bills before them dealing with the well-being of the people, both as regards their housing and as regards their conditions of life.

The Duke of Northumberland, in proposing "The Royal Sanitary Institute," said they were a successful body of men; the Institute went on from year to year doing its useful work without any very marked incidents. The Institute had attempted to find fresh quarters, but so far that effort had not been crowned with success. He was not going to condole with them on that circumstance, for he thought in some respects it was a good thing, because he was quite sure that when either an individual or a public body changed its habitation it was a good thing to do it deliberately. The Institute was accumulating funds, and had received much encouragement from various quarters, and he was particularly glad to see that some public bodies, notably the Corporation of Wigan, and no less than some half a dozen of the City companies of London had come to their support. That showed, he thought, in a very marked way that the value of the Institute was recognised by those who had charge of the public welfare, and he did not lament that their progress was slow, because, if slow, it was sure. They would, however, keep that object before them, and he trusted that before very long the Institute would find a habitation worthy of its aim and of its work. They had heard something that night of the condition of the Houses of Parliament, but he did not know whether he could congratulate them altogether upon the attention which Parliament appeared to be giving to sanitary matters. In one respect he was sorry to see that they had had rather a cold water douche put upon them mainly in the matter of vaccination. In another matter, however, they had received encouragement. He need only mention one matter, and that was the Public Health Act Amendment Bill, which was a most sensible Bill. He spoke with some experience as a landed proprietor. It was a most sensible Bill, calculated very greatly to assist them in the proper housing of the population. He was very glad to see that that Institute had petitioned in its favour, and he trusted that those who wished to see the population better housed than now would do all they could to promote some legislation in that direction. Last year they had an exhibition at the Garden City to teach proprietors how to build their houses. He applauded the intention and the effort, but he was very much disappointed with the

result. He went down there himself with some advisers, who were well qualified to advise him, but he could not say that on the whole they were very greatly assisted in solving the problem. It would be ungrateful and unjust to say that no hints were given to them. Certainly some valuable hints were given, but he was afraid that until they had some legislation for the amendment of the present by-laws of local bodies they would not be able to solve that important problem of how to house the population. An institution of that importance ought not to be parochial. It was their boast that they were told to think impartially, and he was especially glad to think that the Institute was thinking imperially, and were spreading their work and trying to teach their lessons in our possessions all over the world. He saw from the Report that there were several colonies in which they were doing work, by instituting examinations or otherwise, and so trying to press forward sanitary questions, and he was delighted to see that they were advancing in every direction, and were not confining their attention simply to this country. They were thinking more and more of their colonies and of the great dependencies which England boasted of, and he would remind them of the growing interest in what was termed tropical medicine. This would have an important effect on the sanitary condition of their colonies, and they were grateful to the colleges of Liverpool and London, who were working to improve the sanitary conditions of the colonies, and who were in that way assisting the Institute in its efforts.

Col. J. Lane Notter, in reply, said that their principal desire had been to provide a new place for the Institute in order that it could fulfil the increasing demands made upon it. They had the option of a new site, and they solicited subscriptions, but, unfortunately, the subscriptions received did not allow the Council to go forward with the project. The Council had now under its consideration a further scheme, which they hoped would be an advantage to the Institute. The Institute had carefully analysed the several Bills of a sanitary character which had been brought forward, and had petitioned in favour of those which they considered most helpful to the mass of the people of the country. The examinations of the Institute had also of late years been revised, and he would call particular attention to the fact that the candidates who came up for these examinations were obliged to go through practical tests. This they considered to be of the greatest possible importance. The University of Liverpool and the Technical Schools of Manchester and Leeds had taken this up, and were helping the Institute in its work. During the year they had had many examinations abroad. All the examination papers were submitted to the Council here, and the Council approved of them before certificates were granted. The Bristol Conference was proceeding satisfactorily, and they anticipated an exceedingly good meeting. He was glad also to say that the exhibition space had been almost taken up, and everything went to show that the Congress would be an exceedingly successful one. They had had two conferences during the year—one in anticipation of the International Congress on School Hygiene and the other on Smoke Abatement. The latter conference was well attended, but he was afraid that the result, so far as the smoke of London was concerned, had not yet been satisfactory. He hoped, however, that they had been able to diffuse a certain amount of knowledge on the subject, and that it would bear fruit in due season. With regard to the Institute itself, they were rapidly progressing, and they had 135 members more this year than last year. Their funds were also in a satisfactory condition, inasmuch as they carried forward a small balance to their credit. He could not conclude without thanking the municipal authorities of the country for the great interest they had taken in their sessional meetings. These meetings had been of great value, and they had brought together men who had been able to discuss local questions from a large point of view, and they had greatly assisted the local municipal authorities. The work of the Institute was a single-minded one, for they only wished to do the public good irrespective of political or any other motives. They

wished simply to advance the health of the people, and that was a work which ought to appeal to everyone.

Sir Alexander Binnie proposed the health of "The Visitors," and the toast was acknowledged by Mr. Evan Spicer (Chairman of the London County Council).

The health of "The Chairman," proposed by Colonel J. Lane Notter, concluded the proceedings.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Alderman Evan Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Islington Guardians 17,500l. for poor law purposes, and Paddington Guardians 8,541l. for poor law purposes.

Equalisation of Rates.—A long discussion took place on the scheme brought up by the Local Government Committee for the further equalisation of rates in London, and ultimately, on the motion of Lord Welby, the subject was referred back in order that the Finance Committee might be consulted in the preparation of an amended scheme.

Louisiana Purchase Exhibition.—The General Purposes Committee reported as follows:—

"We reported on May 1, 1906, that the International Jury of the Louisiana Purchase Exhibition had awarded the Council a gold medal and a silver exhibit of a model of the Blackwall Tunnel shield. The description of the medal, which has since been received, is as follows:—'In the composition of the obverse of the medal are shown two figures, one of which, Columbia, tall and stately, is about to envelop the youthful maiden by her side, typifying the Louisiana Territory, in the flag of the Stars and Stripes, thus receiving her into the bosom of the States. The other figure is depicted in the act of divesting herself of the cloak of France, symbolised in the emblem of Napoleon, the busy bee, unadorned thereon. In the background is shown the rising sun, the dawn of a new era of progress to the nation. The reverse of the medal shows an architectural tablet bearing an inscription giving the grade of the medal. Below the tablet are two dolphins symbolising our eastern and western boundaries, the whole surmounted by an American eagle spreading his wings from ocean to ocean. The medal was designed by A. W. Weinman. The design was approved by a committee composed of J. Q. A. Ward, Daniel C. French, and Augusta St. Gaudens.'

Piccadilly Widening.—The Improvements Committee recommended, and it was agreed—

(a) That the estimate of expenditure on capital account of 30,450l., submitted by the Finance Committee in respect of the widening of Piccadilly to the west of St. James's-street, as shown upon the plan (registered) of property included in such estimate, be approved.

(b) That expenditure not exceeding 30,450l. be sanctioned in respect of the widening of Piccadilly, as provided in resolution (a), the Westminster City Council having agreed to contribute one-seventh of the cost of the improvement; and that the Improvements Committee be authorised to arrange for the said widening."

By-laws for the Good Rule and Government of the County of London.—The Local Government, Records, and Museums Committee recommended—

(a) That the following by-laws for the good rule and government of the County of London be made by the Council in pursuance of the provisions of sect. 23 of the Municipal Corporations Act, 1882, and sect. 16 of the Local Government Act, 1888; that the seal of the Council be affixed to three copies of the by-laws; and that, in accordance with the statute, a sealed copy be sent to the Secretary of State for the Home Department:—'No person shall (1) sweep or otherwise remove from any shop, house, or vehicle into any street any waste paper, shavings, or other refuse, or being a cestermer, newsvendor, or other street trader, throw down and leave in any street any waste paper, shavings, or other refuse; (2) throw down and leave in any street the purser of advertising, any bill, placard, or other substance; (3) throw down and leave in any street any bill, placard, or other paper which shall have been torn off or removed from any bill-posting station. No person shall deposit in any street or public place, to the danger of any passenger, the rind of any orange, banana, or other fruit, or the leaves or refuse of any vegetable. No person shall throw, place, or leave any hotte or any broken glass, nail, or other sharp substance (not being road material) on or in any street, or public place in such a position as to be likely to cause injury to passengers or animals, or damage to property. In these by-laws the expression "street" includes any highway, and any road, bridge, lane, path, footway, news, square, court, alley, or passage to which the public have access for the time being. Any person who shall offend against any of these by-laws shall be liable, for each offence, to a fine not exceeding 6s.'

(b) That the by-laws made by the Council on May 12, 1903, relative to the throwing down in streets of refuse, paper, refuse, advertising bills, broken glass, etc., be repealed as from the date on which the above by-laws come into force."

Victoria Embankment Gardens and the

Metropolitan District Railway Company.—The Parks and Open Spaces Committee recommended (a) that 1,600l., instead of 1,700l., be accepted from the Metropolitan District Railway Company in respect of an easement acquired by the company under the Victoria Embankment Gardens and the Villiers-street approach adjoining, and that the opposition be dropped; (b) that no opposition be offered by the Council to the company hereafter obtaining Parliamentary sanction to the use of the easement acquired by it.

London County Buildings Bill, 1906.—The Parliamentary Committee reported as follows:—

"The London County Buildings Bill came before a Select Committee of the House of Commons, presided over by Mr. Bilson, on April 30, 1906. Mr. J. W. Cleland, M.P., the chairman of the Establishment Committee, was the principal witness on behalf of the Council, and the Council's Architect, the Chief Engineer, and the Valuer gave evidence on technical matters. The only opponents who appeared in support of their petition were the Lambeth Borough Council, who objected to the proposed exemption of sect. 133 of the Lands Clauses Consolidation Act, 1845, which section provides that, where the promoters of an undertaking acquire lands charged with land tax or liable to be assessed to the poor rate, they shall make good any deficiency in the tax or rate until the works are completed; and Messrs. Holloway Bros., who objected strongly to the acquisition of their premises, alleging that there was sufficient space for the new county hall and offices without interfering with their property. The opposition of the borough council was met by striking out of the Bill the exemption from sect. 133 of the Lands Clauses Consolidation Act. The Committee unanimously found the preamble of the Bill proved, and the Bill has been reported to the House."

Resignation of District Surveyors.—The Building Act Committee reported that Mr. Hugh McLachlan and Mr. Charles James Badger, District Surveyors for the western division of the City of London and the district of Lewisham respectively, have resigned their appointments.

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Lines of Frontage and Projections.

St. George, Hanover-square.—The enclosing of a portico in front of No. 21, Hill-street, Berkeley-square (Messrs. Keeble, Limited, for Captain H. S. Clay).—Consent.

Battersea.—A porch to a proposed new church on the eastern side of Altenburg-gardens, Clapham-common (Messrs. Kelly & Dickie for the Rev. G. Grady).—Consent.

Hampstead.—Bay windows at Block B, The Pryors, East Heath-road, Hampstead (Mr. J. E. Yerbury).—Consent.

Hampstead.—A pair of semi-detached houses on the southern side of Netherhall-gardens, Hampstead, with projecting bay, porch, and pent roof (Mr. C. H. Saunders for Dr. J. R. Whit).—Consent.

Kensington, North.—A one-story addition at the rear of the entrance lodge to St. Joseph's Home, Portobello-road, Notting-hill (Mr. W. Daniell for the Sisters of St. Joseph's Home).—Consent.

Lewisham.—Porches in front of Nos. 159, 161, 163, 165, and 167, Hazelbank-road, Hitler Green, Lewisham (Messrs. Norfolk & Prior for Mr. W. Rolfe).—Consent.

Marylebone, East.—Four projecting stone balconies at a building abutting upon Wigmore-street, Welbeck-street, St. Marylebone (Messrs. Wallace & Gibson for Messrs. Debenham, Limited).—Consent.

Northwood.—Six houses on the eastern side of Knight's Hill-road, West Northwood, at the corner of Rothschild-street (Messrs. Hall & Jacobs for Mr. P. Stock).—Consent.

Strand.—Retention of a projecting balcony in front of Nos. 3 and 4, Sherwood-street, Piccadilly (Mr. J. H. Smith).—Consent.

Strand.—The retention of a projecting iron sign in front of the New Theatre, St. Martin's-lane, Strand (Mr. W. C. R. Sprague for Sir Charles Wyndham).—Consent.

Wandsworth.—A one-story shop in front of No. 12, Bective-road, Wandsworth (Mr. H. J. Cadwell).—Consent.

Whitechapel.—That the application of Mr. F. Selby for an extension of the period within which the erection of additions in front of Nos. 49, 51, 53, and 55, Munsell-street, Whitechapel, was required to be commenced and completed, be granted.—Consent.

Chelsea.—Buildings on the south-eastern side

of Fulham-road, Chelsea, to abut also upon College-street and Kimbolton-row (Messrs. Elms & Jupp for Mr. E. Birmingham and Messrs. T. Crapper & Co., Limited).—Refused.

Fulham.—The erection of projecting steps and balconies in front of St. Clement's parish room, Fulham Palace-road, Fulham (Messrs. E. Monson & Sons).—Refused.

Greenwich.—An advertisement board in front of the Greenwich Central Hall, London-street, Greenwich (Mr. G. G. Woodward for the Rev. W. Spencer).—Refused.

Hampstead.—An iron and glass covered way in front of Block B, The Pryors, East Heath-road, Hampstead (Mr. J. E. Yerbury).—Refused.

Marylebone, West.—Buildings on the north-eastern side of Maida-vale, St. Marylebone (Mr. V. S. Galsworthy for the trustees of Harrow School).—Refused.

Stepney.—A one-story building at the Stepney Jewish School, Stepney-green (Messrs. Joseph & Smith).—Refused.

Wandsworth.—A building on the eastern side of Gwendolen-avenue, Putney, adjoining the Putney Wesleyan Church (Messrs. Thomson & Pomeroy for the trustees of the Putney Wesleyan Church).—Refused.

Width of Way.

Whitechapel.—Retention of a roof over a yard at Messrs. Potter & Clark's premises, Artillery-line, Whitechapel, to abut upon Bell-lane (Mr. H. Line for Messrs. Potter & Clarke).—Consent.

Fulham.—Houses on the northern side of Fane-street, North End-road, Fulham (Mr. J. T. Brown for Mr. W. Haxley).—Refused.

Width of Way, Lines of Frontage, and Projections.

St. George, Hanover-square.—The retention of an iron and glass shelter in front of the Adlington-socket entrance to the Ritz Hotel, Piccadilly (Mr. J. P. Bishop for the Building and Vendor Company, Limited).—Consent.

Brixton.—A one-story addition at the rear of the Plough public-house, No. 66, Coldharbour-lane, Brixton, at less than the prescribed distance from the centre of the roadway of Denmark-road (Messrs. F. J. Eddle & Meyers for Mr. C. Martin).—Consent.

Lewisham.—The retention of a wood and iron porch at Netherleigh, Manor-road, Forest Hill, abutting upon Pearcefield-avenue (Mr. F. Penfold).—Refused.

Width of Way and Space at Rear.

Whitechapel.—Buildings on the site of No. 68, Spelman-street and Nos. 76, 78, and 80, Pelham-street, Whitechapel (Mr. J. R. Moore Smith for Mr. J. Donn).—Consent.

Lines of Frontage and Space at Rear.

Hammersmith.—A building upon a site abutting on Blythe-road and Addison-gardens, West Kensington (Col. E. Clarke for Mr. F. Smith).—Consent.

Space at Rear.

Brixton.—A modification of the provisions of sect. 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the south-west side of Camberwell-New-road, Camberwell, adjoining the Athenaeum public-house, with an irregular open space at the rear (Messrs. Barlow, Roberts, & Thompson).—Consent.

Brixton.—A modification of the provisions of sect. 41 with regard to open spaces about buildings, so far as relates to a building on the north-eastern side of Lilford-road, Camberwell, with an irregular open space at the rear (Mr. E. E. Bird for Messrs. L. Whitehead & Co., Limited).—Consent.

Clapham.—A modification of the provisions of sect. 41 with regard to open spaces about buildings, so far as relates to two buildings erected on the southern side of Battersea-rise, Westward of No. 89, with irregular open spaces at the rear (Mr. H. Bignold).—Consent.

Formation of Streets.

Lewisham.—A deviation from the plan sanctioned for the formation of a new street to lead out of the south side of Sydenham-road, Lewisham, so far as relates to an alteration in the position of the boundary at the north-eastern corner of the street (Mr. R. Appleby).—Consent.

Kensington, North.—Further deviations from the plans approved for the formation of new streets on the St. Quintin estate, St. Quintin-avenue, so far as relates to a slight deviation in the direction of street No. 1 (Highlever-road), and in the position of the boundaries of street No. 4 (Messrs. Trant, Brown, & Humphreys).—Consent.

Cubical Extent.

Hackney, North.—Deviations from the plans approved in connexion with Block 2 of a factory building on a site on the west side of Tyssen-street, Dalston-lane, Hackney (Mr. T. B. Whinney for the Marconi Wireless Telegraph Company).—Consent.

Buildings for the Supply of Electricity.

Wandsworth.—The construction of a new roof over the switch room at the County of London Electric Supply Company's generating station, The Causeway, Wandsworth (Mr. C. Thompson for the Company).—Consent.

Working-Class Dwellings.

Limehouse.—A deviation from the plans approved for the erection of dwelling-houses, to be inhabited by persons of the working-class, on a site to the northward of the Rothchild-tunnel approach, between Rose-lane and Butcher's-row, so far as relates to an alteration in the setting out of certain of the blocks (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Conversion of Buildings.

Finsbury, Central.—The conversion of No. 158, Farringdon-road, Finsbury, into a warehouse and stables without complying with the provisions of sect. 41 of the said Act (Mr. J. B. Pinchbeck for Mr. J. May).—Consent.

Alterations of Buildings.

Islington, North.—An addition to No. 13, Highgate-hill, Highgate, without the provisions of sect. 74 of the said Act being complied with (Mr. C. W. Calcott for Mr. J. W. Galton).—Refused.

Sealing.

Fulham.—That the seal of the Council be affixed to a duplicate of the order sanctioning the formation or laying out of a new street for carriage traffic to lead from Fulham Palace-road to Colehill-lane, Fulham.—Consent.

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

Illustrations.

DESIGN FOR A STEEPLE LEADED.



HIS fine and picturesque drawing, which is exhibited in the architectural room at the Royal Academy, was made by Sir Charles Nicholson to illustrate Mr. Weaver's paper on "Leadwork" read before the Institute of Architects on March 19. It shows a decorative steeple faced with leadwork, rising above the crossing of a church.

No particular description is needed of it beyond what the drawing itself furnishes; it is a fine piece of architectural suggestion for the use of a special material.

HOUSE, NEAR GODSTONE.

THIS house is to be built on a site about two miles from Godstone.

The walls will be built of Sussex bricks, with angles of Pasca's hand-made Wrotham bricks. The stonework is Portland. The roof will be covered with deep red, hand-made Wrotham tiles. The cupola is connected with the bachelors' quarters.

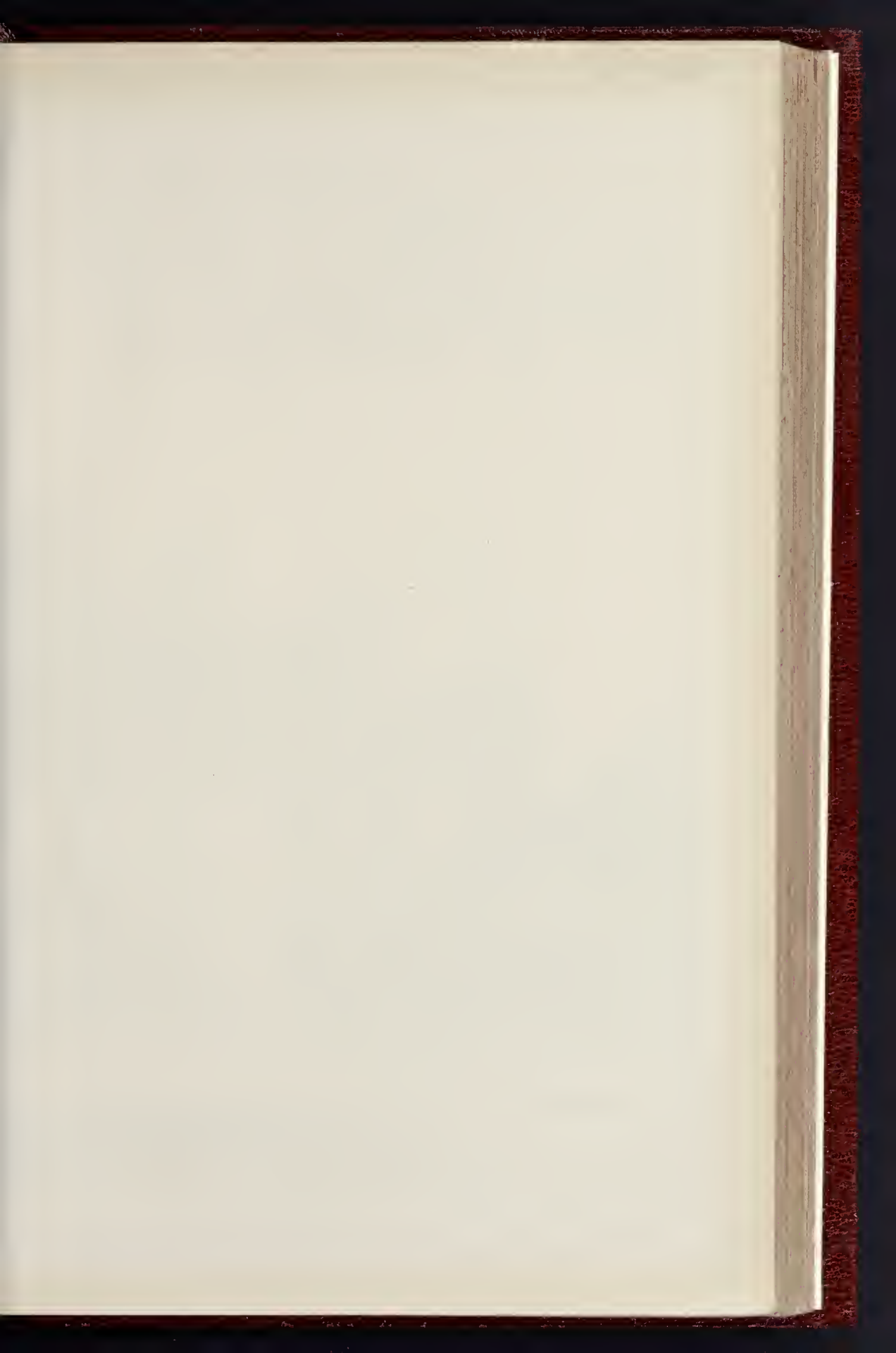
Messrs. Trollope & Sons and Colls & Sons are the contractors for the whole work. The architect for the house and gardens is Mr. Ernest Newton, of Raymond-buildings, Gray's Inn, London.

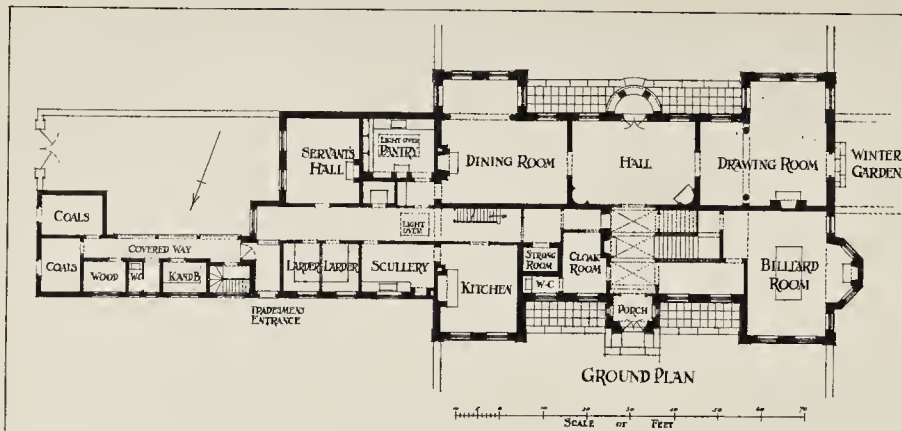
SCULPTURE GROUPS FOR HYDE PARK CORNER.

THIS illustration is from a photograph taken in the sculptor's studio, which shows the work at a certain disadvantage owing to incongruous background of window frame; it would have been hazardous to attempt stopping this out in the photograph, with the risk of encroaching on the outline of the small figures. The model itself is at present in the exhibition at the New Gallery. Those who cannot see it there (as well as those who can) must endeavour to imagine the effect of these groups, in gilt bronze, as they would appear if placed on the well-known Hyde Park screen.

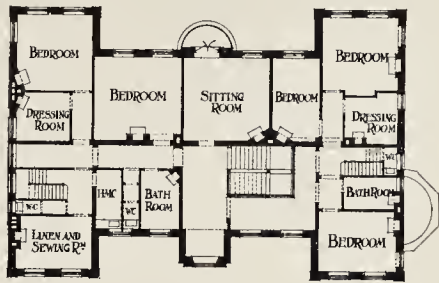
The aim of the artist, Mr. G. Natrop, was to design something absolutely in keeping with the architecture of the screen, as well as to stimulate public interest in the decoration of various bare pieces of architecture, such as the Constitution Hill arch and the Marble Arch, in conspicuous places in London.

The suggestion is an admirable one, and we desire to give our full support to it, and hope that it may receive consideration in official quarters; we do so the rather because we have observed that it has been the object of stupid deprecatory remarks in the press from so-called art-critics who evidently do not understand the relation between sculpture and architecture in works of this kind. Decimus Burton, who designed both the screen and the Constitution Hill arch, specially designed the latter to be crowned by a quadriga group, which has never to this day been carried out; and though we are





"ARDENRUN," G

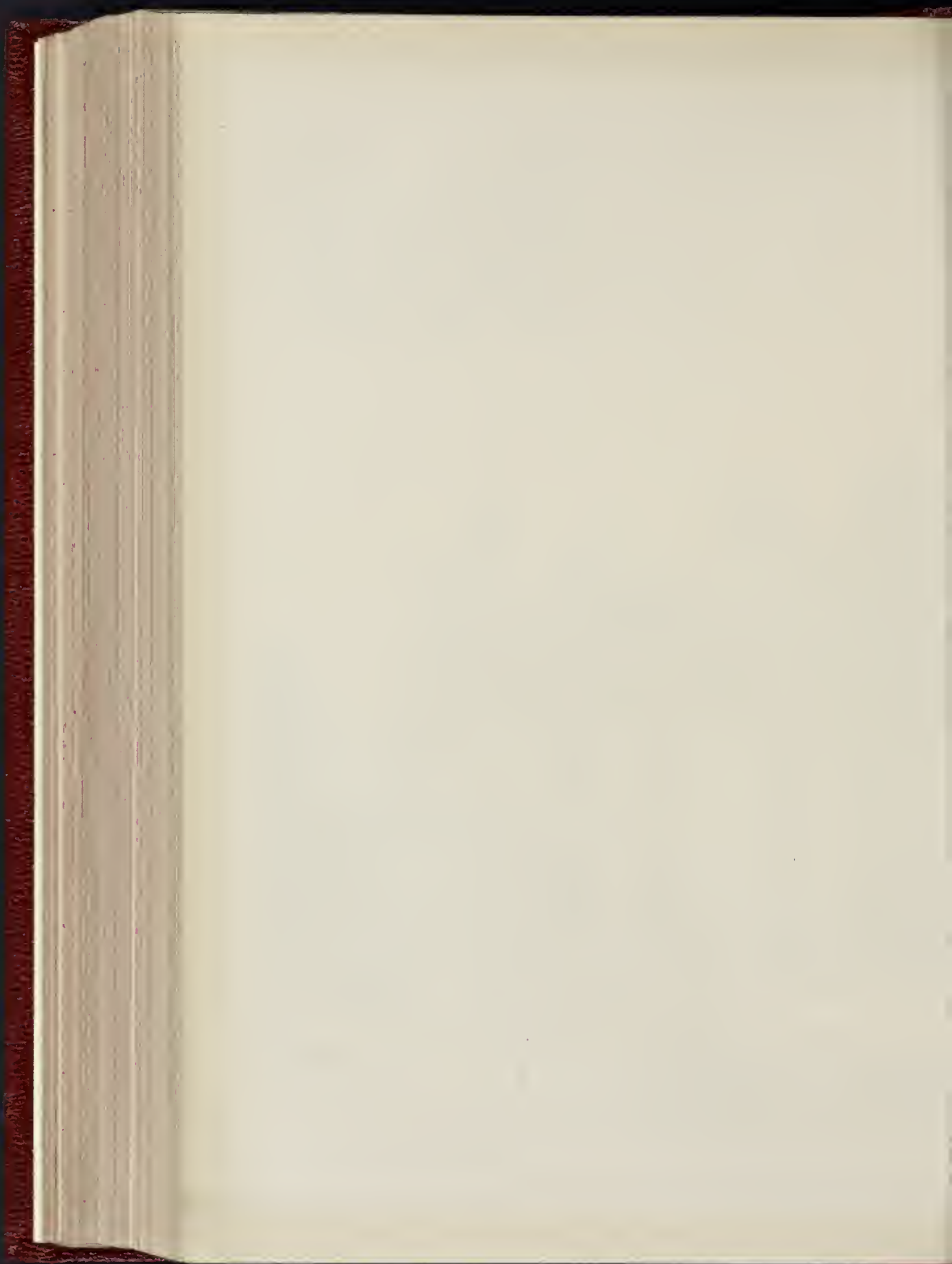


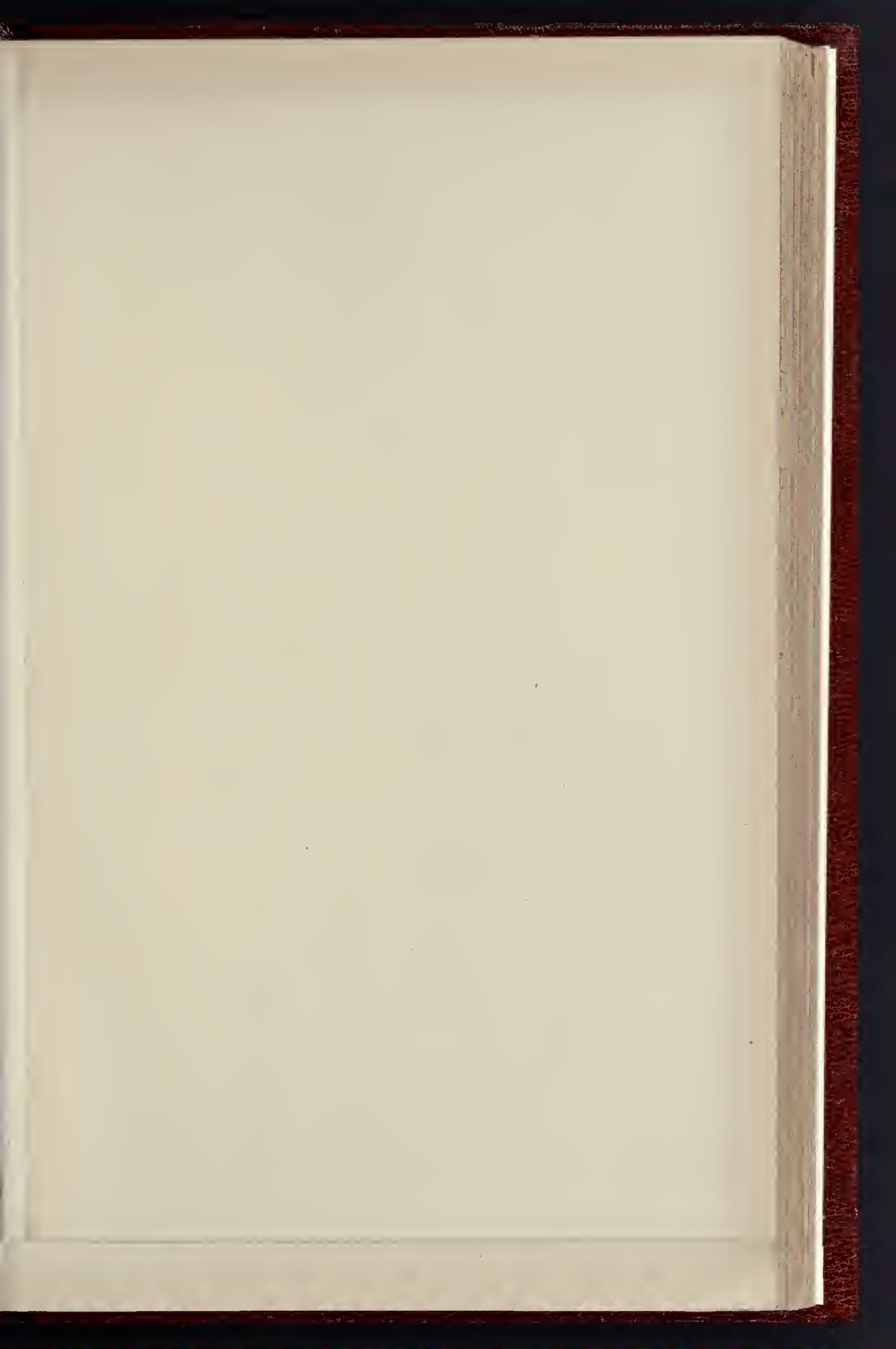
FIRST FLOOR



WYTON NEWMAN - DEL.

PHOTO LITHO SPRAGUE & CO. LITH. 455, EAST HARDING STREET FETTER LANE, E.C.



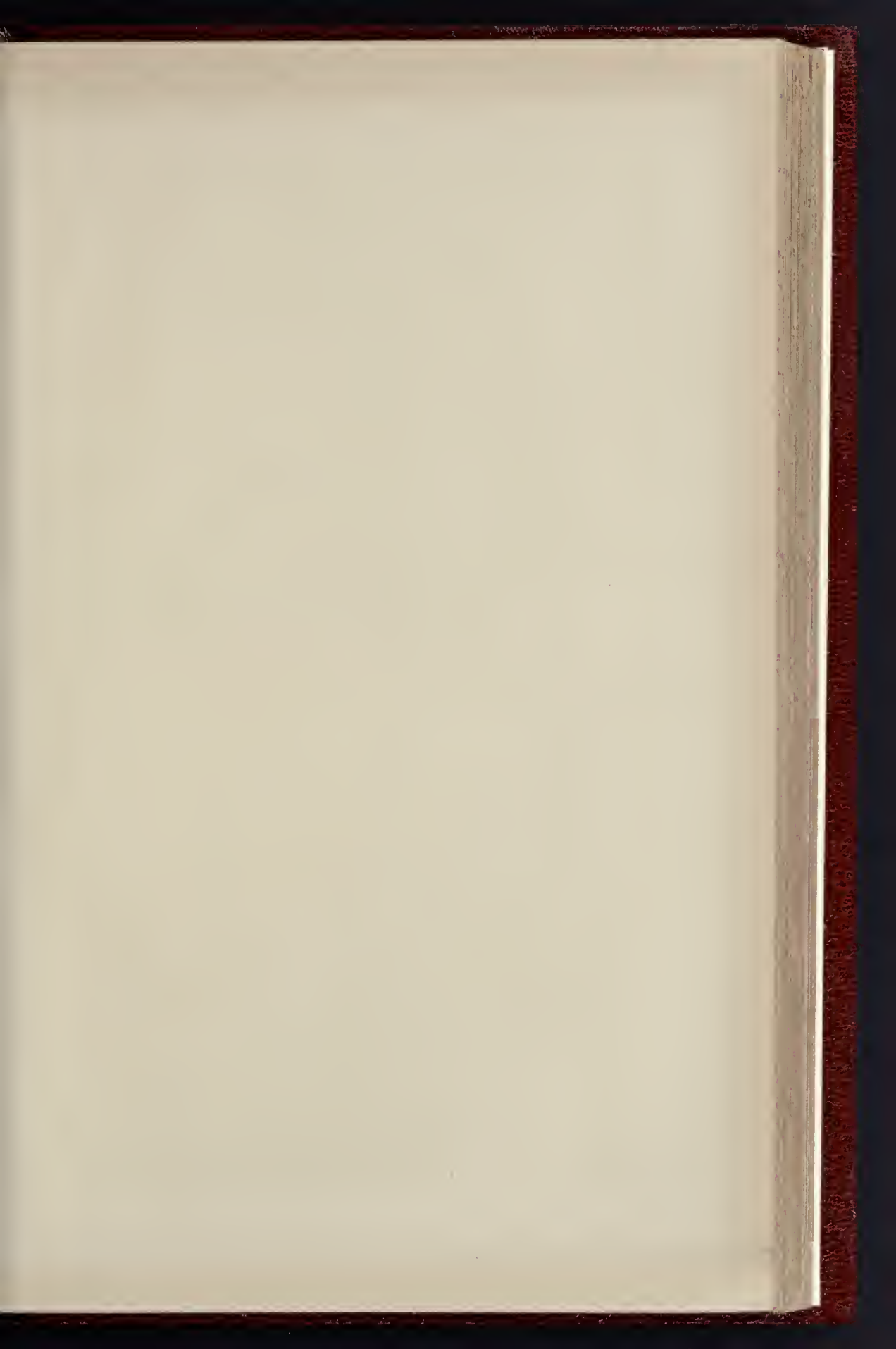




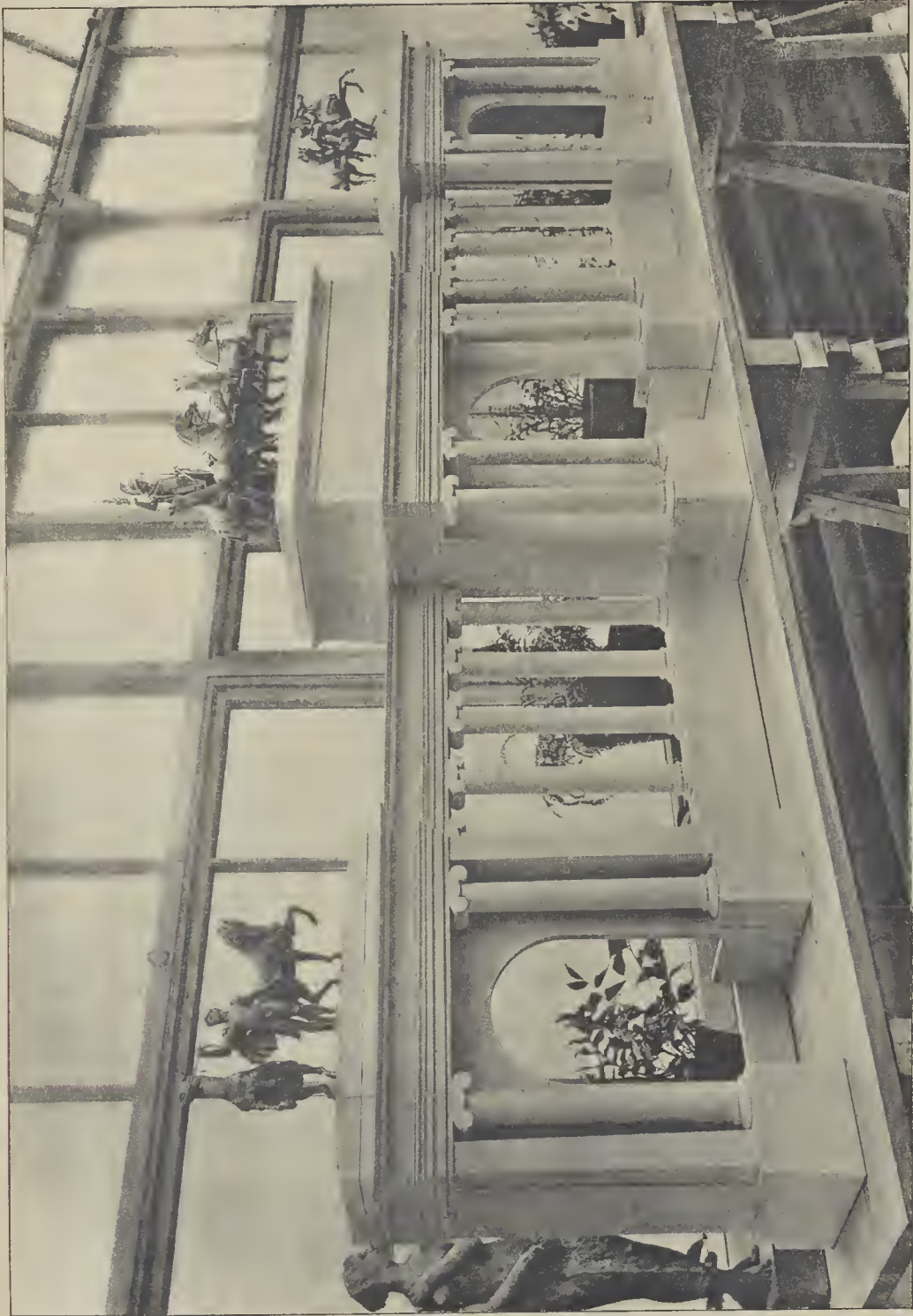
DESIGN FOR A STEEPLE LEADER

C. A. NICHOLSON · INVT ET DELT





THE BUILDER, MAY 12, 1906.





INK PHOTO SPRAGUE & CO. L. 4 & 5 EAST HINDING STREET FETTER LANE E.

"YOUTH'S DREAM OF JOY."—MISS ESTHER M. MOORE, SCULPTOR.
IN THE NEW GALLERY EXHIBITION.

not aware that he left any sketch for the same kind of termination to the screen, we are satisfied that he would have approved of it, and that it would be a very great improvement to the effect of Hyde Park Corner.

"YOUTH'S DREAM OF JOY."

"Youth's Dream of Joy" is intended for an allegory. The boy in the shell-shaped boat is seeing a vision of joy, and is being wafted along on the wings of his dream or fancy. It is only in the coloured plaster, as it has not yet been carried out.

ESTHER M. MOORE.

THE SANITARY INSPECTORS' ASSOCIATION.

On Saturday evening last Mr. W. G. Ker-shaw, of Hampstead, read a paper before the south-eastern centre of this Association at Carpenters' Hall, London-wall, on the "Sanitary Inspector as a Specialist."

The lecturer said that we live in an age of advancement, and the progress made in sanitary science and administration had undoubtedly been one of the most remarkable features of the last half century. They could recall the time when anyone was thought good enough to fill the office of sanitary inspector, and persons were often appointed who had devoted a considerable part of their lives to vocations in no way connected with public health administration. Now none might aspire to the position of sanitary inspector unless qualified by examination at least, and generally by previous training as well. A review of the syllabus of the lectures and demonstrations for the training of officers given by the Royal Sanitary Institute served to convey some idea of the many different matters with which an inspector was called upon to deal, and he was expected to possess a knowledge sufficient to enable him to act promptly and to form a judgment which he might afterwards be called upon to defend under cross-examination, and which might ultimately be the subject of review by the highest tribunals of the land. He was constantly called upon to meet men who were experts in some one or other of the various matters with which it was his province to deal. Thus he might have to discuss with an architect or builder whether an insanitary house was capable of being made fit for human habitation, or whether demolition alone would meet the case. It frequently fell to his lot to instruct and supervise plumbers and other craftsmen in the work of their respective trades, and a Court of Summary Jurisdiction might direct him to say what faults of omission or commission had given rise to a nuisance set up by some complicated trade process, and to specify the steps that must be taken to abate it and prevent recurrence. It need not be wondered at that the question as to what trade, business, or occupation best fitted a man to fill the post should arise; nor need it be a matter for surprise if the average inspector fell short of the ideal. In all the older professions, such as law and medicine, architecture and engineering, it would be found that as the scope of each had extended, so had the tendency for certain members to take up one particular branch increased. Such men had invariably secured for themselves higher remuneration, and had raised the status of the profession to which they belonged. What had taken place with other professions must, he thought, take place in that of the sanitary inspector. The chief aim of every sanitary officer was to arrive at an ideal state of affairs in the shortest possible time, and in his opinion the road lay in the direction of specialisation. He meant that an inspector should devote himself especially to one or the other of the many branches of the work. In London, at least, the tendency to appoint special inspectors for special work was on the increase, and in almost all cases it would be found that those inspectors were in receipt of higher salaries than those who were doing general work. Quite apart from that, however, he thought there could be no question but that the work in those cases was more thoroughly done, and that a higher standard of efficiency prevailed than previously existed.

Replying to questions raised in the dis-

ussion which followed the paper, Mr. Ker-shaw said that it was certainly necessary for an inspector to know something of everything, but that did not preclude him from specialising in one direction. As to the training of youths for taking up the work, he thought it would be desirable that they should have some business training before they entered on the work. There ought not to be specialisation at the expense of the general inspector, but there was no reason why the general inspector should not be in a position to take up special branches of the work.

Architectural Societies.

NORTHERN ARCHITECTURAL ASSOCIATION.—The following is the list of officers and Council of the Association for the session 1906-1907.—*President*—Mr. J. T. Cockett; *Vice-President*—Mr. G. T. Brown; *Hon. Secretary*—Mr. A. B. Plummer; *Hon. Treasurer*—Mr. R. Butts Dick; *Hon. Librarian*—Mr. H. C. Charlewood; *Hon. Solicitor*—Mr. H. C. Harvey; *Council*—Messrs. J. Bruce, J. W. Dyson, C. S. Errington, W. Milburn, J. Oswald, C. E. Oliver, T. Reay, J. Walton Taylor, J. W. Boyd, M. G. Martinson, A. K. Tasker, R. P. S. Tyzack, H. A. Wilson, H. Barnes (Hon. Local Secretary for Hartlepool), F. Clark (Hon. Local Secretary for Darlington), J. Spain (Hon. Local Secretary for Sunderland), and J. H. Morton (Hon. Local Secretary for South Shields).

EDINBURGH ARCHITECTURAL ASSOCIATION.—By permission of Lord Playfair, the members of this Association visited Newbattle Abbey on Saturday last. Mr. A. Hunter Crawford acted as leader, and the members were also accompanied by Mr. Ramsay, clerk of works, under whose supervision the restorations of late years have been carried out. The leader pointed out the position and extent of the abbey before its destruction, and then conducted the party over the crypt and other parts of the abbey which still survive. The members had also the opportunity of seeing the more modern parts of the abbey, in which are some noted paintings. On the motion of the President, Mr. H. O. Tarholton, Mr. Hunter Crawford and Mr. Ramsay received a vote of thanks.

Engineering Societies.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on Monday evening, Mr. Maurice Wilson, President, in the chair, a paper was read on "The Chemistry and Bacteriology of Potable Waters" by Dr. David Sommerville, B.A., M.D., D.P.H., M.R.C.P., Lecturer in Public Health, King's College, London, and of the which the following is an abstract:—The author introduced his subject by pointing out that it touched intimately at many points the profession of engineering. After defining normal and polluted waters, he discussed sources of supply, and laid it down as essential that, owing to the frequently intermittent nature of pollution, systematic and numerous chemical and bacteriological examinations were necessary, and that no report on the safety of a water supply could be considered complete that did not include a careful examination of its source. He proceeded to deal with rain water, surface waters, ground water, and deep wells, dwelling at some length upon the factors which governed the character, and rate and direction of flow, of the ground water. In connexion with the pollution of shallow and deep wells, Dr. Sommerville deplored the fact that too frequently, even on large estates, where the excuse of limited area could not obtain, the well and cesspool were constructed close together. He referred to the fallacious belief that if the well was placed in higher ground than the cesspool, pollution must be out of the question, whilst the only factor of importance in the problem was not the location of the outlet of the well, but the relative position of the cesspool and the point where the water entered the well. Landowners, he said, should not lose sight of the fact that they could only control the

disposition of the surface of their properties. Water examinations were next dealt with, and of four methods at present in use—physical, chemical, biological, and bacteriological—the greater portion of the paper was naturally devoted to the chemical and bacteriological. It was pointed out that where pollution was so gross as to be easily detected by a physical examination, the routine chemical analysis was not only useless, but absurd. A critical examination of some of the more important items in the chemical analysis was made, and the necessity for uniformity of procedure, in certain instances, emphasised. The author pointed out that the consideration of nitrogenous matter had its value, not from the standpoint of absolute amounts, but through the daily relations and variations which appeared in the analytical series. Inorganic constituents should be uniformly expressed as positive and negative ions. Reference was next made to iron and lead in waters, and plumbo-solvency was treated at some length. Chlorine, nitrates, and nitrites were discussed, and nitrification and denitrification fully studied. Hardness was briefly treated, and a ready method for the estimation of carbonates and bicarbonates noticed. The interpretation of the results of the chemical examination was very fully dealt with. It was shown that it was impossible to erect water standards, and that the value of each water must be intelligently estimated on its own merits. The importance of liability to sewage pollution was enforced, as also the fact that positive results in the search for bacteria were much more easily dealt with than negative. In the section treating of the bacteriological examination attention was focused on a few pathogenic bacteria. Three diseases were stated to be almost wholly water-borne—typhoid, cholera, and dysentery. Typhoid touched us most nearly, and although its micro-organism could not usually be isolated from water supplies, bacteriological evidence of its possible presence was derived from the discovery of bacteria characteristic of sewage, especially the *B. coli communis*. The comparative values of the chemical and bacteriological examinations were fully considered, and it was concluded that both had their limits of usefulness, that neither was infallible, that each was assisted by the other, and that the value of either lies in that judgment and skill put into the interpretation of the results which arose only from an intelligent use of a wide and varied experience. Domestic filters were then considered, and, lastly, filtration on the large scale. In conclusion, Dr. Sommerville stated that the ideal treatment of a water supply was thorough protection at its source, continued protection throughout its after-history, and efficient sand filtration prior to distribution.

Competitions.

MUNICIPAL OFFICES, COVENTRY.—It is announced that in the competition, limited to local architects, for new municipal offices on a central site in the city, the premium of 50l. has been gained by Mr. T. F. Tickner. The new site has been acquired at a cost of nearly 60,000l., but the question of proceeding with the premiated designs is, it appears, still under consideration.

PRINCE ROCK SCHOOL COMPETITION, PLYMOUTH.—This competition was confined to architects practising in Plymouth, and sixteen sets of drawings were received. The assessor nominated by the President of the Royal Institute (Mr. H. Dare Bryan, F.R.I.B.A., of Bristol) reported to the education authority placing scheme No. 10 first and bracketing Nos. 4 and 11 for second place. The assessor's report was subsequently unanimously adopted by the education authority, and it was found that Messrs. Thornley & Rooke, of 11, The Crescent, have received the first premium, and that their alternative design also, shared with Mr. A. S. Parker, of 20, George-street, the second premium. Messrs. Thornley & Rooke were in accordance with the assessor's recommendation appointed architects for the new schools. The design of Mr. Priestley Shires was placed third.

HACKNEY PUBLIC LIBRARY.—The Public Libraries Committee reported on Tuesday

that the architect had drawn attention to the following paragraph in the conditions relating to the supply of plans, etc., in connexion with the library competition:—"The architect selected to carry out the work is to supply, for the remuneration aforesaid, a complete set of copies of the contract and all detail drawings, and a copy of the specification, drawings, and quantities for the use of the Council before the building is commenced. He is also to supply copies for the builder, the district surveyor, and (if required) for the London County Council, and on the completion of the building, he is to furnish the Council with a full set of detailed plans, showing the work as executed." He pointed out that this, if carried out to the letter, would mean the preparation of an unnecessarily large number of drawings before the completion of the buildings. The Committee felt that it was not necessary for the Council to insist upon the preparation of the drawings referred to, and had decided to strike out of the paragraph the words, "and all detail drawings."

NORTH WALES COLLEGE, BANGOR.—The selected competitors for the North Wales College, Bangor, are, we understand, Messrs. H. T. Hare, W. D. Carbe, A. Marshall Mackenzie, Arnold Mitchell, and Francis Doyle.

BOOKS RECEIVED.

MODERN BUILDINGS, THEIR PLANNING, CONSTRUCTION, AND EQUIPMENT. Vol. II. Edited by G. A. T. Middleton, A.R.I.B.A. (London: The Caxton Publishing Company, W.C.)

THE COUNTY HOUSE: A PRACTICAL MANUAL OF THE PLANNING AND CONSTRUCTION OF THE AMERICAN COUNTY HOUSE AND ITS SUB-ROUNDINGS. By Charles E. Hooper. (London: B. T. Batsford, 15s. net.)

MEMORIALS OF OLD HAMPSHIRE. Edited by G. E. Jones, M.A., F.S.A. Illustrated. (London: Bennet & Sons, Snow Hill, E.C.)

FINANCES OF GAS AND ELECTRIC LIGHT AND POWER ENTERPRISES. By W. D. Marks. (The Bourse, Philadelphia, Pa.)

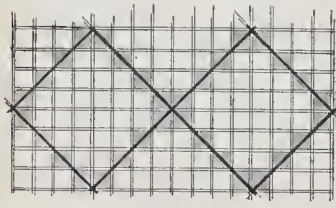
THE TEMPLE OF DEIR EL BAHARI. Part V. By Edouard Naville (Egypt Exploration Fund). (London: Offices of the Fund, 37, Great Russell-street, W.C.)

Correspondence.

THE SAN FRANCISCO REBUILDING SCHEME.

SIR.—It occurs to me in connexion with your remarks (page 456) on the plan for rebuilding San Francisco, that your objection to diagonal roads as producing many triangular sites awkward for building upon might perhaps be met by devoting all those sites to form a diagonal chain of parks or open spaces similar to that which it is proposed to provide as a zone.

I send two rough diagrams to indicate the sort of thing to be aimed at. In these the diagonal



and zonal roads are black, the gridiron roads indicated by double lines and the open spaces are hatched in, while squares for building blocks are left white. If it should be found that such a scheme provided too much open space, the triangular sites would form, if made large enough, suitable open sites for detached buildings, whether public or private, set well within and so largely unaffected by the triangular bounding lines.

Of course it can only be seen whether the idea has any value by taking an actual set of circumstances and endeavouring to apply it.

W. B. HOPKINS.

KERSWILL v. THE WAR OFFICE.

SIR.—The paragraph in your issue last week (page 500) is accurate, but incomplete, and has

the effect of making the award as to costs seem remarkable. The bulk of the "award" of 3,017, 4s. 8d. had been paid to Mr. Kerswill a considerable time before the arbitration. The result of the proceedings before Mr. Steming was an additional payment of 317, 4s. 8d. only. K.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XVIII.

LOGARITHMIC CALCULATIONS.

IN Article XIV., page 412, we gave a tabular statement showing the manner in which the proper value of the characteristic of any logarithm can be assigned without hesitation. The general rules for *positive* and *negative* characteristics are:—

Rule (1).—The characteristic of any number greater than unity is *positive*, and its numerical value is 1 lower than the number of figures to the left of the decimal point.

Rule (2).—The characteristic of any number less than unity is *negative*, and its numerical value is 1 higher than the number of ciphers to the right of the decimal point.

The addition and subtraction of characteristics is sometimes a stumbling-block to those who are not familiar with the use of logarithms, and the association of *negative* characteristics with *positive* mantissae is also a little confusing at first.

In dealing with characteristics, it is important to bear in mind the rules of algebraic addition and subtraction, which are repeated here as a matter of convenience:—

(1) To add two positive quantities, take their sum and make it positive.

(2) To add two negative quantities, take their sum and make it negative.

(3) To add a positive and a negative quantity, take their difference, and give it the sign of the greater quantity.

(4) To subtract a negative quantity, change the sign and add.

(5) To multiply a negative quantity, follow the ordinary rule and make the product negative.

(6) To divide a negative quantity, follow the ordinary rule and make the product negative.

In addition to these simple rules, it is necessary to bear in mind that the effect of adding together two or more mantissae is to increase the value of the final characteristic when the addition provides a figure to be carried to the left of the decimal point, and that the effect of subtracting mantissae one from another is to decrease the value of the final characteristic when a figure has to be borrowed from the left of the decimal point.

The following examples will make clear the method to be adopted in dealing with the characteristics of logarithms:—

Example (1): Addition with two positive characteristics.

$$\begin{array}{r} 1.8470 \\ 3.8774 \\ \hline 4 + 1.7244 = 5.7244 \end{array}$$

Example (2): Addition with two negative characteristics.

$$\begin{array}{r} 1.8470 \\ 3.8774 \\ \hline \bar{4} + 1.7244 = 3.7244 \end{array}$$

Example (3): Addition with one negative and one positive characteristic.

$$\begin{array}{r} 1.8470 \\ 3.8774 \\ \hline \bar{2} + 1.744 = 1.7244 \end{array}$$

Example (4): Subtraction with two positive characteristics.

$$\begin{array}{r} 1.8470 \\ 3.8774 \\ \hline 1 - (3 + 1)9696 = 3.9696 \end{array}$$

Example (5): Subtraction with one negative and one positive characteristic.

$$\begin{array}{r} (a) 1.8470 \\ 3.8774 \\ \hline 1 - (\bar{3} + 1)9696 = 3.9696 \end{array}$$

$$\begin{array}{r} (b) 3.8774 \\ 1.8470 \\ \hline 4-0304 = 4-0304 \end{array}$$

Example (6): Multiplication with a negative characteristic.

$$\begin{array}{r} \bar{3}.8774 \\ 4 \\ \hline \bar{12} + 3.5096 = 9.5096 \end{array}$$

Example (7): Division with a negative characteristic.

$$\begin{array}{r} 3)9.5096 \\ \underline{7.1698+} \end{array}$$

In a case like that in example (7), where the negative characteristic happens to be a multiple of the divisor, the ordinary mode of procedure gives the result without any difficulty, but if, as frequently happens, the negative characteristic is not exactly divisible, some expedient must be employed to obviate the necessity for carrying a *negative* remainder to the first figure of the *positive* mantissa.

The method to be adopted is expressed in the rule given below:

Rule (5).—To divide a logarithm having a negative characteristic which is not a multiple of the divisor, add such a negative number to the characteristic as will make it a multiple of the divisor, and prefix to the mantissa a positive integer of equal value. Then divide separately the increased negative characteristic and the other part of the logarithm, and the first quotient so obtained, with negative value, will be the characteristic of the mantissa, represented by the second quantity.

Of course, the addition of a *minus* quantity to the characteristic, and the preposition of an equivalent *plus* quantity to the mantissa, makes no alteration in the value of the logarithm, for such factors neutralise each other.

Example (8): Division with a negative characteristic which is not a multiple of the divisor.

$$9.5096 \div 4.$$

Here 3 must be added to the characteristic, so that the sum 12 may be divisible by 4, and at the same time 3 must be prefixed to the mantissa. Thus

$$\begin{array}{r} 9.5096 \div 4 = \bar{12} + 3.5096 \div 4 \\ 4)\bar{12} + 3.5096 \\ \hline \bar{3} + 0.8774 = 3.8774. \end{array}$$

The succeeding examples are intended to make clear the application of logarithms to practical calculations, and the immense saving of time to be effected by their employment.

In order to facilitate comparison of logarithmic computations with those performed by the ordinary rules of arithmetic, some of the examples involve the same factors as were used in previous examples, and as a matter of general convenience to the reader, we have employed *four-figure* logarithms and antilogarithms throughout, of which examples are given in Tables XIV. and XV. More accurate results can be obtained if desired by using logarithms carried to more places of decimals.

Although we have given the characteristic in every instance, the rule in practice is to write the logarithms from the table without stopping to add the characteristics, as these can be dealt with more expeditiously at the end of any given calculation. The only exceptions to this rule occur in connexion with involution and evolution, where the characteristics have to be multiplied and divided, respectively.

Multiplication.

Example (9): Multiply 58.45 by 8.7341 (Ex. (1), p. 147).

$$\begin{array}{l} \log. 58.45 = 1.7682 \\ \log. 8.734 = 0.9412 \end{array}$$

$$\begin{array}{l} \text{antilog. } 2.7094 = 512.2 \\ \text{Result, correct to four figures.} \end{array}$$

Example (10): Multiply 67.5941832 by 9.315764 (Ex. (2), p. 147).

$$\begin{array}{l} \log. 67.60 = 1.8299 \\ \log. 9.316 = 0.9692 \end{array}$$

$$\begin{array}{l} \text{antilog. } 2.7991 = 629.6 \\ \text{Result, correct to four figures.} \end{array}$$

Example (11): Multiply 83641253 by 4657

(Ex. (3), p. 147).

$\log. 8364 = 7.9224$

$\log. 4657 = 3.6682$

antilog. $11\ 5905 = 389,500,000,000$
Result, correct to four figures.

Division.

Example (12): Divide 512.2122945 by 58.645

(Ex. (1), p. 206).

$\log. 512.2 = 2.7095$

$\log. 58.64 = 1.7682$

$0.9413 = 8\ 736$

Result, correct to three figures.

This is a case where the divisor evidently should be increased, and by taking its *log* as 1.7683 the result is given correct to four figures.

Example (13): Divide 6843580648 by 7324

(Ex. (4), p. 203).

$\log. 6843 = 9.8353$

$\log. 7324 = 3.8647$

antilog. $5.9706 = 934.600$

Result, correct to three figures.

In this case the figures suggest that a more correct result should be given by increasing the dividend to 6844. But this would not be so. Comparison of *log.* 7324 and *antilog.* 8647 indicates the reason.

Approximations.

Example (14): Find the cost of 12.184 tons of steel bars at 7.5212l. per ton (Ex. (1), col. 3, p. 267).

$\log. 12.18 = 1.0856$

$\log. 7.521 = 0.8763$

antilog. $1.9519 = 91.6 (l.)$

Result, correct within about sevenpence.

Example (15): Find the value of 0.5387376 acre at 670l. per acre (Ex. (2), p. 267).

$\log. 0.5387 = 1.7314$

$\log. 670 = 2.8261$

antilog. $2.5575 = 361 (l.)$

Result, correct to within elevenpence.

Example (16): Find the cost of 54.6 tons of Portland cement at 2.125l. per ton (Ex. (3), p. 238).

$\log. 54.6 = 1.7372$

$\log. 2.125 = 0.3273$

antilog. $2.0615 = 116.0 (l.)$

Result, correct within sixpence.

Proportion.

Example (17): Find the value of *x* in the proportion 634.6 : 0.03435 :: 795.8 : *x*.

$\log. 0.03435 = 2.5359$

$\log. 795.8 = 2.9008$

1.4367

$\log. 634.6 = 2.8025$

antilog. $2.6342 = 0.04307$

Result, correct to five places.

Involution.

Example (18): Find the squares of 0.0156, 0.7854, 1.424, and 23.750.

Logs.

Squares.

$0.0156 = 2.1931 \times 2 = 4.3862 = 0.0002433$

$0.7854 = 1.8951 \times 2 = 3.7902 = 0.6169$

$1.424 = 0.1535 \times 2 = 0.3070 = 2.028$

$23.750 = 1.3756 \times 2 = 2.7512 = 563.9$

Find the values of 2.913³, 0.8749³, 1.004365³.

Logs.

Powers.

$2.913 = 0.4643 \times 3 = 1.3929 = 24.71$

$0.8749 = 1.9419 \times 5 = 9.7095 = 0.5123$

$1.003 = 0.0012 \times 365 = 0.4380 = 2.742$

Evolution.

Example (19): Find the square root of 62.09645.536 (Ex. (1), p. 296).

$\log. 62.09645 = 7.7981$

divided by 2 = 3.8990

antilog. 3.8990 = 7925

Result, correct to four figures.

Example (20): Find the square root of 168,558,289 (Ex. (2), col. 2, p. 296).

$\log. 168558289 = 8.2269$

divided by 2 = 4.11345

antilog. 4.11345 = 12,985

Result, correct to four figures.

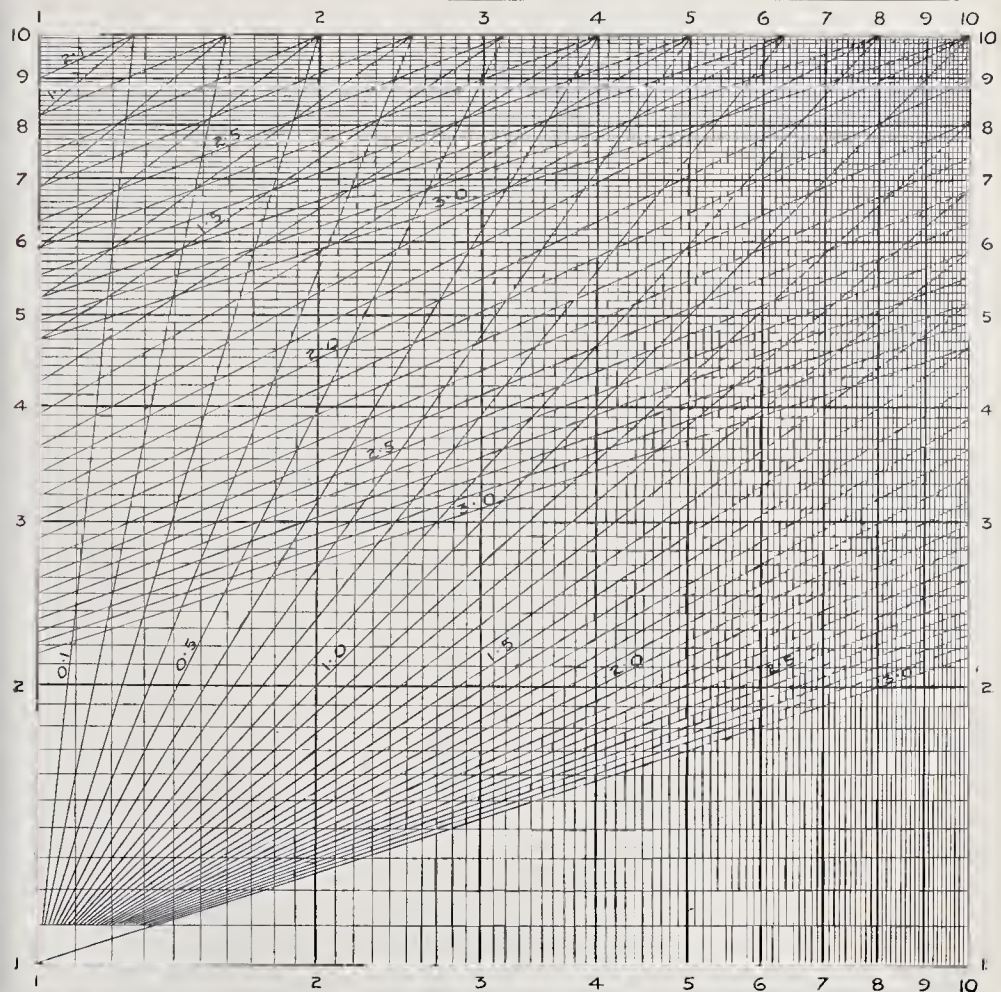


Fig. 1. Logarithmic Diagram.

Example (21): Find the value of
 $\sqrt[3]{\frac{0.5 \times 43560}{3.1416}}$ (Ex. (4), col. 2, p. 297).
 log. 0.5 = 1.6990
 log. 43560 = 4.6391
 4.3381
 log. 3.1416 = 0.4971
 2)3.8410
 1.9205 = 83.28
 Result, correct to three figures, or within 0.02.
Example (22): Find the cube root of
 823128.75 (Ex. (1), p. 325).
 log. 8231+ = 5.9155
 divided by 3 = 1.9718
 ant log 1.9718 = 93.71
 Result, correct to four figures, or within 0.004.
Example (23): Find the cube root of 175616
 (Ex. (3), p. 326).
 log. 1.756+ = 5.2445
 divided by 3 = 1.74816 (say 1.7482)
 antlog. 1.7482 = 56

Example (24): Find the value of $\sqrt[3]{\frac{2 \times 32.1}{3 \times 3.1416}}$

Numerator.	Denominator.
log. 64.2 = 1.8075	log. 4 = 0.6021
less denom. log. 0.6221	log. 3 = 0.4771
divide by 3)1.1854	0.2350
0.3951	log. 3.1416 = 0.4971
	0.6221

 ant.log. 0.3951 = 2.484.
Example (25): Find the 54th root of 30,985
 log. 30.98(5) = 4.4912
 divide 4 by 54 = 0.0831(7)
 antlog. 0.0831(7) = 1.211+
Example (26): Find the value of
 $\sqrt[3]{\frac{7648^2 \times 1.025 \times 36}{4376 \times 3600 \left(\frac{180}{13}\right)}}$

Numerat.	Denominator.
log. 7648 = 3.8836	log. 180 = 2.2553
multiply by 2.5	log. 13 = 1.1139
194180	divide by 2)1.1414
77672	0.5707
9.70900	log. 3600 = 3.5563
log. 1.025 = 0.0107	log. 4376 = 3.6411
log. 36 = 1.5563	7.7681
11.2760	
less denom. log. 7.7681	
divide by 3)3.5079	
1.1693	
antlog. 1.1693 = 14.77.	

Miscellaneous Calculations.
Example (27): Find the breaking weight in tons of a round steel strut 3 in. diameter by 8 ft. long, both ends being jointed, employing Gordon's formula $P = \frac{fS}{1 + 4a\left(\frac{l}{d}\right)^2}$ with the values:
 $f = 30$ tons, $a = \frac{1}{1400}$, $S = (0.7854 \times \pi^2)$,
 $l = 96$ in., $d = 3$ in., $\frac{l}{d} = 96 \div 3 = 32$.
 $P = \frac{30 \times (0.7854 \times \pi^2)}{1 + 4 \times \frac{1}{1400} \times 32^2}$

Numerator.	Denominator.
log. 30 = 1.4771	log. 32 = 1.5051
log. 7854 = 1.8951	multiplied by 2
log. 9 = 0.9542	3.0102
2.3254	log. 1400 = 3.1461
less denom. log. 0.5938	1.8641
1.7326	log. 4 = 0.6021
	0.4692
	antlog. 0.4692 = 2.925
	add 1 1.000
	3.925
	log. 3.925 = 0.5938

 Antilog. 1.7326 = 54.03, and the required breaking weight = 54.03 tons.

Example (28): Find the discharge of water in gallons per minute by a 7-in. diameter pipe, 3,797 yds. long, with 45-ft. head of water in feet, using the equation
 $G = \sqrt{\frac{(3 \times 7)^3 \times 45}{3797}}$
 log. (3 x 7) = 1.3222
 multiply by 3 = 3.9666
 log. 45 = 1.6532
 5.6200
 log 3797 = 3.5794
 divide by 2)1.6848
 2.3424
 antlog. 2.3424 = 220 (gallons).

Logarithmic Diagrams.
 Another illustration of the uses to which the principle of logarithms may be applied is given in Fig. 1, by which the powers and roots, from 0.1 to 3, of any natural number can be obtained without calculation of any kind. The great advantage of logarithmic paper is that hyperbolic and parabolic curves of all degrees may be very readily drawn, because all such and many other curves occurring in practical work become straight lines when plotted on paper so ruled. Only two co-ordinate points have to be found, and when connected by lines all intermediate values are correctly given.

Logarithmic paper can also be applied with advantage in preparing diagrams of variation of bending moment, shearing stresses, and deflection in beams; curves giving loads for different spans of girders and joists; curves for the discharge of water in pipes and channels, for loss of head due to friction in pipes; and various other diagrams useful in connexion with architectural and engineering practice.

As Fig. 1 can be used for the multiplication and division of any numbers, as well as for involution and evolution, it is available for finding without calculation the value of any expression where these processes are indicated; but for very accurate results the diagram would have to be drawn larger and the spaces further subdivided.

The following rules explain the manner in which the diagram can be used. For convenience the horizontal scales are here termed "A" and the vertical scales "B":—

Rule (1).—Multiplication.—Set the L.H. point of a pair of dividers at 1 on A, and the R.H. point at the multiplicand; set the R.H. point of the dividers at 1 and the L.H. point on a continuation of the horizontal line. Open the dividers wider so that the R.H. point reaches the multiplier; then set the L.H. point at 1, and read the answer at the R.H. point on A.

Rule (2).—Division.—Set the R.H. point of the dividers at the dividend on A and the L.H. point at the divisor; then set the L.H. point at 1, and read the answer at the R.H. point on A.

Rule (3).—Involution.—Find on B the number whose power is required; follow the corresponding horizontal line to the point of its intersection with the required curve, and read the result on A.

Rule (4).—Evolution.—Find on A the number whose root is required; follow the corresponding vertical line to the point of its intersection with the required curve, and read the answer on B.

*Example (29).—*Find the value of
 $(2) \sqrt[3]{1.5 \frac{3.142 \times 80}{0.3551^{1.20}}}$
 (1) Find the value of 5.142⁸⁰ by Rule (3) open the dividers to the corresponding length measured from 1 on A. (This value reads 7.85.)
 (2) Find the value of 0.3551^{1.20} by Rule (3), and note the position on A. (This value reads 0.46.)
 (3) Divide 5.142⁸⁰ by 0.3551^{1.20} by Rule (2). (The quotient reads 17.)
 (4) Multiply the quotient into 1.5 by Rule (1). (The product reads 25.5.)
 (5) Find the cube root of the product by Rule (4). (The cube root reads 2.95.)
 (6) Multiply the cube root into 2 by Rule (1).
 The answer read at the R.H. point of the dividers on A is 59 = 5.9.

SALE OF BOOKS ON ARCHAEOLOGY, ARCHITECTURE, AND THE FINE ARTS.

The following were amongst the lots disposed of at a four-days' sale last week by Messrs. Sotheby, Wilkinson, & Hodge, at their rooms in Wellington-street, Strand:—
 "The Illustrated Handbook of Architecture," by J. Ferguson, 1859, and "Domestic Architecture in England," by T. H. Turner, Oxford, 1851, 1l. 10s.; "History of the Modern Styles of Architecture," by J. Ferguson, 1862, Handbook of the Arts of the Middle Ages and Renaissance," by J. Labarte, 1855, and "Cleanings from Westminster Abbey," by George Gilbert Scott, 1863, 1l. 9s.; "Domestic Architecture of the XIVth and XVth Centuries," by J. H. Parker, 3 vols., Oxford, 1853-9, 1l. 18s. (Bumpus); "Brick and Marble in the Middle Ages," 1855, and G. E. Street's "Account of the Abbey of St. Albans," by Rev. P. Newcome, with plates, 1795, and M. Archdall's "Monasticon Hibernicum," with map, 1784, 1785, 1l. 6s. (Sotheby); "Treatise on Chancel Screens and Rood Lofts," by A. W. Pugin, with plates, 1851, and "Illustrations of Medieval Costume in England," by Day & Dives, 1l. (Thorpe); J. Rutter's "Delineations of Fonthill and its Abbey," 1823, and G. Petrie's "The Ecclesiastical Architecture of Ireland," 1844, (Commins); "The Churches of London, Yorkshire, and Lancashire," 3 vols., 1718-23, 2l. 14s. (Miss Ram); "The Mansions of England in the Olden Time," by J. Nash, 4 vols., with lithographic plates, 1839-49, 8l. (Sotheby); "Excavations in Cranborne Chase, near Rushmore, Bokerly and Wansdyke, Dorset and Wilts., etc.," by King John's House, Jollard Royal, Wilts., and "Antique Works of Art from Benin," all by Lieut.-Gen. Pitt-Rivers, privately printed, 1887-1900, 5l. (Quaritch); "Ancient Crosses in East Cornwall," by J. T. Bilgitt, 1858, "Designs for Church Embroidery," 1894, "On Chancel Screens and Rood Lofts," by A. W. Pugin, illustrated, 1851, and "Notable Churches of London, Yorkshire, and Lancashire" (no date), 19s.; "History and Antiquities of St. David's," by W. B. Jones and E. A. Freeman, with plates, 1856, and "Wells Cathedral: its Monumental Inscriptions and Heraldry," by A. J. Jewers, 1892, 1l. 5s. (Edwards); "Ancient Sepulchral Monuments," by W. Brindley and W. S. Weatherley, 21s. plates, 1887, 1l. 15s. (Hill); John Brown's "History of the Metropolitan Church of St. Peter, York," with plans, sections, and engravings, 2 vols., 1847, 13s.; "Memorials of English Medieval Churches," by Charles Wickes, 37 large plates, 1857, 6s.; "A History of the Gothic Revival," by C. L. Eastlake, with plates and illustrations, 1872, 2s.; "Westminster Abbey," by Fulleylove & Smith, 21 coloured plates, 1904, and "Reliques of Old London," by Way & Wheatley, 24 plates, 1896, 1l. 1s. (Edwards); "Illustrated History of Furniture from the Earliest to the Present Time," by Fred. Litchfield, numerous illustrations, 1892, 9s.; "Westminster Abbey Historically Described," by Fenese & Micklethwaite, 75 plates, 1899, 1l. 16s. (Edwards); "Oxonia Antiqua Restaurata," by J. Skelton, 2 vols., 170 engravings of the buildings in Oxford, 1823, 10s.; "Venus and Apollo in Painting and Sculpture," by W. J. Stillman, 1897, 18s.; "English Interior Woodwork of the XVth, XVIIth and XVIIIth Centuries," by H. Tanner, 60 plates, 1902, 1l. 5s. (Parsons); "Etchings of Old London," by Ernest George, 1884, 17s.; "Anecdotes of Painting in England," by Horace Walpole, with considerable additions by the Rev. J. Dallaway, including catalogue of engravings, 1826-28, 4l. 18s. (Edwards); Ruskin's "Lectures on Architecture and Painting," and "Pre-Raphaelitism," first editions, 5s.; "Watteau's Ornamental Designs. Collected from his Works," by W. Nichol, Edinburgh, 1841, 1l. 8s. (Sotheby); "Architectural Remains of the Reigns of Elizabeth and James I.," by C. J. Richardson, 1840, with 30 tinted plates, 15s.; "History of Woburn Abbey, Hardwicke Hall, and Hatfield House," by P. F. Robinson, fine plates on India paper, 1827-35, 1l. 8s. (Luceok); Spitzer Collection—Antiquité, Moyen Age, Renaissance—6 vols., printed on vellum, paper, coloured, and other plates, imperial folio, Paris, 1890-2, 32l. 10s. (Edwards); "Architecture of the Renaissance in England," by J. A. Gatch, six parts, numerous plates, 1891-4, 4l. 14s. (Quaritch); "The Ancient Stone Implements. Weapons and Ornaments of Great Britain," by J. Evans, 1872, and Dr. C. Schuchhardt's "Schillerhans's Excavations," 1891, 12s.; "Stained Glass as an Art," by H. Hollis, 1896, 10s.; "The History of Modern Painting," by R. Muther, 3 vols., 1895, 2l. 12s. (Hill); "A History of Greek Sculpture," by A. S. Murray,

17s.; "Treasures of Art in Great Britain," by Dr. Waagen, 4 vols., 1854-7, li 12s. (Sotheman); "Sculptured Tombs of Hellas," by P. Gardner, 1896, and "The Bible of St. Mark, St. Mark's Church, The Altar and Throne of Venice," by A. Robertson, 1898, li (Bull); "Man in Art, Studies in Religions and Historical Art, Portrait and Genre," by P. G. Hamerton, 1892, 12s.; "Histoire de l'art pendant la Renaissance Italique," by E. Müntz, 2 vols., Paris, 1889-95, 6l. 5s. (Rimell); "Leonard da Vinci: l'Artiste, le Penseur, le Savant," by E. Müntz, 28 plates, 1899, li. 1s. (Rolandi); "History of Painting," by Woltmann & Woermann, edited by Sidney Colvin, 2 vols., 1890-7, li. 6s. (Rimell); "Pictures in the National Gallery," by Sir C. L. Eastlake, 2 vols., plates, 1845-7, 10s. (Gages); "British Miniature Painters and Their Works," by J. J. Foster, 59 plates (only 125 copies printed), 1898, li. 1s. (Halewood); "Great Masters—the Finest Works of the Finest Painters," with introduction and descriptive text by Sir Martin Conway, in 25 parts, with photographic reproductions, by G. Piranesi, 4 vols., 1880, 2l. 14s. (Edwards); "Landscape," by P. G. Hamerton, 43 etchings and other engravings, 1885, li. 11s. (Rimell); "Greek Vase Paintings," by Harrison & MacColl, 1894, 15s.; "Lo Antichità Romane," by G. Piranesi, 4 vols.; "Rome, 1764 and two other wars, by the same author, 12, 10s. (Young); "Picturesque Views in England and Wales," by J. W. M. Turner, with descriptive and illustrative illustrations, by H. E. Lloyd, 2 vols., 1838, 9l. (Young); "Masterpieces of Industrial Art and Sculpture at the International Exhibition of 1889," by J. B. Warren, 4 vols. (Hunt); "Nice Gallery of Marbles"—engravings of the statues, busts, bas-reliefs, gems, bronzes, urns, etc., in the Collection of H. Blundell, 2 vols., nearly 100 plates, 1809 (only 50 copies privately printed), 5l. 12s. 6d. (Gaston); "Antiquities of England and Wales," by Francis Green, 8 vols., plates, 178, li. 15s. (Sotheman); "Environns of London," by D. Lysons, 5 vols., maps, portraits and plates, 1790-1800, 2l. (Edwards).

LONDON COUNTY COUNCIL DRAINAGE BY-LAWS.

The following joint report from the Borough Engineer and the Medical Officer of Health for Southwark upon the suggestion that by-law No. 5 of the series of by-laws made by the London County Council under sect. 202 of the Metropolitan Management Act, 1855, should be repealed, was issued on Tuesday:—

"With reference to the construction of by-law 5 the question of the advisability of amending this law so as to do away with the intercepting-trap is one which must be approached with great care, although there are a great many points in favour of abolishing the interceptor. One of the most important of these is that freer ventilation would be possible, and secondly the question of the intercepting-trap in connection with sewers and decomposing to take place. Both these are important factors, and there is no doubt that under perfect conditions of drains and sewers, with perfectly sound drains and sewers and guaranteed construction, theoretically it would be an advantage to have a free flow of air from the sewer passing up through the outlet or ventilation of the drains. If these conditions are not possible, it would be, in our opinion, a great risk to do away altogether with the interceptor. It is impossible that all sewers and drains shall be absolutely perfect, for, however well constructed in the first place, the work is bound to deteriorate and defects will arise whereby the sewage is held and allowed to decompose and give off dangerous gases which would find their way into private premises. Again, the time for sewage to pass from some distant parts of London to the outfall is such that the sewage must have decomposed when passing through the sewers of other districts. With those unavoidable circumstances, this is one of those unfortunate double arrangements which so often occur in the London County Council by-laws, and which have tended in the past to so many failures in litigation and so much expense to local authorities. The latter part of the section does not explicitly say what is required. In sect. 4 of the London County Council by-laws in the Clapton Buildings, it is stated 'Means of access must be provided at each end of a drain beneath a building.' When this access does not provide adequate means of access to the trap it is stated in sect. 5 'A separate manhole or other separate means of access to such trap for the purpose of cleansing the same shall be provided.' As the by-law does not state it is not compulsory to provide a manhole near the interceptor provided the means of access to the trap is proved adequate, in the opinion of the magistrate, for its cleansing. In places where a number of branch drains concentrate at the front, or where the outlet of the drain is 9 ft. to 10 ft. deep, we think, must be provided to give adequate access to the drain and trap. Differences of opinion exist as to whether

a manhole should be provided in all cases at the outlet of the drain near the interceptor. In the Paddington cases, where a vertical plunging arm was provided on the house side of the trap, it was held by the magistrate that the adequate means required by the by-law had been provided. The practice in Southwark has been on the side of providing a manhole at the front and back of the building in all cases. In all newly-built houses no difficulty whatever has been experienced in obtaining them. In reconstructing drains of old houses, we always demand in our notices these two manholes, but we are frequently met by a refusal on the part of the owner to provide the one at the outlet of the drain near the intercepting-trap, the owner providing in lieu thereof a vertical plunging arm on the house side of the trap and a raking arm to the outgo of the interceptor. We consider that such access to the trap and drain by these two arms is a makeshift arrangement and is quite inadequate when the interceptor is plugged by such things as milk-trins, or where, as we have before stated, many branches concentrate in the front, or where the trap is 9 ft. or 10 ft. below the surface. We have always considered a manhole near the interceptor as absolutely necessary. Our conclusion, therefore, is that while the intercepting-trap should remain, additional powers should be provided for its being constructed in a proper chamber."

Obituary.

MR. GARNER.—We regret to announce the death, on April 30, at his residence, Fritwell Manor House, Oxfordshire, of Mr. Thomas Garner, late of No. 7, Gray's Inn-square, aged sixty-six years. Mr. Garner was a pupil of Sir G. G. Scott, and in 1869 became partner of his fellow-pupil, Mr. G. F. Bodley, R.A. Amongst Mr. Garner's more important architectural works are the following: Churches at Bedworth; Peasdown; and Camerton; additions to Bosworth Hall; a house at Hampstead for Mr. Sidney; a house at Godden Green, Kent; Hewell Grange, co. Worcester, for Lord Windsor; St. Catherine's College, Cambridge—reconstruction of the ante-chapel, repair of the carved woodwork, decoration of the chapel, and designs for the stained glass windows in the chapel; memorial monuments—to the late Bishop Durnford in Clement's Chapel, Chichester Cathedral (February 25, 1899*); the Bishop of Ely, in Ely Cathedral; and the Bishop of Winchester, in Winchester Cathedral; Marlborough School—reading-room and class-rooms, 1898-1900; restoration of Fritwell Manor House, Oxfordshire, for his own occupation; an altar for St. John's, Cambridge; the Empire Hotel, Buxton, at a cost of about 125,000l.; and the chapel and other conventual buildings, Convent of the Visitation, Sudbury-hill, Harrow, after the XVth century Gothic style, 1902. Mr. Garner made designs for the copy of the charter of Archbishop of Canterbury in the coronation of King Edward VII. After the death of Mr. Edward Hanson Mr. Garner was appointed architect for carrying on the building of Downside Abbey Church, near Bath, for which he built the new choir and chancel that were blessed and dedicated in September of last year. Of works by Mr. Garner, Messrs. Bodley & Garner were the architects of St. John's Church, The Brook, Liverpool; River House, Tite-street, Chelsea, completed in 1879; the Master's Lodge, University College, Oxford, 1876-9; the Cathedral, Hobart Town, Tasmania; St. Michael's Church, Camden Town, N.W., begun in 1876 and completed in 1894; restoration of part of the great quadrangle, Christ Church, Oxford, with the Bell Tower, parapet adjoining the Hall, and new entrance from Tom Quad into the Cathedral, 1872-8; Church of the Holy Angels, Hoar Cross, Staffordshire, begun in 1871 (January 6, 1877, two views*); Church of St. Augustine at Pendlebury, begun in 1873 (June 23, 1877*); St. Peter's Church, Harrogate—three windows in the south transept, and the carved and painted rosettes, 1884; New Chapel, Marlborough School (October 16, 1886, interior view, with plan*); reredos and screen, St. Mary's, Nottingham, 1887; Bishop Wordsworth's monument, Lincoln Cathedral (May 12, 1888*); restoration of the chancel, Stratford-on-Avon parish church (September 10, 1892, and the Clapton Chapel*); Medalen College, Oxford—new buildings in St. John Baptist's quad with entrance from High-street, and the new western quod, St. Swithin's, 1889-90 (August 9, 1890*); reredos, St. Paul's, whereof we believe the design is due to Mr. Garner; triptych, St. Albans, Holborn, of which the design is preserved in the Clapton Chapel*); St. John the Baptist, parish church, Epping, 1890-1; decoration of St. Mark's Church, Coventry, and renovation of the interior, 1895; St. Luke's Church, Warrington, for a congregation of 520 persons, 1893; restoration of the interior of Ham House, Petersham, 1889-90; enlargement of the chancel, already long mentioned by R. J. Withers, in 1890; the new east end of St. Paul, Knightsbridge, and the new east-end

five-light window (Messrs. Lavers & Westlake); Gothic reredos, St. Barabas, Pinlick; restoration of Laughton Church, Gainsborough, 1896; restoration of the chancel and the Jesus private Chapel, Wilmslow parish church, Cheshire, 1898; and decoration of G. E. Street's Church of St. John the Divine, Kennington. Messrs. Bodley & Garner and Mr. James Murray were architects, jointly, of All Saints' Church, Embsay, Warwickshire. In our numbers of January 9, January 30, February 13, and February 27, 1886, is published a complete set of illustrations of Messrs. Bodley & Garner's competitive designs for Liverpool Cathedral.

MR. WOODTHORPE.—We have also to announce the death, on May 3, at his residence, "Grey shoot," Ferncroft-avenue, Hampstead, of Mr. Edmund Woodthorpe, M.A., Oxon., aged forty-seven years. Mr. Woodthorpe was the only son of the late Edmund Woodthorpe, of Greyshot House, Liphook, Hants. He was elected an Associate in 1882, and in 1892 a Fellow of the Royal Institute of British Architects. In 1881 he was elected a member of the Architectural Association; and he was a Fellow of the Surveyors' Institution. Mr. Woodthorpe was Architect and District Surveyor for the northern division of the City of London; in February last the Court of Common Council appointed him to act as surveyor for the eastern division, vice H. H. Collins, deceased. He was elected a member of the Practise Standing Committee of the Institute for the sessions 1896-7, 1900-1, 1902-3, 1903-4, 1904-5, and 1905-6; a member of the Science Standing Committee, 1904-5; a member of Council, 1904-5 and 1905-6, and a Fellow and auditor, 1896-7. He served for a while on the Executive of the British Fire Prevention Committee, resigning that position in July, 1903; and he gave a liberal subscription to the New Premises Building Fund of the Architectural Association.

MR. LOW.—The death, on May 2, at his residence, No. 17, Upper Park-road, Hampstead, is announced of Mr. George Low, of No. 10, Basinghall-street, E.C., in his eighty-second year. Mr. Low was a pupil of George Smith, and made the plans and designs, after the Early Decorated style, for the Church of St. James, in Knatchbull-road, Canterbury, 1869-70. He was elected an Associate in 1856, and in 1860 a Fellow of the Royal Institute of British Architects.

General Building News.

NEW CHURCH, HORSNEY.—Lady Donaldson recently laid the foundation-stone of a new church in Priory-road, Horsney, destined to be a chapel-of-ease to the parish church. The total cost of the complete church will be 8,000l., but only the western portion is now being erected, and this will cost 5,500l. The building, when completed, will consist of nave 81 ft. long and 27 ft. wide, aisles of same length and 12 ft. wide, terminating eastwards by transepts, chancel 42 ft. long and 24 ft. wide with apsidal east end, morning chapel 40 ft. long by 14 ft. wide, and a room suitable for parish meetings, etc., 41 ft. long and 18 ft. 4 in. wide, divisible by movable screen into clergy and choir vestries, and with an outside entrance on south side. The style of the building is Early Decorated Gothic, and the material principally used red brick, with which the walls are to be faced outside and inside, relieved by Weldon stone dressings. The stone for the pillars and arches, etc., will be Guiting stone. The roofs of nave, chancel, and chapel will be of arched form, with tie-beams and curved braces to the nave principals, and covered with red tiles outside. The floors will be of wood blocks under seats, and marble mosaic in chancel and passages. The portion now in course of erection will comprise the nave, and aisles with transepts, providing accommodation for over 500 persons. The completed church will provide for about 750 persons. The architect is Mr. J. S. Aldrich of London, and the builders are Messrs. C. Miskin & Sons, of St. Albans.

BAPTIST CHURCH, ABERTILLY.—The dedication services of the new Blaenau Gwent Baptist Church, Abertillery, took place on Sunday last. The new church is of Gothic design. The front elevation is faced with pitched-face shoddes, and the windows of the dressing to the windows, steps, etc., are of grey Forest of Dean stone. The chief feature externally is a seven-light tracery window, with turrets right and left, rising 45 ft. above the ground. Access to the ground floor of the church is obtained through four entrances into lobbies. A church parour has recently been provided with a separate entrance from outside. The baptistry is placed in the rostrum, from which direct access to two special vestries can be gained by candidates after immersion. There are three separate entrances to the galleries. The chapel floor has a fall of 18 in. from vestibule entrance to sacristy. The internal dimensions on the ground floor of the chapel are 66 ft. by 51 ft., and the total seating accommodation is about 1,200. The pews have been specially designed by the architect, Mr. N. Gasenius, Lwis,

* Illustrated in the Builder.

Aberlilly. The whole of the interior wood-work is pitch-pine, and the roofs are partly open and boarded. Mr. W. A. Linton, Newport, has carried out the work of erection under the personal supervision of the architect.

PRESBYTERIAN CHURCH, NEWCASTLE.—The foundation-stone of new Presbyterian church buildings, which are to be erected in Wingrove-road, Newcastle, was laid on the 2nd inst. The new buildings are part of a scheme at the corner of Wingrove and Hadrian roads. The buildings consist of a church hall, small hall, church officer's house, and other rooms. Seating accommodation will be provided for over 400 in the large hall, and for about eighty in the smaller hall. Externally, the building is of stone, with a large tracery window in the front gable. The contractor for the work is Mr. Thos. Weatheritt, of Newcastle; and the architects, Messrs. Cockett & Burns Dick. The cost of site, buildings, and furnishings, etc., will be about 4,200.

CONGREGATIONAL CHURCH, LONGTON.—A new church has been erected by the Congregationalists of Longton at a cost of 2,500, on a site in Caroline street. The new buildings have been erected by Messrs. Tompkinson & Bettelley, to the designs of Mr. E. Forshaw, of Uttoxeter. The main frontage is of Ruabon brick, relieved with buff dressings. In the church and all rooms on the ground level the floors are laid with pitch-pine blocks. Chairs will be used in the church instead of pews. The open roof design is adopted with the main spans resting on carved corbels. For the schools there is classroom accommodation, and two halls. The whole of the buildings are heated with a low-pressure system of hot water pipes, and the artificial light is incandescent gas.

CHURCH RESTORATION, MARTON, LINCOLNSHIRE.—St. Margaret's Church, at Marton, Lincolnshire, is to be restored. A scheme has been prepared, and the work entrusted to Messrs. Harold Bailey & Wood, of London and Newark.

CHURCH ENLARGEMENT, STRETFORD.—Some time ago a scheme providing for the enlargement of All Saints' Church and school, Stretford, was agreed on. The school has been completed, and now the tender has been let for the enlargement of the church by the construction of a south aisle terminating in a chapel with clergy and choir vestries. Accommodation will be increased from 330 to 520, and the cost of the addition and furnishing will be about 1,500. The architects are Messrs. J. Gibbons & Son, Manchester, and the contractor Mr. W. Thorpe, Old Trafford.

CHURCH RESTORATION, BISHOP MIDDLEHAM.—On Saturday last the parish church of St. Michael's at Bishop Middleham was re-opened by Dr. Moule, Bishop of Durham, after having been renovated and restored. The total cost of the renovations is about 1,300. Messrs. Stephen Wilkinson & Crowley, Newcastle-on-Tyne, were architects for the alterations, the work being done by Messrs. G. Graddon & Son, Durham.

BAPTIST CHAPEL, DONCASTER.—A new Baptist chapel, erected in Chequer-road, Doncaster, was opened on the 3rd inst. by his Honour Judge Willis, K.C. The chapel, which is in the Perpendicular style with a tower and spire, was erected by Messrs. H. Arnold & Sons, of Doncaster, from designs by Messrs. J. Willis & Sons, of Derby, the amount of the contract being 3,132.

SECONDARY SCHOOL, BAINTREE.—A new secondary school is being built at Baintree. The work is being carried out from plans prepared by Mr. Wylseham Chancellor, architect, and the builder is Mr. J. McKay.

COUNCIL SCHOOLS, HUNTINGDON.—New schools have been erected by the Huntingdon County Council at Huntingdon. They will accommodate 310 in the mixed department and 140 in the infant department. The cost has been about 5,000. The designs were prepared by the County Surveyor, Mr. Leete, in conjunction with the Organising Secretary, Mr. Cook. The work has been carried out by Messrs. Thackray & Co., Ltd.

SCHOOL ADDITIONS, STRATFORD.—On the 25th ult. the opening of the manual and cookery centre and additional wings at the Bridge-road schools took place. The plans of the whole schools were prepared by Mr. C. M. Shiner, architect, of Grays, under the old School Board, but only a part of the building was erected, at a cost for land, buildings, and furnishing, of 9,985, and it was opened about eight years ago. The present addition completes the original plans together with a centre for manual training and a centre for cookery, at a cost as per contract of 4,488. The whole building has been carried out by Mr. H. J. Carter, of Grays. The school now contains six classrooms and hall on each floor, with teachers' rooms and cloak-rooms for each department, and provides accommodation for 420 girls on the ground floor and 420 boys on the first floor. The manual training-room will be fitted up with benches for twenty boys, and the cookery-room will accommodate fifty-four girls for demonstration and eighteen for practice. The building is now lighted by electricity from the town supply, the work being carried out by Messrs. Pinching & Walton.

SCHOOLS, GAINSBOROUGH.—On the 2nd inst. Mr. James Marshall, J.P., formally opened the

first of the two sets of County Council Schools with which Gainsborough is to be provided. The schools, which were built by Messrs. Moss, of Loughborough, from the plans of Messrs. Gamble & Scorer, of Lincoln, are to accommodate 934 children at the south end of the town. The cost of the schools will amount to 8,700, exclusive of site and furniture.

COUNCIL SCHOOL, BROOKWOOD.—The new school at Brookwood was built to accommodate 150 mixed scholars and 100 infants. It consists of five classrooms for fifty children each, 20 ft. wide by 25 ft. long, leading out of a central hall 47 ft. long by 21 ft. wide. The girls' and infants' cloakrooms are at the west end of the building, that for the boys at the east. The school is heated throughout by radiators, and the floors are of wood blocks. The classrooms are separated from each other and from the central hall by glazed screens. The first floor consists of two teachers' rooms and store and cistern room. The buildings are built of red brick with tiled roofs, the exterior of the first floors being in rough cast. The architects are Messrs. Jarvis & Richards, Architects to the Surrey Education Committee, and the work has been carried out by Messrs. T. J. Hawkins & Co., Westminster.

CONVALESCENT HOME, HARGRATGE.—The new convalescent home of the Durham County Hospital was opened at Hargrattge on the 25th ult. The building is of red brick with stone facings, and apart from the basement, in which are the kitchens, etc., is two stories high. On the ground floor is a sitting-room and smoke-room for men, and sitting and workroom for women, dining-room, dispensing-rooms, matron's sitting-room, and other accommodation. On the first floor are three sleeping wards for females and two for males, also two bath-rooms, and the rooms, the accommodation being adequate for upwards of a score of patients. Mr. W. T. Jones was the architect, and Mr. F. Caldwell the clerk of works. The cost was about 7,000.

COUNCIL OFFICES, PONTYPRIDD.—The new public offices erected by the Pontypridd District Council, at a cost of about 6,000, have been opened by Sir Alfred Thomas, M.P. The building is situated in Gelliwasl-oad-road. The frontages are faced with native stone, with Forest of Dean dressings, and the roof is tiled with Precely slates. The building is fireproof. The windows are fitted with iron casements, glazed with leaded lights, whilst those in the council-chamber are of stained glass bearing various coats of arms. The corridors and main staircase are paved with Hopton Wood stone, and the floor of the ante-room is of black-and-white marble. The building is lighted throughout by electricity, the fittings in the principal rooms having been specially designed. Heating is by the low-pressure system. Mr. Watkin Williams is the contractor, and the architect is Mr. Henry T. Hare.

PUBLIC LIBRARY, BEVERLEY.—A new public free library has just been completed at Beverley and will shortly be opened. The work has been carried out under the supervision of Mr. John Cash, architect, of London. The building contractor is Mr. G. Pape, of Beverley, and the sub-contractors are Mr. Robert Pape, Beverley (stonework), King & Co., Beverley, and Darlington School Furnishing Company (fittings), Robert Canby, Beverley (painting).

HOSPITAL EXTENSION, PORTSMOUTH.—The Mayor of Portsmouth recently laid the memorial stone to the additions that are being made to the Royal Portsmouth, Portsea, and Gosport Hospital. Messrs. Young & Hill are the architects, the builder being Mr. H. Jones.

MECHANICS' INSTITUTE, PONTARDULAI.—Sir John T. D. Llewelyn, Bart., on Saturday last opened a new Mechanics' Institute at Pontardulais, which has been erected at a cost of 2,000. The institute is to replace the old reading-room erected many years ago by the tin-plate workmen. A competition for designs was advertised about two years ago, and the plans of Mr. W. Beddoe Rees, architect, Cardiff, were accepted. On the ground floor is provided a meeting-hall, capable of seating about 250, as well as a reading-room fitted up with newspaper stands, etc., and a lending library. Both rooms are provided with old-fashioned angle fireplaces. On the first floor are arranged the committee-room, entrance to gallery of hall, and a billiard or recreation room, opening from which is a small coffee-bar. On the top floor are the caretaker's rooms. The work has been carried out by Mr. Daniel Jones, Pontardulais, under the supervision of the architect.

CHURCH, MAESTEG.—At a cost of 8,500, the Roman Catholic congregation at Maesteg are erecting a church and schoolroom. The church will seat 450. The turret will be 50 ft. high, with a porch on each side; all the dressings will be Bath stone, and the facings composed of Port Talbot blue. The interior is to be finished with Early Gothic design, with two main entrances in Garv-road and Rock-street. On the north side will be the dome, which will contain the entrance to the gallery, organ loft, and baptismal font. The main nave will be about 60 ft. in length and 34 ft. wide, and the chancel about 24 ft., with room for three aisles to be erected. The architects are Mr. Powell Pugin, of Messrs. Pugin & Pugin, London, and the contractor Mr. John O'Brien, Maesteg.

Stained Glass & Decoration.

CHOIR-STALLS, ST. CUTHBERT'S CHURCH, CARLISLE.—New choir-stalls have been placed in this church. They are of solid mahogany, and contain a series of carved panels, the work of Mr. Knox, of London, which run round them; whilst at each corner of them, at the entrance to the chancel, is the figure of an angel. The work was designed by Mr. J. H. Martindale, architect, and carried out by Mr. George Black.

MEMORIAL WINDOW, CHADDLEWORTH.—A window has been erected in memory of Christopher Chardin Wroughton, in the parish church at Chaddelworth. The window is from the design of Mr. Westlake. It is at the west end under the tower, and is in four panels, the upper two depicting angels in the presence of God. The two lower panels represent Christ calling and blessing little children and the mothers parting with their little ones to go to Him.

Appointments.

COMMISSION OF WORKS, SUEZ CANAL.—The election is announced of Mr. Anthony G. Lyster, Engineer-in-Chief to the Mersey Docks and Harbour Board, as a member of the Consultative International Commission of Works of the Suez Canal, vice Sir John Wolfe Barry, retired.

NATIONAL GALLERY.—The appointment of Sir Charles Holroyd as Director of the National Gallery is announced. Sir C. Holroyd, who thus succeeds Sir Edward Poynter, P.R.A., was knighted in 1902, and has been keeper of the Tate Gallery, Millbank during some years past.

Sanitary and Engineering News.

NEW DOCKS ON THE TEES.—Two graving docks are about to be constructed at Cargo Fleet by Smith's Dock Company, who intend to remove their ship-building works from North Shields to Teesside. The new docks will be both 25 ft. deep, and will be 550 ft. long by 66 ft. entrance, and 450 ft. long by 60 ft. entrance, respectively; whilst the plans will provide for the enlargement of the docks hereafter should occasion arise in view of increased traffic in the river.

A NEW NIAGARA BRIDGE.—As part of a scheme for a double-track express railway line, to be worked by electricity, from Buffalo to Toronto, and passing through Hamilton and Port Dalhousie, a Bill will be introduced in the Albany Senate and Assembly by the International Railway Company of Buffalo and the Toronto Railway Company, for the incorporation of the Trans-Niagara Bridge Company, with a capital of 1,000,000 dol., with the object of constructing a bridge across the Niagara river below the falls.

SEWERAGE SCHEME, PENISTONE.—Penistone's main sewerage scheme, estimated at a cost of about 9,200, has just been opened. Altogether about four miles of sewers, with nearly 100 manholes, flushing tanks, and storm overflows, have been constructed. The total cost of sewers is about 6,200. The district is sewered by gravitation, and in order to make this possible it has been divided into drainage areas, each by its own main sewer, one of which takes the part known as Cubley Brook. The second drains High-street, Market-street, and Sheffield-road, and the third drains the Bridge end district. The main sewers are all brought to one point near the river Don at Spring Vale, where the sewage works are constructed. The sewage disposal works have been designed to treat daily 120,000 gallons of sewage or twice the daily dry weather flow from the district. The works are on the bacterial system, consisting of open septic tanks, capable of holding one day's dry weather flow. From these the sewage passes by way of an open channel into a chamber, where the mechanical works distributes it intermittently on to three circular percolating filters by means of revolving sprinklers at the rate of 168 gallons per cubic yard of filter per day. The filters consist of shells of honey-combed brickwork, filled with screened clinker obtained from the local steel works. The automatic distributing apparatus was made and manufactured by Messrs. Mather & Platt, Manchester. A filter has also been constructed for dealing with the storm water when the volume of the flow exceeds twice the dry weather flow. This is of concrete filled with clinker, and the sewage is distributed by means of stationary automatic distributing apparatus per square yard. There are also filters provided for draining the sludge from the septic tank, the liquid being pumped back for retreatment. Two acres of land have been provided for further treatment of the effluent by natural filtration if it is found to be necessary. The cost of the disposal works is about 3,000, making, with the 6,200 for sewers, 9,200, altogether. The engineers are Messrs. Spinks & Pilling, Leeds.

The case was reported in the issues of the *Builder* of July 23 and 30, August 6, December 17, 1904, and May 5, 1906, and the facts of the case have been sufficiently stated.

Mr. Hughes, K.C., and Mr. Vernon appeared for Dr. Jolly; and Mr. P. Ogden Lawrence, K.C., and Mr. Cann for Mrs. Kine.

At the conclusion of the arguments of counsel judgment was reserved.

DISPUTE AS TO THE APPROVAL OF PLANS.

The case of the King v. the East Stonehouse Urban District Council came before a Divisional Court of King's Bench, consisting of the Lord Chief Justice and Justices Ridley and Darling, last week, for argument on a rule nisi for a mandamus granted at the instance of the Plymouth Mutual Co-operative Society, calling upon the Urban District Council to show cause why they should not be ordered to approve of certain plans submitted by the Society for the erection of a slaughter-house on the Society's premises in Water-lane, East Stonehouse.

It appeared that for the purposes of its business the Society had, since November, 1900, used a slaughter-house in Water-lane within the Urban District Council of East Stonehouse, and in April, 1903, Mr. H. J. Snell, a Plymouth architect, prepared plans for the erection of an abattoir, to be constructed in modern fashion, the structure to be used for the treatment of tripe and other animal fat of beasts slaughtered on the premises. The machinery was designed by Messrs. Wm. Douglas & Co., of Putney, and the plans were presented to the Council for approval. The Council, however, refused to approve the plans, and the Society agreed to certain conditions which included arrangements as to the height of the chimney so as to guard against nuisance and the surrendering of certain land without compensation. These conditions were modified in certain respects, the modifications being accepted mainly in reference to the structure itself, but the Society refused to surrender the land without compensation. A rule was obtained in July last calling upon the Council to show cause why the plans should not be approved on the grounds that there was no proof that any existing by-law would be infringed thereby; and also that the conditions imposed were *ultra vires*.

Mr. Danckwerts, K.C., on behalf of the Local Authority, submitted that owing to the time that had elapsed—1903 to 1905—the Society was not entitled to take these summary proceedings. The Society, he said, was not disinclined properly and fairly to consider any plans that might in future be submitted to them by the Society. He contended that the Court ought not to interfere with the administration of the District Council's affairs which was carried out purely in the interests of the local public.

Mr. Macmorran, K.C., in support of the rule, said the reason for the delay in taking proceedings was the fact that negotiations had been going on between the parties from 1903 up to the time the rule nisi was granted. He contended that as the Society's plans did not break any of the regulations prescribed by the by-laws, the District Council had no power to refuse its approval of the plans.

The Lord Chief Justice, in giving judgment, said the District Council and the Society had been considering the matters in question from 1903 to 1905, and, so far as any complaint as to nuisance went, the Society had tried to meet the District Council. The negotiations showed that it would be unfair and unwise to deal with the matter in respect of what was proposed in 1903, but he had come to the conclusion that there was not sufficient grounds for asking them in 1905 to deal with the plans submitted in 1903. He thought that the rule for a mandamus should be discharged, but without prejudice to any future application which might be made by the Society. He thought that some of the conditions sought to be imposed might be open to objection, but owing to the fact that a long period had been allowed to elapse, he was of opinion that the rule should be discharged without costs.

Justices Ridley and Darling concurred, and the rule was accordingly discharged without costs.

ACTION AGAINST THE SOUTHEAST CORPORAION.

It is the Court of Appeal, before Lords Justices Vaughan Williams, Stirling, and Moulton, on the 8th inst., the hearing of the case of Hobart v. Mayor, etc., of Southend-on-Sea, was concluded on the defendants' appeal from a judgment of Mr. Justice Buckley.

The action was brought by Mr. A. J. Hobart for an injunction and for damages in regard to the pollution of the plaintiff's oyster-beds at Hadeligh, near Southend, by reason of sewage coming from the defendants' outfall sewers. Mr. Justice Buckley held that the plaintiff's oyster-beds had been polluted by the sewage and that the defendants had no right to discharge sewage into the estuary in question, so as to cause a nuisance by polluting the plaintiff's oyster-beds. His lordship accordingly gave judgment for the

plaintiff for an injunction and for 1,500*l.* damages. From this decision the defendants appealed.

In the result, the parties settled the litigation by agreeing that the injunction should be discharged, but that the judgment of the learned judge as to damages should stand. It was also agreed that the plaintiff was to have his costs both in the Court below and in the Court of Appeal. The settlement in question comprised all causes of action between the plaintiff and the defendants up to the present time.

Mr. Lush, K.C., Mr. Herbert Smith, and Mr. Fletcher appeared for the appellat Corporation; and Mr. Macmorran, K.C., Mr. G. A. Scott, and Mr. Wallace Atkins for the respondent.

THE LONDON BUILDING ACT.

MR. ROBERT HODGKIN, of London Wharf, Ratcliff, appeared before Mr. Dickinson, at Thames Police Court, on the 4th inst., to answer an adjourned summons, taken out at the instance of the London County Council, for neglecting to comply with the requirements of the London Building Act, by allowing a boundary fence to be at a less distance from the centre of the roadway than required by the said Act.

Mr. Ryland Atkins, barrister, represented the London County Council; and Mr. Cranston, barrister, defended.

It was stated that Narrow-street, Linchouse, was a thoroughfare of considerable length, and was crossed in three places by docks or waterways. At Dowson's Dock, belonging to the defendant, there was a swing bridge, and during the last fifty years it had been usual when the bridge was open to make other arrangements for the traffic; but Dowson's Dock had now fallen out of use and been filled up. Four or five years ago the defendant put up a notice that it was a private bridge; and he was now building on the south side a warehouse, which was the subject of that summons.

Evidence was called showing that it had been a highway from time immemorial, and the bridge, which was a part of the public highway, had been uninterruptedly used for years; therefore, it was contended, the Council was entitled to see no fence was erected within 20 ft. of the centre of the roadway.

The defendant gave evidence, and stated that in July, 1903, he purchased the dock in question; and the bridge was his own property. His land extended from the river Thames, right under the bridge, to Northley-street. When he took possession of the property the boarded fence on the north side was the same as at the present time, and on the south side were iron railings. With regard to the latter, he had them taken away, and a hoarding substituted, because there was a danger to the people who were in the habit of congregating on the bridge. Every part of the boarded fence rested on the bridge. The Stepney Borough Council were engaged in widening Narrow-street, and the frontages had been put back on the north side. His bridge was 11 ft. or 12 ft. wide, and was over 70 ft. in length. He had agreed to sell to the Borough Council the bridge in question, and some of the land on the north side. He was to be paid 1,500*l.*, but the County Council stopped him building, and subsequently he had notice to remove the fence.

By Mr. Adkins: The public had the right to use the bridge under certain conditions.

Mr. Adkins: The Council were not unreasonable in the matter.

Mr. Dickinson: We can form our own opinion about that matter.

Mr. J. Knight, surveyor, having given evidence, respecting the negotiations, said he had known the bridge for fifty years. The fence on the south side was a part of the bridge, and the street was to be widened on the north side.

Mr. Dickinson said he was prepared to give his decision at once, but suggested the matter should be adjourned in order that the Stepney Borough Council might reconsider Mr. Hough's offer with regard to the amount of compensation to be paid him.

The case was accordingly adjourned.—*Morning Advertiser.*

Patents of the Week.

APPLICATIONS PUBLISHED.*

5,051 of 1905.—A. KNOX: *Window Sashes.*
This relates to window sashes in which the sashes may be arranged upon a pivoted holder, the arms of which holder may, if desired, differ in length, and the pivot may be disposed centrally in relation to the sashes or above or below the centre or meeting rails of the said sashes. The upper rail of the upper sash and the lower rail of the bottom sash are each provided with laterally projecting pins adapted to slide in grooves formed in the styles pertaining to the respective sashes, the said sashes being separated by a central strip or fillet. In order to provide for the turning of the upper

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

sash the styles are formed in a second groove arranged diagonally or transversely to the before-mentioned groove. The diagonal or transverse groove is bisected by the central separating strip or fillet which may be rendered detachable by any suitable means, such as a thumb screw or the like. The lower sash may be similarly arranged so as to be capable of turning. The thumb screw may consist of a screw stem having a collar locked or held in a fixing plate adapted for being carried by the strip or fillet, the screw working in the style and effecting the displacement of the fillet without resulting in the detachment of the screw from the fillet.

8,102 of 1905.—L. P. FRIESTEDT: *Metal Sheet Piling.*

This relates to metal sheet piling, and consists of a wall structure composed of a series of I-beams sections joined together edgewise, the face sides of the cross-flange abutting, and angle clamping irons rigidly mounted on alternate sections and overlapping the flanged edges of the joining sections.

18,418 of 1905.—J. BOARD & CO., LTD., and C. J. GOODLAND: *Roofing Tiles.*

This relates to roofing tiles of the kind having a longitudinal groove and flange lip along the underside of one of its edges and a similar groove and flange or lip along the upper side of the opposite edge, the grooves and lips being designed for enabling the edges of adjacent tiles to interlock. There is provided on the top and bottom faces, ridges, these ridges being four in number on each face, that is to say, one on each meeting edge thereof, and two in the middle so as to furnish three recesses on either side of the tile, the ridges on the end surfaces of the tile being intended to fit into the recesses of the top part of the tile.

22,571 of 1905.—A. WATTS: *Construction of Buildings as used for Sanitoriums, also Applicable in the Construction of Coops, Kennels, and the like.*

This relates to a building or structure for use as a sanitorium or the like with the upper portions of its walls formed with boards arranged at a slight distance apart in two or more rows and those in one row coming opposite the openings in the other row, and said structure also provided with a sloping roof of corrugated iron which at its apex is covered by a ridge.

22,883 of 1905.—G. W. MACKENZIE: *Apparatus for Raising Water.*

This relates to an apparatus for raising water, comprising a tank connected with a source of water supply, a separate vacuum chamber provided with air compressing means, a pipe connecting said vacuum chamber with the tank, and means for preventing entrance of water into the vacuum chamber.

1,777 of 1906.—O. WILHELM: *A Device for Ascertaining the Position of Joints in Dwelling or Other Rooms.*

This relates to a device for ascertaining the positions of joints in the walls of dwelling and other rooms, the distinguishing feature being the arrangement in certain places on the wall of marks or of fillets, strips or the like, provided with marks which indicate the positions of the joints, so that by joining two corresponding marks, which can be effected by means of string, wire, or the like, the position of the joint at a place in the wall lying between these marks can be ascertained.

1,896 of 1905.—A. F. DUTTON and R. H. DUTTON: *Fastener for Windows, Fanlights, Doors, Drawers, and the like.*

This relates to a fastener for windows, fanlights, doors, drawers, and the like, of the kind which automatically comes into action to fasten, and is characterised in that the action of opening the said window or the like automatically operates upon the fastener to set it, so that the closing of the window or the like again brings about the automatic operation of the fastener to lock or fasten the windows.

2,370 of 1906.—S. W. WINGFIELD: *Brick for Building Short Walls and Cutters.*

This relates to an angle brick, comprising parts constructed integrally in one piece adapted to form portions of two adjoining walls which meet at an angle in which the surface of connexion with other bricks are at portions of their length chambered for the insertion of dowels.

25,829 of 1905.—F. C. SUSTINS: *Laying of Wood Floors.*

This relates to floor boards provided with dovetail, ogee, or equivalent interlocking edges for the purpose of locking such boards closely together laterally when laid.

25,352 of 1905.—A. P. BOSSERT: *Floors, Ceilings, and Walls Constructed of Artificial Stone and like Materials, Reinforced with Metal.*

This relates to a method of constructing reinforced floors, ceilings, or walls, wherein hollow blocks, tiles, or the like, forming the said floors,

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this list, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv; Contracts, iv, vi, viii, x; Public Appointments, xix.; Auction Sales, xxx. Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

Competitions.

JUNE 30.—WENNSY.—SCHOOL.—The School Board of Wennsy invite competitive plans for the erection of an elementary school of East Wennsy, to accommodate not less than 600 senior pupils. The school to be erected on the site presently occupied by the infant department of the present school. Plans to be lodged not later than June 30 with Mr. A. Watson Taylor, Clerk to the Board, East Wennsy, from whom any additional information may be had.

*** JULY 2.—LIVERPOOL.—SCHOOL.**—The Liverpool Education Committee invite plans and designs from architects for new secondary school for girls at Alchurch Vale. Applications for conditions of competition (with particulars of premiums offered, etc.) should be made to the Town Clerk, Municipal Offices, Liverpool, with deposit of 1l. 1s. Plans to be submitted on or before July 2.

*** JULY 4.—WARRINGTON.—SEWERAGE WORKS.**—The Warlington U.D.C. invite schemes (with plans, specifications, and estimates) for main sewerage and sewage-disposal works for the parish of Warlington (including the town of Emsworth, Hants). Premium of 100l. is offered for the scheme and estimate selected as first, if approved by the Local Government. In the event of the scheme being carried out the premium will form part of the engineer's commission; 50l. is also offered for the scheme selected as second. Plans, specifications, and estimates to be addressed to the Clerk, Council Offices, Queen-street, Emsworth, not later than July 4.

Contracts.

BUILDING.

MAY 12.—CWOUD.—CHURCH BUILDING.—For rebuilding the nave and restoring the tower of Parish Church of St. Michael, Cwoud, near Chirkhowell, in the parishes of East and West Cwoud, to Messrs. Hunt & Baldwin, architects, 4, Warren-street, Stockport, on or before May 12. Quantities supplied.

MAY 14.—DREEM.—COTTAGES.—The mason, carpenter, slater, and plaster work of two cottages to be built at the office of the architect, by whom sealed tenders will be received not later than 12 noon, on which date quantities will be forwarded. Messrs. Empson & Clarksons, architects and surveyors, 7, Exchange, Bradford.

MAY 14.—ST. AUSSELL.—RESIDENCE.—The erection of a residence, at Turro-road, St. Austell, for Mr. E. Stocker. Drawings and specification may be seen at the office of the architect, by whom sealed tenders will be received not later than 12 noon, May 14. Mr. B. C. Andrew, architect, Biddock's court, St. Austell.

MAY 15.—BARNBORO.—SCHOOL.—Derbyshire C.C. Education Committee invite tenders for the erection of Shirebrook school to accommodate about 640 children. Drawings, specification, agreement, etc., at the office of the Architect to the Committee, Mr. George H. Widdows, A.R.I.B.A., County Education Offices, St. Mary's-gate, Derby, on and after May 4, between the hours of 10 a.m. and 4 p.m., except on Saturday, when they will be open from 10 a.m. to 12 noon. A copy of the bill of quantities, specification, conditions of contract, and form of tender can be obtained at the architect's office upon payment of 1l. 1s. Sealed tenders, in envelopes provided for the purpose, endorsed "Tender for New Council School, Shirebrook," must be delivered to the architect not later than 5 p.m. on May 14.

MAY 15.—PULSCOP.—LABORATORY.—The erection of new laboratory block in connexion with the boys' school at Pulneck. The drawings, etc., may be seen and quantities obtained, at office of Mr. C. S. Nelson, architect, 15, Park-row, Leeds. Tenders to be in by May 15.

MAY 15.—MANCHESTER.—SHELTER.—Manchester Corporation Tramways Committee invite tenders for the construction of the shelter at Beaton Park, Manchester. Bill of quantities and form of tender may be obtained on application to Mr. J. M. Piroz, General Manager, Tramways Department, 55, Piccadilly, Manchester, on deposit of 1l. 1s. Drawings may be seen, and particulars of the work obtained, at the office of the architect, Mr. J. Gibbons, 4, St. Andrew's, Manchester. Sealed tenders, Mary's-parsonage, Manchester, must be enclosed in the official envelope and on the form supplied, are to be addressed to the Chairman of the Tramways Committee, 55, Piccadilly, Manchester, and must be received not later than 9 a.m. on May 15.

MAY 15.—SIRHOWY, ARGOEED, AND LOWER RHYNNY INFANTS' AND MIDDLE RHYNNY INFANTS' COUNCIL SCHOOLS.—The Education Committee invite competitive tenders for building additions to the two first-named schools, and for carrying out repairs and improvements to the two last-named schools and premises. Plans and specifications may be seen either

at the office of Mr. David Morgan (Messrs. James & Morgan, F.F.R.I.B.A.), architect, Charles-street-chambers, Cardiff, or at offices of Mr. C. Danney, Park-chambers, Tredegar. Quantities supplied for Sirhowy and Argoeed schools. Separate sealed tenders, in separate envelopes, for each school, endorsed, respectively, "Sirhowy School Tender," etc., to be delivered to Mr. Danney not later than, in the case of the Rhyenny schools, May 12, and in the case of the Sirhowy and Argoeed schools, May 15.

MAY 15.—TODMORDEN.—HOUSES.—The erection of eight houses, East Wood, Todmorden. Drawings, conditions, and obtain quantities on application at offices of Mr. Jesse Horsfall, F.R.I.B.A., Todmorden; and 4, Chapel-walks, Manchester. Sealed tenders to be sent to Todmorden office on May 15 before 5 p.m.

MAY 15.—WELLINGTON.—SUNDAY-SCHOOLS.—Sunday school for the Primitive Methodist Societies at Tan Brun, Wellington. Plans, names and addresses to Mr. Elijah Jones, architect, 10, Albion-street, Hanley, Staffs. Tenders to be in on May 15.

MAY 15.—GLASGOW.—ALTERATIONS TO TENEMENTS.—Glasgow Corporation invite tenders for the execution of the mason and other works connected with alterations to be made on the tenement at the corner of Castle-street and St. James's-road. Form of tender, etc., obtained, upon application at the office of the City Engineer, 64, Cochrane-street. Tenders, marked "City Improvements Department—Tenement, Castle-street, and St. James's-road," to be sent to Town Clerk, City-chambers, Glasgow, with Mr. A. W. Myles, Town Clerk, City-chambers, Glasgow, on or before May 15.

*** MAY 15.—GUILDFORD.—WORKMEN'S DWELLINGS.**—The Town Council of Guildford, Surrey, invite tenders for eighteen cottages in Cline-road, Guildford, in accordance with plans and specifications prepared by Mr. C. G. Mason, Borough Engineer, and Mr. T. J. Capp, architect, Stone-road, Guildford. Names and addresses to Town Clerk, Guildford, with deposit of 2l., not later than May 15. Tenders, endorsed "Tenders for Workmen's Dwellings," to be sent to Town Clerk on or before May 15, and to be open for inspection at the office of the City Engineer, 64, Cochrane-street, Guildford, on or before May 15.

MAY 15.—HELSINGTON.—FARMHOUSE.—The artificers works required in building a farmhouse at Bridge House Farm, Helsington, for Mr. C. W. Wilson. Plans and specifications may be seen, and other information obtained, by applying at office of Mr. John Stalker, architect, Kendal, and tenders under cover are to be handed in not later than noon, May 15.

MAY 16.—HIRWAIN.—KITCHEN.—For building a new cooking kitchen at the Hirwain schools, for the Hirwain Joint Committee. Plans and specification can be seen, and quantities obtained, at office of Mr. T. Roderick, architect, 23, Clifton-street, Aberdeen. Endorsed tenders to be sent to Mr. J. Morris, Clerk, Council Offices, Aberdeen, not later than May 16.

MAY 16.—LOWER BOSWARVA.—FARM BUILDINGS.—For erecting firm buildings at Lower Boswarva, Madron, for Mr. T. B. Bolitho. The drawings and specifications may be seen, and tenders endorsed, to Mr. Henry White, F.R.I.B.A., "Keigwid," Helmsoor, R.S.O., not later than May 16.

*** MAY 16.—SOUTH TOTENHAM.—STABLES.**—The Midland Railway Company invite tenders for the erection of the stabling houses at South Totenham. Plans and specifications may be seen at engineer's office, Derby Station, on and after May 12. Sealed tenders, by post, to the Secretary of Way and Works Committee, Midland Railway, Derby, before 9 a.m., May 16.

MAY 16.—TORQUAY.—FIRE STATION.—The Torquay Town Council invite tenders for the reconstruction of the fire station at the Corporation Yard, in Market street. San prints of the plan, specification, and form of tender can be obtained at the office of Mr. Samuel C. Chapman, Assoc. M.Inst.C.E., Chief Officer, Town Hall-chambers, Torquay, upon deposit of 1l. 1s. Sealed tenders, endorsed "Fire Station," to be delivered not later than 9.30 a.m. on May 16.

MAY 16.—TULLOCH ESTATE, OLMEDUN.—BUILDINGS.—The mason, carpenter, and slater works, and plaster work of Nos. 3, of the following buildings:—(1) Renovation of steading at Blackbog; (2) roofing and refitting steading at Greensop; (3) new dwelling-house at Ardross. The architect will meet contractors at Blackbog on Saturday, May 12, at 10.30 a.m. Plans and specifications may be seen at the farm and with the architect, and sealed tenders to be lodged with Messrs. Chalmers 15, Golden-square, Aberdeen, or with James Cobban, architect, Haddo House, on or before May 16.

MAY 17.—CAERLON.—SCHOOL EXTENSION.—For Extensions and alterations. Tenders to be enclosed "Alterations of Schools," and delivered to Mr. L. L. Morris, Arlington-chambers, Newport, Mon., not later than 2 p.m. on May 17. Drawings and specifications may be inspected at the offices of the architects, Messrs. Lansdowne & Griggs, Metropolitan Bank-chambers, Newport, Mon., and bills of quantities may be obtained there upon payment of 1l. 1s.

MAY 18.—FORRES.—ALTERATIONS TO FARM BUILDINGS.—Mason, carpenter, plumber, plasterer, slater, and painter and glazier works of additions to and alterations on farm buildings at Section of Deeside near Forres. Plans and specifications may be seen with Mr. Peter Fulton, architect, Forres. Tenders are

to be lodged on or before May 18 with Mr. John Leask, solicitor, Forres, Factor on the Estate.

MAY 18.—GWAELOD-DEITH.—VILLA.—Tenders are invited for building a villa at Gwaelod-deith. Plans and specification can be seen at office of Mr. Arthur Marks, architect, Merthyr, and bills of quantities obtained on deposit of 2l. 1s., which will be returned on receipt of bona-fide tender. Sealed and endorsed tenders to be delivered not later than 12 noon on May 18.

MAY 18.—LANFACHRAETH.—ALTERATIONS TO CHAPEL.—The alterations to Lanfachaeth, C.M. Chapel (Abarim). Plans and specifications may be inspected at the Chapel House, Lanfachaeth. Sealed tenders, endorsed "Tender for Chapel," to be addressed to Mr. A. L. Powell, Reade House, Lanfachaeth Valley, not later than May 18. Mr. J. Hughes, architect and surveyor, Penybont Valley.

MAY 18.—RHUNHAL.—CHAPEL.—Primitive Methodist Church, Rhunhal. Plan and specification at the office of Mr. A. F. Scott, 24, Castle-meadow, Norwich. Tenders to be sent not later than 4 p.m. on May 18, addressed to Rev. J. H. Rose, 3, Park-road, East Dereham, and endorsed "Tender for Rhunhal Chapel."

MAY 19.—ELGIN.—BUILDING, ETC., WORKS.—Tenders are wanted:—(1) For distempereing, etc. at town hall; (2) for repairing and pointing dyke at Lady-hill; (3) for laying concrete pavements; (4) for erecting low-hill-house in Cooper Park; (5) for taking down and re-erecting walls in Greatford-street; (6) for repairing Bishopmill Bridge. All tenders must be lodged with the Town Clerk, on or before May 19. Specification with Mr. Acton A. Turfitt, Burch Surveyor, Elgin.

MAY 19.—GLYN-NEATH.—COTTAGES.—For the erection of thirty-two cottages at Glyn-Neath, for the Abernethy Building Company, Ltd. Plans and specification may be seen at the offices of Mr. J. Cook Rees, architect, Neath. Sealed tenders to be sent to Mr. Thomas Williams, Secretary, 30, High-street, Glyn-Neath, on or before May 19 endorsed "Tender for Cottages."

MAY 19.—KIRKCLINTON.—HOUSE.—Tenders are invited for the various works required in building a dwelling-house for Mr. Stockbridge at West Cliff, Kirkclinton, where plan and specifications can be seen. Tenders to be sent in before May 19.

MAY 19.—WHEATLEY HILL.—WORKMEN'S DWELLINGS.—The Weardeale Steel, Coal, and Iron Company, Ltd., invite tenders for the erection of forty workmen's dwelling-houses at Wheatley Hill Colliery. Plans and specifications can be seen at Thornley Colliery Office, Tenders to be delivered and addressed to the Company, Thornley Colliery Office, Thornley, R.S.O., by May 19.

*** MAY 20.—CREWE.—SCHOOLS.**—The Crewe Education Committee invite tenders for schools for 1,555 children. Names to be sent, with deposit of 2l. 5s., to Mr. H. D. Struthers, Director of Education, Municipal Buildings, Crewe, before May 20. Quantities and other information to be supplied by the architect to those tendering.

MAY 21.—CHESTNUT.—CARP. SPEEDS.—Chestnut U.D.C. invite tenders for erection of carp speed, their depot, Manor House, Forme, etc. on application to Mr. B. H. Jelfes, Engineer and Surveyor, Council Offices, Chestnut, Herts. Sealed tenders, endorsed, addressed to the Chairman of the Council, to be delivered on or before 5 p.m. on May 21.

MAY 21.—NOTTINGHAM.—ALTERATIONS TO CELLARS.—The Castle Museum and School of Art Committee of the Corporation invite tenders for alterations in the rock cellars under the Castle Rock. Plans may be seen, and copies of the specification, bills of quantities, and forms of tender obtained, from Mr. Frank B. Lewis, City Architect, Guildhall, on payment of a deposit of 1l. 1s. Sealed tenders, addressed to Mr. Samuel G. Johnson, Town Clerk, Guildhall, Nottingham, properly endorsed, to be delivered not later than 10 a.m. on May 21.

MAY 22.—LIVERPOOL.—ELECTRIC SUB-STATION.—Lancashire and Yorkshire Railway Directors invite tenders for the erection of buildings for electric sub-station at Altrive. Plans and specification, and specimen and form of tender, quantities, and specification obtained, on application at the engineer's office, Hunt's Bank, Manchester. Tenders, endorsed "Tender for Electric Sub-Station, etc. at Altrive," to be in the hands of Mr. R. C. Irwin, Secretary, Hunt's Bank, Manchester, not later than 10 o'clock a.m. on May 22.

MAY 22.—LANCANELLS.—CHAPEL.—The erection of a new chapel at Luncannell, and other offices at Luncannell. Plans and specifications at Mr. Lisle's, Grimscoth, near Luncannell. Sealed and endorsed tenders to be sent to the Rev. F. Baines, The Manse, Holsborough, on or before May 22.

MAY 22.—SPRINGBURN.—SUB-STATION.—Glasgow Corporation invite tenders for:—(1) Brick and mason work; (2) painter work; (3) wright work; (4) slater work; (5) plumber work; (6) plaster work; (7) iron and steel work in connexion with the erection of a sub-station at Springburn. The plans may be seen, and quantities obtained, on application to Mr. W. W. Lachie, electrical engineer, 75, Waterloo-street, Glasgow, on making a deposit of 2l. for each schedule. Sealed tenders, marked "Tender for Electricity Department, Springburn Sub-Station, Tender for Work," must be lodged with "The Town Clerk, City-chambers, Glasgow," on or before May 22, at 10 o'clock a.m.

May 25.—ABERAMAN.—HOTSES.—Building twenty-one houses at Aberaman for the Treaman Building Club. Plans and specification can be seen at office of Mr. T. Roderick, architect, 23, Clifton-street, Aberdare. Endorsed tenders to be sent to Mr. F. Breese, Secretary, Abaraman-gardens, Aberaman, not later than May 25.

May 24.—DORCHESTER.—HOSPITAL REPAIRS, ETC.—The Committee of Management of the Dorset County Hospital invite tenders for certain repairs and alterations at the hospital. Specifications, prepared by Mr. Walter J. Fletcher, Assoc. M.Inst.C.E., may be seen at the boardroom of the hospital. Tenders must be sent to Mr. Walter E. Groves, Clerk, marked outside "Tender for Repairs," not later than May 24.

May 25.—MALDEN.—SCHOOL, ETC.—The Essex Education Committee invite tenders for new secondary school and pupil teachers' centre shortly to be erected at Maldon. Names to the architect, Mr. P. M. Beaumont, High-street, Maldon, on or before May 24.

May 25.—GREENWICH.—CLASSROOMS, ETC.—For the erection of additional classrooms, science-rooms, lavatories, gymnasium, etc., at the Roan Girls' School, Devonshire-road, Greenwich, S.E., for the Governors. Drawings and specification and bills of quantities obtained from Mr. Alfred Roberts, F.R.I.B.A., 92, London-street, Greenwich, S.E., on and after May 15, on deposit of 5s. Sealed tenders on form, and in envelope supplied, to be delivered before 2 p.m. on May 25.

May 25.—PALMER'S GREENS.—SORTING OFFICE.—For the erection of sorting office at Palmer's Green for H.M. Office of Works. Drawings, specifications, form of contract, etc., can be seen on application to Mr. Wagner, H.M. Office of Works, Westminster, S.W. Bill of quantities and form of tender also to be obtained at above address on deposit of 1s. Tenders, endorsed "Tender for Palmer's Green Sorting Office," and addressed to the Secretary, to be delivered at H.M. Office of Works, Storey's Gate, S.W., before 12 o'clock noon on May 25.

May 25.—PENZANCE.—CHURCH.—For the erection of a new Wesleyan church at Richmond, Penzance. The plans and specifications can be seen at the office of Mr. H. H. Pezzenack, Public-buildings, Penzance. Sealed tenders, endorsed "Tenders for Richmond Church," must be sent to the Rev. G. C. Mayes, 13, Regent-terrace, Penzance, on or before May 15, 1906.

May 25.—ROOPE.—PUBLIC CONVENIENCES.—The Corporation of Roope invite tenders for the construction of public conveniences on the east side of Miranda-road continuation, adjoining the Roope Cricket Ground. Plans and specification may be seen, and bills of quantities obtained, at the office of the Borough Engineer, Tenders, sealed, and endorsed "Public Conveniences, Miranda-road," to be delivered at office of Mr. J. Henry Farmer, Town Clerk, Town Hall, Roope, not later than 10 a.m. on May 28.

May 25.—RHYMNEY.—WALL, FENCING, ETC.—Rhymney R.D.C. are prepared to receive tenders for the following works:—(a) retaining wall, about 100 cubic yds.; (b) barbed-wire fencing, about 2,200 yds.; (c) post and tube fencing, 13 in. and 1 in., about 200 yds. Plans and specifications may be seen at the office of the Council, No. 61, High-street, Rhymney between the hours of 9 and 10 a.m. and 4 and 5 p.m. any day except Thursday and Saturday, 9 and 10 a.m. only. Tenders to be sent to Mr. H. Reynolds, solicitor, Mitton-chambers, Merthyr Tydfil, sealed, and endorsed "Fencing, etc.," not later than 12 noon on May 28.

May 25.—RHYS.—MANS.—For the erection of a manse for the Committee of Second Islandmagee Presbyterian Church. Plans and specifications may be had at office of Mr. Thomas Houston, architect and civil engineer, Kinscoth, Wellington-place, Belfast. Sealed and endorsed tenders to be lodged with architect on or before June 18.

May 25.—COVE MANOR.—VILLA.—The erection of a villa, on the Cove Manor Estate. Plans and specifications may be seen on application to Mr. Brake, Farnborough, Hants.

May 25.—LEEDS.—FACTORY ALTERATIONS.—Alterations and additions to tobacco factory for Messrs. Wood Brothers, Water-lane. Quantities from the architect, Mr. Frederick Masto, A.R.I.B.A., Greek-street-chambers, Leeds.

May 25.—SHEFFIELD, NEAR SWINSON.—SCHOOL.—Erection of school at Dourton to accommodate 100 scholars, for the Managers of Dourton School. Application for bill of quantities to be made to Messrs. Hicks & Symon, 12, John-street, Adelphi, London, W.C., before May 21, who will supply copies on deposit of 2s.

May 25.—USWORTH.—HOTSES.—Building complete of twelve houses at Usworth Colliery. Plans and specification may be seen by appointment on application to Mr. Douglas, Usworth Colliery Offices, Co. Durham.

May 25.—WEST SHERBURN.—CHURCH.—New Primitive Methodist church at West Sleekburn, near Bedlington. Names to Messrs. Davidson & Phillipson, architects, Pearl-buildings, Newcastle-on-Tyne.

ENGINEERING, IRON, AND STEEL.

May 12.—ACTON.—WATER SOFTENING APPARATUS.—The Acton Council invite tenders for the installation of a water softener and heating apparatus in connection with the tubular boilers at their public baths. Names with some particulars as to similar works executed elsewhere to Mr. D. J. Ebbetts, surveyor to the Council, 57, High-street, Acton, London, W., on or before May 12.

May 14.—BIRMINGHAM.—VALVES.—Birmingham Corporation invite tenders for the manufacture of a quantity of steam and water valves, also to make a number of combination hot and cold water valves of the Birmingham Corporation Baths special design and pattern. Application for permission to tender to be made to Mr. J. Cox, M.J.E.C., Superintendent Engineer and Secretary, Kent-street, from whom a copy of the specification and schedule of requirements may be obtained. Tenders must be sent in on May 14.

May 14.—MANCHESTER.—LATHES, ETC.—Manchester Corporation Tramways Committee invite tenders for

the supply of the following:—(a) Self-acting surfacing and screw-cutting lathe, brassinisher lathes, universal milling machine, double car-wheel lathe; (b) 30-horsepower lathe, 24-in. diameter. Specifications and forms of tender may be obtained on application to Mr. J. M. McElroy, General Manager, Tramways Department, 25, Piccadilly, Manchester. Tenders are to be sent to the Chairman of the Tramways Committee, 25, Piccadilly, Manchester, and must be received not later than 5 p.m. on May 14.

May 15.—BLACKBURN.—WATER METER.—The U.D.C. of Blackburn invite tenders for supply and erection of a 9-in. positive water meter, fitted with diagram recorder. Full particulars can be obtained by application to the Township Surveyor, Town Hall, Blackrock. Tenders to be lodged with Messrs. R. Findlay Heron, Town Clerk, Town Hall, Blackrock, marked "Tender for Water Meter," on or before 4 o'clock p.m. on May 15.

May 15.—DUBLIN.—ASPHALT BOILERS.—The Paving Committee of the Corporation of Dublin invite tenders for the construction of six portable asphalt boilers in accordance with the specification prepared by the Borough Surveyor, a copy of which can be obtained on application at the office of Mr. L. J. Lawless, C.E., Assistant Engineer, 26, Castle-street, Dublin, between the hours of 10 a.m. and 5 p.m. daily (Saturdays excepted). Tenders, sealed and endorsed on the envelope "Tenders for Asphalt Boilers," must be addressed to the Chairman of the Paving Committee, City Hall, Dublin, and delivered before 12 o'clock noon on May 15. The work to be executed under this contract shall be done entirely by local labour.

May 17.—SOUTHBOURNE.—MAINS.—Southborough U.D.C. invite tenders for laying and jointing about 2,000 yds. of 6-in. cast-iron, cast-iron water and gas mains on the Southfield Park Estate, Southborough. Specifications and particulars may be seen at the Council Office, Tenders to be sent in on or before May 17, addressed to Mr. Philip Hanner, Clerk to Council, Council Offices, Southborough.

May 17.—TEIGNEMOUTH.—BRIDGE.—The C.C. of the County of Devon invite tenders for rebuilding Vent-over-bridge. The plans, specification, and form of contract can be seen at the office of the Council at the County Exeter, where tenders are to be sent on or before May 17.

May 18.—LEEDS.—PIPS.—Leeds Waterworks Committee invite tenders for the following:—About eleven and three-quarter miles of mild steel pipes (4.625 tons in weight) varying from 32 in. to 33 in. in diameter, delivered at Birstwith, Ripley Valley, Wormald Green, and Ripon stations, North-Eastern Railway. Plans may be seen, and specifications obtained, at the office of Mr. Chas. H. M.C.E., Waterworks Engineer, Municipal Buildings, Leeds, on payment of a deposit of 5s. Tenders, properly endorsed "Tender for Steel Pipes, from Birstwith to Ripon," to be received at the Town Clerk's Office, Town Hall, Leeds, not later than 10 a.m. on May 18.

May 19.—CARDIFF.—WELL SINKING.—Tenders are invited for sinking a well (45 ft. deep by 4 ft. diameter) near the "Gower" in the Parish of St. Nicholas, near Cardiff, for Mr. J. Cory, J.P., D.L. Specifications to be obtained on application to the engineer, Mr. Henry T. Blake, Water Engineer, Ross, Herefordshire. Sealed tenders, endorsed "St. Nicholas Well," to be forwarded to the proprietor's solicitor, Mr. F. S. Collins, Ross, Herefordshire, not later than May 19.

May 21.—BOOLE.—GATE.—The Corporation of Roope invite tenders for the construction of an entrance gate to the wharf in Pine Grove. Plans and specifications may be seen, and bills of quantities obtained, at the office of the Borough Engineer, Tenders, sealed and endorsed "Tender for Gate to Wharf," to be delivered at office of Mr. J. Henry Farmer, Town Clerk, Town Hall, Roope, not later than 10 a.m. on May 21.

May 21.—HAMILTON.—FOOTBRIDGE.—The Landward Committee of Hamilton Parish Council invite tenders for building a footbridge, 185 ft. long, across the River Aven, near the "Gower" in the Parish of St. Nicholas, near Cardiff. Plans and specifications may be seen, and schedules obtained, at the office of Mr. J. B. Brodie, civil engineer, 141, West George-street, Glasgow, on payment of 2s. The engineer will meet intending officers at Ferniegair Railway Station on May 14, on arrival there of 11.12 a.m. train from Central Low-level Station, to point out the site of the works. Sealed tenders, endorsed "Tender for Footbridge and Protection of Right-of-Way at Fairholm," to be sent to Mr. A. L. Smith, Clerk, 25, Duke-street, Hamilton, on or before May 21.

May 21.—LYMINGTON.—BRIDGE.—The R.D.C. of Lymington invite tenders for building a new brick and concrete bridge over the stream at Roll Hill, in the Parish of Boldre. Plans and specifications for the work may be seen at office of Mr. J. Davis Rawlins, Clerk, 38, High-street, Lymington, any day (Sundays excepted) between the hours of 10 o'clock in the morning and 4 o'clock in the afternoon. Sealed tenders, marked "Tender, Bull Hill Bridge," on the cover, must be sent to the Clerk on or before May 21.

May 21.—ROTHERHAM.—RAILS, ETC.—Rotherham Tramways Committee invite tenders for the following:—(1) Steel rails, probable quantity, 105 tons; (2) fish plates, probable quantity, 3 tons; (3) tie bars, probable quantity, 4 tons; (4) bolts and nuts, probable quantity, 22 tons; (5) granite setts, 5 by 4, probable quantity, 1,100 tons; (6) 2-in. x 3-in. x 12-in. wire, 7 1/2 lbs. bars, 12 ft. long. Form of tender to be obtained, and specifications seen for Nos. 1 to 5 upon application to the Borough Surveyor. Form of tender for Nos. 6 and 7 to be obtained on application to the Electrical Engineer, applicable to the accompanying Nos. 1 to 6. Tenders, endorsed "Tramway Materials," to be sent to Mr. W. J. Board, Town Clerk, Town Hall, Rotherham, on or before May 21.

May 22.—CARDIFF.—HEATING APPARATUS.—Cardiff Guardians invite tenders for putting in an apparatus for heating their hospital at Fuschill by means of a system of steam pipes and ventilating radiators.

A plan of the building and copy of instructions can be obtained of Mr. George Armstrong, architect, Bank-street, Carlisle. Persons tendering are to show by their tenders the position of the radiators, and pipes and position of radiators, to prepare and submit with their tender a specification of the work proposed. Tenders, which are to be marked "Tender for Heating," are to be left at 7, Victoria-place, Carlisle, before noon on May 22.

May 22.—JALIA.—TUBES, PLATES, ETC.—The Secretary of State for India in Council invites tenders from such persons as may be willing to supply—(1) boiler tubes; (2) copper fire-box plates; (3) laminated bearing springs. The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office by two o'clock p.m. on May 22. Mr. E. Grant Baris, Director-General of Stores.

May 22.—SKIPTON.—VALVES, IRONWORK, ETC.—Skipton U.D.C. invite tenders from manufacturers only, experienced in the class of work required, for the supply of valves, fittings, pipes, and miscellaneous ironwork, required for the water shaft, etc., of this reservoir. Drawings may be seen, and copies of the specification, form of tender, and schedule of work may be obtained, at the offices of the engineers, Messrs. G. J. Hill & Sons, 5, Victoria-street, Westminster, and Albert Chambers, Albert-square, Manchester, on receipt of the sum of two guineas. A limited number of sets of the drawings, including a plan of the shaft, can be had on application, tendering on payment of the sum of 2s., which will not be returned. Sealed tenders, endorsed "Tender for Valves, Ironwork, etc., Embassy Moor Reservoir," may be received by Mr. Richard Wilson, Clerk to the Council, Skipton, on or before May 23.

May 23.—HEAGE.—PIPE LAYING.—Heage U.D.C. invite tenders for extending their water mains, etc. Plans may be seen, and bills of quantities obtained, and forms of tenders obtained, from the engineer, Mr. Maurice Hunter, Bridge-street, Belper, on and after May 7.

MISCELLANEOUS.

May 14.—BILLCURY.—CARTING, ETC.—Billicury R.D.C. invite tenders for carting material, and also for horse, harness, and man for occasional work, and for water carts, up to March 31, 1907; also for stable rolling, and for carting material, to be obtained from Mr. F. E. Lhalls, Ongar-road, Brentwood; or Mr. R. J. W. Layland, Billicury. Tenders to be sent to the Clerk, and marked "Tender for Team Labour," by May 15.

May 14.—DARTFORD.—TIMBER.—Dartford Guardians invite tenders for the supply (at per fathom) of 60 fathoms of best Baltic yellow deal and batten ends for the purpose of splitting, or firewood, contractor to state when the same can be delivered. Tenders to be delivered at office of Mr. J. C. Hayward, Clerk, Union Offices, Dartford, on or before May 15, endorsed "Tenders for Timber." Contractors to be sent to Mr. Frederick Stevens, Town Clerk, Town Hall, Bradford, on or before May 15.

May 15.—BRADFORD.—SCAVENGING.—The Cleansing Committee of the Bradford Corporation invite tenders for emptying and cleansing all the middens, ash-pits, privies, and cesspools in the town, village, and in the North Bierley and Idle districts for one year, commencing on July 1 next. Specification, form of tender, etc., may be had on application to Superintendent, Cell, at the Hammer-street Depot. Sealed tenders, endorsed "Tender for Scavenging," to be sent to Mr. Frederick Stevens, Town Clerk, Town Hall, Bradford, on or before May 15.

May 16.—DUBLIN.—FENCE.—North Dublin R.D.C. invite tenders from competent parties for the erection of a corrugated iron fence on their property, Clonsilla road, in the Parish of Clonsilla, in accordance with the specification, which, with the Ordnance map, can be seen at office of Mr. John O'Neill, Clerk of the Council, North Brunswick-street, Dublin. Tenders to be sent in not later than 11 o'clock a.m. on May 16.

May 16.—EAST STOW.—CARTING.—East Stow R.D.C. invite tenders for carting road materials in the second ward of the East Stow Rural District during the ensuing year. Forms of specification, all necessary particulars, can be obtained of Mr. Gordon Harrison, surveyor, Stowmarket. Tenders to be sent in by 4 p.m. on May 16, to Mr. R. E. Wilkes, Clerk to the Council, Stowmarket, in envelopes which will be provided for the purpose.

May 16.—GORTON.—ASPHALTING.—Gorton Education Committee invite tenders for the asphaltting of the playground of the Hyde-road Council school. Forms of tender, etc., from Mr. J. W. Wiles, surveyor, Town Hall, Gorton. Tenders, endorsed "Tender for Asphaltting," must be received at office of Mr. W. A. Clegg, Secretary, Town Hall, Gorton, by 10 o'clock a.m. on May 16.

May 17.—WOOLWICH.—WATER VANS, ETC.—The Metropolitan Borough of Woolwich invite tenders for the supply of three water vans, each with a cart, ten slot cars, two street-sweeping machines, one road scraper. Forms of tender, etc., can be seen at the office of Mr. J. Rush Dixon, M.J.E.C., Borough Engineer, Town Hall, Woolwich. Tenders must be sent to Mr. Arthur B. Bryceson, Town Clerk, Town Hall, Woolwich, not later than 12 noon on May 17, in envelope, sealed, and endorsed "Tender for Water Vans, etc."

May 18.—BERMONDSEY.—MAINTENANCE OF WELL.—Bermondsey Borough Council invite tenders for repair and maintenance of artesian well and pump specifications and forms of tenders to be obtained on application to the Borough Electrical Engineer, Mr. W. E. J. Heenan, M.J.E.C., Spa-road, S.E. Tenders must be sent to Mr. Frank R. Ryall, Town Clerk, Town Hall, Spa-road, S.E., not later than 4 p.m. on May 18.

May 19.—SOYLAND.—KEEPSOME, ETC.—Soyland U.D.C. invite tenders for the supply of about 360 yds. of good 22-in. by 8-in. dressed kerlistones, and about 480 yds. of good, sound, 3-in. riven flags, from Ebbw Vale or Southwam quarries, to be delivered at Halfway-road, near Ebbw Vale, Gwent. Also the painting of the whole of the street lamps in the Council's district. Further particulars may be had from Mr. John Wadsworth, surveyor,

Form of tender, etc., obtained at the office of Mr. S. E. Burgess, M.I.C.E., Borough Engineer, and Surveyor, Chapter-row. Tenders, on forms supplied, must be delivered to the Town Clerk, Court-buildings, South Shields, not later than 12 noon on May 21, endorsed "Tender for Road Lowering, Jarrow-road."

May 22.—**STRADGYNHALS**.—Pipes, etc.—Ystradgynhal G.R.C. invite tenders for the following works: Quantities, etc., given below.—6 in. diameter, about 52 yds.; 3 in. diameter, about 5,304 yds.; 4 in. diameter, about 1,180 yds.; 3 in. diameter, about 1,400 yds., delivered at Ystradgynhal or Abertravale. Contract No. 1, for the supply of cast-iron pipes of 6 in. diameter and jointing of about 50 yds. of 6 in. (Maiden Railway), as directed. Contract No. 2, for the laying and jointing of about 50 yds. of 6 in., 5.304 yds. of 5 in., 1,180 yds. of 4 in., and 1,400 yds. of 3 in. cast-iron pipes, and the construction of manholes and collecting tanks, etc. Plans, etc., seen, and bills of quantities obtained, at the office of Mr. John W. Leyshon, Sanitary Inspector, Ystradgynhal. Sealed tenders, on forms to be obtained from Mr. Leyshon, should be endorsed "Contract No. —," and delivered at office of Mr. L. J. Kempthorne, Clerk, Dyffryn-chambers, Neath, not later than 5 o'clock p.m., May 22.

May 25.—**ROADEX**.—SEWERAGE WORKS.—The Visiting Committee of the Cornwall County Lunatic Asylum invite tenders for tunnelling and laying 12 in. iron pipe therein, also stoneware pipes connecting manholes, and other work in accordance with plans, manholes, and other work, to be seen at the office of the engineers, Messrs. S. W. Jenkin & Son, The Parade, Liskeard; or at the Steward's office, at the Cornwall County Lunatic Asylum, Bodmin. Intending contractors will have to deposit the sum of 3*l.* sealed tenders, on printed forms supplied, are to be delivered at office of Mr. M. F. Edyveson, Clerk, the Visiting Committee, Bodmin, on or before 12 o'clock noon on May 25.

May 25.—**BOOTE**.—ROAD.—The Corporation of Boote invite tenders for the construction of Water-bridge through the South Recreation Ground and the Boote Cricket Ground. Plans and specification may be seen, and bills of quantities obtained, at the office of the Borough Engineer. Tenders, sealed, E.C. To be delivered at office of Mr. J. Henry Farmer, Town Clerk, Town Hall, Boote, not later than 10 a.m. on May 25.

May 25.—**SEWER**.—The Corporation of Boote invite tenders for the construction of a sewer along Miranda-road continuation, across the South Recreation Ground. Plans and specification may be seen, and bills of quantities obtained, at the office of the Borough Engineer. Tenders, sealed, and endorsed "Tender for Miranda-road Sewer," to be delivered at office of Mr. J. Henry Farmer, Town Clerk, Town Hall, Boote, not later than 10 a.m. on May 25.

May 23.—**GREENOCK**.—WASHER. SERDBER.—Greenock Corporation Gas Committee invite tenders for the supply and erection of Incheen Gasworks for a washer, scrubber and tar extractor, having a capacity of 3,000,000 cubic ft. per 24 hours; exhaust, brickwork for bench of sixty-four retorts, yard, etc. Specifications and plans can be seen, and tender forms had, by applying to Mr. William Lawson, Engineer and Manager, Incheen Gasworks. Sealed tenders, endorsed "Tender for Washer Scrubber and Tar Extractor," etc., to be returned not later than May 23.

May 23.—**TOWNES**.—SEWERAGE.—The Corporation of Townes invite tenders for the construction of outfall works, storm overflows, screening chambers, manholes, accommodation roads, alterations to engine-house, laying sewers, and other work in connection with the completion of the existing sewerage system of Townes, Devon. Persons desirous of tendering to send their names and addresses on or before May 12 to Mr. C. E. Wray, engineer, 18, Bedford-circus. Particulars will be forwarded as to the inspection of plans, specifications, and viewing site of works, and will also be supplied with a copy of the bills of quantities. Each application must be accompanied by a deposit of 10*l.* Tenders to Mr. P. Windlett, Town Clerk, Townes, before May 23.

May 24.—**ROMFORD**.—SEWERAGE WORKS.—The Romford U.D.C. invite tenders for works of sewerage in the parish of Collier-row, as hereunder:—About 2,976 ft. run of 12 in. foul sewer, Mawneys-road; about 905 ft. run of 6 in. foul sewer, Mawneys-road; about 928 ft. run of 10 in. foul sewer, Elm-road; about 1,426 ft. run of 10 in. foul sewer, White Hart-lane; about 1,070 ft. run of 7 in. foul sewer, Low-shoalane; about 30 ft. run of 10 in. foul sewer, Chase Cross-road; about 1,171 ft. run of 9 in. foul sewer, Chase Cross-road; about 1,472 ft. run of 7 in. foul sewer, Chase Cross-road; about 1,070 ft. run of 10 in. foul sewer, across roads. With all manholes, ventilating columns, inverted siphons, self-acting, junction boxes, etc. required. Plans may be seen, and copies of the specification and schedule obtained in the office of Messrs. Warren & Stuart, 64, Roper-street, Romford, upon payment of 5*l.* Sealed tenders, endorsed "Sewerage Works," must be sent in on the forms supplied, and delivered to Mr. Charles T. King, Clerk to the Council, Council Offices, Romford, not later than May 24.

May 25.—**GLANGEMOUTH**.—DANK.—The Glangemouth Town Council invite offers for the construction of a covered service tank on the summit of the hill north of Millhall Reservoir, east of Polmoan, and other works. Drawings may be seen, and copies of the specification and schedule obtained in the office of Messrs. Warren & Stuart, 64, Roper-street, Glasgow, on payment of 1*l.* Sealed offers, endorsed "Glangemouth Water, Tender for Contract No. 10," to be lodged with Mr. James P. Mackenzie, Town Clerk, Glangemouth, not later than May 25.

May 25.—**EAST GRINSTEAD**.—SENNYSIDE DRAINAGE.—The Council hereby invite tenders for the underground works.—Contract No. 1, supplying 6 in. cast-iron socket pipes (about 1,400 yds.) contract No. 2, laying masonry main and sewers; contract No. 3, building engine-house, tanks, etc.; contract No. 4, supplying and erecting duplicate gas-engines and pumps. Plans and specifications may be seen

and forms of tender and other particulars obtained, from Mr. W. E. Woodam, Engineer and Surveyor, Council Offices, London-road, East Grinstead, during the usual office hours, on days terminating on the usual order of the day. Specification and particulars of contracts Nos. 1 and 4 will be forwarded on application. Tenders, on the prescribed form, and to be sent to Mr. E. P. Whitley Haines, Clerk to the Council, on or before May 26, in sealed envelopes provided for that purpose.

* May 29.—**LONDON**.—PAVING.—The London C.C. invite tenders for providing and laying new tar-paving in playgrounds attached to schools, and also for repairing, retopping, and running tar-paving at the various schools, etc., under its control. Specification, form of tenders and sections may be obtained from the Education Office (Architect's Department), Victoria-embankment, W.C. Tenders must be enclosed in envelope provided, and delivered at the Education Office (Room 148), Victoria-embankment, W.C., before 11 a.m., May 29.

JUNE 2.—**GUILDFORD**.—SURFACE-WATER DRAINAGE.—The Town Council invite tenders for the construction of about the following lengths of surface-water drains in the Charlottetown and Guildford Park Estates, inclusive of all necessary manholes, gullies, and manholes, outfall, etc.—85 yds. run of 45 in. by 24 in. armoured concrete tubes; 490 yds. run of 18 in. armoured concrete tubes; 830 yds. run of 18 in. armoured concrete tubes; 132 yds. run of 35 in. armoured concrete tubes; 189 yds. run of 30 in. armoured concrete tubes; 189 yds. run of 30 in. armoured concrete tubes. Bills of quantities, and form of tender to be obtained on application to Mr. C. G. Mason, A.M.I.C.E., the Borough Engineer, 32, Sealed tender, upon payment of 10*l.* "Tender for Charlottetown and Guildford Park Surface-Water Drainage," are to be sent to Mr. F. S. Miller, Town Clerk, Guildford, before 12 o'clock noon on May 29.

* JUNE 6.—**FINSBURY**.—PAVING.—For the laying of 1,070 yds. of tar paving in the Finsbury Gardens for the Corporation. Particulars may be obtained from the City Engineer, Guildhall, E.C. Tenders to be addressed to Town Clerk, Public Health Department, Guildhall, R.C., and delivered at the Hall-keeper's office, Guildhall, on or before June 6, 12 o'clock noon.

NO DATE.—**BODENHAM**.—DRAINING.—The Managers of Bodenham School invite tenders for draining and repairing the school playground, forming and carting with ashes, and dressing with Clew Hill chips; also tarring and sanding same, to form what is locally known as asphalt. Area to be so treated about 500 yds. Tenders to be forwarded to the Corporation of the School, Bodenham Vicarage, near Leominster.

STONE, MATERIALS, AND STORES.

May 14.—**BATH**.—PIPES.—The Bath R.D.C. invite tenders for the supply and delivery of 120 yds. of Midland stations. Forms of tenders, with particulars, may be obtained from Mr. R. H. West, Bath, Clerk to the Council, 1, The Arcade, Bath, before 12 o'clock on May 14, and 4 p.m. on May 14, marked "Tenders for Pipes," not later than 12 o'clock on May 14.

May 14.—**RENGADIAN** AND WHITE LEAD.—The Bengal and North-Western Railway Company invite tenders for the supply and delivery of 70 tons red lead, and 50 tons white lead, as per specification. Tenders, addressed to Mr. The Managing Director, 237, Gresham House, Old Broad-street, London, E.C., and marked "Tender for Red and White Lead," etc., to be sent in not later than noon on May 15. For each specification a fee of 1*l.* will be charged, which cannot be returned.

May 14.—**BILLERICA**.—GRANITE. ETC.—Billericay R.D.C. invite tenders for the supply and delivery, by carrying up to March 31, 1907—Guernsey granite, Queanast granite, Kentish rags, flints, etc., to be delivered to the Surveyor, according to forms of tender, to be obtained from Mr. W. E. R. F. Ennals, Engineer, Billericay. Tenders, to be sent to the Clerk, and marked "Tender for Stone," by May 14.

May 15.—**BRADFORD**.—GOODS.—Bradford Cleansing and Tram Labour Committee invite tenders for the supply of the undermentioned goods during the supply of the undermentioned goods during the year ending June 30, 1907.—Iron castings, iron, steel, bolts and nuts, carbonic acid, street sweeping machine brushes, brooms, shovels, nails, lime, iron piping. Forms of tender may be obtained on application to the Superintendent, Call, at the Hammerton-street Depot. Sealed tenders, duly endorsed, to be sent to Mr. Bradford, Stevens, Town Clerk, Town Hall, Bradford, on or before May 15.

May 15.—**GLASGOW**.—MATERIALS.—Glasgow Corporation invite tenders for supplying the undermentioned materials as may be required by the Sewerage Department on or after June 1 next, according to standard samples, to be seen at the office of the Sewerage Department, 30, Cochran-street, Glasgow. The tenders, to be sent in sealed envelopes, must be lodged with Mr. A. W. Myles, Town Clerk, City Chambers, Glasgow, on or before May 15.

May 16.—**HAM**.—MATERIALS.—Ham U.D.C. invite tenders for the following materials, etc.: (1) Tenders for 300 yds. (more or less) of Guernsey granite broken to pass through 14 in. ring, delivered alongside at Petersham Dock; (2) 200 yds. (more or less) of broken brown Kent flints, to be delivered alongside at Petersham Dock; (3) tenders for cartage of granite and flints from Petersham Dock to any part of the district of the Council, as required at per yard; (4) tenders for hire of horse,

cart, and man, at per day, for ashes, water, gravel, and rubbish at Ham. Further particulars may be obtained on application to the Surveyor of the Council, Mr. H. J. Turner, Vine Cottage, Ham Common. Tenders, sealed and endorsed, must be delivered to Mr. Turner, at the above address, not later than May 16.

May 17.—**BIRKENHEAD**.—LIME.—The Corporation of Birkenhead invite tenders for the supply of 550 tons, or thereabout, of lime for gas purifying, delivered free to their gas works as required during the twelve months ending on June 30, 1907, and as directed by the Gas Engineer, Mr. T. O. Paterson, from whom forms of tender and all particulars may be obtained. Tenders, sealed and endorsed "Tender for Lime," to be sent in to Mr. Alfred Gill, Town Clerk, Town Hall, Birkenhead, not later than 5 p.m. on May 17.

May 19.—**HADLEIGH**.—GRANITE.—Hadleigh U.D.C. invite tenders for supplying 170 tons of 2 in. broken Guernsey or Alderney granite, to be delivered free at Hadleigh (Suffolk) Railway Station, between June 15 and 30 next. Sealed tenders, endorsed "Tenders for Granite," with samples, to be sent to Mr. Charles J. Grimwade, U.D.C. Office, Hadleigh, Suffolk, on or before May 19.

May 19.—**LEEDS**.—LEADS.—Leeds Corporation Gas Committee are prepared to receive tenders for the supply of about 11,000 tons of best Craven or Derbyshire lime, required for the twelve months commencing July 1, 1906. Forms of tender may be had on application to Mr. R. H. Townsley, General Manager, Gas Offices, Leeds. Samples of granite, to be delivered to Mr. H. Parade, Leeds. Endorsed tenders, addressed to the Town Clerk, Town Hall, Leeds, to be delivered not later than May 19.

May 19.—**LEEDS**.—TEES, BRICKS, FLAGS.—Leeds Corporation invite tenders for wrought-iron tubes, for pressed and common red bricks, for 24 in., 3 in., and 4 in. self-faced Bradford or Halifax flags. Forms of tender may be had on application to Mr. H. Parade, Leeds. Endorsed tenders, addressed to the Town Clerk, Town Hall, Leeds, to be delivered not later than May 19.

May 22.—**SAFFRON WALDEN**.—GRANITE.—Saffron Walden R.D.C. invite tenders for the supply and delivery of about 500 tons of granite, broken to 14 in. gullies, as follows:—Samples of granite, G.E.R. 150 tons; Newport Station, G.E.R. 150 tons; Barton Station, G.E.R. 100 tons; Eleantham Station, G.E.R. 100 tons. The above quantities to be delivered before May 22, 1906. Samples of granite, to be delivered to Mr. H. Smith, District Surveyor, Saffron Walden, not later than May 19.

May 22.—**LONDON**.—STONE.—Great Western Railway Directors invite tenders for the supply of machine-broken road stone and stone chippings. Conditions of contract and forms of tender (upon which alone tenders will be received) may be obtained on application to Mr. G. K. Mills, Secretary, Paddington Station, London, by whom tenders, marked outside "Tender for Road Stone, etc.," will be received on or before May 22.

May 22.—**MONMOUTHSHIRE**.—MATERIALS FOR ROADS.—For the supply of materials or for hauling broken and unbroken stone for the repair of the main roads within the county for the year ending June 30, 1907. Particulars, and forms of tender, on application to the County Council Offices, Newport. Sealed tenders to be sent to Mr. William Tanner, County Surveyor, County Council Offices, Newport, on or before May 22.

May 22.—**WALSLEY**.—SPICES.—For the supply of the undermentioned articles, from the date of acceptance of tender and until October 31, 1907:—Samples of undermentioned articles, paid for by the Surveyor, in pick-hands, pick shafts, shovels (No. 4, No. 6, and Black's No. 4), manhole covers and frames weighing not less than 42 cwt. or 32 in. square cast-iron, whistleone chips, whistleone setts, 4 in. by 5 in. and 3 in. by 6 in. bricks, ballast, sand, lime cement, coals, limestone, and slag (crushed), to be delivered to Mr. W. B. Wilester, Town Clerk of Walsley, 28, Sandhill Newcastle-upon-Tyne, marked "Tender for Goods," on or before noon of May 22.

May 23.—**RAMSAY**.—GRANITE EDGE KEAR.—The Corporation of Ramsay invite tenders for the supply and delivery of 3,000 ft. 6 in. by 12 in. granite edge kerb. Specification and forms of tender may be obtained on application to Mr. T. G. Taylor, Borough Engineer, Borough Engineer's Office, Albion House, Ramsay. Sealed tenders, on forms supplied, must be delivered not later than May 23.

May 24.—**CUCKFIELD**.—MATERIALS, ETC.—Cuckfield U.D.C. invite tenders for the supply of about 550 tons of granite broken to 14 in. gullies, and for 125 yds. of flints. To be delivered, carriage free, at Cuckfield, before the date of the survey, on or after before May 24. Tenders are also invited for carting the above materials from Haywards Heath Station on to the several roads in the district. Tenders, on forms to be obtained from Mr. A. C. Woodcock, Town Clerk, Haywards Heath, must be sent in on or before May 24.

May 24.—**GREENOCK**.—ROAD MATERIALS.—The Corporation of Greenock invite offers for the supply of Whin setts, kerbstones, road metal, and Whin gravel, also for pitch and pitch oil, for twelve months from June 10. Specification and form of tender may be obtained from Mr. James J. Turnbull, C.E., Master of Works, Sealed tenders, marked outside "Tender for—," to be lodged with Mr. Colin MacCallum, Town Clerk, on or before May 24.

May 25.—**LEEDS**.—LEADS.—Leeds Corporation invite tenders for the supply of the following materials for maintenance of roads, etc.:—Granite, limestone, tar macadam (carriage free), broken brown Kent flints, to be broken to 2 in. size; black ashes, hard burnt red ashes, hard stone flags, concrete flags, bricks, and sanitary

tubs; horse hire for team labour. Forms of tender... MAY 29.—GREAT YARMOUTH.—GRANITE.—The Great Yarmouth Town Council invite tenders for the supply of the following road materials:—1,400 tons of Caenese granite, 1,400 tons of 3-in. local, quartzite, Penlee, or other stone of equal value for road making; 1,500 yds. cube broken flint; 600 yds. cube coarse gravel; 1,000 yds. cube fine footpath gravel.

Specifications, form of tender, and envelopes in which the tenders must be enclosed, can be obtained at the office of Mr. W. Cockrill, M.C.E., Borough Surveyor, Town Hall, Great Yarmouth. Tenders are to be delivered at the office of the Town Clerk, Town Hall, Great Yarmouth, before noon, May 29. JUNE 7.—PENRHYWELER.—STONES.—The Directors of the Penrhyweler Navigation Colliery Company, Ltd., Penrhyweler, R.S.O., Glam., invite tenders for following during a period of twelve months from July 1, 1906. Tenders to be sent in later than Thursday, June 7. Forms of tender may be obtained on application to the Secretary. No. 1. iron and

steel; No. 2, castings; No. 3, bolts, nuts, rivets, iron washers, and nails; No. 4, miners' lamps and lamp glasses, electric lamps, and fittings; No. 5, rubber, leather, waste, wick, brattice cloth, packing, yarn, and leather belting; No. 6, steam, water, and gun metal fittings, etc.; No. 7, ironmongery, files, saws, gouges, colliers' tools, helves, shovels, and sundry stores; No. 8, paints, driers, brushes, brooms, etc.; No. 9, pitch-pine deals, red pine, best quality, American birch boards and deals, poplar and elm curbs, elm, G. and T. match, and flooring boards; No. 10, wire ropes; No. 11, lime and cement; No. 12, cal. talow, and grease.

Public Appointments.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, Applications to be in. Includes roles like London County Council, Kingston-on-Thames Corp., and Leicester Mun. School of Art.

Auction Sales.

Table with 4 columns: Nature and Place of Sale, By whom Offered, Date of Sale. Lists various real estate sales with details on location and agent.

PATENTS.—Continued from page 534.

ceilings, or walls, are supported upon temporary centring or scaffolding arranged beneath the joints only of the said blocks, tiles, or the like, and cement is then filled in between the blocks to form a bed for the reinforcing metal rods which are laid thereon and covered with more cement, and then previously to the pouring in of cement to completely fill the interstices between the said blocks, tiles, or the like, arches, rings, or other suitably shaped strips of suitable material are placed in position to prevent overflowing of the cement into the chambers or hollows in the said blocks, tiles, or the like.

By H. DONALDSON & SONS. Mile End.—66 to 72 (even), Devonshire-st., u.t. 54 yrs., gr. 171, 13s., wr. 1504, 16s. Stratford.—4 to 20 (even), Paul-st., u.t. 16 yrs., gr. 174, wr. 1822. 29 to 29 (odd), Paul-st., u.t. 17 1/2 yrs., gr. 84, wr. 972, 10s. Steppay.—16, 18, and 20, White Horse-la., f. w.r. 1922. Dalston.—83, Albert-st., u.t. 42 1/2 yrs., gr. 51, y.r. 341. 73, Albion-rd., u.t. 37 yrs., gr. 31, 13s. 6d., y.r. 342. Mile End.—38 and 52 Grosvenor-rd., u.t. 38 1/2 yrs., gr. 91, y.r. 841. Millwall.—102 to 112 (even), Glangall-rd., u.t. 32 1/2 yrs., gr. 24, wr. 1704, 15s. May 2.—By BAXTER, PAYNE, & LEPPER. New Cross.—1, 2, and 3, Kenderge-rd., f. w.r. 622, 8s., reversion in 23 yrs. 140. By DAVID BURNETT & CO. Clapton.—1, 1A to 9, 3A (odd), Leagrave-st., u.t. 98 yrs., gr. 311, 5s., wr. 2081. Hackney.—17 to 27 (odd), Ada-st., f. wr. 1562, 1,325. 29 to 34, Goring-rd., f. wr. 1234, 10s. 1,050. By FOSTER & CRANFIELD. Balham.—97 and 99, Fernlea-rd., u.t. 67 1/2 yrs., gr. 122, 13s., y.r. 684. Kennington.—49, 43, and 50, Chandeville-rd., u.t. 74 1/2 yrs., gr. 354, ar. 1951, u.t. 54 yrs., gr. 75, y.r. 401. Kennington.—13 to 24 (even), Medley-st., u.t. 25 yrs., gr. 201, increasing to 26 1/2, y.r. 1602. 1,600. By HUBBERT & FLINT. Holloway.—Tollington-pk., f.g. rents 2522, 10s., reversion in 87 yrs. 5,025. Birmans-rd., f.g. rents 1441, 10s., reversion in 87 yrs. 3,390. By C. H. MASON. Hornsey.—Turnpike-lk., f.g. rents 211, 10s., reversion in 73 and 71 yrs. 535. 20, 50, 52, and 54, Turnpike-la., f. y.r. 1481, 1,580. 110, Turnpike-la., f. y.r. 454, 490. Wood Green.—2, 4, and 6, Fernlea, f.g.t. 144, 15s., reversion in 66 1/2 yrs. 340. Station-rd., a plot of building land, area 2,700 sq. ft. 155. By C. H. MASON. Brompton.—189, Rotherhithe New-rd. (s.), f. ar. 401. 305. May 3.—By BOWDITCH & GRANT. Addiscombe.—Lower Addiscombe-rd., "Gutram House," u.t. 65 yrs., gr. 154, p. 600. By GLASIER & SONS. Holloway.—Everleigh-st., "Everleigh Hall," f. y.r. 301. 410. 86, Campbell-rd., u.t. 62 1/2 yrs., gr. 51, wr. 971, 14s. 200. 83 to 96 (even), Campbell-rd., f. y.r. 2004, 6s. 4, Parkhurst-rd., u.t. 48 yrs., gr. 61, 6s., y.r. 423, 10s. 700. By CHESTERTON & SONS. Kensington.—29 and 31, Kensington High-st. (s.), one-half share, f. y.r. 9502, 11,100. 113 and 115, Kensington High-st. (s.), u.t. 43 yrs., gr. 1301, y.r. 1,000. 13,500. Putney.—83, West-hill, f. y.r. 1501, 3,000. West-hill, "Ravenswood," and 5 a 1 r 7 p, l. p. 6,000.

Leicester.—1, Humberstone-gate, and 2, Gallowtree-gate (hooused premises), one-half share, f. y.r. 3901. 58,100. Islington.—Upper-street, "The Marlborough Head" p.h., one-half share, f. y.r. 2501. 3,800. Commercial Road East.—Brunton-pk., f.g.t. 211, reversion in 42 1/2 yrs. 590. York-rd., f.g.t. 101, 10s., reversion in 42 1/2 yrs. Peckham.—Reedham-st., f.g.t. 101, reversion in 42 1/2 yrs. Sandison-st., f.g. rents 201, 15s., reversion in 21 1/2 yrs. 295. 730. Denmark-rd., f.g.t. 101, reversion in 44 1/2 yrs. Limehouse.—103, East India Dock-rd. (s.), y.r. 261. 355. Rotherhithe.—45, Alabaster-st., f. wr. 109, 10s. 130. By C. H. MASON. Hatherlyden.—26, Craven-pk., u.t. 82 yrs., gr. 81, y.r. 704. 680. By NEWBORN, SHEPHERD, & EDWARDS. Wood Green.—16, Imperial-rd., u.t. 89 yrs., gr. 61, 10s., ar. 321. 225. Hornsey.—12, Holland-rd., u.t. 61 yrs., gr. 61, wr. 861, 8s. 190. Clerkenwell.—Warren-st., f.g. rents 501, u.t. 21 yrs., ar. nil. 500. By WM. STEVENS. Hackney.—3, 5, and 9, Norwich-rd., u.t. 39 yrs., gr. 101, 10s., ar. 1101, 10s. 585. Kingsland-road.—No. 435, u.t. 191 yrs., gr. 61, ar. 454. 210. By SIMMONS & SONS. Blackfriars.—5, 6, and 7, Surrey-row, f. wr. 881, 8s. 1,700. 9, Surrey-row (forge and stable), f. y.r. 1001. 740. Mitcham.—Common Side East, a block of freehold building land, area 11,088 ft. 400. Wandsworth.—2, 3, and 9, Church-row, y.r. 921; also f.g.t. 291, 10s., u.t. 411 yrs., gr. 201, with reversion. 1,170. Hackney.—23, 25, and 27, Southwell-st., f. wr. 1241, 16s. 985. 32A, Dunlop-st., f. wr. 622, 8s. 500. 16 and 17, Horton-rd., u.t. 611 yrs., gr. 101, y.r. 621. 600. Wood Green.—89 and 91, Nightingale-rd., u.t. 54 1/2 yrs., gr. 91, y.r. 404. 415. 16, Winkler-rd., u.t. 57 yrs., gr. 31, 5s., wr. 361, 8s. 195. By FERRIS & PUGKIDGE. Little Hungerford, Berks.—"Chapel Farm" (part of), 13 a 3 r 16 p, f. (in lots). 1,045. May 4.—By ELLIS & SON. City.—10 and 12, Cephalon-av., area 3,600 ft., building lease for 80 yrs., let at per annum. 1,500. By FERRIS & PUGKIDGE. Mayfair.—119 Mount-st. (s.), u.t. 69 1/2 yrs., gr. 721, y.r. 581. 7,850. Dulwich.—42, 44, and 46, Goodrich-rd., u.t. 72 yrs., gr. 131, 10s., wr. 1141, 8s. 620. By HERRING, SON, & DAW. Peckham.—Commercial-rd., the "Sidsmonth Arms" p.h., etc., f.g. rents 1191, 5s., reversion in 94 and 69 yrs. 3,025. By MARTIN, WHITE, & CO. Dulwich.—87, Pellat-rd. (house, workshops, and stabling), area 2,600 ft., u.t. 73 1/2 yrs., gr. 121, p. 700.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT. April 27.—By RUMMEL & EDWARDS & MAPLE & Co. (at Harpenden). Harpenden, Herts.—Ayles End-rd., an enclosure of freehold building land, 12 a 0 r 29 p. 1,430. The common an enclosure of building land, 5 a 0 r 38 p, f. 770. April 30.—By J. H. BETHELL. East Ham.—98 to 104 (even), Wakefield-st., f. w.r. 521. 525. 106, Wakefield-st. (s.), f. wr. 261. 195. By GARTWRIGHT & ECHOLS. Pimlico.—33, Churton-st. (s.), y.r. 351; also f.g.t. 61, u.t. 81 yrs., gr. 31. 1,100. Balham.—42, Endesham-rd., f. gr. 601. 950. Ponders End.—Hertford-rd., a piece of building land, f. 700. By THOMAS, FEYER & MILES. Bromsgrove, Worcester.—The brewery, with nine tied houses, f. 7,500. By WILKINSON, SON, & WELCH (at Brighton). Withdean, Sussex.—"Withdean Hall Estate," 6 1/2 acres, part f., and part u.t. 51 yrs., gr. 631, p. 4,500. May 1.—By CHANCELLOR & SONS. Staines, Middx.—Church-st., "Ferndale," l. p. 400. By FRANCIS DOD & CO. Hoxton.—St. John's-rd., f.g.t. 1551, u.t. 18 yrs., gr. 1101. 295. Stoke Newington.—10 and 14, Defoe-rd., u.t. 59 yrs., gr. 121, wr. 911. 450. Dalston.—May-st., u.t. 15 yrs., gr. 108, wr. 271, 18s. 130. Willesden.—117, 119, 121, 123, and 131, Maye-rd., f. wr. 1504, 16s. 1,005. By FLEURY, SONS, & ADAMS. Linslade, Beds.—Old-rd., "Sunny Side House," f. ar. 354. 250. By H. HOLMES & CO. Notting Hill, 88, Ladbrooke-sq., f. ar. 1501. 1,600. Ilford.—43, Belvedere-rd., f. ar. 511. 615. By G. PEARCE & SONS. Hoxton.—36, 48, and 49, Buckland-st., u.t. 284 yrs., gr. 151, y.r. 1201. 830. Bethnal Green.—1 to 5, Crossman-sq., u.t. 82 yrs., gr. 151, wr. 1431. 540. Hackney.—12, 13, and 14, Barrowgate-rd., u.t. 64 yrs., gr. 121, y.r. 821. 610. Leyton.—210 and 212, Viaragong-rd., f. y.r. 761. 995. Viaragong-rd., a plot of building land, f. 310.

BY VENTON, BULL, & COOPER.
Ruislip, Middx.—"Ruislip Park Estate," 41 s.
3 r. 0 p. 1. £9,500
London-rd., "The Poplars" and 2 of an acre.
1 p. 810
Cannon Bridge—Rose Cottage and 1 s. 2
33 p. 1 p. 500
Shepherd's Bush.—75, Fritchville-gdns., nt. 70j
yrs., g. r. 6s. 8s., y. r. 40s. 430
By T. B. WESTACOTT.
Camden Town.—25, Delancy-st., ut. 32 yrs.,
g. r. 6l. y. r. 55l. 395
Kenish Town.—65, Falkland-rd., ut. 56j yrs.,
g. r. 6s. 8s., y. r. 34l. 375
Contractions used in these lists.—F.g.r. for freehold
ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for
improved ground-rent; g.r. for ground-rent; r. for rent;
f. for freehold; c. for copyhold; l. for leasehold; p. for
possession; e. r. for estimated rental; w. r. for weekly
rental; q. r. for quarterly rental; y. r. for yearly rental;
n. for unexpired term; p. a. for per annum; j. for years;
l. s. for lb. st. for street; rd. for road; sq. for square;
pl. for place; ter. for terrace; cres. for crescent;
av. for avenue; gds. for gardens; yd. for yard; gr. for
grove; h.h. for herbaceous; p.h. for public-house; o. for
office; s. for shops; ct. for court.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters,
and papers read at meetings rests, of course, with the
authors.
We cannot undertake to return rejected communica-
tions, and the Editor cannot be responsible for
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All communications regarding literary and artistic
matters should be addressed to THE EDITOR; those
relating to advertisements and other exclusively busi-
ness matters should be addressed to THE PUBLISHER,
and not to the Editor.

MEETINGS.

FRIDAY, MAY 11.
Royal Institution.—Professor J. H. Poynting on "Some
Astrophysical Consequences of the Pressure of
Light." 9 p.m.
Junior Institution of Engineers.—Mr. Adam Hunter on
"The Structural Design of Estuaries." 8 p.m.
Association of Engineers-in-Charge.—Annual meeting,
8 p.m.
SATURDAY, MAY 12.
Royal Institution.—Professor C. Weldstein on "English
Furniture in the XVIIIth century"—11. 3 p.m.
Edinburgh Architectural Association.—Associates'
morning visit to St. Andrew Steel Works.
MONDAY, MAY 14.
Surveyors' Institution.—Mr. William R. Beldwin-
Wiseman on "The Effect of Fire on Building Stone." 8
p.m.
Society of Arts (Lectures).—Mr. G. W. Ewe on
"Hershey in Relation to the Applied Arts"—1. 8 p.m.
Clerks of Works' Association (Carpenters' Hall).—Paper
by Mr. T. Adams, entitled "A Few Notes on the First
Garden City." 8.15 p.m.
TUESDAY, MAY 15.
Institute of Sanitary Engineers (Students' Lectures).—
Mr. J. H. Smyth, Q.S.A., on "Quantities and Measure-
ments of Sanitary Work." 7 p.m.
WEDNESDAY, MAY 16.
Architectural Association Discussion Section and the
Institution of Junior Engineers (Tufton-street).—Con-
tinuation of discussion on Mr. Bylender's paper on
"Ferro-Concrete." 7.30 p.m.
Builders' Foremen and Clerks of Works' Institution.—
Ordinary meeting of the members. 8 p.m.
Society of Arts.—Mr. Clayton Besle on "The Develop-
ment of Watermarking in Hand-made and Machine-made
Paper." 8 p.m.
Royal Meteorological Society (70, Victoria-street).—(1)
"An Instrument for Testing and Adjusting the Campbell-
Stokes Sunshine Recorder," by Dr. W. N. Shaw, F.R.S.,
and G. C. Simpson, M.Sc.; (2) "The Development and
Progress of the Thunder Squall of February 8, 1906," by
R. G. K. Lempfert, M.A. 4.30 p.m.
THURSDAY, MAY 17.
Architectural Association—Members' Dinner, Georgian
Hall, Gaiety Restaurant, Strand, 7 p.m.
Home Arts and Industries Association.—Exhibition
open at Albert Hall.
Carpenters' Hall, London-Wall (Lectures on Carpentry
and Joinery).—Mr. H. D. Searles-Wood on "Timber and
Half-Timber Houses—Decay and Preservation of
Timber." 7.30 p.m.
Royal Institution.—Rev. J. P. Mahaffy on "The
Influence of Ptolemaic Egypt on Greco-Roman Civiliza-
tion." 8 p.m.
Institution of Electrical Engineers.—Extraordinary
general meeting at the Society of Arts, John-street,
Adelphi, W.C. "Notes on Overhead Equipment of
Tramways," by Mr. R. N. Tweedy and Mr. H. Dugden.
Paper read at meeting of the Birmingham Local Section
on February 14. 8 p.m.
FRIDAY, MAY 18.
Royal Institution.—Professor A. Schuster on "Inter-
national Science." 9 p.m.

SATURDAY, MAY 19.
Royal Institution.—Professor Sir J. Dewar on "The
Old and the New Chemistry"—1. 3 p.m.
Institute of Sanitary Engineers.—Visit to the Waltham
Abbey Sewage Works.
Edinburgh Architectural Association.—Visit to Bonny-
bridge Foundry, Stirlingshire.
Incorporated Association of Municipal and County
Engineers.—Metropolitan district meeting, to be held at
Battersea. Discussion on the following paper, "Engi-
neering Notes on the Public Works of a Metropolitan
 Borough"—Battersea," by Mr. T. W. A. Hayward,
Borough Engineer and Surveyor.
Junior Institution of Engineers.—Visit Hornchurch,
Essex, for inspection of a wharf being constructed in
ferro-concrete. Train leaves Fenchurch-street (London,
Tilbury, and Southend Line) at 2.40 p.m.

PRICES CURRENT OF MATERIALS.

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

BRICKS, &c.	
Hard Stocks.....	1 8 0 per 1000 alongside, in river.
Rough Stocks and Grizzles.....	1 5 0 " " "
Picked Stocks for Facings.....	2 15 0 " " delivered.
Flettons.....	1 6 0 " " at railway depôt.
Red Wire Cuts.....	1 12 0 " " "
Best Fenchurch Bed.....	3 12 0 " " "
Best Red Pressed Ruabon Facing.....	5 0 0 " " "
Best Blue Pressed Staffordshire.....	3 15 0 " " "
Do, Bullnose.....	4 0 0 " " "
Best Stourbridge Fire Bricks.....	3 14 0 " " "
GLAZED BRICKS.	
Best White and Ivory Glazed Stretchers.....	12 0 0 " " "
Headers.....	11 0 0 " " "
Quoins, Bullnose, and Flats.....	16 0 0 " " "
Double Stretchers.....	19 0 0 " " "
Double Headers.....	16 0 0 " " "
One Side and two Ends.....	19 0 0 " " "
Two Sides and one End.....	20 0 0 " " "
Splays, Cham- fered, Squints.....	20 0 0 " " "
Best Dipped Salt Glazed Stretch- ers and Header.....	12 0 0 " " "
Quoins, Bullnose, and Flats.....	14 0 0 " " "
Double Stretchers.....	15 0 0 " " "
Double Headers.....	14 0 0 " " "
One Side and two Ends.....	15 0 0 " " "
Two Sides and one End.....	15 0 0 " " "
Splays, Cham- fered, Squints.....	14 0 0 " " "
Second Quality White and Dipped Salt Glazed.....	2 0 0 " " less than best.

Thames and Pit Sand.....	s. d.	4 9 per yard, delivered.
Thames Ballast.....	5 3	" "
Best Portland Cement.....	25 0	per ton, "
Best Ground Bone Lime.....	19 0	" "
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.		
Grey Stone Lime.....	11s. 0d.	per yard, delivered.
Stourbridge Fireclay in sacks.....	27s. 0d.	per ton at rly. dpt.

STONE.	
BATH STONE—delivered on road wag- gons, Paddington Depôt.....	1 6j per ft. cube.
Do, do, delivered on road waggon, Nine Elms Depôt.....	1 8j " "
PORTLAND STONE (20 ft. average)— Brown Whitbed, delivered on road waggon, Paddington Depôt, Nine Elms Depôt, or Fimlico Wharf.....	2 1 " "
White Basebed, delivered on road waggon, Paddington Depôt, Nine Elms Depôt, or Fimlico Wharf.....	2 2j " "
Ancaster in blocks.....	1 10 per ft. cube, deld. rly. depôt.
Beer.....	1 6 " " "
Greenhill.....	1 10 " " "
Barley Dale in blocks.....	2 4 " " "
Red Corshill.....	2 2 " " "
Cloisburn Red Freestone.....	2 0 " " "
Bed Mansfield.....	2 4 " " "
Yates Stone—Robin Hood Quality.	
Scrapped random blocks.....	2 10 " "
6 in. sawn two sides land- ings to sizes (under 40 ft. super).....	2 3 per ft. super, "
6 in. rubbed two sides ditto, ditto.....	2 6 " " "
3 in. sawn two sides slabs (random sizes).....	0 11j " " "
2 in. to 2 1/2 in. sawn one side slabs (random sizes).....	0 7j " " "
1 1/2 in. to 1 in. ditto, ditto.....	0 6 " " "
HAZEL YONG.— Scrapped random blocks.....	3 0 per ft. cube,
in. sawn two sides land- ings to sizes (under 40 ft. super).....	2 8 per ft. super, "
6 in. rubbed two sides ditto.....	3 0 " " "
3 in. sawn two sides slabs (random sizes).....	1 2 " " "
in. self-faced random flags.....	0 5 " " "

STONE (continued).	
Hopton Wood (Hard Bed) in blocks.....	2 0 per ft. cube, deld. rly. depôt.
" " " 6 in. sawn both sides landings.....	2 7 per ft. super, deld. rly. depôt.
" " " 3 in. sawn both sides random slabs.....	1 0 " " "
" " " 2 in. do. 0 8j " " "	

SLATES.	
In. In. £ s. d.	
20x10 best blue Bangor.....	13 2 6 per 1000 of 1200 at r. d.
18x10 " " " " " "	13 7 6 " " "
20x10 first quality.....	13 0 0 " " "
20x12 " " " " " "	13 15 0 " " "
16x8 " " " " " "	7 3 0 " " "
20x10 best blue Port- madoc.....	12 12 6 " " "
20x10 best Eureka un- fading green.....	15 17 6 " " "
20x12 " " " " " "	13 7 6 " " "
16x8 " " " " " "	10 0 0 " " "
20x10 permanent green.....	11 12 6 " " "
18x10 " " " " " "	9 12 6 " " "
16x8 " " " " " "	6 12 6 " " "

TILES.	
Best plain red roofing tiles.....	43 0 per 1000 at rly. depôt.
Hip and Valley Tiles.....	3 7 per doz. "
Best Broseley tiles.....	50 0 per 1000 "
Do. Ornamental do.....	52 6 " " "
Hip and Valley Tiles.....	4 0 per doz. "
Best Ruabon red, brown, or bruddled do. (Edwards).....	57 6 per 1000 "
Do. Ornamental do.....	59 0 " " "
Hip tiles.....	4 0 per doz. "
Valley tiles.....	3 0 " " "
Best Red or Mottled Stafford- shire do. (Peaks).....	51 9 per 1000 "
Do. Ornamental do.....	54 6 " " "
Hip tiles.....	4 1 per doz. "
Valley tiles.....	3 8 " " "
Best " Rosemary" plain tiles.....	48 0 per 1000 "
Best Ornamental tiles.....	50 0 " " "
Hip tiles.....	4 0 per doz. "
Valley tiles.....	3 8 " " "
Best " Hartshill " brand plain tiles, sand-faced.....	50 0 per 1000 "
Do. pressed.....	47 6 " " "
Do. Ornamental do.....	50 0 " " "
Hip tiles.....	4 0 per doz. "
Valley tiles.....	3 6 " " "

WOOD.	
At per standard.	
Deals: best 3 in. by 11 in. and 4 in. £ s. d.	£ s. d.
by 9 in. and 11 in.....	13 10 0 .. 15 0 0
Deals: best 3 in. by 9 in. and 4 in. do.	13 0 0 .. 14 0 0
Battens: best 2 1/2 in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	11 0 0 .. 12 0 0
Battens: best 2 1/2 in. by 6 in. and 3 in. by 6 in.	10 0 0 .. 10 0 0
Do. second quality.....	1 0 0 less than 7 in. and 8 in.
Battens: seconds.....	0 10 0 .. 0 10 0
2 in. by 4 in. and 2 in. by 6 in.....	9 0 0 .. 10 0 0
2 in. by 4 in. and 2 in. by 5 in.....	8 10 0 .. 9 10 0
Foreign Sawed Boards— 1 in. and 1 1/2 in. by 7 in.....	0 10 0 more than battens.
3 in.	1 0 0
At per length of 50 ft.	
Fir timber: best madding Danzig or Hartzog specification.....	4 10 0 .. 5 0 0
Seconds.....	4 0 0 .. 4 10 0
Small timber (8 in. to 10 in.).....	3 12 6 .. 3 15 0
Small timber (6 in. to 8 in.).....	3 0 0 .. 3 10 0
Swedish balks.....	4 10 0 .. 5 0 0
Pitch-pine timber (30 ft. average).....	4 0 0 .. 4 15 0

JOINERS' WOOD.	
White Sea: first yellow deals, 3 in. by 9 in.....	24 0 0 .. 25 0 0
3 in. by 9 in.....	22 0 0 .. 23 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 16 in. 10 in.	18 0 0 .. 18 0 0
Second yellow deals, 3 in. by 11 in. 18 in. 20 in.	20 0 0 .. 20 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 17 in. 10 in.	17 0 0 .. 17 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 13 in. 10 in.	14 0 0 .. 14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.....	13 0 0 .. 15 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 11 in. 0 in.	12 0 0 .. 12 0 0
Petersburg first yellow deals, 3 in. by 11 in.....	21 0 0 .. 22 10 0
Do. 3 in. by 9 in.....	18 0 0 .. 19 10 0
Battens.....	13 0 0 .. 15 0 0
Second yellow deals, 3 in. by 11 in. 16 in. 0 in.	17 0 0 .. 17 0 0
Do. 3 in. by 9 in.....	14 0 0 .. 16 0 0
Battens.....	11 0 0 .. 12 10 0
11 in.	13 0 0 .. 14 0 0
Do. 3 in. by 9 in.....	12 0 0 .. 14 0 0
Battens.....	10 0 0 .. 11 0 0
White Sea and Petersburg First white deals, 3 in. by 11 in. 14 in. 0 in.	15 0 0 .. 15 10 0
3 in. by 9 in. 13 in. 0 in.	14 10 0 .. 14 10 0
Second white deals, 3 in. by 11 in. 13 in. 0 in.	13 0 0 .. 14 0 0
3 in. by 9 in. 12 in. 0 in.	13 10 0 .. 13 10 0
" " battens.....	10 0 0 .. 11 0 0
Pitch-pine: best.....	11 0 0 .. 12 0 0
Under 2 in. thick extra.....	0 10 0 .. 1 0 0
Yellow Pine—First, regular sizes.....	44 0 0 upwards.
Oddments.....	32 0 0
Seconds, regular sizes.....	33 0 0
Yellow Pine oddments.....	28 0 0
Kaur Pine—Planks, per ft. cube.....	0 3 6 .. 0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube.....	0 3 0 .. 0 3 6
Small.....	0 2 6 .. 0 2 9
Wainscot Oak Logs, per ft. cube.....	0 5 6 .. 0 6 0
Dry Wainscot Oak, per ft. super.....	0 0 3 0 .. 0 0 9 0
Do. do. do.....	0 0 7 .. 0 0 7
Dry Mahogany—Honduras, Ta- casco, per ft. super, as in list.....	0 0 9 .. 0 1 0
Selected, Figury, per ft. super, as in list.....	0 1 6 .. 0 2 6

WOOD (continued).

Table listing wood types and prices: JOINERS' WOOD (continued), Dry Walnut, American, per ft. £ s. d., etc.

VARNISHES, &c.

Table listing varnishes and prices: Fine Pale Oak Varnish, Fine Copal Varnish, Superfine Pale Elastic Oak, etc.

CHESHUNT (Herts).

For erecting a public library, Turner's Hill, for the Urban District Council. Mr. J. Myrtle Smith, architect, & Traill, square, Chelsea, S.W.

TERMS OF SUBSCRIPTION.

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JOISTS, GIRDERS, &c.

Table listing joists and girders: Rolled Steel Joists, ordinary £ s. d., Compound Girders, ordinary 9 0 0 to 10 0 0, etc.

METALS.

Table listing metals: Common Bars, Staffordshire Crown Bars, Root merchant quality, etc.

TENDERS.

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

HAMPTON.—For erecting a porter's lodge at the Isolation Hospital, Uxbridge-road, Hampton-hill, for the Urban District Council. Mr. S. H. Chambers, Surveyor, Public Offices, Hampton, Middlesex.

HAMPTON.—For erecting conveniences, High-street and Bell-hill, for the Urban District Council. Mr. S. H. Chambers, Surveyor, Public Offices, Hampton, Middlesex.

Table listing sheet iron and corrugated sheet: Sheet Iron, Galvanised, flat, ordinary quality, etc.

LEAD, &c.

Table listing lead and other materials: LEAD—Sheet, English, 3lb. and up, Pipe in coils, etc.

BADMINTON (Gloucestershire).—For erecting recreation hall, for the Badminton Estate. Mr. F. W. Wills, architect, 8, St. Stephen-street, Bristol:—E. S. Bennett £2,224 0 1 Stephens, J. Perkins & Son 2,178 0 0 Bastow & Co., Ltd. 1,875 0 0 S. & J. Cole 2,134 8 0 A. Dowling 1,875 0 0 R. F. Ridd 2,118 0 0 E. Love 1,871 0 0 W. Jones 1,995 0 0 J. G. Norman 1,851 12 0 W. Cowley & Son 1,960 0 0 T. R. Lewis 1,818 0 0 Son 1,940 0 0 J. Long & Sons 1,760 0 0 E. Clark & Son Adams & Co. 1,915 0 0 Hayward & Wooster 1,757 0 0 G. Humphreys & Son 1,900 0 0 Brit-oh-wa 1,717 0 0 J. Hatherly 1,805 0 0 Orchard & E. Peerce 1,894 0 0 Peer 1,850 0 0

BADMINTON.—For the erection of a pair of labourers' cottages at Badminton, Glos. Mr. F. W. Wills, architect, 8, St. Stephen-street, Bristol:—R. Love 2,879 0 0 W. Webb 2,697 0 0 J. Perkins & Son 825 0 0 Wooster 947 0 0 E. S. Bennett 819 19 10 J. Hatherly 695 0 0 R. F. Ridd 795 0 0 W. Jones 650 0 0 W. Cowley & Son 733 0 0 Son 677 0 0 A. Dowling 753 0 0 Adams & Stephens 670 0 0 Long & Co., Ltd. 750 0 0 T. R. Lewis 625 0 0 J. Long & Sons 740 0 0 Orchard & Peer 609 0 0 E. Clark & Son 740 0 0 E. Peerce 600 0 0 G. Humphreys & Son W. J. Orbell & Son 730 0 0 Torranston 598 0 0 F. Chown 712 0 0 J. G. Norman 543 12 0 S. & J. Cole 699 11 0

BALLYMONEY.—For constructing Portlaine and Bushlock Waterworks, for the Rural District Council. Mr. McCormick, engineer, Diamond, Coleraine:—McKee & McNally, Dungannon 1,832 9 4

BEXLEY HEATH.—For the erection of a new police-station at Bexley Heath. Mr. J. Dixon Butler, Architect, surveyor to the Metropolitan Police, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son, & Childrey, Charing Cross-chambers, Duke-street, Adelphi:—Spencer & Son 19,650 Lathley Bros. 18,880 H. L. Holloway 9,473 Holloway Bros. 8,880 Thomas & Edge 9,149 Linselles & Co. 8,831 C. Ansell 9,000 F. & H. E. Higgs 8,670 Graham & Co. 8,999 Higgs & Hill 8,594 Howlett & Co., Ltd. 8,618 Howlett & Co. 8,472 H. Kent 8,987 Godson & Sons 8,368

CARLISLE.—For pumping-station, tanks, filters, etc., for the Corporation. Mr. H. C. Marks, City Engineer and Surveyor, 36, Fisher-street, Carlisle. Quantities by the City Engineer:—S. S. Stott & Co., Haslingden 2,970

CARLISLE.—For sewage screens, elevators with motors, for the Corporation. Mr. H. C. Marks, City Engineer and Surveyor, 36, Fisher-street, Carlisle. Quantities by the City Engineer:—Gwynnes, Ltd., 80, Cannon-street, London 1,803

CHEVINGTON.—For private street improvements, Red-row, for the Morpeth Rural District Council:—Messrs. Bradthwaite & Curtis 1765 10 11 G. Armstrong 488 13 0 J. Lant 691 5 6 J. Johnson & E. Edgar 677 0 6 Son, Embleby J. Ligns 617 6 6 ton 474 18 2 M. D. Young 628 7 6

HAMPTON.—For erecting a porter's lodge at the Isolation Hospital, Uxbridge-road, Hampton-hill, for the Urban District Council. Mr. S. H. Chambers, Surveyor, Public Offices, Hampton, Middlesex:—E. Potterton 2,468 0 Wright & Sons 1,832 10 H. J. Budd 452 0 C. H. Keen, Cranford 337 10 J. Barker & Co. 419 0 ford, Hounslow 337 10

HAMPTON.—For erecting conveniences, High-street and Bell-hill, for the Urban District Council. Mr. S. H. Chambers, Surveyor, Public Offices, Hampton, Middlesex:—Bell-hill Convenience. B. Finch & Co. 1,199 10 C. H. Keen 1,131 0 E. Potterton 174 0 Wright & Sons 120 0 J. Barker & Co. 141 0 H. J. Budd 141 0

High-street, Hampton-hill, Convenience. Finch & Co. 1,184 10 C. H. Keen 1,128 10 E. Potterton 157 10 H. J. Budd, King's Cross 134 12 ton-on-Tbanes 128 0 J. Barker & Co. 133 0

HEREFORD.—For erecting a pair of semi-detached villas, for Mr. F. Peerce, on the Highfield Building Estate. Messrs. Groome & Bettington, architects and surveyors, Paisioo-chambers, Hereford:—G. Cooke, Hereford 2,780 11

LEEK.—For extensions to the rector house at gasworks, Newcastle-road, for the Urban District Council. Mr. W. E. Beauchamp, Surveyor, Town Hall, Leek. Quantities by the Surveyor:—R. Donpster & Sons 21,150 T. Orace 2,900 J. Heath & Sons 924 S. Sals, Leek 898

LETCHWORTH.—For erecting four houses, Garden City, for Miss Cayley. Mr. H. Cayley, architect, Bank-chambers, Rothwell, Kettering:—

Table with columns A, B, Total. Shopland 980 0 517 0 1,506 0 0 Matlock & Parsons 892 0 487 17 5 1,349 17 5 Wilmore & Sons 802 0 447 0 0 1,249 0 0 Raban & Sons 833 0 425 0 0 1,258 0 0 Brown & Co. 782 0 445 0 0 1,227 0 0 R. J. Hatherly 821 0 404 0 0 1,222 0 0 Beckley & Turpin 802 8 3 402 0 0 1,204 8 3 H. Hurst 782 0 395 0 0 1,177 0 0 S. Redhouse, Senr. 780 0 352 13 0 1,172 13 0 Fleck & Hope 771 9 392 11 9 1,133 19 2 A. Ellis 750 0 350 0 0 1,100 0 0 Bowman & Sons 735 0 363 0 0 1,098 0 0 Jeffs & Edwards 714 0 370 0 0 1,084 0 0 Evans, Mead, & Co. 707 0 380 0 0 1,067 0 0 Palmer & Bay 693 0 353 0 0 1,046 0 0 G. W. Souster, Northampton and Letchworth 648 18 3 320 4 9 969 1 0

LONDON.—For building an economiser and farroon, etc., at the workhouse, Sidney-road, Homerton, N.E., for the Hackney Guardians. Mr. L. J. Todd, 25, Brooke-road, Stoke Newington, N.:—T. Dower & Sons, Kilbey & Gayford 2,600 Bolla Pond, St. 1,888 H. Windsor & Co. 1,888

LONDON.—For Improvements, Walnut-tree-walk, Lambeth, for the London County Council:—F. & H. P. Higgs 211,667 0 0 J. W. Garland & Sons 19,846 0 0 W. Dowling 10,662 0 0 J. Smith & Sons, Ltd. 10,626 0 0 W. Klog & Sons 10,613 0 0 Rice & Sons 10,543 0 0 Spencer, Santo, & Co., Ltd. 10,431 0 0 Holiday & Greenwood, Ltd. 10,424 0 0 J. Garrett & Son 10,183 0 0 J. Appleby & Sons 10,180 0 0 E. Triggs 9,971 0 0 L. Whitehead & Co., Ltd. 9,908 0 0 J. & C. Bowyer 9,777 0 0 Lisle & Co. 9,731 0 0 W. Smith & Son 9,679 0 0 W. Johnson & Co., Ltd. 9,679 0 0 J. & M. Patrick 9,516 0 0 C. Wall, Ltd. 9,399 15 9 Martin, Wells, & Co., Ltd. 9,300 0 0 Galbraith Bros., 46, Camberwell-green 8,908 5 10

[The architect's (Education) estimate, comparable with these tenders, is £8,817.]

LONDON.—For alterations to the heating and hot-water works at Admiralty, Markes-road, for the Kensington Guardians. Messrs. Dolny & Williamson, engineers:—O. D. Berry & Sons, Regency-street, Westminster 589 S.W.* [Twenty-three tenders received.]

Table listing English sheet glass in crates of 20: 15 oz. thirds 2d. per ft. delivered, 21 oz. thirds 3d., etc.

Table listing English rolled plate in crates of 20: Hartley's 2d. per ft. delivered, 21d., 22d., etc.

Table listing oils and other materials: Raw Linseed Oil in pipes per gallon 0 2 0, in barrels 0 2 3, etc.

Surveyor's estimate, £174 7s. 11d.]

LONDON.—For paving, etc., works, Woodlands Park-road, for Greenwich Borough Council:—
 G. J. Anderson .. £820 0 J. Etheridge, 84,
 W. Pearce .. 731 0 E. Collins-street,
 Fry Bros. 780 18 Old Kent-road,
 J. Mowlem & Co., S.E. £692 0
 Ltd. 756 0

LONGTON (Staffs.).—For erecting a pavilion at the bowling-green at Queen's Park, for the Corporation. Mr. J. W. Wardle, Borough Surveyor, Council House, Longton:—
 H. Goodwin .. £296 Tompkinson &
 Young & Son .. 287 Bettelley* .. £280
 [All of Longton.]

NEW MALDEN.—For making up Blagdon-road, for the Urban District Council of the Maldoon and Coombe:—
 Norris .. £3,495 Mowlem & Co. £2,757
 Harrison & Harris 3,354 Fry Bros. 2,753
 Etheridge .. 3,208 Hes .. 2,730
 W. H. Wheeler .. 3,040 T. Adams .. 2,719
 Thacker .. 2,892 Free & Son .. 2,584
 James & Hebborn 2,551 Kavanaugh & Co. 2,487
 Morecroft .. 2,300 J. May* .. 2,483
 [Surveyor's estimate, £2,980.]

NORWICH.—For heating and hot-water supply work at the extension of the City Asylum, Hellesdon, for the Asylum Committee. Mr. A. E. Collins, City Engineer, Guildhall, Norwich:—
 Dargue, Griffiths, & Co., 51, North John-street, Liverpool* .. £1,293

NOTTINGHAM.—For house, Lockwood-drive, Mapperley Park. Messrs. A. R. Calvert & W. R. Gleave, architects, 18, Low-pavement, Nottingham:—
 W. Crane, Ltd. £1,898
 [Lowest of nine tenders.]

PLYMOUTH.—For alterations and additions to licensed premises, Whimple-street. Mr. T. Rogers Kiteell, architect, George-street-chambers, Plymouth. Quantities by Mr. S. W. Haughton:—
 A. Andrew .. £4,300 Peares Bros. £3,820
 W. E. Blake .. 4,200 W. T. Stevenson &
 G. B. Turpin .. 4,200 Co. 3,788
 H. J. Allen .. 4,141 F. Stanbury .. 3,769
 G. P. Finch .. 4,097 Pettick Bros., Laira
 Peary Bros. 3,945 Bridge* .. 3,769

PONTARDAWE.—For the supply of cast-iron sluice valves, etc., for the Rural District Council:—
 Glenside, Kennedy, & Co., Kilmarnock. £71 8

PONTARDAWE.—For laying and jointing tubes and pipes, for the Rural District Council. Mr. J. Morgan, Engineer and Surveyor:—
 G. Davies .. £1,055 18 2½ Buckley .. £1,245 12 2
 E. Griffiths .. 1,785 6 2 W. G. Williams
 Meredith .. & Son and
 Broa. 1,868 10 5 Lewis .. 1,206 6 0
 Leon & Count 1,591 13 5 J. W. Thomp-
 E. Taylor .. 1,311 10 4 son .. 1,143 6 9
 W. Jones & W. Brown .. 1,081 18 3
 Sons .. 1,368 16 2 T. Walker,
 J. Williams .. 1,392 0 0 Clydach-on-
 F. J. Hanney 1,250 11 2 Tawe, Glam.
 R.S.O. 931 11 101

PONTARDAWE.—For the supply of cast-iron pipes, for the Rural District Council:—
 Stewart & Lloyd, 132, Bute-street, Cardiff.—3-in. cast-iron pipes, 57, 58, 10d. delivered; 4-in. cast-iron pipes, 67, 3s. 4d. delivered.

PWLLHELL.—For erecting a new schoolroom attached to Abererch C.M. Chapel, near Pwllhell. Mr. R. Lloyd Jones, architect, New-street, Pwllhell and Carnarvon:—
 W. & R. Jones .. £418 15 J. T. Jones,
 W. Owen .. 389 5 Abererch-Pwllhell* £335 0
 E. Thomas .. 362 11 Prydderch & Ed-
 wards .. 308 0

TREDEGAR.—For erecting houses at Charles-street, for Charles-street Building Club. Mr. T. Danks, architect and surveyor, Oakfield-road, Tredegar:—

For Twenty-Two.			
	Per House.		Per House.
D. J. Vaughan ..	£279	W. J. Madley ..	£199
G. & D. Jones ..	234	E. & D. Davies ..	174
	206	T. W. & J. Jenkins ..	173
Amended for Seventeen Houses Only.			
	Per House.		Per House.
E. & D. Davies ..	£177	T. W. & J. Jenkins ..	£175
Dowlais ..	177	Merthyr ..	175

‡ For seventeen. § For five.

WARGRAVE.—Newshops and bakehouse for Mr. D. Burgess. Mr. Charles Clements, architect, Henley-on-Thames:
 Collier & Catley .. £1,512 Hughes .. £1,350
 Newberry .. 1,475 Met. Pitt .. 1,345
 Walker & Cox .. 1,400 Cox & Sons .. 1,299
 Easterling .. 1,400 Edwards, Maiden-
 Heeky Bros. 1,367 head* .. 1,260
 Elliott .. 1,358

WESTERHOPE.—For erecting conveniences, fencing, etc., at temporary Iron school, Westerhope, near New-castle, for the Northumberland County Council. Mr. G. Topham Forrest, Architect to the Education Committee:—
 Ginger, Lee, & Co., Longsight, Manchester £220 10 0
 Provision and Erection of Boundary Fencing, Out Office, etc.
 Charlton & Henderson, Throckley New-castle, R.S.O. £70 6 8

WEST HAM.—For constructing new wharf-wall on the Channan River, at the sewage pumping-station, Abbey-road, for the Corporation. Mr. J. G. Morley, Borough Engineer, Town Hall, West Ham:—
 T. W. Pedrette £1,496 13 3 J. Jackson .. £957 5 0
 D. T. Jackson 1,218 18 4 W. Fasey .. 914 10 0
 B. E. Night- incals .. 1,198 0 0 W. Orithis .. 809 10 7
 H. Philby .. 1,056 16 10 & Co. 783 0 0
 Campbell & Handman .. 989 4 0 J. W. Jeram 742 0 0
 Cochran & Sons .. 970 0 0 A. E. Symes,
 A. Facey & Sons .. 959 5 3 Stratford* .. 670 0 0

WEST HAM.—For making-up streets (Drew-road, Leonard-street, Wythes-street, and Lord-street), for the Corporation. Mr. J. G. Morley, Borough Engineer, Town Hall, West Ham:
 H. Philby .. £2,014 2 5 D. T. Jackson £1,820 3 6
 T. Free & Sons .. 1,908 6 11 Griffiths & Co.,
 J. Jackson .. 1,910 0 1 Ltd. 1,668 14 0
 W. Harris .. 1,877 0 0 G. J. Ander-
 son .. 1,535 5 10
 Shelbourne & Co. Parsons &
 T. Adams .. 1,853 0 0 Parsons ..
 T. Adams .. 1,848 17 10 Hord* .. 1,497 7 4

WOOTTON BASSETT.—For work to be executed at Nore March House, Wootton Bassett, for Mr. W. Gough, Messrs. Read & Osborne, architects, Regent-circus, Swindon:
 Mrs. C. Williams £361 18 1 W. Tarrant .. £323 14 10
 Tyelman Bros. 335 4 0 J. G. Norman* 293 2 6
 For Hot and Cold Water.
 Hope & Smith .. £73 8 6

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The Builder.

VOL. XC.—No. 3302.

MAY 19, 1906.

ILLUSTRATIONS.

New Offices for the Alliance Assurance Company.....	} Mr. R. Norman Shaw, R.A., and Mr. Ernest Newton, Joint Architects.
Busbridge Hall, Godalming.....	
Royal Exchange Buildings, City Offices, Catherine-street.....	Messrs. Ernest George & Yeates, Architects.
Offices, Covent Garden, as Originally Proposed.....	Mr. H. H. Statham, F.R.I.B.A., Architect.

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The Paris Salons.



EITHER of the two Salons can be said to be at its best this year; in the New Salon especially the works that are of any real interest are few and far between,

and in the Old Salon there cannot be said to be any work which in importance and excellence combined is of the highest rank; many of the best things, artistically speaking, are to be found among the smaller paintings which, though admirable in themselves, do not come into the most important class of pictures of the year. Yet, for a visitor who has the patience to pick them out from among the crowd of exhibits, there are plenty of good pictures to be found.

The large room (L)* at the top of the second staircase contains, as usual, two or three immense decorative paintings which are commissions for the decoration of public buildings. The most important of these is M. Roussel-Géo's painting of a street scene in Paris the day after the taking of the Bastille, intended for the Council-room of the Hôtel de Ville of Ivry. It represents a joyous crowd, with the street architecture as a background, running, shouting, waving flags and

emblems, etc.; it is entirely realistic as to drawing, but is kept in a very low and light key of colour, which removes it from realism, and the whole effect is sufficiently bright and decorative. M. Delacroix' long pastoral picture for the Salle des Fêtes of the Hôtel de Ville of Solesmes has a fine restful effect, and the groups are interesting in themselves; it is in fact a long harvest field, the horizon marking a level line along the centre of the composition, and occupied by separate groups designated (from left to right) "Fiançailles," "La Moisson," "La Voiture" (the hay-cart), "Les Glaneuses," and "Sérénité"—the last represented by a shepherd, with his sheep folded, watching the rising moon. There is both decorative effect and poetic suggestion in this. But the most important decorative exhibit is that of M. Henri Martin, who has a whole long room (XVI.) to himself for his decorations for a gallery in the Capitol of Toulouse, together with 87 small figure and landscape studies which went to the making of the two large pictures. These occupy the two long sides of the gallery, painted in M. Martin's well-known *pointilliste* manner, the paint laid on in thick ridges (no wonder the colour-shop trade is said to be a prosperous one in Paris). One side represents the river with the town on the further bank, in a glow of rich colour; in the foreground the nearer bank is peopled with various promenaders whose costume is not of a decorative character, but the whole effect of colour and sunlight is very fine; and the other picture, which represents the fields and reapers, with wooded hills

beyond and the long shadows of the trees across the foreground, is beautiful both in general effect and in the design of the figures and groups. The whole is a really great achievement in decorative painting. M. Quost's "Panneau Decoratif" for the Ministry of Public Instruction (XXXIII.) is not symbolical of public instruction but is simply decoration—a long panel broken by a pilaster near each end, in which groups of flowers spring up along the front in one plane but of irregular heights; garlands are festooned along the top of the canvas, and in the rear is a faint hazy background of woodland, with an architectural balustrade curving out on each side to the centre of the picture—all this kept in faint and delicate tones; the result, as a wall decoration, is exceedingly pretty; two smaller panels of the same type are exhibited in the same room. The Old Salon also contains two or three of the class of designs to be executed in Gobelins tapestry which the French artists, or some of them, understand so well. The most important of these is M. Cormon's Jean de Berry buying objects of art at Bruges, only the landscape background is too pictorial in character for tapestry; it was probably considered necessary to show the town as a background; but the foreground, with its assemblage of rich detail, presents work admirably suited for translation into tapestry.

Two of the largest and most prominent pictures of the year are mistakes; both by eminent painters, one of them pre-eminent, if we may put it so. M. Gervais, who has painted finely some

*The numbers in brackets throughout this article represent the number of the room in which the work mentioned is to be found, which may be useful to any of our readers who intend to visit the Salon. To give the catalogue number of a work is useless, as the numbers follow no order, and the finding of them is a mere matter of chance.

great subjects of antique legend, has chosen this year to represent the ill-behaviour of the Centaurs, at the marriage of Hippodamia (XVII.), when, having drunk too freely, they seized on the ladies and carried them off. The picture is, of course, a tumult of galloping and overthrown figures, hard in execution and too grotesque to be agreeable; drunken and shouting Centaurs come out too realistically in painting, they do better in sculptured metopes, where there is no attempt at illusion. The other picture referred to, by M. Rochegrosse, is a production one regrets to see from a man who has done some really fine things: it is entitled "La Joie Rouge" (XXXIII.), and appears intended to symbolise the outbreak of the savage instinct in human nature; a horde of furious figures surging from the back of the scene and trampling over and killing women and children in wanton slaughter. As a work of art it has nothing to recommend it; it is violent, coarse, and exaggerated both in action and colour; but this offensive production is labelled "Acquis par l'Etat"; why, it is difficult to understand. The State and municipal purchases out of the Salon seem to be in general prompted by the desire to secure pictures which point a moral suitable for the instruction of the crowd in public galleries—at least, that is the only way to account for most of them; but what moral is to be pointed by M. Rochegrosse's fantasia of slaughter is a mystery.

Having noticed some of the principal large decorative works, we may now take the rooms of the Old Salon in their order of numbering, just pointing out what is best worth looking for in each, so as to render this article something of a practical assistance, to any of our readers who may be visiting the exhibition, in finding out the best works with less trouble than they might otherwise have, among the crowd of pictures which are of but mediocre interest. In the large (room L.) at the head of the staircase, hang the two large landscapes by M. Didier-Pouget, one of them a repetition of what he has often painted—a high foreground of heather and a valley partly in mist behind it. He has done this as often and as regularly as Mr. Peter Graham has done his Highland hills and cattle, but it is so well done that one can hardly complain of the repetition. His other landscape, a moonrise effect, is rather hard and precise. An interior by a Dutch artist, Herr Pieters, a *genre* picture on a large scale, is worth looking at. Room III. contains two or three good landscapes, and M. Brispat has made an interesting little picture (IV.) out of the readers at the bookstalls on the Quai Voltaire, a little bit of Paris life which was worth preserving. In Room V. we come on one of the most perfect works in its way of the year, M. Bail's interior, "La Laiterie," just a painting of a dairy and its customers, but as perfect in style and execution as any example of the Dutch school in the National Gallery, and yet not so merely realistic; there is a certain breadth of style about it which we do not find in the Dutch School. M. Brouillet's picture of the return of Quinet and Michelet to their lecture-room at the Sorbonne in 1848, and the

cheers of their listeners, after being expelled through political clamour, is a State Commission for the decoration of the Sorbonne, interesting as a historical record, and with plenty of vigour in its representation of the scene, and as such not to be passed over, though not of the highest pictorial value. This room contains two of the best nude studies in the exhibition, by M. Benner and M. Bérond, the latter of whom, by an odd fancy, has grouped a lion with the lady. M. Clairin's "Ame Vivante des Siècles Mortes" is a curious and interesting picture, a kind of allegory; the idea seems to be that of the survival of the spirit of ancient Egypt, above the modern personages sleeping in the foreground; winged visionary figures flutter about, like the ghosts of the past; it is a fanciful and poetic work.

The portrait of M. Injalbert (VII.), the eminent sculptor, by M. Calbet, is one of the most straightforward and unpretending portraits in the exhibition, where the tendency is to over-elaborate portraits with a profusion of ornamental accessories; one can pardon this, however, in such a work as M. Chartrain's sumptuous portrait of the Maharajah of Kapurthala (IX.); the richness of a magnificent oriental costume and equally magnificent throne were too tempting to a painter; and after all, what is an Oriental potentate without his blaze of ornament? M. Injalbert, member of the Institute, may be painted in a quiet grey coat, but an Eastern potentate must have his exterior splendour. But we have passed over the two charming works of M. Paul Chabas (VIII.), of which "La Nagense," a young girl swimming in the sea, no one should miss, the whole thing is so fresh and charming, and so perfectly carried out, even to the effect of refraction on the part of the body that is under water; it is not an intellectual picture, but it is full of the joy of health and beauty. Mme. Demont-Breton's child on the seashore, "Le Coquillage," is in the same room; not quite equal to some of her former works of the same kind.

M. Debat-Ponsan's large picture symbolising two torrents leaping down the rocks (XI.), in the shape of two exceedingly robust young women, is too large to pass over, and the painter has a good name, but his work here is rather amusing than anything else. Far more satisfactory are M. Dupré's two quite small pictures of rural landscape and figures in the same room, which might easily be missed if not looked for, but are quite perfect in their unity of style. A landscape by M. Maurice Chabas, in the same room, is an interesting example of the effect of *pointilliste* execution; it is called "La Rayons Dorés à Port Maneck"; on a near view it looks perfectly dead in surface, like worsted work; but look at it from the other side of the room, and the effect of the light on this ridged surface of pigment gives the effect intended—that of a southern landscape in exceptionally strong sunlight. It is curious to contrast this with M. Biva's two pond and woodland scenes (XII.), which represent the most absolute and uncompromising realism—so real that it is almost optical illusion; not of course the highest form of landscape painting,

but yet if a man has a special talent for this particular kind of effect, it is better he should use it than do something else not so well. A decorative picture for a room in M. Rostand the poet's house, in the same room, should be looked at for its fine colour.

We may skip several rooms now (M. Martin in Room XVI. we have already paid our respects to) till we find in Room XVIII. a landscape of another type from those last mentioned. M. Harpignies' one contribution, "Le Ruisseau," an upright forest landscape with an open distance. Style in landscape painting can reach no greater perfection than this; it is not realistic, it is nature translated into painting, omitting some detail only to get greater unity of effect, and yet the feeling of nature is entirely preserved. If M. Harpignies recalls Constable—a Constable with somewhat more self-restraint and a tenderer feeling for colour, M. Humbert, in his portrait of a lady (XXI.) recalls Gainsborough, and is equal to Gainsborough too. This is a somewhat interesting room in its varieties, for here we have M. Hébert producing a modern Virgin and Child picture almost in the manner of a *primitif*—a beautiful work of its kind both in colour and in its spiritual expression, and a few paces from this we find him exhibiting one of the brightest and most characteristic little portraits of a modern lady to be found in the exhibition, and which should by no means be overlooked, as it easily might be; it is a small picture in one corner of the room, a cabinet portrait. It is rather distressing, after looking at these beautiful and refined works, to see in Room XXIV., one of the angle octagon rooms in which, it must be admitted, the best things are never put, a specimen of what French art of the day can degrade itself to, in M. Gorguet's big ceiling picture for one of the Paris Mairies, representing a sort of Pierrot and Columbine group; a man in a fancy dress with a tall hat, others in fantastic dresses carrying Chinese lanterns; and this seriously and permanently to be painted on the ceiling of a public building at the expense of the Municipality! It is really melancholy; a whitewashed ceiling would be preferable, for it would at least be inoffensive.

Sea-painting is not a strong point with the French; they do not like the sea well enough; but M. Jamar's "L'Océan" (XXVI.) is a really good sea; a coast scene on a cold day grey with a long stormy swell rolling in; and, by the way, the artist is not a Frenchman after all, but a Belgian both by birth and residence. M. Tattégain, who is French to the backbone, also relies this year mainly on a sea-painting, showing a coasting craft, "Désenparé" in a tremendous sea—"désenparé" is a mild way to put it, for she will be swamped by the next wave; but the sea is really fine, and far superior to most storms in French seas, for we do not imagine their sea-painters rough it at sea as ours do, and hence when they imagine a gale they are apt to overdo the sublime; but still, this is a grand and effective painting. We have passed over, in coming to it, one of the most remarkable works of the year, M. Robert-Fleury's painting of Marie Antoinette waking in prison on the day fixed for her execution.

It seems almost too cruel a subject to choose, and yet it is as well that the present generation of Frenchmen, who for the most part glory in the Revolution, should be reminded of the way a high-minded though misjudging queen was hounded down and trampled on. The picture is painted with simplicity and with no striving after dramatic effect; the mere facts as portrayed are enough; the queen in her shabby dress and looking almost old with misery, the female guardian who has a sort of half pity for her, and the warring lot of a sentinel stretching himself in his chair by the window—these look real, and the reality is enough; it is a very impressive bit of historical painting.

M. Zwiller's homage to Henner (XII.) is one of the noteworthy works of the year; it is a very clever imitation of Henner's style, representing the mild and dreamy nymphs whom Henner painted coming to mourn over his tomb. A picture belonging somewhat to the same class is to be found in the large gallery (I.), M. Bérout's imitation of the composition of Veronese's Marriage of Cana, the personages who fill the scene being composed of figures from well known Renaissance paintings, as well as some of the figures of the painters themselves. The idea is well carried out and the picture (not on a large scale) is rich and pleasing in colour, but it is rather a question whether it was a fancy worth the talent displayed over it.


As the Salon authorities profess to have rather made a move lately in the direction of recognising applied art, we may direct the visitor's attention to the case of M. Lalique's work in the middle of Room IX (one of the corner octagon rooms) as an example of the "French taste" which we hear critics belauding so at present. The principal object in this case is a large silver bowl or urn, entirely decorated with, or rather composed of, huge metal lizards, by no means well or delicately modelled, which crawl up the sides, while others form a radiating pattern at the top. Anything more hideous or more detestable in taste it would be impossible to see, and the only thing one would like to do with it would be to treat it as Hezekiah treated the brazen serpent—stamp it down and grind it small to powder. And this is the French taste in decorative work, which our silly newspaper critics talk about and applaud!

The immense array of sculpture in the central court is not, taken as a whole, as remarkable as in some previous years, but it contains some very fine works, of one or two of which we may be able to give illustrations. M. Dubois's monument to Fromentin, to be erected at La Rochelle, is the best of the central series of monuments or memorial works on a large scale; the bust of Fromentin, to which the treatment of the drapery gives great sculptural breadth, is on a lofty stele, beside which an Algerian cavalry soldier rears his horse (Fromentin's life and art were much connected with Algeria). Among the best of the leading works is M. Cordier's fine group "Le Doute," a youth whom a lean sarcastic-looking old man is plying with sceptical criticism; as a piece of expression in sculpture it is remarkably powerful. M. Frémiet exhibits a realistic portrait statue of

Rude, the great sculptor, seated and contemplating a model of his winged figure on the Arc de l'Etoile. M. Michel, a classical sculptor *par excellence*, has a fine figure representing "Autumn"; M. Peyre's group, in one alcove, entitled "Offrande à Venus," is a fine composition; and M. Guilloux has a fine and interesting work entitled "La Nouvelle Muse"; the muse of antique art is seated on a fragment of a Doric column, the new muse (apparently Music) standing by and over her with a countenance expressive of energy and aspiration; it is not only a fine composition but expresses a new idea. There are many other things worth looking at in the vast collection of sculpture, including some powerful and successful treatment of subjects bearing on modern life, in which the sculptor's art is used to express a moral meaning, in some instances with great success and in a manner not at variance with artistic conditions, though this cannot be said in all cases.

The New Salon is a very poor collection, only relieved here and there by a few fine things, such as M. Lhermitte's landscapes (XIII.), M. Iwill's Venetian scenes (X.), some good portraits by MM. Carolus-Duran, Besnard, Gervex, and others. M. Béraud has painted a scene of the expulsion of nuns from a convent (XVII.), which has a present-day interest as a subject picture. Among the large decorative pictures M. Auhurtin's "Orphée" (purchased by the State) is the only real success, but architects may find some interest in M. Koos's ideal picture of building operations, under the significant title, "Mens agitât Molem." Among other things worth looking at are M. Berton's "Femme et Fleurs" (XIV.), a whole room (XVIII.) filled with works by the late M. Carrière—ghosts of pictures, we call them; M. Guillaume's little picture, "Le Reveil" (X.); M. Lerolle's "Femme dans les Fleurs" (VI.); M. Le Sidaner's contributions (XV.) in his usual style of artificial light effect; M. Morissot's "Le Repos" (I.), a fine nude study in a rather unusual style; M. Picard's "Femme dans un Loge" (XI.); and M. Roll's life size "Dragon" and his little idyll "Journée d'Été" (VI.); his "Après la Douleur" one had better turn one's back upon. Some of the things that are hung are beyond belief in their crudeness, ugliness, and absurdity, and lead to the conclusion that it is high time the New Salon were abolished, if it is reduced to filling up its walls in this way.

LIABILITIES OF TRADE UNIONS.


 HE case of Denaby and Cadeby Main Collieries, Ltd., v. Yorkshire Miners' Association, in which the House of Lords have affirmed the judgment of the Court of Appeal, is one of interest when the liability of trade unions is under consideration. The strike, which was the cause of action in this case, commenced in June, 1902, and was advocated by certain branch officials. The men engaged in it were under fortnightly contracts, and those they broke, and in consequence the Supreme Council of the defendant association refused to grant strike pay, and advised the men that the strike was illegal. When, in

July, 1902, the men offered to resume work, they were required to enter into new agreements, which said agreements contained some regulations as to timbering which had been issued by the Home Office. The men objected to these agreements and continued the strike, and in this action they were supported not only by the branches but by the Supreme Council, and the defendant association granted strike pay. It was subsequently held by the House of Lords, in the case of Howden v. Yorkshire Miners' Association, at the suit of one of the members of the association, that this payment of strike pay was not authorised by the rules of the association, and he was granted an injunction to restrain them from further paying it.

The present action, shortly stated, was brought against the association and certain of its members for having instigated the strike and encouraged the men to break their contracts; the jury had found against the defendants on a long series of questions left to them by the judge at the original trial. The facts of the case are too complicated to be entered into in detail here, but the Lord Chancellor carefully considered the relationship of the central authority to the branches and the rules regulating strikes as made by the association; and the House of Lords unanimously came to the conclusion that liability for the action of the branch agents had not been brought home to the central authority, and that the action against the association failed. It is to be observed that no strike pay was authorised until after the period when the contracts between the men and their employers had terminated.

This case having been decided in favour of the Trade Union under the law of agency as it at present exists, may well raise the question as to how far any alteration in that law is really a necessity. If the central authority acts lawfully, and endeavours to restrain its members within the limits of the law, this case shows that its funds are abundantly protected by the law as it stands.

NOTES.

 AN important extension of the scope of the Workmen's Compensation Bill was made in Committee last week. The Bill, as originally drawn, excluded from its provisions employers of less than five men. In other words, the small jobbing builder or plumber was to a considerable extent allowed to be outside its provisions. This limitation has been struck out in Committee, and the Bill when it becomes law will, therefore, apply to workmen of every employer. It would unquestionably be a hardship on a workman that he should not be able to obtain compensation because his master has not half-a-dozen workmen. It is said that the small employer has to pay a much larger premium than the more important employer. It is impossible, however, to say that this is a good reason for excluding his workmen from the benefit of the Bill. If the small employer is liable to pay compensation he is more likely to have sound materials, such as scaffolding, and

if he cannot afford to pay the necessary premium he had better not be in business at all. But, as a matter of fact, the premium will, in one form or another, be paid by the customer. Any such exclusion as first appeared in the Bill could only be temporary, and it is best that the new Act should settle the law for some time to come.

Smoke
Abatement.

MUCH credit is due to the Coal-Smoke Abatement Society for their efforts to dissuade manufacturers and others from the habit of presenting fuel to the inhabitants of London in the unusable and inconvenient form of smoke. In the annual report of the Society presented last week it is pointed out that, during the past year, 1,057 cases of smoke pollution were reported by the society's inspector, and that 1,000 complaints relative to the constant emission of black smoke were forwarded to local authorities. In spite of this, however, only fifty-five summonses were issued, a fact which shows how reluctant public bodies are to perform their duty, in respect of smoke abatement, to the people whose representatives they are. If these lagging councils would take a proper view of their responsibilities, owners of factory chimneys would soon realise the practical economy attending the complete combustion of fuel, and the people of London would have reason to rejoice. It is really a scandal that the most important work of the Society should be the arousing of local authorities to a sense of their responsibilities in this matter.

Preferential
Railway Rates.

THE opinion expressed in these columns when this vexed question has been more than usually prominent, that the evil was rather exaggerated, seems to be borne out by the report issued this week by Lord Jersey's Committee. This body was appointed in response to strong complaints of a general nature to the effect that home industries were being prejudiced by preferential rates enjoyed by foreign competitors, with a view to ascertaining how far these complaints were warranted by actual facts and figures. The conclusions arrived at by the majority of the committee were that the evidence failed to show that the railway companies are giving undue preferential treatment to foreign and colonial produce as compared with home produce, contrary to existing legislation, and that there has been a marked absence on the part of complainants to avail themselves of the existing remedies in the case of any infringement of the law. The latter, they add, is sufficiently strong and effective to justify them in declining to recommend any further legislation—in which they confirm our own impression.

East London
Water Supply.

FROM the proceedings at the last meeting of the Metropolitan Water Board it seems that a serious hitch has arisen with regard to such parts of the Metropolitan Water Board (Lea Valley) Bill as relate to the scheme for the construction of intercepting sewers, sewage disposal works, and a new intake at Feilde's Weir. This is a very important scheme

for the improvement of supplies drawn from the River Lea, and it is to be regretted that the Board have resolved to withdraw it for the present. The fact is that the local authorities in the valley are not willing to co-operate without placing excessively onerous conditions on the Water Board, the War Office have come forward with demands in respect of their works at Waltham Abbey, and numerous petitions have been lodged against the project. As we understand the matter, the new works are only necessary because the local authorities and the War Office have chosen in the past to pollute the river instead of making provision for sewage disposal in a proper manner, and these delinquents now hope to saddle the Water Board with an excessive proportion of the outlay necessary for restoring the river to its original state, so far as practicable, and for giving the inhabitants of East London the opportunity of drinking water instead of sewage solution. We fully sympathise with the anxiety of the Local Government Board that the Bill should proceed, and hope that they will put pressure on those who are responsible for its temporary withdrawal. We all know that district councils object to expend money on such prosaic objects as drainage systems while there is a chance of wasting it upon ambitious undertakings such as council halls, electricity supply works, and tramway systems, but they must be taught their duty to the public, and there is reason for hoping that assistance in this direction will be forthcoming as a result of the new régime established at the Local Government Board.

The
San Francisco
Disaster.

WHILE the amount of damage caused at San Francisco by the recent earthquake is sufficient justification for the prominence given to the subject in the European press, it is worthy of note that similar results followed the convulsion throughout an extensive region along the Pacific Coast. The actual centre of disturbance was near San José, some 50 miles south of San Francisco, where the business portion of the city was wrecked and many lives were lost. No injury was sustained, however, by the buildings or instruments of the Lick Observatory in the same neighbourhood—a fact which speaks well for the shock-resisting qualities of high-class masonry. At Leland Stanford University, 34 miles south of San Francisco, the memorial church, library, gymnasium, power-house, and other buildings were demolished, but the Encina Hall, the chemistry building, and the inner quadrangle remain practically uninjured. At Santa Cruz, 121 miles south of San Francisco, various public and other buildings were destroyed, but no lives were lost. To the north of San Francisco, Santa Rosa and other towns in the Sonoma Valley suffered severely, but others seem to have escaped almost entirely. Owing to the strict rules of martial law in San Francisco no unofficial examination has been made of the buildings in that city and no detailed particulars are available as to the condition of buildings in other places along the Pacific seaboard, but sufficient information is forthcoming

from various sources to show that substantial masonry buildings, as well as steel-frame structures, offered successful resistance to earthquake and fire. The greatest trouble at San Francisco after the first shock was, as already observed, the lack of water owing to the breakage of the mains, and it would certainly be a wise precaution for the authorities to insist upon the provision of a large tank on the top of every building, so as to establish an auxiliary supply of water for the use of the fire department in case of need.

LESSEES of old houses should
Old Houses, note the decision in the
case of *Torrens v. Walker*.

The plaintiff had in 1890 taken a lease of the first, second, and third floors of a house in Glasshouse-street for eighteen years, the lease containing a covenant on the part of the lessor to keep the outside of the house in good repair. In 1905 the walls of the premises, which were some two hundred years old, were found to be so worn as to be dangerous, and the County Council served a notice under the Building Act requiring the owner to take down the front and back walls as being dangerous. The lessee communicated this notice to the lessor, and vacated the premises. The Court, in an action by the lessee for breach of the covenant, held that as there is in law no breach until notice has been given, and the first notice was that above given when the premises were pronounced to be dangerous and irreparable, the lessee had no ground of action for breach of covenant, since the house by that time was impossible of repair. Whether the lessee apart from the covenant has any remedy against his landlord it is not for us to say, but the lesson to be derived from the case is that lessees should not delay in giving their landlords notice of want of repair until the house has ceased to exist as a house.

QUESTIONS arising out of
Drain or Sewer? the distinction between
"drains" and sewers have
not recently been so much before the Courts, but the point arose once more in the case of *Harvey v. Busby* (May 2). The case turned upon the effect of the Metropolis Management Act, 1855, which gives the local authority power to make orders as to the combined drainage of contiguous houses, and which by sect. 250 enacts that drains so combined by order shall be drains and not sewers. In 1878 the owner of three houses in Hackney, numbered 21, 23, and 25, had obtained an order for the combined drainage of these houses. In 1879 an order by the same owner was obtained to drain four other houses by combined drain, these houses being numbered 27, 29, 31, and 33. The plan attached to the application showed that the intention was to drain these into the pipes at the rear of the other houses, which formed part of their combined drainage system. This apparently was never carried out, for it was found that 27 alone was drained with 21, 23, and 25, whilst the remaining houses drained elsewhere. This deviation from the order as approved has had the effect of converting the system behind the houses 21, 23, 25, and 27 from a drain into a

sewer, and a nuisance having occurred by a defect in the pipes behind No. 25, the local authority failed to make the owner liable. The case at present is only shortly reported, and it does not appear what the present ownership of the houses is or who was responsible for this deviation from the order for combined drainage. The addition of one house to the original houses has nullified the effect of both orders, since the houses are differently grouped.

The Surface Finish of Concrete Structures. WITH the object of securing a uniform colour and surface for the exterior of concrete buildings, a mixture of cement mortar and crushed stone is very frequently applied to the outer mould before the concrete proper is deposited. In this way a perfect bond between the facing and the body of the work is assured, and by careful selection of the sand and stone it is not difficult to obtain a finish of satisfactory colour and appearance for concrete work, providing the outer film of cement is washed out before it has thoroughly hardened, so as to leave the sand and stone exposed. The necessary removal of the planks forming the side of the mould can easily be effected by situating the uprights a few inches away from the face of the work, securing the planks by cleats and wedges. In order to prevent the joints between successive layers of concrete from showing, triangular beads are sometimes employed, leaving an imprint along each joint, and relieving surfaces which would have a somewhat dreary aspect if left perfectly plain. This method of treatment has been largely adopted in the United States, and a recent example of it in this country is furnished by the new concrete-steel bridge built by Mr. S. S. Platt, M.Inst.C.E., over the canal at Rochdale.

The Cooling of Cast-Iron. THE changes of volume that take place during the solidification and cooling of metals and alloys, are of much practical importance, and it is to be regretted that the general subject has been so little studied in Great Britain. The paper, therefore, read last week by Professor Thomas Turner, of Birmingham University, to the Iron and Steel Institute should be received with welcome by those who make and use castings—especially iron castings. In American iron-foundries different forms of apparatus have been adopted for measuring the changes of volume of cast-iron from the moment it begins to solidify until it reaches atmospheric temperature, and in this way it has been shown clearly that iron expands before shrinking to its final volume. Professor Turner now gives some results of the experiments conducted at Birmingham University upon iron and other metals, by the aid of very simple and inexpensive apparatus. From the diagrams presented in his paper it is seen that the curves obtained may be divided into four classes, according to the number of arrests observed in the normal rate of contraction. Thus, the curve given by pure electrolytic copper is uniform and there is no arrest of volume as the metal cools; the curve given by white iron exhibits one retardation

during contraction which may or may not lead to actual expansion; and the curves given by grey hematite and Northampton iron show two and three expansions respectively. Of course, other curves than those of the sharp and definite character indicated in these diagrams are obtainable when different mixtures of iron are under examination, and for this reason the method adopted by Professor Turner affords the iron-founder a ready means of checking and controlling his foundry mixtures, and if intelligently interpreted the curves obtained furnish reliable information as to the chemical composition, the hardness, and the strength of the metal.

Wireless Telegraphy. IN the *Journal of the Institution of Electrical Engineers*, published last week, there are two papers of great interest on Wireless Telegraphy by Dr. Erskine-Murray and Lieutenant Tissot respectively. The former describes some of the recent advances that have been made in the application of electromagnetic waves to industrial purposes, and also elaborates a theory to account for some of the recently discovered phenomena. In the first place he accounts for the fact that the intensity of the signals received diminishes inversely as the distance instead of inversely as the square of the distance by making the supposition that the rarefied air in the upper layers of the atmosphere is conducting. Hence the waves, instead of spreading into space, are confined to the lower layers of the atmosphere. It will be remembered that Mr. Tesla made a similar supposition several years ago in order to account for the propagation of signals across the Atlantic. Dr. Murray also accounts for the fact that it is easier to signal at night time than during the day by supposing that some of the radiations from the sun make the air a better conductor for electricity, and so the waves are damped out more readily. He mentioned that on H.M.S. *Vernon* signals had been received from Poldhu at a distance of 180 miles by a wire down one mast, whilst at the same time signals were sent to another ship 50 miles away by a wire from another mast. It appears to be easy to arrange so that many stations can send signals simultaneously without interfering with one another, but it would be easy for an expert to time his receiver so as to intercept any of the signals being sent. At present secrecy can only be obtained by using a code for the signals. It is interesting to notice that the power required for the new Machrihanish station in Cantyre for signalling to America is about 70 horse-power, whilst it is rumoured that Marconi will use 200 horse-power in his new Transatlantic stations.

The Growth of Wiesbaden. FEW places in Germany increase more than the town of Wiesbaden. It was only three or four years ago that the fine theatre and opera-house, with its magnificent foyer, was opened. Now the Kurhaus is being rebuilt. When completed it will be a large building, with a central block surmounted by a dome, and with two long wings. The lake in

the grounds has been drained, and will be laid out as gardens and shrubberies. When this building is completed there will be few places in Europe with a finer *ensemble* than this part of Wiesbaden. There will be the theatre, the Kurhaus, and opposite it the Kaiser Friedrich platz, with its fine hotels. The number of these, too, has within the last two years been sensibly increased, and fine buildings they are. Internally, as the phrase is, may be found every modern convenience; externally the designs, if somewhat florid, are in keeping with the general character of the architecture of Wiesbaden—a garden city of the best kind.

St. Marylebone Court House and London Watch-Houses. It is stated that proposals are entertained for the building of municipal offices for the Borough of Marylebone, in place of the inconvenient and wholly inadequate quarters now supplied by the Court House at the south end of Marylebone-lane, near Oxford-street. The present building embodies one of the few watch-houses now remaining in London. Above the east door is a finely-modelled achievement of what we take to be the coat-arms of Harley, with a difference, with an angel and a lion rampant for supporters, and a coronet; beneath is "A.D. MDCCXXXIX." A lower tablet bears the inscription—

ST. MARYLEBONE WATCH HOUSE
REBUILT A.D. MDCCIV.

Lady Margaret Cavendish Harley, only daughter and heir of Edward, second Earl of Oxford, brought the Marylebone estate in marriage to William, second Duke of Portland, in 1734; but the Portland property passed some years ago to Lord Howard de Walden. Of the old parish watch-houses which have survived to our own time may be mentioned the (later) St. Giles's Round House in the Coal-yard—now Goldsmith-street—which was taken down in 1884 for the erection of new almshouses adjoining Barley-court; one in a corner of St. Botolph's churchyard, Bishopsgate Without, built, as its tablet records, in 1771, but latterly converted into a shop in the main street; and that in the churchyard of St. Anne's, Soho, adapted as a mortuary. The watch-house adjoining the east end of St. Sepulchre's, Holborn, was built in 1791, close to the site of St. Stephen's Chapel of that church. The "Watch and Engine House" in Collingwood-street, at the south-west side of the churchyard of Christ Church, Blackfriars-road, bearing an inscription stating it was built in 1819, was converted into a mission-hall; another is that of St. Botolph's, Aldgate, in Houndsditch.

The Modern Gallery.

At the Modern Gallery there is a small exhibition of oil sketches of Natal by Miss Percival-Clark. The colour in most of the sketches is rather curious; we suppose that the effects of mauve sky and pink distance are a peculiarity of the country; they are certainly un-English, and very effective. The interest of many of the pictures is a good deal enhanced by association. One of the best sketches is of "Spion Kop" (16), in which the dark foreground and hazy pink distance make a very striking contrast. "The Tugela, near Harts Hill Station" (18) and the

same from Pieters Hill (26) are also very successful paintings. Miss Percival-Clark's skies are as a rule very good; "A Summer Morning at Hilton Road" (2) is a very nice open-air effect with a clear sky.

At the French Gallery in Pall Mall there is on view a rather heterogeneous collection of works by artists living and dead, among which we notice two really fine though small examples of Troyon, a small study of a stag by Rosa Bonheur, and an excellent pastel landscape by M. Lhermitte. The feature of the exhibition is a collection of the works of Herr Tholen, which are good work, but not specially remarkable.

AT THE CHÂTEAU DE BAGATELLE.

On Friday last week was the private view of a small loan exhibition of pictures and a few works in sculpture organised by the Société Nationale des Beaux-Arts at the Château de Bagatelle in the Bois de Boulogne, now, as our readers are probably aware, the property of the Paris Municipality, who purchased it two years ago from the heirs of Sir Richard Wallace, whose property it was previously. The Château, which is a pretty long walk or drive from the barrier at the Porte Maillot, is reached *en* the "Porte de Madrid" and the Boulevard Richard Wallace, and turning to the left out of the latter into the drive leading to Longchamps, a little on the left stands the small Château. This is really the back entrance to the grounds near the stables; the principal entrance is at the other side of the estate, by a drive entered through a handsome iron gateway; but it is the entrance easiest of access from the city, and the best for driving, as the gate here is close to the house; the other one is a long way off, and vehicles (apparently) are not allowed inside the park.

The exhibition now open is, we believe, the first successfully organised one in this building, which was bought, as already mentioned in one of our Letters from Paris, with the intention of making the house the scene of various special exhibitions, a matter which seems to have been mismanaged so far. The present exhibition is one of the works of deceased French artists, and is not of the highest interest; but the Château and park (now open to the public) are well worth a visit on their own account, in summer weather at all events, for it is essentially a summer residence.

The property of Bagatelle consisted, originally, of a small "Pavillon de Chasse" belonging to Mlle. de Charolais, daughter of Prince Louis de Condé. It subsequently became the property of Comte d'Artois, brother of Louis XVI., who afterwards reigned under the title of Charles X. This prince built, on the site of the Pavillon de Chasse, a small Château at first known as "La Folie d'Artois," but which subsequently took the name of Bagatelle. This building, very rapidly executed, cost 600,000 francs. After a number of vicissitudes it became the property of Sir Richard Wallace, who built the one-story pavilion at the side of the forecourt, in which the exhibitions are now to be held. The chateau, the new pavilion, and the park were sold by Sir Richard Wallace's representatives to the municipality of Paris in 1904, for six and a half million francs.

On entering the grounds and turning to the left, you find yourself in a large oblong forecourt to the right of which is the one-story pavilion in white stone, standing on a terrace with a recessed portico with Ionic columns, containing a suite of rooms which form the exhibition galleries. Although this building is larger on the ground plan area than the principal Château, and carried out in the same style of graceful classic architecture, it is obviously only an annexe to the Château proper, which faces the visitor at the further end of the forecourt, and is an exceedingly graceful two-story classic house in white stone, decorated with an order nearly the full height

of the building, and with busts in circular medallions, and the motto "Parva sed Aptata" in raised letters on the attic over the centre. On the other side of the house, on the same axis as the forecourt, is a terrace and a long lawn with raised walks at the sides and a fountain basin in the centre, and opening on the terrace on this side is a small but beautiful circular salon, projecting as a semi-circular bay on to the terrace, the interior going up both stories and finishing in a gracefully decorated domed ceiling. It is an ideal residence *de luxe* on a small scale, as far at least as the ground floor suite of rooms is concerned. The house is open to the public, and contains some works of art which are there permanently; but the chief interest is in the suite of rooms and the exterior and surroundings of the house itself.

As to the loan exhibition in the other house, it contains a good many works by well-known painters and sculptors, both living and dead, the definition of it as an "exposition retrospectif" only signifying that it does not include new works first exhibited. A good many of the works are studies and sketches by eminent painters; but the collection also includes finished pictures by MM. Roll, Carolus-Duran, Gervey, Lerolle, etc., among living artists, and by Boudin, Cazin, and J. Lewis Brown among deceased artists, and studies and sketches by Meissonnier, Puvion de Chavannes, Burne-Jones, and others. There are some rather noteworthy works in sculpture by Mme. Marie Cazin (chiefly in the forecourt outside), and a curious essay in what may be called *genre* sculpture by M. Bartholomé in the shape of a portrait statuette of a lady, in modern costume, seated on a sofa.

In the bright weather of Friday the 11th at Paris (almost like a June day) the real attraction was not so much the pictures as the park, a perfectly beautiful sylvan retreat, apparently pretty fairly kept up, at all events it has not been open long enough to the public for them to have spoiled it much yet. On a public holiday it would very likely be crowded, otherwise it is too much off the general public routes to be much frequented. As we have said, the place is well worth a visit, independently of any exhibition, when the weather is such as to show it at its best.

MAGAZINES AND REVIEWS.

The *Quarterly Review* contains a very judicious article on "The Pre-Raphaelite Brotherhood," ostensibly a review of Mr. Holman Hunt's autobiography and of some other books bearing on the subject. The general conclusions of the writer as to the bearing of Pre-Raphaelitism on modern art are exceedingly just. As a matter of detail, we quite agree with him that in the "Lorenzo and Isabella" Millais was consciously painting a picture in early Italian style. At that date, as the author remarks, Millais was a consummate master, and could give to his paintings any look he liked. The entire difference of style in the picture which shortly succeeded this, "Christ in the House of His Parents," is a sufficient proof that Millais was merely, in the "Lorenzo," making a kind of excursus into the primitive style as an artistic exercise. "Trade Unions and the Law" is an able summary of the situation from the point of view of common sense and logic, which under present conditions are unhappily little consulted in connexion with such questions.

To the *Art-Journal* Mr. Bernard E. Ward contributes an article on the fascinating subject of brush-work drawing, which is such an admirable medium for teaching firmness and sweep of line in drawing. Besides some practical examples, a fine coloured design by Mr. J. W. Nicol, based on the tulip, illustrates the article. Mr. Claude Phillips is continuing his series of articles on the pictures in the Wallace collection. An article on "Art Handiwork and Manufacture" contains, among other things, some charming examples of modern lace made at the Royal Irish Industries Association.

The *Architectural Record* (New York) has an article by Miss Katharine Budd on Saracossa, illustrated with a number of sketches. The sections of some of the wide-spreading wood-hull cornices are very interesting. We cannot say that the architectural treatment of "The Griswold—a Study in Hotel Building"

seems worth the long article bestowed on it; the description of the planning and construction is of some interest. The Morgan Library and Art Museum, New York, by Messrs. McKim, Mead, & White, is a fine building, treated exactly in the right manner externally, for an art museum. A chapter on some of the Baldwin pianos, which looks rather like an advertisement of a piano-making firm, serves to introduce some designs for pianofortes, of which the "grand" at the head of the article is a fine and artistic specimen. The materials used were stinn-hued wood, and the floral marquetry is executed in holly, maple, redwood, walnut, and prima vera, "shaded to resemble natural flowers by means of hot sand." We do not like that last item, but the whole design seems to be one that would have been worth detailed illustration on a larger scale. Of the two upright pianos illustrated, that in a kind of "art nouveau," with legs that look as if they were of some substance half melted down, is hideous, the more so in contrast with the clean lines and refined appearance of the design described as "Sheraton."

In the *Burlington Magazine* Mr. Weaver's article (No. 6) on "Some English Leadwork" deals with the subject of leaden portrait statues, of which some illustrations are given. Mr. Yates Thompson contributes an article on "The Romance of a Book," the French illuminated MS. of Josephus, in the Bibliothèque Nationale, a page of which is reproduced in black and white, as well as some others of its pictorial decorations. "The Development of Rembrandt as an Etcher" is the first instalment of a serious critical essay by Mr. C. J. Holmes, who treats the subject not only in reference to Rembrandt himself but in reference to the development of the capabilities of etching as illustrated in his work, which Mr. Holmes considers to be a remarkable instance of the truth of Reynolds's celebrated and often-contested dictum that "genius" was largely the result of intelligent labour—that Rembrandt obviously acquired his final power as an etcher by a long struggle with the difficulties of this form of art.

The illustrations in the *Berliner-Architekturwelt* show that the evolution of grim tower monuments in honour of Bismarck is still exercising the minds of German architects in competition designs, three of which are illustrated. They were probably submitted in a competition instituted by some municipality which desired to be in the fashion by having its own "Bismarckthurm"; no information on the subject is given. They are, however, rather fine conceptions of a gloomy ideal architecture. They are all by one architect, Herr Breunin, and have a strange pre-historic appearance, as if they might have been built in the Stone Age.

Public Works includes, among other interesting papers, one by Mr. Tullis on "Belt Engineering," the making, fitting, and management of belting for conveying engine power. Readers who are not conversant with the subject may think that belt-working seems a very simple matter; as it does when you see the belts in operation; they may be surprised to learn how many points have to be seen to and how many causes of failure guarded against, before the satisfactory working of belting in a large mill can be secured. M. Cotfancini, perhaps one of the best authorities on the subject included in his title, contributes an article on "Reinforced Concrete Theatre Construction in France."

The May issue of *Concrete* is full of useful information; we may mention particularly an article, under the heading "New Uses for Concrete," on reinforced concrete chimneys. After mentioning brick and steel as two suitable materials for tall chimneys, and the drawbacks to both—the friction from the joints in a brick chimney, and the expense of maintenance and shortness of life of a steel chimney, the writer proceeds, under the heading "Monolithic Chimneys"—

"The third form seems to meet the requirements to a far greater extent. Monolithic concrete is smooth on the surface, a non-conductor of heat, requires no lining to resist any temperature, at least up to 1,500 deg. F., requires no expense for maintenance, and, because of its inherent properties, becomes stronger and better with age. As to first cost, the three usually rank—steel, concrete, and brick. As to final cost, they almost invariably shift

this order to concrete, brick, and steel. The difference even in first cost between concrete and steel is rarely so great as to warrant the use of steel for this reason for any but temporary purposes. The ground space, which is often very important, is economised to the greatest extent by the use of reinforced concrete—the saving over brick being about one-third. Until the development of a suitable system of reinforcing concrete it is impossible to use it in chimneys, where the tensile strength of concrete being insufficient to economically resist the wind stresses.

A section and plans of a reinforced concrete chimney are given, which, from the photographic view appended, appears to have been actually erected, though the locality is not mentioned. It is a very ugly thing, looking like an immense narrow tube set on end, and we should be sorry to see the type come into general use unless its economic and structural advantages are great and uncontested. It is possible to make a large brick chimney a rather fine thing, but evidently this cannot be the case with a concrete-steel one, except by adopting proportions which would be wasteful.

The *Art-Workers' Quarterly* is largely occupied with criticisms on and illustrations of work at the recent Arts and Crafts Exhibition. Mr. Alan S. Cole contributes an article on some "Phases of Old English Embroidery." The volume is full of interesting illustrations of applied art design, including a coloured plate of a charming wall-paper designed by Mr. Walter Crane.

Mr. Julius M. Price writes an article in the *Fortnightly Review* on "The Cradle of Modern British Art," which, interestingly written as it is, shows a most extraordinary perversion of view as to facts. The writer andes to himself an old Paris artist-stand, and his "Cradle of Modern British Art" is France; the advance of British art to-day being stated to be largely due to French influence. It is absurd to say so; certain painters are obviously influenced by French methods and study, and if there were more of French influence in our landscape-painting it would be better; but the advance of English painting as a whole is due more to the Pre-Raphaelite movement and the influence it left behind it than to anything over the Channel. He laments the possible downfall of the "English school" under French influence, while the very complaint of French critics is that the English have no "school," only individual painters with individual methods. As to the "cradle" question, why, the cradle of the present great school of French landscape painters was actually in England; they are the descendants of Constable. Best of all, he asks us to believe that the improvement of English taste in applied art of late years is due to French influence! Why, English applied art at the present moment is as far superior to French as light to darkness, and its great advance in recent years is due wholly to influences within this country—to William Morris more than to anyone else. Our conclusion is that Mr. Price must be an American.

In the *National Review* an article by Mr. J. R. Macdonald, M.P., on "The Ethics of the Trade Disputes Bill," is an amusing, or should we rather say an unblushing confession of the views of the Labour party as to the respective rights of Trade Unions and employers. A great part of the paper is of course employed in showing the enormity of the idea of making Trade Unions peculiarly liable for injury and loss caused by their action or that of their agents. The following quotation is sufficient to indicate Mr. Macdonald's ideas of logic and of the rights of man—

"A Union in dispute with an employer pickets his premises, drives away his customers, damages his trade. The loss is assessed, and has to be made good from the union funds. The employer in dispute with his workmen locks out his men, prevents them from finding work elsewhere till peace is restored, hurls them down from a tolerably secure footing upon the cliff face of life into the depths of poverty and debt below. How can the victimised workman pursue his employer for damages? But such a claim on the part of the workman is the counterpart of the claim for compensation for injury to property and profits on the part of the employer.

That the Union is interfering with another man's business, while the employer is dealing with his own, is of course a trifling difference which it is not worth while to take into consideration. According to the writer's logic, it would seem that a man who is employing and paying labourers is *ipso facto* under a moral obligation to go on employing

and paying them, whatever demands they make on him, and they are to claim compensation because he refuses to do so. It is something beyond comment!

In the *Contemporary Review* Mr. L. March-Phillips writes a most able article on "Pre-Raphaelitism and the Present." His main point is that the Pre-Raphaelites, after having started with the profession of going straight to nature and putting nothing between that and art, really became medievalists who entirely separated art from life as it is; and that Morris was the only one of the band who really took the practical view of seeing what could be done with the art of the present (though, in our opinion, he was not quite practical enough).

"While Holman Hunt retired to Palestine to foster his devotional instinct, while Rossetti ranged all history like a wild beast in search of the choicest morsels of sentiment, while Burne-Jones covered in his studio, dreamer of things that had never happened in a world that had never existed, while Ruskin raved of cusps and crockets, and cursed modern architecture, the Western Railway—in a word, while, in one way or other, all the leaders of the movement seemed to have made up their minds to cut their own ears and their own country; Morris alone, divining more truly what the medieval spirit consisted in, had flung aside all æsthetic and other squeamishness, and turned to help English craftsmen and English craftsmanship to regain what they had lost."

Blackwood contains a long and interesting article on "The Early Royal Academy." It is a review of Messrs. Hodgson & Eaton's recent book "The Royal Academy and Its Members," but introduces a good deal of the personal opinion of the writer. His estimate of the character of Reynolds, and of the worldly wisdom and tact which assisted the great President in founding the Academy on a strong basis, is good, and emphasises a side of Reynolds's character sometimes overlooked. We note with sympathy also the dry remark in the first column, that while the writer has views, which a Panhard should not drag from him, on the Academy's administration of the Chantrey Trust, "we have also had visions, which shall be equally uncommunicated, of that Trust administered by some of its critics." So have we.

We recommend these who want to understand what "peaceful picketing" really means or may mean to read the examples cited by Sir Herbert Maxwell, from his own experience, in his eloquent and forcible article in the *Nineteenth Century* under the title "Why Lift Trade Unions Above the Law?" the whole of which is a protest of the most forcible kind against the mob tyranny of the working man and his allies with which we seem to be every day more and more threatened.

The *Century* has an article on "The Gardens of Cornwall," a small new Hampshire town in which there seems to be a great interest taken in the development of the beauty of gardens; the illustrations, however, do not indicate much in the way of the artificial treatment of gardens. A short paper on "The Architectural Treatment of a Small Garden," by the late R. Riordan, forms a further comment on the subject, which seems to condemn the Cornish gardens, as the writer says (truly) that the smaller a garden the more necessity is there for treating it with a certain architectural severity. We see no trace of this in the illustrations of the Cornish gardens.

Scribner contains an article on "The Railways of Africa" by Colonel Girouard, with some illustrations of some of the bridges and other works. The author remarks on the fact that the one-metre gauge has been chosen for the British-made Uganda railway, in spite of the fact that the 3 ft. 6 in. gauge was already established for most of the railways of Africa, some 4,000 miles of 3-6 gauge being already in existence when the Uganda railway was projected. It certainly seems unfortunate that a hindrance should thus have been thrown in the way of establishing a universal though rather small gauge for the South African railway system. Under "The Field of Art" Mr. Russell Sturgis contributes a second article on "Colour Prints," illustrated by a frontispiece to the magazine of a moonrise scene, which is successful in effect, but in a very simple scheme of colour.

The *Cornhill* contains an article on "Pre-historic Man on the Downs" by Dr. Hubbard and Mr. G. Hubbard, which is

apparently practically an embodiment of the two lectures of which a report is published in this issue; but it is accompanied with sectional diagrams and a plan, which are useful in elucidating the subject. "Carbon and the Shores of Atoms" is the subject of the fourth of Mr. Shenstone's series of articles on "The New Chemistry"; and Mr. G. D. Hogarth contributes an interesting article on "Chimera and Phaselis" in *Asia Minor*.

The *World's Work* prints three articles under the heading "Shall there be a Channel Tunnel?"; of course in favour of it. We agree that the old scare as to danger of invasion through a tunnel had little in it, the protection of the exit on this side would be so easy, and the immediate destruction of its continuity, in case of necessity, still easier. But we suspect the engineering difficulties, and especially that of adequate ventilation, are being much underrated. The great use of such a tunnel would be for goods traffic, as doing away with the necessity for trans-shipment on each coast. Even if made, we should question if it would ever be popular for passenger traffic. The risk of sea-sickness is a trifle compared with the risk of being choked.

The *Antiquary* contains a detailed account of the steps which have been taken by the Hertfordshire County Council, at the instigation of the East Heris Archaeological Society, to take under their charge and to safeguard the archaeological relics of Hertfordshire. It is stated that Hertfordshire is the only county which has so far availed itself of the permissive Act of 1900 to undertake the care of ancient monuments; if so, it has set an example which it is to be hoped that other county authorities will follow. The Rev. A. H. Collins contributes an article on the carvings at Barreston Church, with illustrations of some of them.

In *School* Mr. Sydney F. Walker, whose articles on the hygiene of school buildings we have before noticed, devotes his chapter on "The Ventilation of School Buildings" mainly to the description of several methods of ensuring ventilation, giving a large space to a description of the "plenum" system, without expressing an opinion on it, contenting himself with giving the main facts as to the working of such a system, and a statement in a short concluding sentence of the advantages and disadvantages attributed to it. The summary is correct and useful.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The fourteenth general meeting (ordinary) of the session will be held on Monday, May 21, at the conclusion of the special general meetings announced below, when a paper will be read by Mr. Paul Waterhouse on the "Report of the London Traffic Commission." The special general meeting summoned by the Council under by-law 60, on the requisition of Messrs. Alfred W. S. Cross, Max Clarke, C. H. Brodie, George Hubbard, C. P. Francis (members of the Fellowship Procedure Committee), Ernest George, Alfred B. Yeates, Edmund Wimperis, T. W. Cutler, Mervyn Macartney, William A. Forsyth, and J. R. Best, will be held to receive the Report and recommendations of the Fellowship Procedure Committee appointed at the meeting of March 5.

The Fellowship Procedure Committee recommend:—(1) That the regulation under by-law 9 be amended by omitting all the words after "respective proposers" and adding the year in which the candidate was articulated, and in the case of a candidate for Fellowship the year in which he commenced practice; the regulation further to state that the voting papers shall be in the form of the papers issued for the election of the Council. (The present regulation under by-law 9 reads as follows:—"The voting papers shall state the name and address of every candidate, with the names of his respective proposers, and be divided into columns for affirmative and negative votes, such votes only to be counted as are marked in such columns.")

The Committee also recommend:—(2) That the direction to voters printed at the foot of the voting paper should read as follows: "1. The voter (Fellow or Associate) is to strike out in ink the name of any candidate for whom he does not wish to vote. All

names not so struck out will be counted as voted for."

The Committee further recommend:—(3) That a notice be printed in bold type at the head of the voting paper urging the importance of the papers being returned.

The Chairman will move, in accordance with recommendation 1, that the regulation under by-law 9 be amended so as to read as follows:—"The voting papers, which shall be in the form of the voting papers issued for the election of the Council, shall state the name and address of every candidate, with the names of his respective proposers, the year in which he was articulated, and, in the case of a candidate for Fellowship, the year in which he became engaged as a principal in the practice of architecture."

The Chairman will further move that recommendations 2 and 3 of the Fellowship Procedure Committee be adopted.

A special general meeting, convened by the Council under by-law 60, will then be held for the following purpose:—The Chairman to move that the resolution passed at the special general meeting of May 7 be confirmed, as required by clause 53 of the Charter. The resolution is:—"That the President and members of the Council for the current session do retain office until the conclusion of the Seventh International Congress of Architects, to be held in July, and that, in order to give legal effect to this resolution, the provisions of by-law 30 affected thereby be temporarily suspended."

THE SURVEYORS' INSTITUTION: THE EFFECT OF FIRE ON BUILDING STONE.

An ordinary general meeting of the Surveyors' Institution was held on Monday, at No. 12, Great George-street, S.W., when Mr. W. R. Baldwin-Wiseman, M.Sc., read a paper on "The Effect of Fire on Building Stones."

In the course of his remarks he said that the temperature and destructiveness of any conflagration were so entirely dependent upon the plan of the building, the nature and disposition of the material used in its construction, the nature of its contents, the time, location and cause of the fire, and other incidents, as to preclude all possibility of reduction to any standard formula, and a study of the stresses which a building had to withstand during and after a severe conflagration was also so complex a problem as to be practically indeterminate if viewed as a whole; but if one resolved it into separate considerations of design and material, it was brought more within the bounds of solution and the range of every-day practice in design. For this reason he regarded as practically valueless all experiments which involved the construction of, say, a model room, and its destruction by fire, when, in many cases, the building material of which it was composed was comparatively fresh, the wall and floor stresses were trivial, and the internal space was utterly inadequate for the generation of a really serious fire. Far more profitable experience would result from a careful inspection of all interiors after the extinction of a fire, for much information as to the temperature of the fire could be obtained by a careful examination of the condition, fused or otherwise, of the metallic fixtures, and by tabulating the records of the intensity and destructiveness of fires in various buildings of similar plan, structural arrangement, and trade, one would create an almost invaluable record for reference, from which much good must eventually result.

The purpose of the author's research was not so much to determine the design of a building for fire resistance as to estimate the ultimate stability of an edifice after subjection to a severe conflagration, and to afford some small assistance to those who might be called upon to decide whether demolition or reconstruction should succeed the wrecking influences of a big conflagration. The following points were considered:—

"First.—The transverse and crushing strength of stone, (a) when thoroughly dried in the steam oven so as to expel all absorbed water held in the pores, but not the water of crystallisation; (b) when thoroughly soaked in water; (c) when subjected for various definite periods to constant temperatures ranging from 500 deg. C. to 650 deg. C., and either slow cooled in air or suddenly cooled by immersion in cold water, immediately upon removal from the furnace, the latter case being intended to somewhat imitate the conditions when a jet of water was directed upon a burning building. Second.—The

expansion of the stone with increase of temperature from 20 deg. C. to 300 deg. C., and the permanent alteration in dimension on subsequent cooling."

For the whole of the data of that part of the research bearing upon expansion and permanent swelling the author acknowledged his indebtedness to Mr. O. W. Griffiths, B.Sc., A.R.C.S., with whom he is collaborating in another research on the physical properties of concrete and ferro-concrete, and who had specially devised a delicate extensometer for the determination of the data on expansion recorded in tables given in connexion with the paper.

In heat resistance or the depreciation in strength of stone after subjection to high temperatures, there was not so far as he was aware any statistical table whatever, and, in fact, the only tabular statement at all on this question known to him was that of Dr. Cutting, giving the order of resistance in decreasing ratio of fire-resisting material, when water was not applied, viz.:—(1) Marble, (2) limestone, (3) sandstone, (4) granite, (5) conglomerate. The accuracy of this table was not at all borne out by the data derived from his (the author's) research, and from this tabular arrangement he most strongly dissented, since the physical structure of each class and subclass of stone varied so considerably as to preclude any generic grouping such as this list presumed. There were doubtless many isolated examples in personal experience of the relative effects of fire on different stones in the same edifice, but these were unfortunately not readily available. In 1878 the granite body of the Church of St. Peters, Laverton, was demolished whilst the freestone tower stood intact, although the heat was sufficient to destroy the granite sills and jambs in the tower, and to melt the bells in it, the temperature being, say, about 850 deg. C.

The stones tested by the author were selected to be as representative as possible of the geological formation and geographical distribution of those more commonly used in construction in this country; in all, twenty-four classes of stone were experimented upon, of which six were sandstones, nine were limestones and calcareous freestones, six were marbles, and three were of igneous origin.

The author then briefly described the stones, after which he gave a description of the apparatus and methods of making the tests. All the test-pieces were dressed to strips 6 in. by 1 in. by 1 in., excepting the marbles, which were 6 in. by 2 in. by 2 in., the red granites 6 in. by 1 in. by 2 in., and the quartzites 6 in. by 1½ in. by 1½ in. The granites and marbles were also polished upon one face. All the test-pieces were carefully inspected to insure that they were free from flaw or crack. Each stone was placed in the electrical furnace, and its temperature regulated and maintained constant throughout the experiment, which usually lasted from three to four hours. It was then allowed to cool, and the permanent swelling observed after twelve hours' cooling.

Discussion of Observed Data: A. Structure and Appearance.

Considering first those experiments for the determination of the strength of the stone, there were several phenomena worthy of recording. Many of the Douling, Portland, and Bradford test-pieces emitted a peculiar crackling noise during the first few minutes after insertion in and removal from the furnace; the York stone changed in colour from a straw yellow to a terra-cotta red, due possibly to a chemical change in the composition of the iron oxide in the cementing material of the grains of the stone. The diabase changed from a dark greenish black to a dirty yellowish green; the Monks Park, Portland, Hopton Wood, and Boxground stones became chalky in appearance and somewhat lighter in colour; the Hopton Wood stone became internally mauve-grey in colour, and developed brown stains here and there; the Bradford and Bath oolites lost their fresh crisp appearance, became more or less earthy, and developed irregular red stains round some of the larger grains. The Aspatria test-pieces, soon after their insertion in the furnace, gave off a dense smoky cloud, which soon after faded and burnt steadily, with a smoky yellow flame for about a minute. By titration of some of the crushed stone with alcohol and subsequent

distillation of the alcohol, a viscous amber-coloured combustible oil was collected. Several stones, such as Douling, disintegrated in the furnace or immediately after removal therefrom. Others, such as Douling or Daresbury, disintegrated immediately on immersion in or removal from the water; and one Daresbury retained its form during cooling, and carried its own weight upon the supports, but broke when the stirrup, weighing only two pounds, was carefully placed upon it, and fell as a mass of incoherent sand to the floor. Some, such as Douling, Carrara marble, the red and, in a less degree, the grey granite, the Bradford and Bath oolites, and the Daresbury sandstone, had but little cohesion, and crumbled to powder when touched, or when more or less coarsely rubbed with the hand. Several Carrara marbles warped upon cooling, arching slightly; others, such as Hopton Wood, Monks Park, and Boxground stones, retained a sharp arched shape, but the sides caved in, and cracks more or less deep developed at right-angles to the direction of the greatest length of the test-piece.

B. Strength.

All the bars tested transversely failed, as one would expect, in tension—i.e., broke on the under surface immediately after developing cracks running from the underside upwards. If one considered a rock mass as an aggregation of similar or dissimilar interlocking grains or crystals, then, when this mass was subjected to a high temperature, each of these grains expanded, or tended to expand, with varying amount, in different directions. To permit of this individual expansion of the grains or crystals, each and all would move outward; but upon subsequent cooling they would not move back to the positions they originally occupied, but each would contract along its own axes about its own individual mass centre, resulting in a less intimate interlocking of the crystals or grains and a consequent diminution of the strength of the mass as a whole. If, on the other hand, the temperature be suddenly reduced through a considerable range, as when cold water was brought into contact with the heated stone, then the molecular stresses set up by this sudden change of temperature, coupled with the disruptive tendency of the heated and expanding water which had obtained access to the innermost pores, tended to a further reduction of its strength. The strength of the stone in some cases was insufficient to maintain its own outward form, or so slight as to carry no load of even moderate magnitude; whilst, in other cases, the original strength was materially reduced when heated and slowly cooled in air; and still further depreciated, with exceptions, when suddenly cooled in cold water. There was a still greater diminution of strength with increase of the temperature, or of the period of exposure to the same high temperature. This question of diminution of strength was not at all one of heat decomposition of the calcareous constituents of the stone. Care was taken that all the test-pieces of the same stone were of similar dimensions, so as to be readily comparable, and that all were tested when resting upon their natural bed.

The ratios have been calculated to the third place of decimals, but, as stones in the same geological formation might vary in structure and chemical composition from point to point, and from district to district, similar experiments might produce results differing in the second or third place of decimals. Considering his Tables 2 and 3 as a whole, it was evident that there could be no class grouping into sandstones, limestones, etc., of the fire-resistance of stones, such as Dr. Cutting presumes in his classification.

Taking the several items in detail, and taking the resistance to crushing and transverse loads when dry, in tons per square foot to the nearest ten tons, as the standard of comparison, one saw that York stone, which had a crushing strength of 550 tons per square foot, and a transverse strength of 70 tons a square foot, or a strength only 1/8 of that in compression, deteriorated after subjection to high temperature, so that its resistance to crushing was only 36 per cent. of its original crushing strength when slowly cooled in air, or 40 per cent. when suddenly cooled in water, whilst its transverse strength was only 65 per cent. and 27 per cent. respectively, of its initial transverse strength when slow and fast cooled, so that

of a fairly high factor of safety had been chosen in the original design, a structure built of this stone might yet be serviceable, with certain safeguards, after a serious conflagration. The red Mansfield stone had a crushing strength of 160 tons per square foot and a transverse strength of 40 tons, or a transverse strength only quarter of that in compression; its crushing strength after subjection to a high temperature and the two modes of cooling was 100 per cent. and 37 per cent. respectively, whilst in cross-breaking the strengths for the corresponding conditions of cooling were 62 per cent. and 50 per cent., so that, although the deterioration in resistance to cross-breaking was material, it was not of such magnitude as to seriously impair the utility of a well-designed edifice, still less was this the case in regard to compressive stresses.

The Aspatria stone was somewhat similar to the red Mansfield stone, in that its resistance to crushing and transverse stresses was 160 and 30 tons respectively, a ratio of 5 to 1, and the post-conflagration crushing strengths are 100 per cent. and 99 per cent. respectively, but it differed from the red Mansfield stone in that there was a more marked depreciation in its resistance to transverse stresses, to 20 per cent. and 15 per cent. respectively, so that if this material had to withstand crushing stresses only, its deterioration may under ordinary circumstances be negligible, but its depreciation in transverse strength was so material as to necessitate grave consideration in the matter of its replacement.

The Quartzite, which had the moderately-high crushing strength of 240 tons per square foot, and the phenomenally high transverse strength of 150 tons, over twice the transverse strength of the York stone and five times that of the Aspatria stone, had a ratio of crushing to transverse stress of 8 to 5. It depreciated in compressive strength to 71 per cent. in both cases of slow and fast cooling from high temperature and in transverse stress to 89 per cent. and 93 per cent. respectively. The comparatively moderate diminution of its strength in compression and cross-breaking made it a valuable stone, and as it was possessed of a good colour and appearance, especially when polished, it should command an extensive market, not only for building purposes but also as road metal for which its hardness and the clearness of its surface especially commended it.

The soft Daresbury sandstone, with but little natural cementing material, had the comparatively low-crushing and transverse strengths of 60 tons and 10 tons per square foot respectively, a ratio of 6 to 1; its resistance to crushing after both modes of cooling was practically nothing, as was likewise its resistance to transverse stresses when fast cooled; when slowly cooled, however, its resistance to transverse stresses was about 48 per cent. of its original strength. It was possible that some small, but purely academic, values could have been obtained for the depreciated crushing strengths, but it was not possible with his apparatus, since one was unable to apply the first 100 lb. or 200 lb. with any reliable degree of accuracy.

The hard Daresbury sandstone being more coherent offered a greater resistance to crushing and cross-breaking than the soft Daresbury sandstone, the breaking stresses being 130 tons and 20 tons per square foot respectively, a ratio of 6 to 1; but after subjection to high temperatures its resistance to crushing, when cooled in any manner, was so trivial as to be negligible; so also was its resistance to transverse stresses when fast cooled. When slowly cooled, however, its transverse strength was 24 per cent. of the maximum, so that, although initially twice as strong as the soft Daresbury sandstone, its depreciation of strength was twice as great, and both broke under practically the same load; or, in other words, the heat had the effect of entirely breaking down the efficiency of the cementing material, on which its greater initial strength depended.

Turning to the consideration of the calcareous freestones, one found almost as varied a diversity of strengths as among the sandstones. The Douling stone, which had a crushing strength of 80 tons and a transverse strength of 20 tons per square foot, a ratio of 4 to 1, offered little or no

resistance to crushing after subjection to high temperatures, for in most cases it fell into an incoherent mass of shelly fragments and sand, in the furnace, or whilst cooling, or soon after placing on the table of the crushing machine. Under transverse loads its resistance fell to 2 per cent. and 7 per cent. respectively of its maximum strength, so that at a moderately high temperature it had no fire-resistance value whatever.

The Portland base bed stone, the strongest of all the calcareous stones which he tested, had a crushing strength of 260 tons and a transverse strength of 90 tons per square foot, a ratio of 3 to 1. This subsequently depreciates after subjection to high temperature to 60 per cent. and 51 per cent. in crushing strength, and to 66 per cent. and 14 per cent. in transverse strength respectively, when slow and fast cooled, so that one saw that the local action of the water in suddenly cooling the stone materially depreciates its strength under both conditions of loading.

The Monks Park stone, with a compressive strength of 100 tons and a transverse strength of 40 tons per square foot, a ratio of 10 to 4, depreciates in compression to 82 per cent. and 74 per cent. respectively, and in transverse strength to 45 per cent. and 37 per cent., so that, in sustaining crushing loads, it might within certain limits be trusted after a conflagration to perform its office, but could not be trusted to sustain any severe transverse stresses.

The Boxground stone, with crushing and transverse strengths of 60 and 30 tons per square foot respectively, a ratio of 2 to 1, depreciates in compression to 49 per cent. and 54 per cent. of its original strength, when slow and fast cooled, and depreciates in transverse strength to 2 per cent. and 24 per cent. respectively; so that, whilst it might, with due precautions, serve again in compression, it could not be trusted to bear any transverse loads whatever.

The Bradford stone, with crushing and transverse strengths of 60 tons and 30 tons per square foot, a ratio of 2 to 1, deteriorates so that its strength, after subjection to high temperature, was 50 per cent. and 40 per cent. of its initial compressive strength, and 34 per cent. and 23 per cent. of its initial transverse strength.

The Bath stone, with slightly greater resistances to crushing and transverse stresses of 70 tons and 40 tons per square foot respectively, a ratio of 7 to 4, deteriorates similarly to 51 per cent. and 45 per cent. in compression, and to 35 per cent. and 26 per cent. in transverse loading. The depreciation in strength of both the two previous stones was so great as to render them untrustworthy after subjection to a severe conflagration.

The Hopton Wood stone, with crushing and transverse strengths of 190 tons and 60 tons per square foot respectively, a ratio of 3 to 1, depreciates in compression to 57 per cent. and 39 per cent. respectively, and when transversely loaded to 39 per cent. and 29 per cent.

The Chalks, with their low initial strengths of 20 tons and 10 tons per square foot respectively, had no residual strength whatever, after subjection to the high temperature, the expansion set up by the high temperature in all probability serving only to rupture the walls of the pores and break up the material.

The marbles also varied somewhat in the magnitude of the depreciation of their strengths. The Carrara marble, with initial compressive and transverse strengths of 290 tons per square foot, and 50 tons per square foot, a ratio of 6 to 1, depreciates to 55 per cent. and 66 per cent., and to 19 per cent. and 9 per cent. of the respective strengths, when heated and cooled in the two prescribed modes.

The Rouge Royal marble with compressive and transverse strengths of 410 tons per square foot and 120 tons per square foot respectively, deteriorates to 55 per cent. of its initial compressive strength when cooled in either way, and to 35 per cent. and 24 per cent. of its transverse strength when slow and fast cooled.

The St. Anne's marble, with compressive and transverse strengths of 590 tons and 140 tons per square foot respectively, a ratio of 4 to 1, depreciates to 38 per cent. and 45 per cent. in compression, and to

34 per cent. and 27 per cent. in transverse strength; this stone was remarkable in that it depreciates in an almost identical ratio in both strengths when slowly cooled.

The Dove marble, with a compressive strength of 380 tons per square foot and a transverse strength of 140 tons per square foot, a ratio of almost 3 to 1, depreciates in ratios somewhat similar to those for the Carrara marble; its compressive strength diminishing to 50 per cent. and 41 per cent. respectively, and its transverse strength to 8 per cent. and 15 per cent. according to the two modes of cooling.

The Black marble, with an initial resistance to crushing of 430 tons, and to transverse loads of 190 tons per square foot, a ratio of 2 to 1, depreciates in crushing strength to 61 per cent. and 70 per cent., and in transverse strength to 59 per cent. and 14 per cent. This marble and the Portland stone exhibited the most marked depreciation of resistance to transverse loads, when suddenly cooled from a high temperature, and to a lesser extent the Belgian granite displays similar qualities.

The Belgian granite, which had a considerable vogue owing to its uniformity of texture and its comparative cheapness, had a compressive strength of 350 tons per square foot and a transverse strength of 130 tons per square foot, a ratio of about 3 to 1, depreciates to 59 per cent. and 69 per cent. in compression, and to 46 per cent. and 22 per cent. respectively when transversely loaded.

The three types of Plutonic rocks with which he experimented exhibited a greater diversity in the depreciation of their strengths than all the other classes of stone. Thus the red granite with initial crushing and transverse strengths of 350 tons and 90 tons per square foot respectively, a ratio of 4 to 1, depreciates to 8 per cent. and 6 per cent. in crushing strength, and to 10 per cent. and 6 per cent. when transversely loaded; at once indicating the absolute inutility of granite as a fire-resisting medium; comparable only in its utter depreciation with the poorer sandstones and calcareous freestones.

The grey granite, with slightly higher initial crushing and transverse strengths of 380 tons and 170 tons per square foot respectively, a ratio of about 2 to 1, depreciates to 33 per cent. and 51 per cent. in crushing strength, and to 11 per cent. and 1 per cent. in transverse strength, so that this stone, although it greatly deteriorates, did not so utterly fail in compression as the red granite; doubtless owing to the somewhat smaller and more uniform size of its component crystals, giving rise to less internal disturbance during expansion and contraction; and it should be noted that, as with York stone, Boxground, St. Anne's marble, black marble, and the Belgian granite, the crushing strength was slightly increased when suddenly cooled, compared with that when slowly cooled, doubtless, because the sudden cooling at the surface gave rise to an intimately interlocked skin; but the grey granite failed more absolutely under transverse loads than did the red granite, owing to its smaller-sized grains.

Finally the Diabase, with compressive and transverse strengths of 30 tons and 120 tons per square foot respectively, a ratio of 3 to 1, depreciates to 86 per cent. and 50 per cent. of its initial crushing strength and to 24 per cent. and 5 per cent. of its initial transverse strength when slow and fast cooled, so that it might within limits be trusted in compression after subjection to the high temperature of a conflagration, but could not be at all trusted under transverse loads.

The effects detailed at length in the preceding paragraphs were more marked if the period of exposure be prolonged, or if the temperature be materially increased; thus York stone exposed for two hours to a temperature of 618 deg. C. had a residual strength of 43 per cent., which, after six hours at a temperature of 696 deg. C., diminished to 35 per cent., and after twelve hours at a temperature of 728 deg. C., diminished to 28 per cent., so also red Mansfield stone after subjection for similar periods to similar temperatures had residual strengths of 58 per cent., 49 per cent., and 33 per cent. respectively.

Excepting for the relatively non-absorbent marbles, granites, and quartzites, the

more absorbent Hopton Wood stone, the transverse strength of a stone when thoroughly dry was materially greater than that for the same stone when its pores were thoroughly charged with water; whilst the same general rule held for the crushing strength, if to the list of those already enumerated be added the York, Red Mansfield, and Aspatia sandstones, and the Doulting stone. So that a fire in a moderately old building would be productive of more havoc to the structure than in a new one, as the stone would not have the high initial strength of his test-pieces, but would be depreciated to an extent, depending on its relative exposure to diurnal and seasonal variations of temperature, the composition and destructiveness of the atmospheric impurity, the relative porosity of the stone, the inequality of its texture, and the incidence of wind, rainfall, and frost.

c. Expansion.

The sandstones as a class had the greatest coefficients of expansion in the first range of temperature from 20 deg. C. to 100 deg. C., the coefficients varying from 9 millionths for Aspatia stone to 16 millionths for the Quartzite; in the higher or second range of temperature, from 100 deg. C. to 200 deg. C., there was an increase of the coefficient to 15 times that at the lower range in the case of the Red Mansfield as the greatest rate of increase, and 17 times that at the lower range for the Hard Daresbury as the least variable. In the highest or third range of temperature from 200 deg. C. to 300 deg. C., there was a greater variation in the rate of change of the coefficient than in the two previous ranges, the coefficient for the Red Mansfield being 1.9 times that in the first range, whilst that for the Aspatia and the Quartzite remain practically constant at the value for the second range. In general, the sandstones exhibit least variation in their rate of change at the higher temperatures, but the initial mean coefficient of expansion in the lowest range was so high that the uniformity was more apparent than real.

The Oolites exhibit a most marked diversity at all temperatures, the Doulting stone having the greatest coefficients of expansion in all three ranges, the values being 22.4, 26.2, and 26.7 millionths respectively in the first, second, and third ranges.

The Bradford stone had the least coefficient in the first range, the coefficient being only 2.5 millionths, which was the least value in the coefficient of all the stones upon which experiments were conducted, the Monks Park, Boxground, Portland, and Bath stones having similarly low coefficients of 3, 4, 5, and 5 millionths respectively. But with increase of temperature, the diversity was most marked, the coefficient of expansion from 100 deg. C. to 200 deg. C. considered as a ratio of that at the lower range, varying from 1.2 for the Doulting stone to 4.0 for the Bradford stone, with values of 1.6, 2.3, 2.3, and 2.5 respectively for the Portland, Monks Park, Boxground, and Bath stones; in the still higher range from 200 deg. C. to 300 deg. C. the coefficient remained practically the same for the Doulting stone, but increased to 5.4 times the coefficient in the first range for the Bradford stone, with intermediate ratios of 2.9, 3.5, 3.8, and 4.6 respectively for the Portland, Bath, Monks Park, and Boxground stones.

If, instead of the ratios of the coefficients in the several ranges, the coefficients themselves be considered, the diversity was still more apparent; thus, from 20 deg. C. to 100 deg. C. the coefficients had extreme values of 22.4 millionths, and 2.5 millionths for the Doulting and Bradford stones respectively; in the range from 100 deg. C. to 200 deg. C. the coefficients for these two stones were 26.2 millionths and 10.1 millionths, the former being the greatest coefficient in this range; but the least coefficient was now 7.8 millionths, that for the Portland stone. In the third range, from 200 deg. C. to 300 deg. C., the Doulting stone had still the highest coefficient, 26.7 millionths, the least being that of 13.4 millionths for the Monks Park stone, and the coefficients for the Bradford and Portland stones being 13.5 millionths and 14.6 millionths respectively.

The Hopton Wood stone, by its expansion

and also by its geological horizons, belonged more closely to the marbles than to the calcareous freestones, in which, from a desire to avoid too much classification, he had grouped it; but, in the question of expansion, he proposed to consider it with the marbles rather than with the calcareous freestones.

In the case of the marbles, the greatest coefficient of expansion, for the lowest range of temperature from 20 deg. C. to 100 deg. C., is 9.2 millionths for the Dove marble, and the least 4.4 millionths for the St. Anne's marble; in the next range, from 100 deg. C. to 200 deg. C., the extreme ratios of the coefficients to those in the lower range, were 3.7 for St. Anne's marble and 1.8 for the Hopton Wood stone, and in the higher range, from 200 deg. C. to 300 deg. C., the extreme ratios were similarly 4.1 and 2.1 times that of the lowest range for the St. Anne's and Dove marbles respectively.

The igneous rocks in general possessed coefficients similar to those of the sandstones, the coefficients being 10.2 millionths and 9.7 millionths respectively for the Red Granite and the Diabase, but with increase of temperature there was a material increase in the rate of expansion; the Red Granite having coefficients of 17.0 millionths and 21.6 millionths in the higher ranges, from 100 deg. C. to 200 deg. C., and from 200 deg. C. to 300 deg. C., the ratios being 1.7 and 1.7 respectively in the three ranges of temperature; whilst the Diabase had coefficients of 15 millionths and 16 millionths at the two higher ranges, giving corresponding ratios of 1.0, 1.5, and 1.6 respectively in the three ranges.

Stones, which had almost identical coefficients of expansion in one range of temperature, had widely varying coefficients in another; thus, for instance, Aspatia sandstone, Dove marble, Red granite, and Diabase had coefficients of 9.0, 9.2, 10.0, and 9.7 millionths respectively in the range from 20 deg. C. to 100 deg. C., differing from one another only in the ratios of 100, 102, 111, and 108; in the next range, however, from 100 deg. C. to 200 deg. C., the coefficients differed in the ratios of 100, 169, 149, and 132, and in the third range, from 200 deg. C. to 300 deg. C. they differed in the ratios of 100, 168, 188, and 139 respectively, so that if two such stones were bonded together in a structure, and subjected to any considerable range of temperature, the varying expansion at identical temperatures would give rise, not only to severe molecular stresses within the material of the stone, but would also induce a disturbance in the distribution of the external stresses in the structure.

Furthermore, these four stones had coefficients of expansion in the first range of temperature, from 20 deg. C. to 100 deg. C., not greatly differing from those for iron, steel, etc.; but in the higher ranges of temperature there was a great diversity, so that in a combination of, say, granite and steel, as in the modern skeleton steel framework structure, with masonry exterior, most severe stresses must be set up during a fire by the variable expansion of the metal and stone alone, irrespective of the heat distortion of the unprotected ironwork, giving rise to a depreciation of the strength of the stone in addition to that produced by heat alone.

Again, a dissimilar stone, such as, say, the granite forming the sill, etc., in the sandstone tower to which he referred at the commencement of the paper, might by its greater expansion have to carry a greater load at high temperature than that for which it was originally designed, and this load might exceed its ultimate strength at that temperature, and one might presume that the disruptive effect of local cooling, as when a hose plays with some pressure upon one face, was greater than when cooled uniformly and simultaneously over its whole surface. From these considerations it would be at once apparent that, although the incorporation of dissimilar stones in the fabric of an edifice might, by their contrast in colour and texture, materially contribute to the artistic and architectural effects, such a miscellaneous assemblage was not to be recommended from a fire-resistance point of view, and in a less degree this heterogeneity was not, in the strictest sense, advisable, bearing in mind that the diurnal and annual

variations of temperature were not inconsiderable even in these climes. Also, in designing for fire-resistance, no masonry whatever should be carried on the upper boom of a plate girder, for not only were the molecular stresses set up by the variable expansion of metal and stone injurious, but the increased deflection of the beam, under increase of temperature, induced a settlement of the masonry above it, and brought additional lateral stresses upon the masonry.

$$\text{This deflection } D = \frac{W L^3}{8 E I}$$

Where W was the load on the beam,
L was the span of the beam,
I was the moment of inertia of the section,
N was a numerical quantity varying with the type of beam and the incidence of the load,
E was Young's modulus of elasticity.

Since, from the formula, D varied inversely with E, which decreased in an irregular manner with increase of temperature, according to Pisati's experiments, it followed that D must increase with temperature, and the beam failed to support the load it was designed to carry at a time when it was most needed.

Some of the stones had a greater percentage porosity after subjection to high temperatures than they possessed in the normal condition, so that after a conflagration, besides the tendency to distortion of the structure, induced by permanent swelling and the mere heat depreciation of the strength; the stones would take up a larger quantity of water in the pores, which would give rise to a more rapid deterioration by weathering, as well as a further depreciation of strength on account of the presence of the greater quantity of absorbed water.

Fire Statistics.

He had made every effort to obtain information as to the approximate maximum recorded temperatures of conflagrations. These temperatures would, of course, vary within wide limits, according to the local conditions, the trade, plan of the buildings, nature of the contents, etc., and the data was but very scant, for a fire captain's energies were of necessity concentrated on the work of extinction to the exclusion of all else, but much valuable information upon this point could be collected, after the extinction of the fire, by a careful inspection of all the metallic fittings of the interior of the building; there were numerous records of zinc and lead having been melted during the progress of conflagrations, or that temperatures of 415 deg. C. and 326 deg. C. were exceeded. He was particularly indebted to Mr. William Paterson, chief officer of the Glasgow Fire Brigade, who informed him that the slates of a timber shed in a small fire at which he attended melted like soft metal, and had the appearance of lava; and also to Mr. J. G. Lewis, Chief Constable and Superintendent of the Fire Brigade, Blackburn, who informed him that the maximum temperature of a fire in his experience was about 600 deg. C. He (the author) was therefore of opinion that, in experimenting with stones exposed to temperatures ranging up to 800 deg. C. for periods of from two to eighteen hours, he was reproducing conditions as severe as those occurring in the more serious conflagrations.

The relative immunity of a town from serious conflagrations was largely dependent on the ratio of the height of the higher buildings in the town, to the maximum pressure on the mains, or to the greatest pressure which the engines could afford.

General Conclusion.

Finally, he briefly summarised the points of primary importance in determining the most efficient design for fire-resistance:—

1. That the edifice should in no wise be flimsy.
2. That it should be constructed of stone possessing an uniform or fairly uniform coefficient of expansion, and retaining a considerable strength after subjection to high temperatures.
3. That all combinations of different stones should be avoided as much as possible.
4. That combinations of stone and metal should be avoided, especially when the former rests directly upon the latter, even

when the metal was entirely enshrouded in stone, for stone acts as a fairly good conductor of heat.

5. That stairwells and lift-wells should open as little as possible on to the main building, and should preferably be enclosed and glazed with wired glass from basement to roof.

6. That floor areas should not be unduly large nor corridors unduly long.

A discussion followed, and a hearty vote of thanks was accorded to the author.

HOME ARTS AND INDUSTRIES ASSOCIATION EXHIBITION.

PROVIDED one does not set himself too high a standard, a profitable hour can be spent at the twenty-second annual exhibition of this Association; the show is well set out, fills the whole of the upper gallery at the Albert Hall, and will remain open until Monday evening next.

The aim of the Association is the excellent one of reviving and stimulating craftwork in village and rural communities, the initiative coming as a rule from voluntary effort on the part of those who have at heart the welfare of the country worker. In most cases this means that not only the starting of the classes, but much of the subsequent direction, is in the hands of amateurs whose training in design has not been very thorough, with the result that much of the painstaking and really excellent workmanship is thrown away upon trivial and commonplace motives. It is only fair to make this criticism from an artistic point of view, though in other respects the objects of the Association are praiseworthy, and have often resulted in the establishment of self-supporting village industries, animated by a very real feeling for design. This is evidenced by the exhibits from the Lake District centres and from Compton, to mention only a few.

It must be admitted that the most interesting exhibits are those of industries into which art, in the ordinary sense of the word, enters but little, and among these the Irish lace from Moneygynnen, the homespun from the Stonehenge centre, the chairs from Lacock, and the Saxmundham baskets are all charming. Quite a large field should be open for the cottage-made chairs provided they keep to the traditional lines of the Lacock ones, and retain the rough but individual workmanship. Of large constructive work there is, of course, not much, but some softwood stained nursery furniture, made by the Challey section of the Guild of the Brave Poor Things, is remarkably good as the work of crimped boys; in this stall also the toys are again quite a feature.

The woodcarving from Eversley and Fleet is distinctly better than the average of this kind of work shown; a couple of small barge boards, evidently for a porch, boldly carved with a "running vine," stand out from the rest of the carving. Perhaps the most ambitious piece of furniture exhibited is a chest, designed by Mr. F. A. Rawlence, and executed at Ebbesbourne Wake in connexion with the Wilton class by Mr. Foyle and Mr. Young, the village carpenter and blacksmith. The lock-plates and hinges have been decorated in a strictly traditional manner, and are in every way excellent. In other respects the metal-work shown, especially the repoussé copper, is not very satisfactory; the only exhibit in this material worthy of note is from Fivemiletown, in Ireland, some of the pieces having great merit and an original treatment. Among the textiles the Langdale display of embroidery and drawn-thread work is full of good things. Holyhead shows three magnificent panels of silk embroidery, evidently from an old design adapted, and Failand is also to the fore with clever needle-work and an excellent sampler. Why are samplers so rarely worked nowadays?

There is a good deal of pottery. Mr. Howson Taylor makes a large display of "Ruskin" ware, and the Castle Hedingham centre has a stall of pots, which are nice in colour but sadly lacking in good design. A very little skilled direction would set this right; for an example of what it will do one has only to turn to the exhibit of the Birkenhead Della Robbia pottery or to Mr. Ashbee's two cases of silver and jewellery, which are almost in a class of their own.

On the whole, this is an interesting exhibition.

PREHISTORIC LIFE ON THE DOWNS.

ON Thursday evening in last week Dr. A. J. Hubbard and Mr. Geo. Hubbard lectured at the Elmhurst Club, St. James's-square, on "Prehistoric Life on the Chalk Downs." The lecture was illustrated by a series of most interesting lantern slides.

Dr. Hubbard said that he and his brother proposed to consider the manner and conditions of human life during a period the antiquity of which was so great that they were not only without historical records, but could not, with more than a vague approximation, assign either a date or a duration to it. They hoped to be able to show how prehistoric men advanced from a lower to a far higher state of civilisation. In these depths of time to which they must in imagination descend, such a movement must have been, as they judged such things now, almost insupportably slow. Thousands of years were involved. Beginning some 50,000 years before the dynasties of Egypt, they found its culmination in the building of Stonehenge, and perhaps the great pyramid was 2,000 years old when Stonehenge was new. It was spoken of as the neolithic age. The neolithic men were by no means uncivilised, for they co-operated on a vast scale, and some of the works which they had left were stupendous and as permanent as the pyramids, but, nevertheless, not one word of their language had been preserved. Although the works of neolithic men could be traced more or less all over the world, they were nowhere, so far as he knew, better preserved than in the South of England, and to that district they would confine themselves. On examination they found that two stages of culture can be defined, and he called the earlier of these the "Hill Period," and the later the "Plain Period." The men of the hill period were exclusively earth workers. Their settlements were of the earth earthy, and the purpose of every part of them was purely utilitarian. Invariably they were placed upon the hill-tops, and the dominating idea of the hillmen was terror of the plains. On the uplands of the downs man's work was practically everlasting, and there the ever-renewed mantle of short, dense turf spaced itself over the surface, moulded itself to every detail, and reproduced in its green outlines the forms which were graven in the white chalk below. It was the turf which had preserved the record of a forgotten civilisation whose work was to be seen league after league upon the downs. The principal earthworks of the hill period fell into four groups:—(1) The embankment and trench; (2) the cattlesways; (3) the level platforms; (4) the dew-pond. The camps were always on the top of a down, and ranged in size from comparatively small undertakings to the immense and awe-inspiring works at Maiden Castle, near Dorchester. These camps were the forts in which prehistoric man defended himself against the flint-tipped arrows of his human adversaries. The cattlesways, such as at Cissbury Camp, near Worthing, showed that the cattle were herded in the camps. The level platforms, bounded by a deep slope which extended league after league at the base of the downs along the plains which culminated in the gigantic works called the "Shepherd's Steps," at Pewsey, were undoubtedly for the protection of the cattle against wolves, and this was particularly answered by the combination of entrenchment and trench on the level platform at Poundbury Camp, near Dorchester. It was evident that life could only be lived if water for man and beast could be obtained on the top of the springless and streamless downs, and there was a great deal of converging evidence which showed that prehistoric man solved his problem by means of the dew-pond. At Chanctonbury Ring, Worthing, and at Cissbury Camp there were dew-ponds of neolithic origin. Although the dew-pond was one of the most interesting and most ancient structures in this country, so little notice had been bestowed upon it that it was not so much as mentioned in the "Encyclopædia Britannica." A properly-made dew-pond was a complicated structure. It was a circular, saucer-shaped hollow of some 70 ft. or 80 ft. in diameter, and 7 ft. or 8 ft. deep, lined and, as it were, thatched with straw. Upon this straw was superimposed an impervious layer of finely-puddled clay, and this, after being well trampled by horses or oxen, was often charged with water by casting snow upon it.

Mr. Geo. Hubbard, taking up the subject, showed how, as time went on, and the mastery over the wolf became more and more complete, neolithic man could with increasing security descend into the plains. The chief characteristic of the neolithic man's works in the plain was that they were constructed in stone rather than in earth. The stones were often of huge size, and their transport and erection gave evidence of surprising engineering capacity. Amidst the maze of stone monuments of the neolithic period which might be found in many parts one might trace, though possibly incorrectly, an ascending scale in their development. The early habitations of our prehistoric forefathers were extremely small, the internal measurements of the houses sometimes not exceeding 5 ft. or 6 ft., and there was an almost cyclopean massiveness in the unwhim masonry of the external wall, which was probably not more than 3 ft. or 4 ft. high. The doorways were generally clearly marked by the upright impost, and into these huts the people must have crawled. These huge stones must have been brought together with laborious care, and it was a grievous shame to see, as he had seen, these relics of an extinct race being broken up to make road metal. Neolithic man, finding himself free from the instant requirements of self-preservation, appeared to have passed on insensibly to the development of his spiritual nature, for his structures during the plain period assumed a religious significance. Maumbury Rings, he ventured to think, formed a link between the hill settlements and the works of the plain, although it was universally referred to as a Roman amphitheatre. The structure possessed not the characteristics of Roman work, but those which distinguished the labour of neolithic man. The ornamentation of the long axis was carefully determined by his (the author's) brother and himself, and it was found to coincide accurately with that at Stonehenge, and the impression left upon their mind was that, in the earthwork, they probably had one of the earliest temples erected to the sun. Mr. Hubbard proceeded to deal with Scorhill Circle, Fenworthy Circle, the Campstone Circle, and the tall monoliths standing on Dartmoor, and said that these circles and campstones doubtless had a vital interest and a vital meaning to neolithic men who erected them. It was possible to speculate as to their significance, but in order to do so with some probability of accuracy it would be necessary to argue from the known to the unknown. The circles of stones were sometimes found in connexion with stone alignments or avenues of stones, as at Ascombe; sometimes the alignments terminated with a great member; but until these had all been properly mapped out, the first step to the definite solution of their mysteries had not been taken. In Stonehenge they found the culminating structure, and here some authoritative statements might be made. After the full significance of Stonehenge had been realised, it became possible to speculate with more assurance about these earlier structures on Dartmoor and Maumbury Rings. It was obvious that there was some definite intention in the design of Stonehenge, and thanks to the investigations of Mr. Gowland and Sir Norman Lockyer, that intention had been made clear, and a flood of light had been thrown upon the religion of neolithic man. Mr. Gowland had shown that, by standing in the middle of the horseshoe curve at a point once marked by the aperture between the two piers of the central and greatest trilithon, and looking in the direction of the Hele stone, the sun would be seen to rise approximately over the summit of that monolith on a midsummer day. From this and other evidence there could be no doubt but that Stonehenge was a sun temple. When his brother and he looked upon Maumbury Rings and speculated upon it, they felt that, if it were a sun temple, it was of far greater antiquity than Stonehenge, but it lacked a confirmatory piece of evidence. It should have had a great stone at its entrance analogous to the "hele" stone of Stonehenge. They searched for that stone, and failed to find it, but later they found, in John Hutchins' book on the antiquities of Dorset that "Roger Gale derived the name of Maumbury from 'maen,' a great stone which lay at the entrance when he saw it 1719." By another authority they had found it stated that a large stone formerly existed at the entrance, but as this

was found to be an obstacle to the cultivation of the land, a hole was dug and the stone was deposited in it. If at Stonehenge they found circles and a stone having an obvious solar significance, and they found elsewhere circles and stones apparently bearing no such significance, then the question arose as to what change took place in the evolution of the faith of neolithic man which resulted in his becoming a sun worshipper? Here, in England, as in all the world over, the evidence showed that the earliest forms of faith were Phallic. The sun, the giver of life, became no doubt symbolical of the earlier forms of faith, and the symbols of the organs of reproductions which had previously been objects of veneration were still used after prehistoric man had emerged from a state of Phallicism to that of sun worship. In this solution might be seen the obvious answer to the previous question.

THE HISTORY OF SYMMETRY IN ART.

From a circular which has reached us from the Landesgewerbe Museum of Stuttgart it appears that the Central Board of Trade and Commerce in that city propose to hold an exhibition which is to illustrate the progress of the perception of symmetry in art and handicraft. In the words of the circular (as here translated) the Board is planning for the autumn of this year a great and special exhibition, at which it is proposed to trace for the first time the history of an aesthetic principle, viz., the question of symmetry and balance in arts and handicrafts in every direction; to produce examples and counter-examples from all countries and ages, and bring them under discussion; to point out the physiological hypotheses on which they rest, as well as their types and counterparts in nature and in the practice of art. The object, we are told, in view is a double one, viz., theoretic and practical.

"On the one hand, it will be possible to study this important question in the light of the past and of the present; to consider how the conservative and revolutionary schools have dealt with this question of symmetry, or have disregarded it; while on the other hand our modern art-workers and handicraftsmen, who to some extent believe themselves bound to uncompromising symmetry, have been delivered from a chain and have been stimulated to freer creations.

All museums, artists, and art-lovers are hereby invited to co-operate. All works of high art, as well as works from all areas without respect to date or place of origin will be welcomed in so long as they display in a characteristic manner either a scrupulous adherence to axial or central symmetry, or a sovereign disregard of these static requirements. Even counter-examples, in which the obvious laws of equilibrium have been flagrantly transgressed, will be of interest."

We should certainly be rather curious to see the result of this interesting attempt *rerum cognoscere causas*.

THE SOCIETY OF ARTS.

On Monday evening Mr. George W. Eve gave the first of three lectures on "Heraldry in Relation to the Applied Arts." He first expressed the wish for a more sympathetic and broader view on the part of both artist and public, though he feared that good heraldry could not come into general use so long as the present craze for cheapness continued. A knowledge of how and why certain things were done in the past would do much to prevent many of the serious mistakes made by craftsmen through their careless interpretation of even the simplest rules and principles.

The practice of heraldry, which probably began in early times with the use of badges, became important in the XIIIth century when the closing of head armour made necessary some clear means of distinction. First used in fighting only its symbolism was simple and spontaneous, but in later and degenerate days, when it became a vehicle for the exploitation of family, civil, and religious pride, there arose that desire for mystery and complication which caused the almost complete decay of the art.

The lecturer then described the development of the shield, from the long, narrow Norman type, through the later forms suitable for serious work on horseback, to the small and graceful tilting shield of Tudor times. As examples of the practical basis of heraldry, the strengthening metal bars of the early wood-and-leather shield were instanced as determining the general form of the ordinaries, while later, the irregular outline developed by the use of the tilting lance

in tournaments gave rise to the decorative scrolled forms of the XVIIIth century. The great increase of effect gained by retaining the curved surface of the true shield should be remembered when dealing with modern carved work; while important, both from the heraldic and artistic point of view, was the question of raising or incising the charges. He then emphasised the importance of simplicity and unmistakable clearness of form, no system of proportion being necessary if this was kept in view.

Among animals, the lion, though having been the most frequently used in all periods, was of great value in any critical study of development, but, owing to the number of definite poses caused by this constant appearance, care must be taken, when designing, to avoid apparently slight alterations, as of the position of limbs or head, since these might quite alter the heraldic action. In treating animals vigour of action was the first essential, and this might often be attained by setting out skeleton lines before filling in detail.

Mr. Eve then summed up the qualities which make for a good treatment of heraldry as follows: Suitable shape of shield, proportion and clear definition, good distribution, strong characterisation, and utmost vigour.

The lecture was illustrated by a number of lantern slides.

THE LONDON TRIBUNAL OF APPEAL:

CRYSTAL PALACE PARADE.

REFERRING to the appeal heard by the Tribunal on the 1st inst., and reported in the *Builder* of the 5th inst., and at which the Tribunal reserved their decision, the Tribunal have now made an order by which they allow the appeal, on the ground that the certificate of the Superintending Architect, dated March 24, 1906, affects the exercise by the appellants, the South-Eastern and Chatham Railway Companies' Managing Committee and the London, Chatham, and Dover Railway Company, of the powers conferred upon them by the special Acts of Parliament for railway purposes produced to the Tribunal, and, further, they make no order as to costs.

FERRO-CONCRETE.

A JOINT meeting of the Discussion Section of the Architectural Association of the Junior Institution of Engineers was held on Wednesday, at 18, Tufnell-street, when the discussion on Mr. S. Bylander's paper on "Ferro-concrete" (reported in the *Builder* of April 21) was continued. Mr. Wonnacott presided.

Mr. S. Bylander gave a brief *résumé* of his paper, and added that, with regard to columns, the bearing capacity was increased three or four times if they were hooped. As to the testing power of ferro-concrete he thought that Portland cement was a better protection of steel than paint, and therefore they need not have much fear of the steel rusting. He would suggest that they should try and agree upon a method of calculation that would be recognised as sufficiently accurate for ordinary practice, and further a standard of materials as well as construction.

Mr. J. H. Pearson said that the author in his paper did not claim that ferro-concrete was the right material for all constructions, and emphasised the fact that each kind of material should be used to its greatest advantage—the total cost of the structure, its safety, and its duration to be considered. They were warned that ferro-concrete work was dangerous if not carried out well, and that to guard against failure a large factor of safety was employed. Architects therefore would be chary about using it unless there was some special advantage. It was all very well to know how to use it, but it was still more advantageous to know when to use it, and that was the first thing to know from the architect's point of view. This, no doubt, was largely a question of cost. Mr. Pearson proceeded to sketch a plan of a site, and asked Mr. Bylander if he could give some idea of the difference in cost in the erection of a stated building on the site in steel-work and ferro-concrete, particularly with regard to flooring.

The Chairman said that Mr. Adams Hunter, who was unable to be present, had sent some notes as a guide to the discussion. Mr. Hunter pointed out that notwithstanding the extensive use of ferro-concrete it was still regarded as an experimental material, and must be tested by the standard of experience. They were being constantly told that by the use of steel imbedded in cement concrete the steel was sufficiently protected as to render it imperishable, and that the cost of maintenance was reduced to a minimum. Most elaborate formulæ had been devised to determine the stresses of strength of ferro-concrete structures, which appalled one by their elaboration and detail. The author was correct in stating that a large factor of safety was necessary to cover unknown stresses. French engineers had lately conducted experiments in testing bridges to determine the actual stress developed in a member, and found that in few cases did the actual stress agree with that calculated. The expansion of the differences amounted to from 100 to 300 per cent., and if these differences existed in steel bridges it was natural to assume that there would be some differences in the actual from the calculated stresses in ferro-concrete structures. Concrete was a less uniform material than steel, and anyone who had seen iron cramps from old buildings knew how they were corroded, and how in some cases they had caused the opening of the joints by their swelling due to corrosion. In most cases these cramps would be bedded in lime mortar. In general the determination of stresses was based upon certain relations existing between the moduli of elasticity of the steel and the concrete, and this was a variable proportion, depending so much upon the quality of the cement, the age of the concrete, the care in mixing the ingredients, and so on. The expansion of cement in setting set up initial stresses in the steel reinforcing rods, and there were also the stresses due to the slight differences in the thermal expansion of the two materials. It was calculated that steel, amounting to 0.8 per cent. of the sectional area of the beams was required for resisting these stresses alone. Mr. Considère, whose authority on ferro-concrete was undisputed, assumed that the concrete took up some of the tensile stresses even beyond the elastic limit of the concrete, but the experiments made by Professor Turneaure, of Purdue University, U.S.A., clearly demonstrated that the concrete would take its share of the tensile stresses up to its elastic limit, after which the steel reinforcement must take the whole of the tensile stresses. Hair cracks were a source of weakness, as they would allow moisture to get in and corrode the bars, and the ferro-concrete piles at Southampton jetty showed the rust through the concrete. It was very important to remove all mill scale from the rods before using them, and the simplest way was to allow them to rust. It was not necessary that the rods should be free from rust when they were embedded in cement of first-class quality, as the chemical action of the Portland cement on the rust formed a new compound, and arrested further corrosion. Round rolled bars were more suitable for reinforcement than expanded metal. The most suitable use of ferro-concrete seemed to be in floor systems for buildings, the main columns and girders being of steel, and the secondary girders and floor slabs of ferro-concrete. Its use in foundations did not seem advisable, as it had not yet had the practical test of age. A foundation was covered up, and inspection was impossible, and any failure involved great cost to remedy. It was difficult to give comparative costs of ferro-concrete and other similar materials and similar structures, as local conditions affected prices to a large extent. There was not much difference in cost between a well-designed ferro-concrete building and a similar building of steel-frame construction with brick walls and fire-proof floors.

Mr. Rugg said he saw a building about three months ago being erected at the Royal Oak by the Great Western Railway. It was being constructed on the Hennebique system, and the remarkable fact was that, owing to the London Building Act, they had to construct the walls about 20 in. thick at the bottom, which was a sheer waste of money. He thought they ought to pass some resolution asking that Parliament should look into

the Act. With regard to ferro-concrete, he thought the whole question depended on whether the iron was going to rust in the concrete. He believed that Mr. Hennebique had constructed these ferro-concrete buildings in France for the last twenty years, while in America they had been using the material for five years. In England, however, they were frightened of doing anything, and asked if the iron was going to rust and if the adhesion was strong enough. He believed it was granted now on the Continent and in the States that no trouble had been experienced as to rust. A good deal was to be said about adhesion, but there were a number of bars now on the market which provided for a mechanical bond between concrete and steel. He would like to know the minimum distance to the edge of concrete for reinforcement. It was said that round bars were preferable to expanded metal, but they did not get so many cracks in expanded metal as with round bars.

Mr. D. Forster said he would like to emphasise what Mr. Bylander had said as to the necessity for an accurate and sufficient quantity of drawings. His experience of carrying out actual building work on the site made him feel very strongly that sufficient and proper drawings were required, no matter if it was a ferro-concrete or any other kind of building. It was known that steel exposed to air would degenerate, and he would like to know if it would degenerate when embedded in concrete. As to the thickness of walls, the prevention of fire was one reason for keeping them thick. He would like to know something about the materials in the composition of the concrete, for he knew that serious trouble had arisen from the expansion of concrete. Particularly he would like to know if coke breeze was a reliable material to use.

Mr. R. Marshall remarked that, with regard to the question of the corrosion of iron and steel work embedded in concrete, that was not positively settled. Mention had been made of Southampton jetty, but, on the other hand, he believed it was the fact that in many cases where old stanchion work was pulled down the base blades had been found in an almost perfect state of preservation. In the case of high buildings and buildings required for carrying great weight, the air cracks which had been alluded to were of great importance. Granted that it was impossible to guarantee that ferro-concrete work should be airtight, might it not be advisable to treat the structure with a preservative compound. In the case of a water-tower particularly they might treat it with a wash of preservative paint.

Mr. P. Waldram added to his remarks made at the previous meeting, and pointed out that Hennebique's formula, assuming that the compression on concrete was distributed equally, could not be a correct assumption. Before any responsible architect or engineer adopted a particular system he ought to be in a position to calculate it himself, and he thought the general principles could be so calculated. The question which mostly troubled people was that of shearing, but if the shear was considered simply as the inner link between vertical forces coming on the beam and the horizontal tension by which they resisted these forces, the subject was absolutely simple. A ferro-concrete floor should be solid, or, in other words, the aggregate should be carefully ascertained before mixing, and enough sand must be put in to fill up the voids in the large aggregate, and then the lime would distribute itself through the sand, and they would get a solid concrete. Ferro-concrete had been used in foundations for many years, and no failure had resulted so far.

Mr. J. E. Conzelman thought that an agreement of formulae and a uniformity as to the factor of safety was greatly required. The question of the distribution of shear had puzzled a great many people, and had not been settled yet. Where they had horizontal shear they had also vertical shear. The durability of concrete had been settled by the engineers of the United States and France. Steel was practically protected for all time as long as there was a coating of cement around it.

Mr. Eade believed there was such a

diversity of opinion with regard to formulae that it would be necessary in the case of a very large work to have some full-sized beams made and tested on the site. It was true this would add to the cost of the building, but there seemed to be a large variation between the calculated strength of a beam and the actual strength, and it would be well to make beams of the actual materials to be employed and test them.

Mr. Keevil observed that the great advantages of ferro-concrete was its fireproofness when the rods were properly embedded and the increased floor space it gave for a certain site. He also thought the ferro-concrete lent itself very easily to architectural beauty, and, in addition, speaking more particularly of places abroad, the materials were very easily obtained. As to formulae, it was very well understood on the Continent and in America that a concrete of one in twenty-four was strong enough to take shearing up to 50 per cent. for a load up to 50 lb. per square inch for a load of vibration, and up to 80 lb. per square inch for a steady load.

Mr. Tennant said that mention had been made to the deterioration of iron cranes taken out of concrete walls, but in all probability, when these were put in, no special precautions were taken to preserve them, whereas, in ferro-concrete construction, the first consideration would be given to the preservation of the reinforcement from the access of air or water. They heard at the last meeting a great deal about the position of the neutral axis, but it could not be too clearly insisted upon that the position of the neutral axis had nothing whatever to do with the ultimate strength of the material, but it had very much to do with the elastic resistance of the material, which was quite another thing, for its strength. In ferro-concrete there was a great difference in the elasticity of the materials employed, and therefore they got a neutral axis shifted out of the geometrical position. He could not help thinking that the recent earthquake at San Francisco and the Baltimore fire ought to give experience as to the behaviour of ferro-concrete which would be distinctly profitable.

The Chairman said that, with regard to getting some finish on ferro-concrete by giving it a coating of plaster of Paris, he imagined that, in a few years, that would be an expensive building to maintain. As regarded the possibilities from the architectural point of view, that would be dealt with at the forthcoming Congress, but he thought the only means of treatment which could be suggested was to look on ferro-concrete as a plastic material, and, therefore, from the architect's point of view, they could be hopeful. It could be treated with a few strings, or mouldings, or panels, or something of the kind. There was also a great possibility of colour decoration of a permanent nature which could easily be employed, and he thought they would see examples in Persia, China, and Japan of permanent coloured decorative material applied externally.

Mr. Bylander, in reply, said the question of the cost of the building shown by Mr. Pearson would be a matter for the estimator. He thought 14 in. was the most practical thickness for walls. He would not advocate 4-in. walls on account of the dampness. As regarded the distance of the rods for the outer surface of the concrete, he should say 1½ in. if complete fire protection was required; but it must be remembered that the material used for a ferro-concrete structure was of much better quality than for ordinary steel-frame buildings. If coke breeze was used the adhesion between the steel and the material was not so great, and, further, it was porous. So far as fireproof was concerned, clinker was the best material, but if stone or gravel was crushed to a sufficiently small size the possibilities of cracking in case of fire was minimised. Water tanks were often treated with a wash of paint, but the most important thing was that the concrete should be made rich, and that the steel was properly embedded, and that there should be no voids.

MEMORIAL TO WHITEFIELD.—On the afternoon of Sunday, May 13, a marble bust of George Whitefield was unveiled in the Whitefield Memorial Building, the central hall of the London Congregational Union, Tottenham Court-road. The bust has been sculptured by Mr. H. A. Pegram.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

I.—ALL SAINTS' CHURCH, Tooting.

The first summer visit took place on Saturday, 12th inst., at the Church of All Saints, Tooting Graveyard, an important modern ecclesiastical work in the south of London. The church, which is erected from funds bequeathed by a lady, is the central object in a group of buildings, the remainder of which comprises a vicarage and a large parish hall.

The architect (Mr. Temple Moore) was unavoidably absent from the visit, but was represented by a member of his office staff and the general foreman.

The church has a seating capacity of 1,024 persons, distributed in a lady chapel at the south end, chancel with aisles, transepts, nave with aisles, and narthex, the latter at the north end. It will thus be seen that the axis is practically north and south instead of the usual orientation.

A large square tower rises above the east transept, and will eventually contain a full peal of bells. Vestries adjoin the west transept, and the passage connecting them communicates with the vicarage. In this transept the organ will be placed. The internal length is about 168 ft.; the width of nave and chancel is 25 ft., and the aisles each about 22 ft. The height is of generous proportion, so that an air of spaciousness characterises the interior.

There is no chancel arch, or, indeed, anything to mark the choir other than the steps and screen, so that the main arcades are uniform and continuous from end to end of the church.

Although the work was, as yet, two months from date of completion enough existed to show that dignity was achieved in the design, and that the plan was well adapted to the purposes of a large congregation.

Various stones are employed. In the interior the wall surfaces are plastered, but the material at and above the main arcade is chiefly Bath stone. Forest of Dean is used in shafts and piers and also in steps and flooring, and the interesting natural variation in tones gives a very satisfying effect. Another and kindred material, Quarrella, is used in the large bases of the piers. The exterior mainly consists of yellow stock brick-facing, and the sparingly-used stone is Ketton in the usual dressings, and Forest of Dean for bases and weatherings.

Heating is provided by means of hot water pipes at window-sill level, the pipes being hidden in the projecting cornice of an oak-panelled dado. Pipes are continued up to the clearstory, passing round the whole interior of the church.

The nave and chancel have a vaulted roof of a stone character entirely constructed in wood and painted. Stone springers are introduced to start the ribs of the vaulting. A XIIIth century English Gothic influence is the motif in the architecture.

Messrs. Sherwin & Son, of Boston, have carried out the entire works, including the vicarage and hall, both of which are very tasteful stock-brick buildings.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Alderman Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to sanction the borrowing of £800f. by Deptford Borough Council; and it was agreed to lend Finsbury Borough Council £5,65f. for paving works; and Lewisham Borough Council £1,845f. for constructing a public convenience.

Reconstruction of Tramways from Islington to Highbury—Supply of Electric Power.—The Highways Committee recommended, and it was agreed:—

"That the agreement entered into with the County of London Electric Supply Company, Ltd., in pursuance of the resolution of August 1, 1905, be extended so as to include a supply at the same rate of electric power for working the tramways from the Angel, Islington, via Upper-street, to Highbury (N.L.E.) Station, and to provide that the company shall give the Council facilities to erect switch panels at the Old-street generating station, and shall supply the cable-ducts necessary from the station to the Angel, Islington, and a telephone cable for coupling up to the Council's Great Queen-street sub-station."

Norbury Estate — Brickmaking. — The Housing of the Working Classes Committee recommended:—

(a) That the resolution of May 21, 1901, fixing the minimum rates of pay and the maximum hours of labour to be observed in the making of bricks on the Norbury estate be rescinded so far as it relates to minimum rates of pay.

(b) That the undermentioned rates of pay be fixed as the minimum rates to be observed in the manufacture of bricks on the Norbury estate, viz., digging, 4d. a cubic yard; soiling, 3d. a thousand bricks; shoring out, 6d. a thousand bricks; setting, 1s. 11d. a thousand bricks; moulding (stocks), 5s. 6d. a thousand bricks; moulding (reds), 8s. a thousand bricks; crowding, 2s. 6d. a thousand bricks; skilting, 5d. a thousand bricks; burning, 1s. 6d. a thousand bricks; drawing, 1s. 4d. a thousand bricks; runs, 12d. each; day work, 6d. an hour; engine driver, 8d. an hour.

Mansell-street and Great Prescott-street. — The Improvements Committee recommended:—

(a) That the supplemental estimate of expenditure on capital by the widening of Mansell-street and Great Prescott-street, as shown upon the plan of property included in such estimate be approved.

(b) That expenditure not exceeding 3,200l. be sanctioned in respect of the widening of Mansell-street and Great Prescott-street as provided in resolution (a); and that the Improvements Committee be authorised to arrange for the said widening.

The Council adjourned at 7.30 p.m.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Lines of Frontage and Projections.

Deptford.—Five gate piers at the entrances to the South-Eastern Hospital on the western side of Avonley-road, New Cross-road, Deptford (Messrs. T. W. Aldwinckle & Son for the Metropolitan Asylum Board).—Consent.

Woodrick.—Bay windows in front of Nos. 13, 15, 17, and 19, Glensfield-road, Eltham (Mr. J. J. Bisset for Mr. A. Cameron Corbett).—Consent.

Dulwich.—The retention of porches in front of Nos. 13, 14, 15, 16, 17, and 18, Ruskin-walk, Herne-hill (Mr. R. E. Mayo).—Consent.

Lambeth, North.—The retention of an iron and glass porch in front of No. 40, York-road, Lambeth (Messrs. Ohlson & Sons for Mr. Hitchcock).—Consent.

Norwood.—Re-erection of Lundsowne Hall, Canterbury-grove, West Norwood (Mr. W. G. Scott for the Rev. Fuller Gooch).—Consent.

Wandsworth.—Re-erection of buildings on the south-western side of Gerrard-lane, Wandsworth, with bank walls abutting on the north-western and south-eastern sides of Rostella-road (Mr. W. Bartholomew for Mr. P. C. Newman and Mr. C. Newman, jun.).—Consent.

Finsbury, Central.—Buildings on the northern side of Peptonville-road, to abut also upon Winchester-street (Mr. C. E. Pettit for Mr. T. Lilley and Messrs. Lilley & Skinner, Ltd.).—Refused.

Brixton.—Projecting one-storey shops in front of Nos. 5 and 7, Flaxman-road, Loughborough-junction (Messrs. Binsted Brothers).—Refused.

Kennington.—Projecting one-storey shop in front of No. 210, South Lambeth-road, Kennington (Mr. F. E. Williams for Mr. J. Hill).—Refused.

Width of Way.

Finsbury, East.—That the application of Messrs. Joseph & Smith for an extension of the period within which the erection of warehouse buildings on the north side of Great Arthur-street and south side of Bayer-street, Golden-lane, was required to be completed, be granted.—Consent.

Lines of Frontage and Construction.

Rotherhithe.—A deviation from the plans approved for the construction of an iron gangway to connect Hay's Wharf and Wilson's Wharf, over the public right-of-way leading from Battle-bridge-lane to Battle-bridge-stairs, Rotherhithe, so far as relates to an alteration in the position of the gangway (the proprietors of Hay's Wharf).—Consent.

Formation of Streets.

Westminster.—An extension of the time within which the roadway of a proposed street for carriage traffic to lead from Francis-street to Cobourg-row, Westminster, was to have been clearly defined throughout by posts and rails, or so otherwise as the Council should permit, and thrown open to the public as a highway (Messrs. R. B. Grant-ham & Son).—Consent.

Wandsworth.—Extension of time within which the roadway of a proposed street for carriage traffic to lead from Wimbledon Park-road to Granville-road, on the Wimbledon Park estate, Wandsworth, was to have been clearly defined

throughout by posts and rails, or so otherwise as the Council should permit, and thrown open to the public as a highway (Messrs. Clasier & Sons).—Consent.

Adaptation of Ways for Streets and Width of Way.
Newington, West.—The adaptation for carriage traffic of Jerome-place, Hillingdon-street, Walworth, and the erection of buildings at less than the prescribed distance from the centre of the roadway of Jerome-place (Messrs. Gedhill Brothers).—Consent.

Space at Rear.

Whitechapel.—A modification of the provisions of sect. 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a block of dwellings on the western side of Rupert-street, Whitechapel with an irregular open space at the rear (Mr. R. W. Hobden for Messrs. Hickman, Ltd.).—Consent.

Alteration of Buildings.

Southwark, West.—A bay window on the space at the rear of block "P" of the Peabody-dwellings, Peabody-square, Blackfriars-road and Webber-street, Southwark (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

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

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

Bishopsgate-street.—Mr. Baumberger asked if there was anything to report with regard to the proposed widening of Bishopsgate-street. In reply Sir George Woodman stated that new proposals on this subject would shortly be placed before the London County Council.

Loan Exhibitions.—A report was presented from the Coal and Corn and Finance Committee on the report of the Library Committee as to holding a Loan Exhibition of Pictures in the Art Gallery in the summer of 1907, at a cost of 4500l. exclusive of insurance; and recommending that no exhibition be held in the year 1907. Mr. Deputy Baddeley moved that the matter be referred back to the Coal and Corn and Finance Committee for further consideration. Mr. Clousdley seconded the amendment, and said that the loan exhibition at the Guildhall Art Gallery was a great attraction to the whole of London. Mr. Deputy Wallace thought that the Corporation could not afford to spend money in such a manner. Mr. Deputy Ellis pointed out that a Bill, promoted by the London County Council, who wished to establish an art gallery, was being opposed by the Corporation. Mr. Romer stated that as a result of several of the exhibitions which had been held substantial sums of money had been returned to the Corporation. Mr. Painter declared that it was a question whether the permanent exhibition did not suffer by having an annual loan exhibition. On a show of hands the amendment was carried, and the subject was referred back to the Committee for further consideration.

Central Markets.—Mr. Brinsley-Harper submitted a report from the Central Markets Committee recommending the covering-in of the space over the railway facing Charterhouse-street, comprising an area of about 14,000 ft. super between the fish, fruit and vegetable section of the Central General Market and the premises in the occupation of the London Central Markets Cold Storage Company, Ltd., and also the erection thereon of buildings for market and other purposes at a total estimated cost of 16,225l. The recommendations were referred to the Coal and Corn and Finance Committee.

Correspondence.

KING'S NORTON AND WREXHAM SCHOOLS COMPETITION.

SIR.—The two competitions for new schools at King's Norton and Wrexham have not yet, we believe, been decided. In view of the fact that the drawings had to go in for the former on February 7 and for the latter on March 2, it does not, we think, display an undue curiosity to inquire publicly through the medium of your columns into this latest example of the mysterious ways of a Borough Council's "COMPETITORS."

LIVERPOOL CATHEDRAL.—The contract for the portions of the Liverpool Cathedral which are to be immediately proceeded with has been let to a local firm of builders, Messrs. Morrison & Sons, of Wavertree, near Liverpool, who have already carried out the foundations. The portion to be proceeded with includes the choir up to the crossing, the Lady Chapel, the Chapter House, and the vestries. It is not expected that the choir can be ready for service before ten or twelve years.

Illustrations.

THE ALLIANCE ASSURANCE COMPANY'S BUILDING, ST. JAMES'S-STREET.



THE building is planned round a central court, and consists of a sub-basement, basement, ground, entresol, first and second floors, and two floors in the roof. In the sub-basement are vaults, etc., heating apparatus, and lift machinery. In the basement is a large office for clerks on the south side, and on the north side kitchens, etc., for the post-office.

On the ground floor in the centre of the St. James's-street front is the general entrance, opening out of which on the south side is the general office of the Alliance Assurance Company, a room 66 ft. long, 24 ft. wide, and 22 ft. high. This room is panelled to a height of 13 ft. with Italian walnut panelling, above which is Istrian marble, with bands of Siberian cippolino. The ceiling is of enriched plaster. On the north side of the entrance is the post-office.

The walls of the entrance-hall are lined with marble, the floor is of Portland stone and marble, the ceiling is of enriched plaster, the gates are of wrought-iron. On the entresol, first and second floors, and most of the third floor are bachelors' flats. The fourth floor consists of caretaker's rooms, kitchens, bedrooms for servants, etc.

The building is entirely of Portland stone. The roofs are covered with Westmorland slates. The floors throughout, and also the roof, are of steel and concrete. The partitions on the upper floors are of Aston's asbestos composition.

The whole of the general contract has been carried out by Messrs. Trollope & Sons and Colls & Son; the steelwork by Messrs. Mathew T. Shaw & Co.; the sanitary work, heating, and electric installation by Messrs. Wenham & Waters; the electric lifts by the Otis Elevator Company; and the electric-light fittings by Messrs. Shirley & Co. The architects are Mr. R. Norman Shaw, R.A., and Mr. Ernest Newton. The drawing is exhibited in the Royal Academy.

BUSBRIDGE HALL.

Our illustration shows the new house that is being built on this well-known estate, near Godaiming, for Mr. Percy N. Graham.

Its position has been chosen overlooking a series of lakes, which, with fine trees and lawns surrounding them, are of great natural beauty.

The old house, which stood by the water's edge, with its principal windows facing north, has been pulled down.

The design is simple in character, the south front being broken by three large five-sided bay windows, gables occurring above between the bays.

The forecourt is formed by the billiard-room wing on the west side and the offices to the east. At the one end of the southern terrace is an arched loggia. The balustraded terrace takes a lower level on the south-west side, where the hill falls away.

The architects are Messrs. Ernest George & Yeates, of Maddox-street, W., and the contractors, Messrs. Norman & Burt, of Burgess Hill, Sussex.

ROYAL EXCHANGE BUILDINGS, CITY.

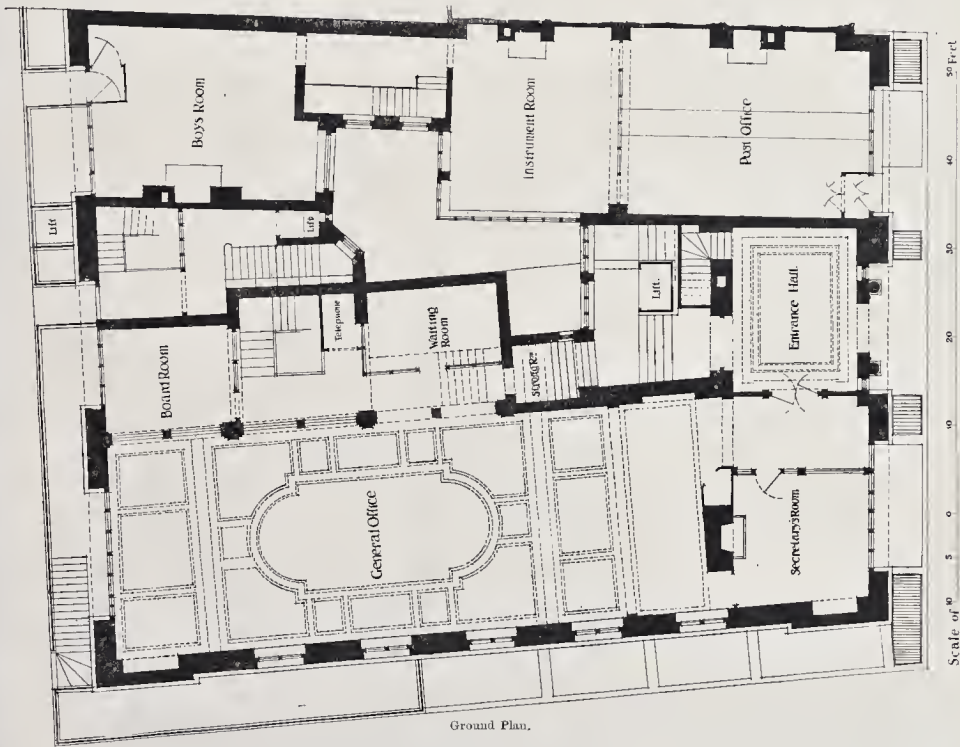
THE existing buildings are being rebuilt at the instance of Magdalen College, Oxford, who are the freeholders, the tenants of the greater part being the Union Assurance Society, while the lease of the south-west portion is taken by Messrs. Hayes, the present occupiers.

The site being shallow the architects have avoided any important breaks or recesses for their effect. The treatment is generally broad and simple, with rusticated arcading for the ground floor, quite a strong shadow being obtained by two deep recesses which form balconies to the upper windows. The front is of Portland stone.

The architects are Messrs. Ernest George & Yeates, who were appointed by Magdalen College.

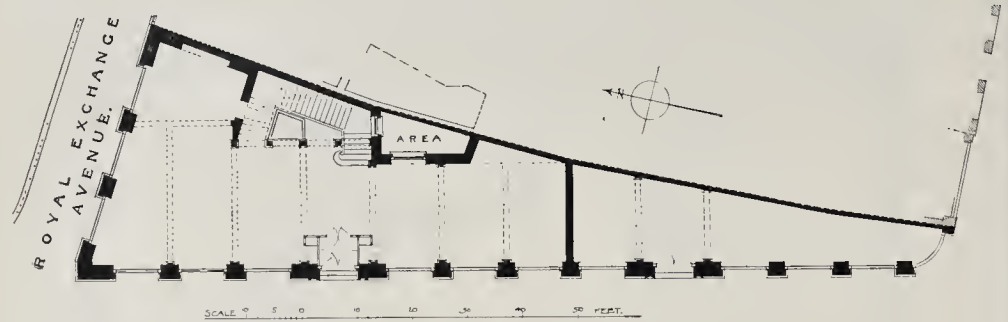


First Floor Plan.



Ground Plan.

Alliance Assurance Offices, St. James's street. Plans.

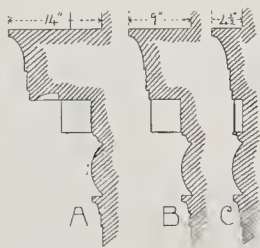


Royal Exchange Buildings. Plan.

OFFICES, CATHERINE STREET — AS ORIGINALLY PROPOSED.

It had been intended that the narrow and awkward strip of land left between the *Builder* office and York-street, Covent-garden, should have been occupied by premises built by the Bedford Estate and planned for occupation, in the basement, ground, and first floors, by a well-known specialist journal; and the plans were completed and a tender obtained for the building as represented in this illustration. Unfortunately difficulties about rights of light led to the Bedford Office abandoning the scheme as not sufficiently remunerative, and the block has been subsequently carried out in a planer form and with large ground floor openings for shop windows, which have naturally not improved its appearance.

The unusual arrangement of building the chimney stacks on the outer wall is explained by the second floor plan, for offices to be let, as otherwise it would have been impossible to get a passage past to the private office without cutting off the fireplaces; and as the long side has a south aspect, very large windows were not necessary. As the Building Act thickness of the walls was reducible above the first floor, the reduction was made outside instead of inside, so as to get the lines of the chimney stacks as an exterior feature; an expedient which might often be adopted as a means of making a little point in an exterior elevation; why, in fact, should the reduction always be made inside? The floor space saved is hardly worth counting. In order to stop the stone cornice against the projection of the chimney stacks, which looked much better than carrying it round them, it was, so to speak, flattened out, but so as to mitre with the front cornice; the same cornice mouldings were to be worked for three different projections in fact, as shown at A, B, and C.



The final balls were to be gilded, like those on the *Builder* office, only they come out dark in the lithograph. H. H. STATHAM.

ADULT SCHOOL-HALL, COALVILLE. — A new adult school-hall is in course of erection off Bridge-road, Coalville. The main building is 52 ft. by 33 ft. 6 in., with a classroom at the rear, provision being made for entertainments, etc. Mr. A. Boot, of Park-road, is the architect, and the executors of W. Moss the builders. The building will be of red brick and stone.

Competitions.

NEW BUILDINGS, UNIVERSITY COLLEGE OF NORTH WALES, BANGOR. — The following five architects have been selected by the Council of the College to send in competitive designs for the new buildings which it is proposed shortly to erect:—Mr. W. D. Carie, Mr. J. F. Doyle (Liverpool), Mr. H. T. Hare, Mr. A. Marshall Mackenzie, and Mr. Arnold Mitchell.

THE PALACE OF PEACE. — The competition for the Peace Palace at The Hague has been decided as follows:—First premium, 12,000 florins—M. L. M. Cordonnier, Lille; second, 9,000 florins—M. F. A. Marcel, Paris; third, 7,000 florins—M. Franz Wendt, Charlottenberg; fourth, 5,000 florins—M. Otto Wagner, Vienna. Premiums of 3,000 florins were awarded to Mr. Howard Greenley and Mr. H. S. Olin, of New York, and one of 3,000 florins to M. Franz Schwechten, of Berlin.

BOOK RECEIVED.

DORRING AND LEATHERHEAD. By Joseph E. Morris. B.A. (The Homeland Association. 1s.)

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XIX.

SLIDE-RULES—GENERAL PRINCIPLE.

BRIEFLY defined, the slide-rule is an instrument by which logarithmic calculations can be performed mechanically.

As long ago as 1620 Edmund Gunter, the colleague of Professor Briggs at Gresham College, made public the logarithmic scales which are still identified with his name. By the aid of a logarithmic scale and a pair of dividers the operations of multiplication and division can be readily performed, as we demonstrated last week in the explanation of Fig. (1).

In its most elementary form the slide-rule comprises two parts—a body graduated so as to correspond with a Gunter's scale, and a similarly graduated slide whose functions correspond in some measure with those of the dividers, but are exercised in a far more convenient and more expeditious manner.

The mechanical principle of a slide-rule can be demonstrated in a very simple manner by taking two decimally graduated scales C and D, placing them side by side, as shown in Fig. (2); next moving C until 0, which we will call the index, is opposite 2 on D, and then comparing the relative positions of the figures marked on the two scales. It will be seen by Fig. 3 that when the index of C is opposite 2 on D, the value of every figure on D is 2 more than that of the contiguous figure on C, and the difference of any two numbers is constant for any adjustment of the scales. If the index of C were set opposite 3 on D, the value of every figure on D would be 3 more than that of the contiguous figure on C; if the index of C were set opposite 4 on D, the value of every figure on D would be 4 more than that of the

contiguous figure on C, and so on for the whole length of the scale.

Thus we are enabled to add any two integers, mixed numbers, or fractions within the range of the two scales by following the rule:—

Rule (1).—To add two numbers, set the index of scale C to one of the factors on scale D, and under the other factor on scale C read the sum on scale D.

Conversely, we are enabled to perform subtraction by observing the rule:—

Rule (2).—To subtract one number from another, set the subtrahend on scale C to the minuend on scale D, and under the index of scale C read the difference on scale D.

If we now place the two scales so that C is inverted, as shown in Fig. (4), we find that the sum of any two contiguous numbers has the constant value 10.

Next, moving scale C to the left until its index is opposite 8 on D, as in Fig. (5), we find that the sum of any two contiguous numbers has the constant value 8. Moving scale C more to the left until the index of C is opposite 7 on D, the sum of any two contiguous numbers has the constant value 7, and so on for the whole length of the scale.

Inasmuch as the difference of any two numbers is constant for any adjustment when the scales are in normal position, and the sum of any two numbers is constant for any adjustment when one scale is inverted, Rules (1) and (2) require reversal for application under the latter condition.

Hence we have Rule (3).—To add two numbers (with scale C inverted), set one number on scale C to the other number on scale D, and below the index of scale C read the sum on scale D.

Rule (4).—To subtract one number from another (with scale C inverted), set the index of scale C to the subtrahend on scale D, and under the minuend on scale C read the difference on scale D.

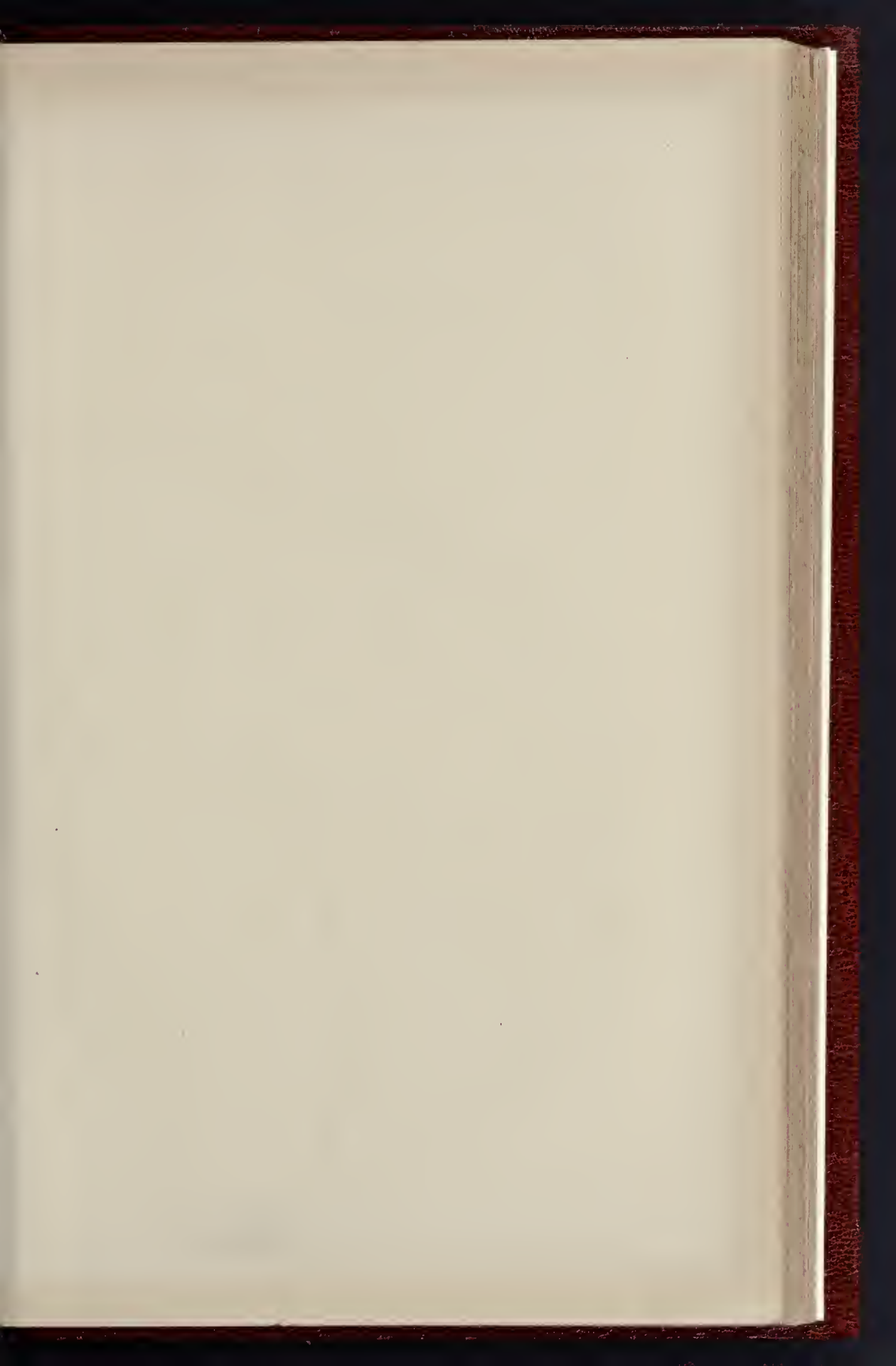
From the foregoing it is evident that by the aid of two exactly similar decimal scales any two numbers may be added or subtracted with great facility and with perfect accuracy to as many decimal places as are provided for by the subdivision of each unit length of the two scales. There is nothing to be gained by inverting one of the scales as described above for the purposes of addition and subtraction, but we shall see later the manner in which the inversion of a scale can be turned to useful account.

The operations of addition and subtraction are so simple that mechanical aid is quite unnecessary. Multiplication and division stand on a different footing, but cannot be conducted by the aid of two scales such as we have been considering.

If, however, we substitute for equal divisions from 1 to 10 graduated divisions corresponding to the logarithms of the numbers 1 to 10, the rules of logarithmic computation are brought into play. Consequently the attempt to perform addition and subtraction results in multiplication and division.

In Fig. (6) we have the elements of a slide-rule graduated logarithmically, the first figure being 1 instead of 0, as in the case of an ordinary scale, since $\log. 1 = 0$.

Now, assuming the index of scale C to be set opposite 15 = 15 on scale D, as in Fig. (7), every number indicated on scale C





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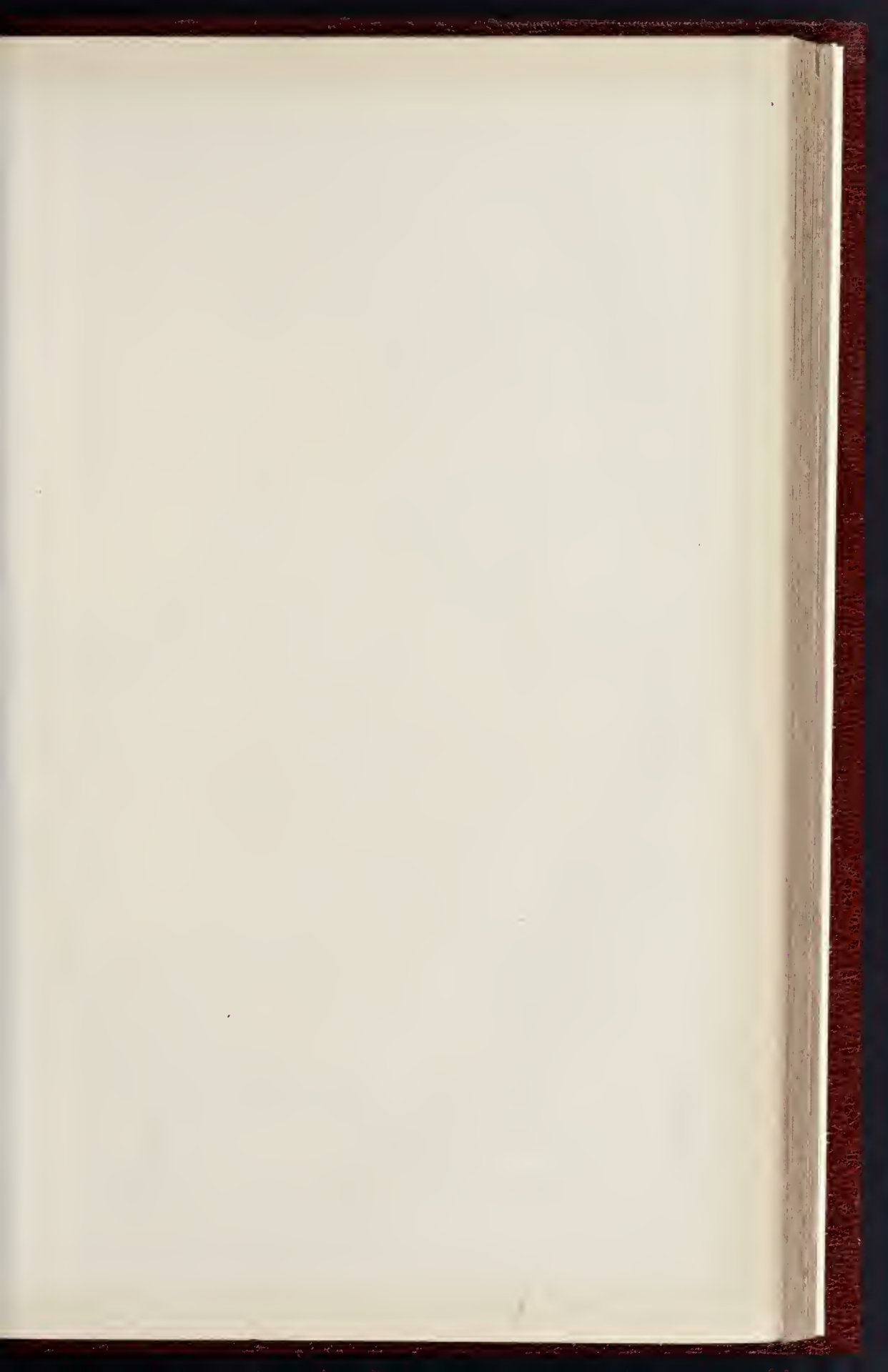
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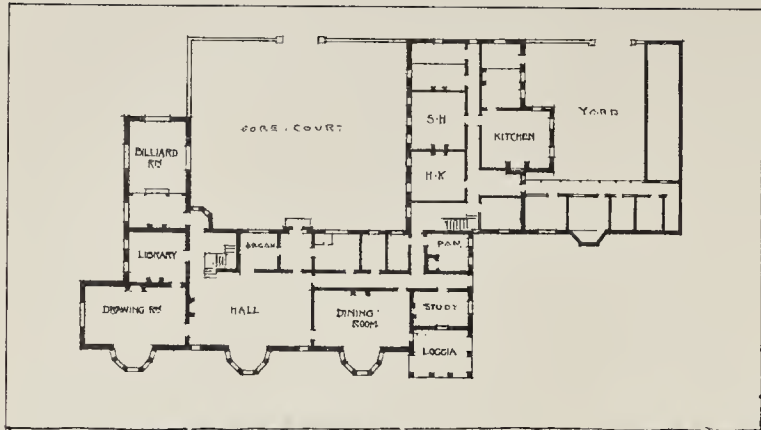
ROYAL EXCHANGE BUILDINGS.
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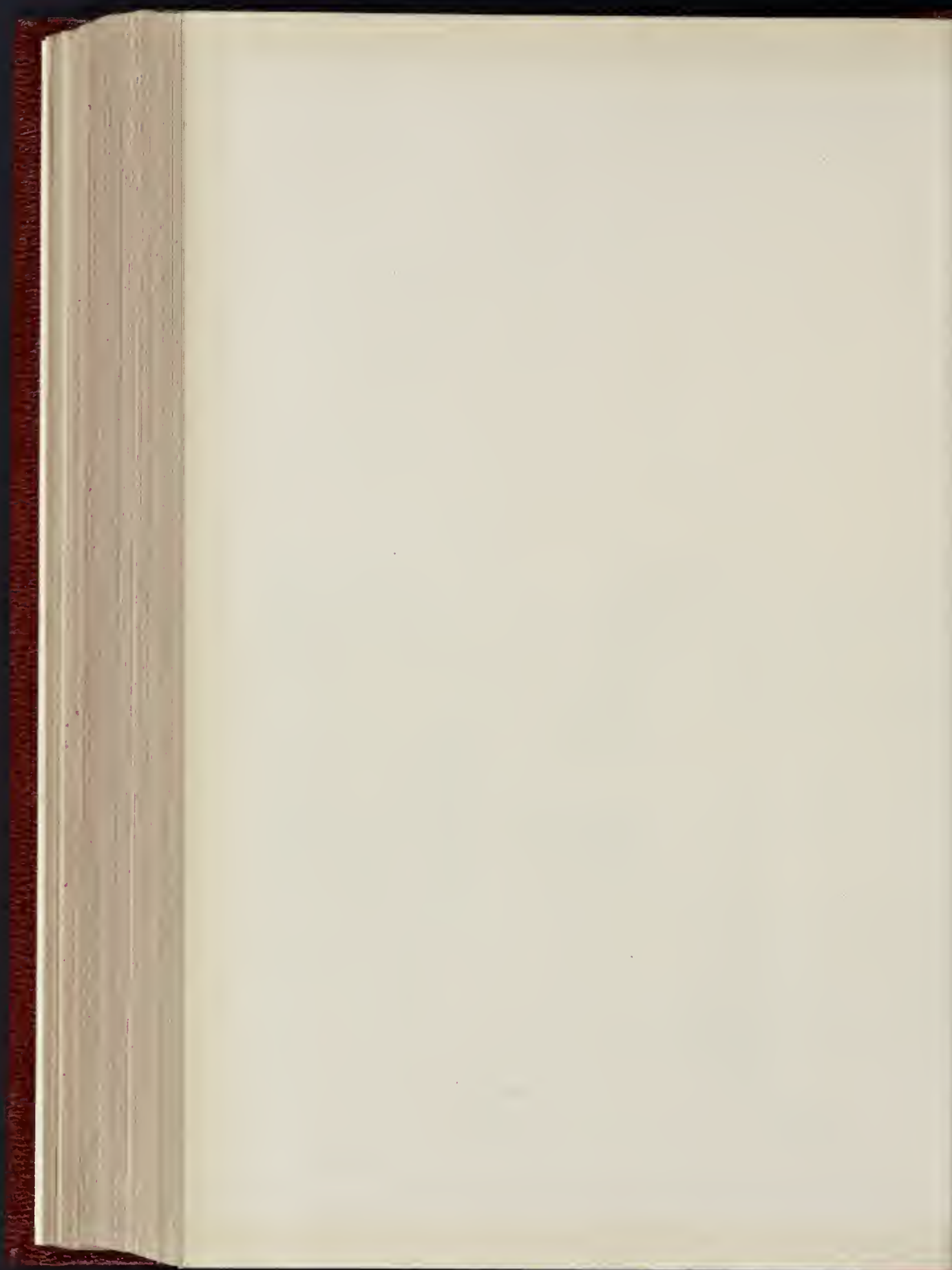


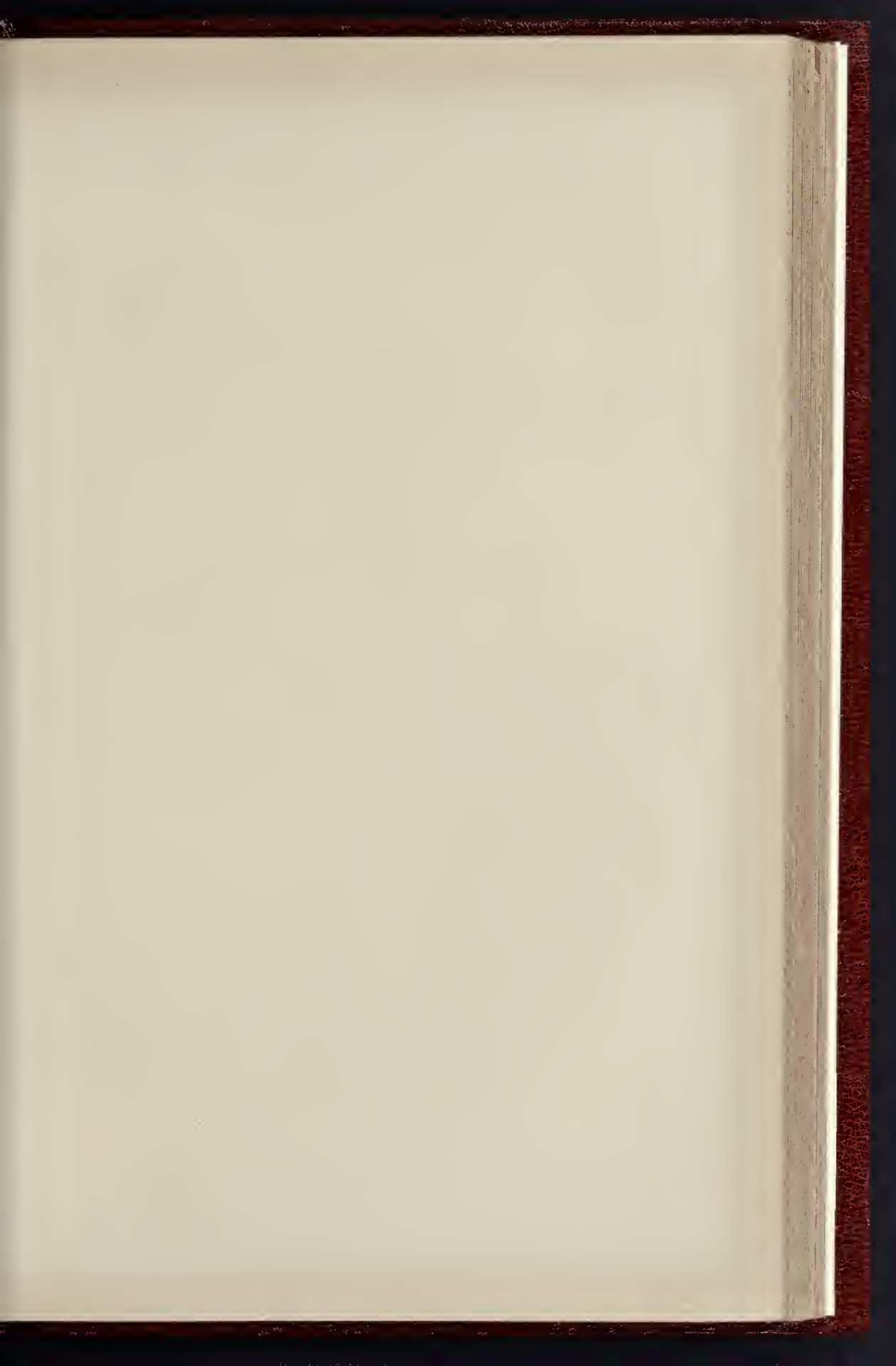


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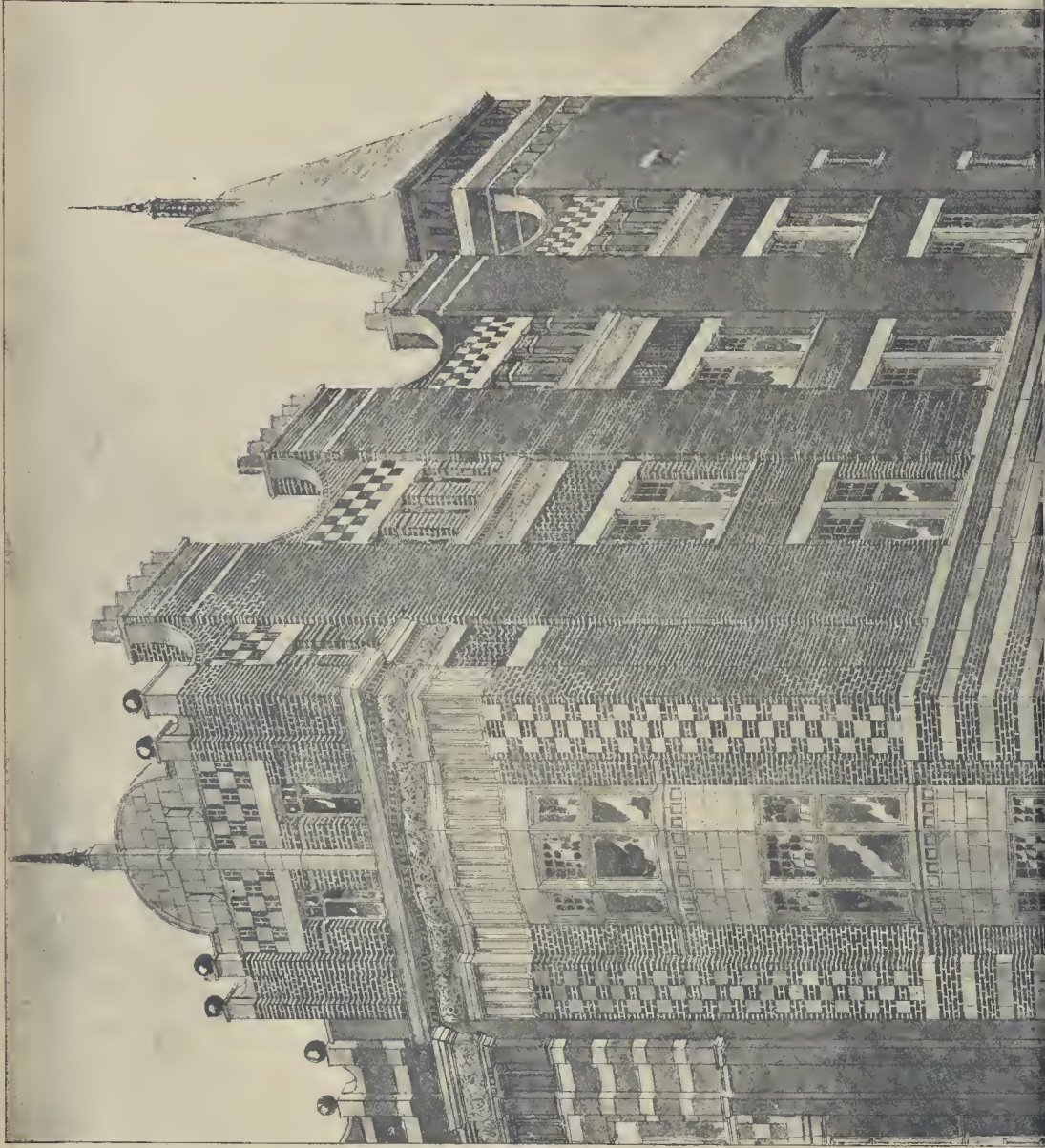


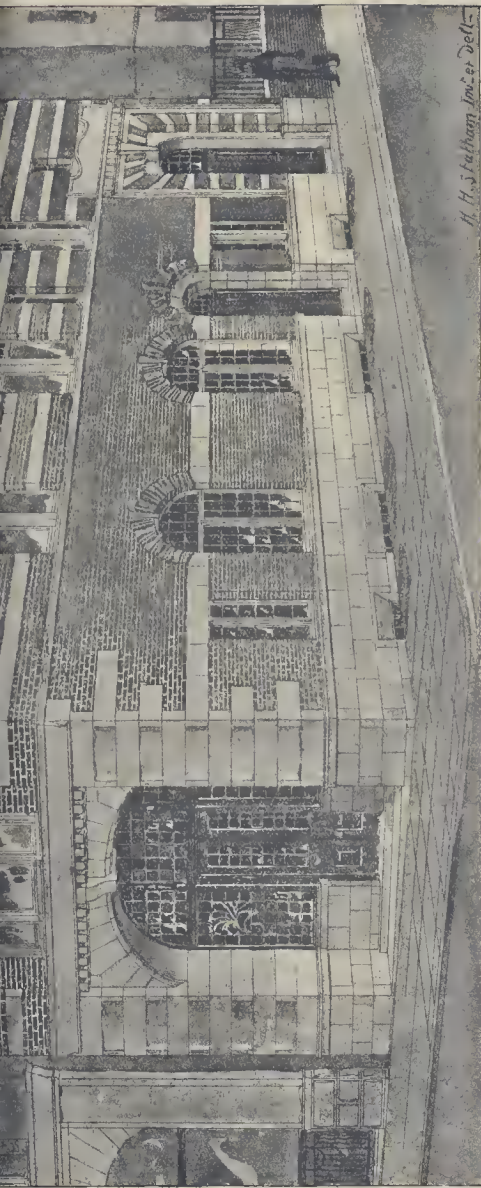
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THE BUILDER, MAY 19, 1906.

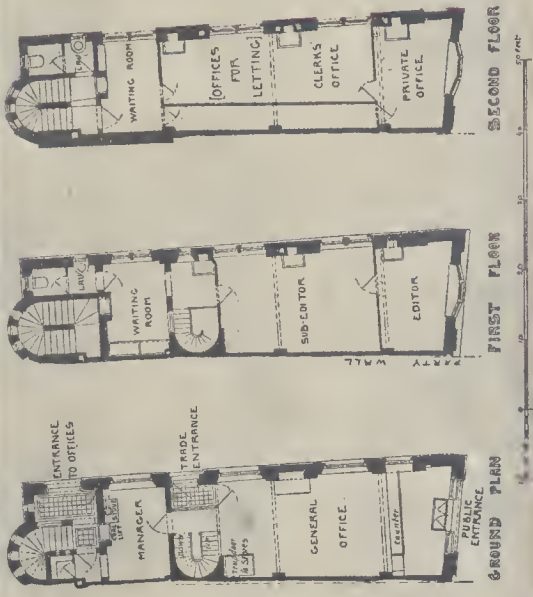




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WILEY-INTERSCIENCE, NEW YORK, N. Y.

points to 1.5 times its value on scale D. If the index of scale C be set opposite 2 on scale D, every number indicated on scale C points to twice its value on D, and so on for all other numbers until the product falls beyond the limit of scale D.

When the index of scale C has been slid to the right hand as far as the geometric mean between 1 and 10, no products higher than $(3.16+ \times 3.16+) = 10$ can be read on scale D.

To get over this difficulty scale D might be increased in length so as to give readings up to 31.6, thereby permitting the higher numbers of scale C to be used as multipliers.

But such an expedient is unnecessary, for the added portion of scale D would be simply a repetition of the first part of the same scale. We can obtain the same result by sliding scale C to the left, and using the right-hand end as an index (see Fig. 8).

Then, considering the decimal point to be shifted one place to the right, all products up to 100 can be read on scale D. Thus in Fig. (8) the right-hand index is set so that all products from 10 to 60, obtained by multiplying 6 by whole numbers or mixed numbers, are given on scale D. It will be understood, of course, that by suitable adjustment of the decimal point products

read on scale D may represent tens, hundreds, thousands, millions, and so on, or tenths, hundredths, thousandths, millionths, and so on, and that the same treatment can be applied to multipliers and multiplicands.

The theory underlying the two methods of employing the sliding scale C for multiplication ought to be clearly realised.

When scale C is moved towards the right we have

$$\log. a + \log. b = \log. ab.$$

As illustrated in Fig. (9) :-

$$\log. a = 2 \text{ and } \log. b = 3, \therefore \log. ab = (2+3) = 6.$$

As illustrated in Fig. (10) :-

$$\log. a = 3.5, \log. b = 3, \therefore \log. ab = x.$$

We cannot read the value of $\log. ab$, because the product is beyond the end of scale D. Therefore we must use the right-hand index of scale C and the left-hand half of scale D.

When scale C is moved towards the left $\log. 10$ is automatically deducted, and we have

$$(\log. a + \log. b) - \log. 10 = \log. \frac{ab}{10}$$

Therefore to obtain the correct result we must shift the decimal point one place to the right.

As illustrated in Fig. (11) :-

$$\log. a = 3.5, \log. b = 3, \therefore \log. ab = \frac{3.5 + 3}{10} = 1.05$$

Shifting the decimal point one place to the right gives $1.05 \times 10 = 10.5$, which is the correct result.

Two points now deserving special notice concerning the multiplication of whole numbers are :-

(1) That when the product is obtained with scale C projecting to the right hand the number of figures in the product is one figure fewer than the number of figures in the two factors.

Thus

$$\begin{aligned} 2 \times 3 &= 6 \\ 2 \times 30 &= 60 \\ 20 \times 30 &= 600 \end{aligned}$$

and so on.

(2) That when the product is obtained with scale C projecting to the left hand, the number of figures in the product is the same as the number of figures in the two factors.

Thus

$$\begin{aligned} 3.5 \times 3 &= 10.5 \\ 35 \times 3 &= 105 \\ 350 \times 3 &= 1050 \end{aligned}$$

and so on.

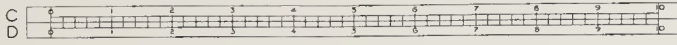


FIG. 2



FIG. 3

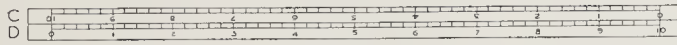


FIG. 4

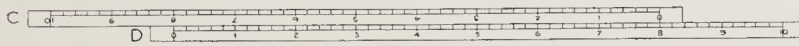


FIG. 5

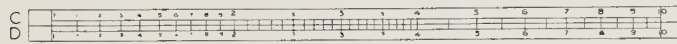


FIG. 6

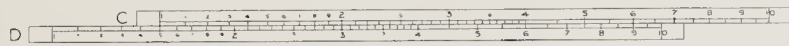


FIG. 7

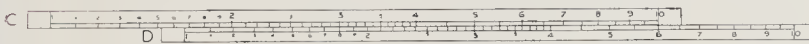


FIG. 8



FIG. 9



FIG. 10

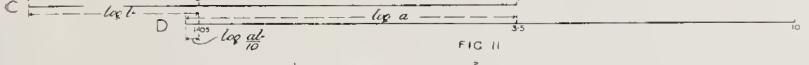


FIG. 11

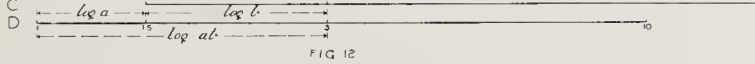


FIG. 12



FIG. 13

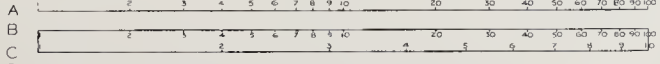


FIG. 14



FIG. 15

In using scales C and D for division the process is a reversal of that adopted for multiplication.

The divisor on scale C is set opposite the dividend on scale D, and the quotient is read on scale D under the left-hand or the right-hand index of scale C.

When the significant figures of the divisor are not greater in face value than the significant figures of the dividend, scale C must be moved towards the right so that the left-hand index may point to the quotient.

Thus, as illustrated in Fig. (12), to divide 3 by 2 the figure 2 on scale C must be set opposite to figure 3 on scale D, and the quotient is found at 15 = 1.5 on scale D. The same figures answer equally for $30 \div 2 = 15$, $300 \div 2 = 150$, $3000 \div 2 = 1500$, and so on.

But when the significant figures of the divisor are greater in face value than the significant figures of the dividend, scale C must be moved towards the left, so that the right-hand index may point to the quotient.

Thus, as illustrated in Fig. (13), to divide 3 by 4, the figure 4 on scale C must be set opposite to figure 3 on scale D, and the quotient is found at 75 = 0.75 on scale D. The same figures answer for $30 \div 4 = 7.5$, $300 \div 4 = 75$, $3000 \div 4 = 750$, and so on.

The theory underlying these two methods of performing division is illustrated below.

When scale C is moved towards the right we have

$$\log. ab - \log. b = \log. a.$$

As shown in Fig. 12:—

$$\log. ab = 3, \log. b = 2, \therefore \log. a = 3 - 2 = 1.5$$

When scale C is moved towards the left the answer has to be read below the right-hand index, and $\log. 10$ is automatically added to the quotient. Then we have

$$(\log. ab - \log. b) + \log. 10 = \log. 10a.$$

Therefore to obtain the correct result we must shift the decimal point one place to the left.

As shown in Fig. 13:—

$$\log. ab = 3, \log. b = 4, \therefore \log. a = \frac{10 \times 3}{4} = 7.5.$$

Shifting the decimal point one place to the left gives $7.5 \div 10 = 0.75$, which is the correct result.

Two important points to be noted in connexion with the division of one whole number by another are:—

(1) That when the quotient is obtained with scale C projecting to the right hand it contains one figure more than the difference between the number of figures in the dividend and the divisor.

Thus

$$\begin{array}{r} 3 \div 2 = 1.5 \\ 30 \div 2 = 15 \\ 300 \div 2 = 150 \\ \text{and so on.} \end{array}$$

(2) That when the quotient is obtained with scale C projecting to the left hand it contains the same number of figures as the difference between the number of figures in the dividend and the divisor.

Thus

$$\begin{array}{r} 30 \div 4 = 7.5 \\ 300 \div 4 = 75 \\ 3000 \div 4 = 750 \\ \text{and so on.} \end{array}$$

The foregoing explanation should make clear, so far as concerns multiplication and division, the mechanical principle of the slide-rule, and the manner in which the mathematical principle of logarithmic calculation is combined therewith.

It should also serve to suggest the great saving of time to be effected by means of the slide-rule as compared with the use of logarithmic tables.

Of course, the very simple computations dealt with above could be performed with greater speed by mental arithmetic than by the employment of a slide-rule or a table of logarithms.

But take as an example

$$17.98 \times 5.675 = 102.0+$$

By the aid of a slide-rule with two logarithmic scales each 10 in. long and graduated with the ordinary subdivisions the approximate result 102.0 can be obtained in 15 sec.

By four-figure logarithms and antilogarithms (Tables XIV. and XV.) the result 102.1 may be obtained in about 50 sec.

By ordinary arithmetic the result 102.0365 is obtainable in about 70 sec.

Again, take an example such as

$$\begin{array}{r} 2620 \times 348 \times 575 \times 83 \\ 1740 \times 68.75 \times 470 \times 34.4 = 22.5+ \end{array}$$

We have worked this out by the three methods, with the following results:—

$$\begin{array}{r} \text{By slide-rule Result } 22.5 \text{ time } 70 \text{ sec.} \\ \text{By logarithms } \text{,, } 22.5 \text{ ,, } 150 \text{ sec.} \\ \text{By arithmetic } \text{,, } 2.4:8 \text{ ,, } 500 \text{ sec.} \end{array}$$

When we come later to inquire into the wonderful facilities offered by the slide-rule for dealing with more complicated calculations, wherein the powers and roots of numbers are involved as well as multiplication and division, it will be seen that the advantages of the instrument as a labour-saving device are still more marked.

This preliminary chapter may be closed appropriately by calling attention to the simple arrangement, included in all parallel slide-rules, by which the square and square root of any number can be instantly found. The arrangement is illustrated diagrammatically in Fig. 14, where in addition to scales C and D we have two other scales, A and B, the latter marked on the upper edge of scale C and the former assumed to be connected with scale D, but at a sufficient distance to permit the slide, on which are scales B and C, to be moved freely between scales A and D.

The graduations on scales A and B are exactly one-half the length of the graduations on scales C and D, and, as the graduations are logarithmic, the effect is that every number (*n*) indicated on scale D has opposite to it on scale A a number representing $\log. n \times 2$, and the same relation exists between scales C and B. Conversely, every number indicated on scale A has opposite to it on scale D a number representing $\log. n \div 2$, and the same relation exists between scales B and C.

We have already shown in Article XIV. that when the logarithm of a number is multiplied by 2 the result is the logarithm of the square of the number, and that when the logarithm of a number is divided by 2 the result is the logarithm of the square root of the number. These principles applied in the manner illustrated by Fig. 14 give the squares and square roots of all numbers without calculation of any kind beyond suitable adjustment of the decimal point. It is only necessary to find on scale D the number whose square is desired and to look on scale A for the result, and, conversely, to find on scale A the number whose square root is desired and to look on scale D for the result.

Further, as the same relation exists between the numbers on scales B and C, it is almost as easy to find the cube of any number.

In Fig. 15 the slide is drawn to the right so that the index of scale C points to 2 on scale D; the index of scale B points to 4, its square, on scale A; and the number 2 on scale B is opposite B, its cube, on scale A. In the same way are obtained the square and cube of any other number.

Although the square root of any number on scale A can be instantly found, the extraction of a cube root requires special manipulation, which will be described in a succeeding article.

It should be remarked, however, that by adding another scale with graduations one-third the length of those on scale D, the cube and cube root of any number can be read directly on scales A and D respectively, and, as we shall see later, the logarithmic principle has been extended in this manner to the construction of slide-rules.

CHURCH RESTORATION, BISHOP MIDDLEHAM.—The restoration of the parish church of Bishop Middleham has just been completed. The high pews have disappeared, and in their places are modern seats. The flat ceiling has been replaced by a pitched roof of dark timber. The organ has been transferred to the north aisle, and the chancel has been resented with carved stalls. There is now a choir vestry at the west end of the south aisle, and the whole of the walls have been plastered and tinted cream. The architects were Messrs. Stephen Wilkinson & Son, Newcastle, Messrs. G. Graddon & Crow, Durham, being the contractors. The undertaking has cost about 1,000.

Obituary.

MR. SALOMONS.—We regret to announce the death, on May 12, at Ireton Bank, Platt-lane, Rusholme, Manchester, of Mr. Edward Salomons, of Prudential-chambers, No. 78, King's-street, Manchester, and until lately of No. 39b, Old Bond-street, London, in his 79th year. Mr. Salomons was elected an Associate in 1851, and in 1860 a Fellow of the Royal Institute of British Architects, and served as a member of the Council. Mr. Salomons was the architect, in conjunction with Mr. John Ely, of a house at Knutsford, for Mr. C. J. Galloway (October 3, 1855, with two plans *); Beeston Lodge, Chester, about two years ago; and of the Midland Bank, Manchester. He was joint architect with Mr. R. Selden Wormum of a house at Françon, Biarritz, for Mr. J. Pennington Mellor (June 21, 1884 *); with Mr. J. P. Jones of Coen Wood Towers, Highgate, for Mr. E. Brooke (June, 1870, and June 1, 1872 *); and with Mr. A. Steinthal of the Crematorium, Manchester (October 22, 1892, two views, plan, and canopy of the bi-plateform *), and also for the reconstruction, with additional floor, stabling, etc., of Alveston Hall, Nantwich, for Mr. A. Knowles (April 17, 1897, drawing, three plans, and three drawings of the interior *). He was joint architect with Mr. N. S. Joseph of the Churches in Chichester place, Harrow-road, N.W., in 1862-3; in September, 1897, he was deputed to make the designs for the case of the organ in the Royal Manchester College of Music. Mr. Salomons was appointed to act as assessor in the competitions for the Board of Sanitary Officers in John-street, in 1892, and the North Wales student at Denbigh, in 1894. In our numbers of April 11 and May 2, 1896, we published illustrations of a set of five water-colour sketches drawn in Bruges by Mr. Salomons, comprising views taken from the Quai de Rosaire, with the belfry in the distance, and the Place de la Vigne, with the entrance to the Béguinage, and some of the old and picturesque houses on the canal-banks. On May 8, 1897, we published four of his drawings (then in the New Gallery), taken in Bretagne, illustrating St. Malo: some old houses in Morlaix; La Porte du Roi, Mont St. Michel; and La Maison Duquayroun, St. Malo.

MR. GEORGE LOW.—We have to record also the death, at the age of 82, of Mr. Geo. Low, architect, who had kept up his professional work till within a few weeks of his death. At the early age of 14½ years he was placed in the offices of George Smith (Surveyor to the Mercers Company) and Wm. Barnes, with whom he served his articles. In 1842 he was elected a student of the Royal Academy of Arts, and in 1844 was awarded, by the Council of the Academy, the first silver medal for the best measured drawings of the Church of St. Mary, Woolnoth. These drawings were presented by Mr. Low, some years ago, to the Royal Institute of British Architects' Library. In 1847 he commenced practice, and in 1850 was elected an Associate of the Royal Institute of British Architects, becoming a Fellow in 1860. In 1850 his design for a Town Hall and Market at Hemel Hempstead was selected in open competition, and the building was subsequently erected on his designs, and later added to, in conjunction with his son, Mr. Ralph Low, A.R.B.A. In 1855-65 he erected large business premises in Northampton and Dunstable. Subsequently up to his death he enjoyed a very large general practice, varied in character, and consisting of churches, church schools, board schools, private residences, and large commercial premises in the City and elsewhere. Since 1855, in partnership with his son, Mr. Ralph Low, he erected a large number of warehouses, blocks of shops, business premises, and private residences. Mr. Geo. Low was well known as a compensation surveyor and arbitrator, being engaged in a very large number of these cases for the Metropolitan and Metropolitan District Railway in the acquisition of property for the construction of their lines, and was one of the arbitrators employed by the Post Office Authorities in connexion with the property required for the new Post Office buildings in St. Martin's-le-Grand. The practice will be continued by his son, Mr. W. Ralph Low.

MR. HENRY FRANCIS FROGGATT.—The death is announced of Mr. Henry Francis Froggatt, the Hereford District Surveyor. The deceased had passed his 75th year.

MR. WRIGHT.—The death, on May 11, at No. 48, Kingsland-road, Oxford, S.E., is announced of Mr. Thomas Wright, aged eighty-four years. Mr. Wright was during thirty-five years Clerk of the Works to the Dean and Chapter of Westminster Abbey, and possessed a practical knowledge, which we believe was almost unrivalled, of the structural history of the Abbey and its appurtenant buildings.

CENSUS OF PARIS.—The general totals of the census taken on March 4 show that the population of the capital was then 2,731,728, as compared with 2,660,559 in 1901, and 2,511,629 in 1896.

* Illustrated in the *Builder*.

General Building News.

CHURCH, EVESHAM.—The foundation-stones and bricks in connexion with the new Wesleyan Church which is being built at Avon Bank, Evesham, have just been laid. There will be accommodation for some 950 people, and the complementary buildings will include schools, classrooms, and hall. The designs were selected in a limited competition, and the building will have Stoucheous brick facings relieved with stonework, the face work being in Bath and the weatherings in Taynton stone, while the roof will be of Bangor slates. The church will seat 630 on the ground floor, 150 in the gallery, and forty in the choir gallery. It is proposed to execute the seating and gallery front in American oak, and the roof timbers will be stained to imitate fumed oak. An organ is to be included, at a cost of at least 500*l.* The schools are to accommodate 150 boys and fifty infants on the ground floor, and 150 girls on the first floor, all arranged in classrooms round a large central hall. The cost of the buildings, including the organ, the site, and the minister's house, will be about 8,300*l.* The architect is Mr. Frederic Foster, of Coventry, and the work is being carried out by Messrs. Espley & Co., of Evesham, the amount of whose invoice contract is 6,350*l.*

BRAMPTON CHURCH TOWER.—On the 10th inst. the Bishop of the diocese dedicated the tower which has been added to Brampton parish church, and which completes the building as originally designed by Mr. Philip Webb. The tower now completed is not so elaborate as that originally planned, the new work being built at a height of 41 ft. above the floor of the church, and from there to the parapet it rises a further 35 ft., making a total height, if measured from the ground outside, of 82 ft. A feature of the tower is its great width, which averages 25½ ft. on each side, a width which allows an ample space for the bells as well as the very thick walls. The roof is a step and covered with lead, and it is crowned with a spirelet 30 ft. high. The erection of the tower was begun in May last year by Messrs. Laing & Son, Carlisle. Mr. Jack, of Carlisle, has acted as supervising architect for Mr. Webb, while Mr. Alexander Routledge has discharged the duties of clerk of the works.

CHURCH RESTORATION, EAST BERGHOLT.—East Bergholt was recently visited by Bishop Sheepshears, who held a dedication service at the parish church, which has undergone alterations, a new reredos and choir-stalls being constructed. The repairs included a solid re-construction of the south porch, the practical re-construction of the cupola on the roof, which was much decayed; attention to the stonework and the exterior of the chapel, as well as the relaying of the chancel roof and the North Chapel roof. The entire work has been carried out under the supervision of Mr. T. G. Jackson, R.A., by Mr. Wheeler, of East Bergholt, and the wood carvings and the marble work have been executed by Messrs. Farmer & Brindley.

BAPTIST MISSION CHAPEL, EASTVILLE, BRISTOL.—Memorial-stones of a new Baptist mission chapel at Eastville were laid on the 10th inst. The plans were prepared by Mr. B. Wakefield, and the contractor was Alfred Downing, of Bishopston. The new building is arranged to accommodate a congregation of 250, with four classrooms and offices. The cost of the scheme is estimated at 1,700*l.*

SCHOOL-CHURCH, TUNSTALL.—The foundation-stones of a school-church for the new district of St. Chad was laid recently on a site in King William-street. Mr. H. Dain was commissioned to design the building, and his plans are being carried out by Mr. C. Cope. Accommodation will be provided for 300, and the work will cost 1,400*l.*

EXTRADIOROADS, TABERNACLE.—This new building in Bloomsford-road, now near completion, has been erected at a cost of just over 3,000*l.* The architect was Mr. R. Norman Hewitt, Shepherd's Bush, and the builders Messrs. T. E. Mills & Son. The general design of the building is Gothic. The front is of red brick, dressed with Bath stone. There are three entrances on one side, the main porch reached by separate flights of granite steps, immediately inside the chapel is a vestibule, separated from the main building by a leaded glass screen to match windows, with Frazzo flooring, and double doors. The windows, all in lead lights, are by Messrs. Fry & Sons, Bricklayers' Works, Hammersmith. There is seating accommodation on the ground floor for about 350, and in the gallery for about 250.

NEW ELECTRICAL SCHOOL, CHATHAM.—We are informed that the general contractors for this building, referred to in our issue for April 27, were Messrs. W. Pattinson & Sons, Ltd., of Barking, Essex, London, and that Street's Brickworks Company were only sub-contractors for the reinforced concrete beams and floors.

SUNDAY SCHOOL EXTENSION, SOUTHAMPTON.—At Southampton on the 2nd inst. the foundation-stones were laid of the new classrooms which form an extension of the Wesleyan Sunday schools. The new buildings will be of stone, and will ac-

commodate a men's Bible classroom, 18 ft. by 20 ft., a women's classroom, 14 ft. by 18 ft., and two smaller classrooms, the total increasing the available accommodation by about 130. The work is being carried out to plans prepared by Mr. Fred E. Sargent, architect, of Southampton, the contractors being Messrs. W. Saunders & Son.

COUNCIL SCHOOL, HOPE, NEAR CAERGWYLE.—A new elementary school has been opened at Hope by the education authority of Flintshire. The building is of red brick, with the window woodwork painted white and green. There are ornamentalations of terra-cotta dressings, with blue slated roof. There is a central hall surrounded by six classrooms, with corridors and cloak-rooms. The accommodation provided is for a total of 330 children, 220 mixed and 110 infants. The total cost is about 3,300*l.* Mr. R. Williams, Brynho, was the contractor, and Mr. S. Evans (County Council Surveyor), the architect.

SCHOOL, SAMPBRIDGE. The new school which has been erected by the Gloucestershire Education Committee, in the parish of Slimbridge, was recently opened. The school is built to accommodate 200 scholars—100 boys and girls and forty infants. The architect was Mr. R. S. Phillips, the builders being Messrs. Baxter & Sons, Stroud. Messrs. Crisp & Sons, supplied the heating apparatus, and the clerk of the works was Mr. A. E. Morgan. The cost of the work was about 2,000*l.*

COUNCIL SCHOOLS, HUNTINGDON.—New schools have been erected by the Huntingdonshire County Council, at Huntingdon. The buildings will accommodate 310 in the mixed department, and 140 in the infant department. The cost has been about 5,000*l.* The designs were prepared by the County Surveyor, Mr. Leete, in conjunction with the Organising Secretary, Mr. Cook. The work has been carried out by Messrs. E. B. Thackray & Co., Ltd.

WESLEYAN SUNDAY SCHOOL, LEEDS.—The Park Wesleyan Sunday School, Dewsbury-road, Leeds, was opened on the 12th inst. The total outlay on the new school, which has been erected from designs by Messrs. Dunby & Stinson, architects, Leeds, has been 5,000*l.*, excluding the value of the building land. The school has a central hall to accommodate 630 persons. There is a gallery round the hall, and from this and the main floor open nineteen classrooms. To the rear of the hall are placed a mission hall capable of seating 150 persons, three other classrooms, and a caretaker's cottage. There is also a basement, which can be used for tea meetings and similar gatherings, accommodating 300 persons. The premises are built of stone.

SUNDAY SCHOOLS, TODMORDEN.—Twelve memorial-stones in connexion with York-street New Wesleyan Methodist Sunday School, Todmorden, were laid recently. The large room of the new building will seat about 700 people, and there is to be a suite of classrooms on the ground floor. The estimated cost is 3,600*l.* Mr. Morley, of Bradford, being the architect.

SUNDAY-SCHOOLS, SOUTHPORT.—The new Sunday-schools, which have been erected in connexion with the Baptist Tabernacle, Southport, were opened by Mr. W. P. Hartley, J.P., on May 16. Mr. E. H. Halsey, of Southport, was the architect of the new premises, and he has provided about fourteen ordinary classrooms, in addition to the principal rooms. Another feature is the provision of two new staircases from the Tabernacle gallery, there having up to the present been only one winding stone staircase. The large school-room, or assembly-hall, occupies the same, but more extended position of the old school, and is 63 ft. long by 32 ft. wide, and has a balcony round three sides, fitted with fixed seats, for the use of scholars occupying upstairs classrooms. The principal entrance to this school-room is on the Scarsbridge New-road side, and is semi-octagonal in shape, a staircase leading thence to the balcony and classrooms. The library adjoins this entrance, and alongside of this come two classrooms on the ground floor and three classrooms coming above. The lower rooms are separated from the main room by patent folding partitions filled in with clear glass.

On the opposite side of the school there are two new vestries for minister and deacons, with classroom for about seventy men above. This portion is not yet completed. On the Southbank road side is the lecture-hall, with separate entrance. It is 39 ft. long by 25 ft. wide and 12 ft. high, and above this are classrooms and kitchen, etc. There is a communicating passage between the Tabernacle and the schools. A special feature is a large mullioned and transomed circular-headed window at the south end of the school. The elevations have been carried out in Turkey and brick, with grey terra-cotta, the latter being from Jabez Thompson's, of Northwich. The school has been coloured internally with Duresco, and the woodwork is of pitch-pine, varnished. The total cost is expected to be about 2,600*l.*, exclusive of land and furnishing. The contractors were Messrs. Dunsell Brothers, and the following were sub-contractors: the Brickwork and terra-cotta, Mr. J. Marshall; stonemason, Mr. J. Rimmer; slater and plasterer, Mr. Tom Southworth; plumber, etc., Mr. Wm. Wright; painters, Messrs. Brandreth & Burdon; heating, Mr. Lewis Hill, of Liverpool; lead lights,

Messrs. Ockleston & Drayton, Johnson, of Liverpool and Chester.

NAUTICAL SCHOOL, PORTSEAHEAD.—Princess Christian opened the new nautical school at Portseahead on the 9th inst. The structure, which was designed by Mr. Edward Gabriel, and built by Messrs. W. Cowlin & Son, has been erected on a seaside slope, the ground inclining considerably from back to front. The drop in level has been utilised for the construction of a row of arches used as store-rooms and workshops, and having above them a broad, covered terrace, above which the school itself rises. The block has a frontage of 382 ft. in length. The building consists of two wings, about 45 ft. in height, measured from the terrace pavement, and connected by an ornamental central tower, beneath which is the chief entrance. The central portion of the building is carried up to a height of 70 ft., and is finished off with wood and copper "fliche" of ornamental character. This central tower stands well above the rest of the building, and has a clock in its front face. Red brick dressings and white rough-cast walls indicate the nature of the exterior treatment of this and other parts of the school. On one side of the main entrance in this middle section is located the committee-room, and on the other the captain superintendent's offices, while on its upper floors are cabins for the officers and for the old boys revisiting the institution. Passing through the central entrance the visitor would find himself in the gymnasium, a ground-floor building at the rear, 80 ft. by 60 ft., and useful not only for physical exercise, but for meetings and services. Both wings are relieved by smaller towers rising above the roof line, and the stretch of front wall, with its numerous windows, is divided off by red brick pilasters. The roof is also of red tiles. The south-west wing on the ground floor contains the mess-room, with kitchen, officers' mess-room, and stores at the back; at its extreme end is the chief officer's house, and also a residence for the schoolmaster. The ground floor of the north-wing contains the school accommodation, library, teachers' room, and at its end is the house of the captain superintendent. This residence is a separate building, but has covered communication with the main block, so that the captain superintendent will be able to go round the whole institution without coming into the open. The two upper floors of both wings are devoted to dormitories. The elder boys sleep in hammocks suspended in long lines on each side of the central avenue, while officers' cabins, located at the corners of the dormitories, command a view of each room. These dormitories are large, and, roundly, may be said to accommodate 100 boys in each. The one for the younger lads is fitted with bedsteads instead of hammocks. The heating, hot-water supply apparatus to baths and kitchen, laundry, drying apparatus, etc. has been installed by Messrs. James Crispin & Sons, of Bristol. In the arches of the basement are fixed two large steam Cornish boilers, and steam is supplied from these boilers to patent calorifiers or heaters, one of which generates the hot-water supply. This is stored in a large cylindrical container of 600 gallons capacity, and from this container secondary loop circulation pipes are carried. The heating calorifier connects a series of heating main pipes which are attached to radiators in the main entrance corridor near the gymnasium, and in each of the classrooms four radiators are fixed, fitted with regulating valves. The calorifiers are also fitted with Row's Patent Attachment, which allows of steam being automatically shut off, and any desired temperature is registered by the thermometer on the calorifiers. The condensed water from the calorifiers is carried to an automatic receiver which pumps the water back to the boiler, and thus ensures economy in maintenance. In connexion with the sanitary arrangements of building the committee adopted the bacteriological treatment system on the plan applied by Mr. F. Wallis Stoddart.—*Western Daily Press.*

PARISH HALL, KINGSTON.—A parish hall has been erected in Park-road, Kingston, in connexion with St. Paul's Church. The hall has been built by Mr. Frank Hawkey (Surbiton) of stone, with red brick dressings and roof of Broseley tiles. There are three entrances to the principal room, which is 48 ft. in length and 27 ft. wide, and has a platform 3 ft. above the floor measuring 18 ft. by 12 ft. From the platform exits have been planned to allow of its use for dramatic representations, and access is also gained to the cloak-rooms and lavatories for men and women on either side. The holding capacity of the hall has been fixed at 550 by the Surrey County Council. The cost, including site, has been about 1,650*l.* The plans for the work were prepared by Major Mearns.

PUBLIC LIBRARY, ARNOLD.—The new public library which is being built at Arnold is now nearly completed. The main entrance is central and leads into a hall which will be used as the lending library. On the right is a reading-room, on the left a ladies' room and reference library. The private room for the use of the librarian is so placed as to command a view of each of the departments. The floors will be of wood blocks,

and the rooms will have a wood dado to the height of 4 ft. 6 in., the upper part of the walls being plastered. Externally the building is of pressed bricks, with stone dressings. The heating will be on the low-pressure hot water system. The tenders were confined to Arnold builders, and the Council accepted that of Messrs. H. Jew & Son, amounting to 1,320, for the library, and 250, for the caretaker's house adjoining. The architect is Mr. H. Wigginton, of Arnold and Nottingham.

PROPOSED ELECTRIC LIGHT WORKS, WELLINGBOROUGH.—Colonel A. C. Smith, C.E., Inspector of the Local Government Board, attended at the Council Chamber, Wellingborough, on the 1st inst. to hold an inquiry respecting the application made by the Urban District Council to be allowed to let part of their storage-yard to the County of Northampton Electric Power and Traction Company. Evidence supporting the application was given by Mr. E. Y. Harrison, the Surveyor.

CHILDREN'S HOSPITAL, HESWALL.—The foundation-stone of the Liverpool County Hospital for Children, which is being erected at Heswall, was laid a short time ago. The site for the new hospital, comprising 10 acres, is on the side of Heswall Hill, off Telegraph-road. When the complete scheme is carried into effect the buildings will stand in the form of the letter H, the ward wings being connected by the central block, and accommodation for 200 beds will be provided. The total cost will be 60,000, but at present only the central block, in which temporary ward accommodation can be found for 100 beds until the ward blocks themselves are erected, is being undertaken. This part of the scheme will cost 25,000. The hospital is being built by Mr. W. H. Forde, of Birkenhead, and the architects are Messrs. H. & A. F. Fry, of Liverpool.

GOLF PAVILION, BELWELL FOREST, NOTTINGHAM.—The new pavilion recently erected in Balwell Forest for the convenience of golfers was opened on the 3rd inst. Mr. F. B. Lewis, the City Architect, prepared the plans for the work.

CYCLE FACTORY, COVENTRY.—Messrs. Harrison & Hattrell, of Coventry, are the architects, and Mr. Gray Hill, also of Coventry, is the general contractor for a new factory which is now being built, at a cost of upwards of 40,000, as an extension of their workshops, by the Rudge-Whitworth Company.

MANCHESTER INFIRMARY.—A special meeting of the Royal Infirmary Board was held on the 8th inst. for the purpose of receiving a report from the Building Committee on the tenders received for the superstructure of the new infirmary, and Mr. Hopkinson, Chairman of the Building Committee, in moving the adoption of the report, explained that the work had been divided into sections "A" and "B." Section "A" included four large blocks and all the general medical and surgical departments of the hospital, while section "B" consisted of the lodges, the casualty and special blocks, the out-patients' blocks, the superstructure of the laundry, and the pathological and ophthalmic blocks. The architect's estimate of the cost of section "A" was 240,000, and of section "B" 69,000. The tenders which had been received for section "A" were as follows: Arnold & Son, Doncaster, 239,640; Brown & Son, Salford, 244,480; Foster & Dicksee, Rugby, 253,620; Holliday & Greenwood, Brixton, S.W., 258,277; Morrison & Son, Liverpool, 251,300; R. Neill & Son, Manchester, 245,000; Rowbotham, Birmingham, 256,752. In considering the tenders the committee had regarded either price or time alone, but with regard to time they asked that the tender should be based on the completion of the contract in September, 1908. By that he meant both sections "A" and "B" together.—The tender of Messrs. Arnold & Son was accepted.

ELECTRIC POWER STATION, BIRMINGHAM.—The new power station in Summer-lane, which is being constructed by the Electric Supply Committee of the City Council for the provision of electricity for lighting and for power, is now nearing completion. The engine-house, which is 270 ft. long, 100 ft. wide, and 65 ft. high, is divided by a central gangway, the high-tension plant being installed on one side and the low-tension plant on the other. The switchboards are situated at the front of the engine-house, mounted upon a gallery. The cables connecting the generators to the switchboard are run along two subways under the central gangway. The boiler-house, which adjoins the engine-house, is equipped with underground flues, so arranged that any battery of boilers can be brought into use as required. When finished the boilers will be arranged in four batteries, each containing six water-tube boilers, fitted with super-heaters and economisers. The coal from the overhead store is automatically fed into mechanical stokers, and the ashes produced will be allowed to accumulate in underground chambers, now in course of construction, from whence they can be fed into a conveyor and taken away. Mr. R. A. Chattock is the City Electrical Engineer and manager, and Mr. J. P. Kenp the resident engineer.

UNIVERSITY SETTLEMENT HALL, BARDIE.—This building is shortly to be enlarged. Plans have been prepared by Mr. R. Weir Schütz, architect, of London, who also designed the hall,

and they have received the approval of the city authorities. The new building will be built of Somersetshire red bricks and roofed with pantiles. The walls inside will also have a brick face, and only the ceilings will be plastered. There will be a billiard and smoking room for men and a reading-room as well, while large playrooms are provided for the Lads' and Girls' Clubs, and several classrooms for each. The Mothers' Club will also have a separate room.

BUSINESS PREMISES, NORWICH.—New business premises have been erected in St. Benedict's-street, Norwich. They have been built from the plans of Mr. H. Tooley, architect, Buckhurst Hill, Essex, by Mr. T. Gill, Norwich. The internal lighting has been carried out by the Corporation Electricity Works. Electric bells and gas fittings have been installed by Self Brothers, Norwich, and the general decorations have been carried out by Mr. Taylor, also of Norwich.

FREE LIBRARY, NEWBURY.—On the 2nd inst. a new Free Library was opened at Newbury. The building, which was designed by Mr. S. J. Lee Vincent, Borough Surveyor, has been constructed of red brick, with Monks Park stone dressings. The design is based on the Elizabethan style. On the ground floor there is first the library, with borrowers' space, counter, and indicators for 10,000 volumes. Shelving has been provided for 8,000 volumes, and there is space for a further 2,000 volumes if necessary. Adjoining this room is the librarian's office, overlooking the reading-room. From the reading-room a lobby and staircase leads to the reference room, 30 ft. by 20 ft., over the lending department. Overlooking the reading-room is a railed-off space forming a library accommodation is provided. The cost has been 2,000. Messrs. Hoskings, of West Mills, were the builders.

SWIMMING BATH, CHELMSFORD.—An open-air swimming bath has just been opened by the Chelmsford Corporation. The bath, which with the inclosure covers an area of five-sixths of an acre, is 150 ft. by 100 ft., with a water area of 15,000 square ft. It has a depth of water from 3 ft. to 6 ft., and holds 400,000 gallons. It is constructed partly above and partly below the ground level, and is surrounded by two paved footpaths in the form of terraces, which are formed with the excavation material from the centre of the bath. The bottom of the bath is lined with 1,490 square yds. of concrete flags, grouted together, and the sides are formed of cement concrete. A sand filter 50 ft. by 20 ft. is provided at the end, through which the water passes before entering the bath. On the top terrace, which extends the full length of the site, and stands 2 ft. 6 in. above the water level, thirty-six dressing boxes are erected. There is also an open dressing shed, about 80 ft. long, for free bathers, with caretaker's shed and cycle store adjoining. An island built of timber is fixed in the centre, and arranged in the form of step platforms for diving purposes. In addition there are two spring diving boards. The water is supplied from the river Chelmer, and is conveyed from the dam at Springfield Mill by a 12-in. pipe main to the sand filter. The work has been carried out departmentally under the supervision of the Borough Engineer and Surveyor, Mr. Culbert Brown, and the total cost of the works is under 700.

Appointments.

BIRMINGHAM CITY COUNCIL.—The Public Works Committee have decided to recommend that Mr. Henry E. Stigloe, A.M.I.C.E., Borough Engineer and Surveyor to the Corporation of Dover, be appointed City Surveyor for Birmingham, at a salary of 1,250, per annum, vice the late Mr. John Price.

BRITISH SCHOOL, ATHENS.—Mr. R. McG. Dawkins has been elected as Director of the School in the place of Mr. R. C. Bosanquet, whose appointment to the chair of Archaeology in the University of Liverpool we recently announced. Mr. Dawkins is a Fellow of Emmanuel College, Cambridge; he has taken a prominent part in conducting the excavations at Palaikastro in Crete, and is at present Mr. Bosanquet's co-adjutor in the investigations recently undertaken on the site of ancient Sparta.

STAFFORDSHIRE IRON AND STEEL INSTITUTE.—Mr. William Somers, of Holesowen Forge, has been elected President, and Mr. William H. Corder has been re-elected Secretary, for the ensuing year.

Sanitary and Engineering News.

A REINFORCED CONCRETE BRIDGE OF 146 FT. SPAN.—A bold example of concrete-steel construction is to be found in the footbridge recently built across the river at Playa del Rey, California. This bridge has a total length of nearly 200 ft., and crosses the river in a straight line with a clear span of 146 ft. and a rise of 18 ft. The three arch ribs are each 14 in. thick by 24 in. deep at the crown, and spring from abutments of concrete

strengthened by grillages of rails and resting on pile foundations. The ribs are reinforced by angle bars, but the main and railway rails are connected by transverse beams of concrete, each reinforced by a railway rail which, from plates are riveted to form brackets reinforcing the connexion of the main ribs and transverse beams. The floor consists of a 4-in. slab of concrete reinforced by a network of $\frac{3}{8}$ in. diameter bars, 5 in. apart, crossing the bridge diagonally. The working was struck seven weeks after completion of the concreting, when settlement took place to the extent of $\frac{3}{4}$ in., but did not increase to more than $\frac{1}{2}$ in. in all. The bridge was afterwards tested by a dead load of 870 lb. per square foot, with satisfactory results.

MANHATTAN BRIDGE.—It is now hoped in New York that the last controversial question relative to the structural details of the Manhattan Bridge across the East River has been settled by the recent decision of the Bridge Department to carry out the design of their predecessors in office, providing for a cable instead of an eye-bar suspension bridge. No real importance attaches to the point raised, for other type of structure would be perfectly safe and reliable, if properly designed and executed. The New York public are little interested in the relative merits of eye-bars and cables—a matter upon which engineers are by no means in agreement. On the contrary, their chief anxiety is to have the bridge opened at the earliest possible date so that the additional cross-river communication may relieve the almost crushing traffic which takes place on the Brooklyn Bridge every morning and evening.

CONCRETE-STEEL IN MARINE ENGINEERING.—Owing to the fact that timber employed in tidal waters suffers to a serious extent from attack by the *teredo navalis*, and is also affected by other destructive agencies, the use of concrete-steel is rapidly extending in the construction of wharves, jetties, landing-stages, and kindred works, where timber piles and frameworks were once almost universal. The usefulness of ordinary concrete-steel in the design of wharves and jetties has been sufficiently demonstrated by various examples of such construction at Southampton and elsewhere in the United Kingdom, and as an illustration of the extent to which the Admiralty are availing themselves of the valuable properties exhibited by this material the fact is stated on the authority of Mr. L. G. Mouchel, that more than a dozen jetties on the Hennebique system are under construction at the present time. The works in question include two jetties at Haslar, and two torpedo-boat destroyer jetties at Portland for the Admiralty; an isolated breakwater in Waterford Harbour for the Public Works Department of Ireland; a jetty and approach at Hornchurch Marsh for the City Corporation to the designs of Mr. Frank Sumner, M.Inst.C.E., the Engineer to the Public Health Department; a coaling jetty at Erith, and a coal wharf at Rochester, for Messrs. Cory & Co., from the designs of Mr. H. Slocum, M.Inst.C.E.; a jetty at Coves for the Southampton and Isle of Wight Steampacket Company; an important jetty at Newcastle-on-Tyne on 18-in. by 18-in. hollow ferro-concrete piles for the Co-operative Wholesale Society; the Caledon Jetty, Dundee, from the designs of Mr. J. Thompson, M.Inst.C.E., the Harbour Engineer, and a jetty for the Great Western Railway at Plymouth Harbour. Our readers are chiefly interested in reinforced concrete as a material for the construction of buildings, but it may be pointed out that piles of the kind which are suitable for wharves and jetties should be found equally useful in ordinary foundation work as a substitute for timber piles or heavy masses of plain concrete, for timber is apt to decay sooner or later, and weighty foundation blocks and slabs constitute an undesirable additional load upon unstable soil, and so tend to cause settlement of the buildings which they are intended to support.

IRON AND STEEL INSTITUTE.—At the thirty-seventh annual meeting, opened on May 10, the President, Mr. H. G. Gulliver, presented the Carnegie gold medal to Mr. H. Gulliver, and Mr. W. Rosenbain, of Birmingham, and announced that the Bessemer gold medal for 1906 would be presented to M. Floris Omond, of Paris, a leading authority upon the diagnosis of steel. The council have recommended that scholarships, each worth 100, be awarded to Messrs. E. F. Lave (London), P. H. H. (United States), O. Stutzer (Germany), and C. A. P. Benedicks (Sweden). The statement of accounts for the year 1905 showed that the income amounted to 6,271, and the expenditure to 5,257. In order to meet the cost of publishing the journal, each worth 100, the Institute, Mr. Carnegie has supplemented his previous contribution of a sum of 25,000 dollars in 5 per cent. debenture bonds.

MANUFACTURE OF PORTLAND CEMENT.—The *Iron Age* states that the use of producer-gas instead of coal for calcining purposes has been successfully adopted in six rotary kilns by the Portland Cement Works of the National Cement Branch, Ohio, with a concurrent saving in expense, fuel, and labour. The kilns are 60 ft. long, with a

diameter of 6 ft. ; the tested output amounts to 40 barrels, of 380 lb. per barrel, in 24 hours, with a consumption of 110 lb. of coal-fuel to the barrel. It is deemed that the use of low-grade coal can be applied to existing kilns at a moderate outlay.

ELECTRICAL POWER SCHEME, CALCUTTA.—The *Indian Daily News* describes some proposals which are made to promote a company, with a capital of 300,000, with the object of supplying electrical current to the mills and factories along the river Hooghly, from a generating-station with mains laid along both banks of the river to a distance of seventeen miles south to Budge Budge, and a distance of twenty-five miles north to the town of Hooghly. Within that area are mills and factories using an estimated amount of 20,000 h.p., exclusively of those within the limits of the Howrah and Calcutta, covered by the existing rights of the Calcutta Electric Supply Association.

SEWAGE DISPOSAL WORKS, NEWCASTLE-UNDER-LYME.—The formal opening of new sewage disposal works, constructed by the Newcastle-under-Lyme Town Council, took place on the 6th inst. Mr. J. E. Wilcox (Messrs. Wilcox & Talbot, Birmingham) was engineer of the works, and Mr. S. Wilton, jun., Newcastle, was the contractor. The new works have cost about 35,000l. There is a new main outfall sewer (20 yds. long, special design chamber, and 19 operating apparatus, and old liquefying tanks re-utilised). The effluent from the tanks discharges into a main channel, along which it flows into a circular pump, well constructed in brick-work, 25 ft. diameter by 6 ft. 8 in. deep below the level of the overflow, and having a capacity of about 28,000 gallons. The pumping plant consists of three sets of 22-h.p. gas engines and 6-in. centrifugal pumps, having a total lifting capacity of 900 gallons per minute. After leaving the pumps the sewage passes through an 18-in. cast-iron rising main to the distributing chambers above the high level filters; these are three in number, each 112 ft. diameter, and having a total area of 3,260 yds. From the high level filters the effluent can be discharged direct to the stream; or, if desired, on to the low-level filters or double filtration.

EXPOSED NEW BRIDGE, STAKEFORD.—At a recent meeting of the committee having in hand the bridging over of the Wasbeck at Stakeford, it was agreed that Messrs. D. Balfour & Son, civil engineers, Newcastle, should be instructed to prepare details and plans of the structure. The estimated cost being 8,000l.

THE ROYAL SANITARY INSTITUTE.—The following is the list of members and associates elected this month:—*Members*.—W. Boby (Salisbury House, E.C.); E. A. Bush (Beeston, Notts); E. E. Collins (London, E.C.); F. Cottle (Donglas, N. Ireland); W. H. Dairo, (Gizeh, Cairo, Egypt); E. T. Hayes (Chotzenburg); L. L. Honey (Chatham); A. P. Maddocks (Stoneycross, Spendon, Derby); F. E. Marsh (Pinchley, N.); W. W. Lewman (Loughborough); A. C. Norman (Norwich). *Associates*.—H. G. Allen (Methergingham, Lincolnshire); H. Clapham (Ince, near London, W.); D. G. Carriff; W. Holt (Munzenberg, Cape Colony); W. A. Hullon (Lowey Crumpsall, Manchester); D. Llowellyn Blaengorn, near Bridgend); E. Mantell (Sparkhill, near Birmingham); Miss M. A. Raw (Tooting, W.); J. P. Shannon (Dunfriess, N.B.); Miss C. G. Cheskes (Melmas, S.W.); Miss E. Swain (Brincliffe, Sheffield); Mrs. A. C. Young (London, S.W.).

Foreign.

ROME.—Mr. Morgan, the British Consul, in his report for the year 1905, just received at the Foreign Office, observes that people who return to Rome after an absence of a decade or so can scarcely recognise the old city under its modern garb, which, however adversely it may affect its archaeological interest, cannot but impress the visitor. As population in the comparatively brief space of twenty years has risen from 1,015,035 to over 500,000, and the extensions around Rome have given way to suburban quarters, which, although unsightly, give shelter to thousands of new comers from all parts of Italy, who contribute their share of individual burr towards the economic development of the city. Numerous new hotels have been built on modern systems, and the discomforts of which so much used to be heard in the past have been removed. Smoking chimney-stacks, quite a new feature among the ruins of the past, mark here and there the presence of rising manufactures. Electric trams have superseded the lumbering omnibuses, and a large and rapid traffic of passengers is carried on daily. Notably the opposite quart of the town are now connected by the new tram lines, but the pretty half towns near Rome, such as Frascati and Cotterafatta, are now served by them. It is interesting to note that the price of commodities has risen. It was at first supposed that the rise was due to the manœuvres of speculators,

but there is every reason for believing that the improved local economic conditions have been determining factors. The scale of wages also tends to increase. It has been the prevalent custom in the past for a great many of the inhabitants of Rome to quit the city on the approach of summer, which fact is justly considered to be seriously detrimental to the economy of the district. A British company is now going to give effect to a plan whereby the inhabitants of Rome will be provided with a summer resort custom in the immediate neighbourhood of the capital. The site chosen for the new summer town is called "Pratone", a small plain, or table-land, surrounded by shady woods of chestnuts, acacias, and oaks. The "Pratone" is 3,210 ft. above the sea level, and general local conditions are reported as being favourable for the carrying out of the object in view—short distance from Rome (twenty-one miles as the crow flies), clear bracing mountain air, the temperature in summer rarely exceeding 70° Fahr., and good water. The company intend running electric carriages between Rome and the "Pratone", which distance they estimate will be covered in an hour. The ascent to the "Pratone" will be effected by means of a series of steep inclines. The electric energy will be derived from the river at Tivoli. The available supply is estimated at 800 horse-power, of which 500 will be required for working the railway and 300 will be utilised for lighting and industrial purposes. A large area on the top of the "Pratone" has been secured for the erection of a hotel and restaurant, as well as for a club house, theatre, etc., the remaining land will be sold to private individuals who may wish to build thereon summer residences. The cost of the railway and buildings is estimated at 150,000l. An electric tramway line connecting Rome with the surrounding villages has been opened for traffic. The advantages accruing to the population of the capital will be considerable, inasmuch as it is proposed to build houses for the less favoured classes in the districts near Rome served by the projected line, and thus enable them to live out of the city, where house rents have of late years increased very much owing to the dearth of apartments consequent upon the demolitions ordered by the municipal authorities and the increase of population.

GERMANY.—The old mint at Friedrichstadt is to be restored under the direction of Professor Haupt. A competition is to be held for designs for an Exhibition Hall in Frankfurt, the premiums for which will amount to 36,000 marks.—The new bridge at Dresden—the Augustus Bridge—is to be built from designs by Herr Wilhelm Kreis; the work will be begun on both sides of the Elbe simultaneously, in the autumn of this year.—The town of Kiel has voted the sum of 2,475,000 marks for the erection of a new land.—In the course of the instalment of a new organ in the Church at Pietenen (Canton Bern), a tablet, dating from the XIVth century, and several frescoes of this and later periods, were discovered.—The expenses of the restoration of the Church of St. Francis, at Lausanne, amounted to 14,761 francs less than was estimated; the surplus is to be employed to supply stained glass windows, which are now being designed by Herr Heaton, of Neuchatel.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The business of Messrs. Alexander Boyd & Son, 105, N. Old Broad-street, has been transferred to Messrs. O'Brien Thomas & Co. (range, stove, and sanitary goods merchants), and the original business of Messrs. Boyd & Son will be carried on as a branch of theirs, at 297, Oxford-street, under the management of Mr. R. W. Boyd.—Messrs. Davis & Bennett, sanitary and hot-water engineers, have taken into partnership Mr. Leslie E. Wilton, and the style of the firm will in future be "Davis, Bennett & Co."

HOUSE PROPERTY AND INVESTMENT COMPANY (LIMITED).—The report for the twelve months ended March 31st, 1906, has just been published, 4,504l. for depreciation, and the payment of 2,341l. out of revenue for structural and sanitary repairs, the surplus amounts to 25,527l., giving a total available balance of 27,283l. The net revenue (25,527l.) is 192l. less than that during the preceding period, which was stated to be satisfactory, regard being had to the unusual amount of unimproved property in and around London, of which at present there is no sign of improvement. An interim dividend of 2 per cent. having been already paid, the directors recommend the payment of a final dividend of 2 per cent., making 4 per cent. for the year, leaving 1,950l. to be carried forward, and 500l. to be placed to the reserve which is thus increased to 42,000l.

TOWER BRIDGE.—In giving evidence before the Committee of the House of Commons respecting the Corporation of London (Blackfriars and other Bridges) Bill, Mr. Pellico, City Remembrancer, stated that under clause 64 the Corporation seek for powers to discontinue the

use of the upper part of Tower Bridge. The Tower Bridge Act required that provision should be made in that form for crossing the bridge when the bascules were lifted, but as a matter of fact the upper bridge is not used on those occasions, since foot-passengers prefer to walk until the roadway is lowered. The Committee found the preamble of the Bill proved, upon the understanding that the upper footway of the bridge will be kept in working order so that it may be availed of in the event of any temporary failure of the machinery which operates the lower roadway.

QUEEN VICTORIA MEMORIAL.—In the House of Commons, on the 9th inst., Sir W. Collins, asked the First Commissioner of Works what was the nature of the building operations which were now being carried on at Primrose-hill; whether the buildings to be erected were of a permanent or temporary character; and if he would undertake that the buildings in question should be so designed as not to interfere with the picturesque character of the neighbourhood.—Mr. Harcourt: About one-fifth of an acre has been raised off for a studio for Mr. Brook for his work on the Queen Victoria memorial; the temporary building will be removed when the work is completed. From my knowledge of the elevation I am satisfied that it is not likely to interfere with the surrounding scenery.

ST. LOUIS EXHIBITION.—The report of the Royal Commission which has just been issued contains a report, written by the secretary, Colonel Sir C. M. Watson, upon the transportation and installation of the collective exhibits of British Industries, and a description by Professor L. F. Vernon-Harcourt, British juror for Civil Engineering and Public Works, of the civil engineering exhibits which consisted mainly of models of maritime dock, navigation, and irrigation works, with some exemplars of military architectural engineering works. Mr. H. S. Cunyngame, C.B., furnishes the report of the committee for mines and metallurgy, and Sir Boverton Redwood one upon chemical industries. The United States Government Bureau of Standards bought the complete plant of the exhibited apparatus for the liquefaction of hydrogen.

TRAMWAY AND RAILWAY BILLS IN PARLIAMENT.—The House of Commons Committee, of which Sir Lewis Melver is chairman, gave their decision last week upon the London County Council (Tramways and Improvements) and the Middlesex County Council (Tramways) Bills. The Committee found the preamble of the former Bill proved except in so far as it relates to the proposed tramway along Edgware-road from Marble Arch to Cricklewood. They have amended the London County Council's Bill by providing that the terminus of the tramway on Victoria-embankment must be at a point opposite John Carpenter-street pending the widening of Blackfriars Bridge, and that the Council shall widen the roadway of Westminster Bridge by throwing into it 2 ft. of the footway on each side before they carry the tramway over the bridge. They have, moreover, reduced from seven to five years the period for the construction of the over-bridge tramways, in order that the term may synchronise with that taken by the Corporation of the City for the widening of Blackfriars Bridge. As regards the North-East London Railway Bill, the Select Committee of the House of Commons on Unopposed Bills, Mr. Emmott being the chair, have ordered to be reported for third reading a measure for conferring further powers in respect of the proposed construction of a railway from the Monument to Waltham Abbey. Sir Douglas Fox is engineer to the company, who seek to acquire additional land for a sub-station at Gresham House and to provide more rolling-stock in order to increase the service from a three to a two minutes' service, and to raise an additional capital of 333,000l. for those purposes. The Metropolitan District Railway Bill was passed through the Committee stage on May 8 by the House of Commons Private Bill Committee, presided over by Sir G. Doughty. The Bill relates to certain minor works and the construction of a subway from South Kensington Station, giving access to the Albert Hall. The Albert Hall Commissioners agreed, through their counsel, to the insertion in the Bill of a clause safeguarding their interests in respect of the subway.

STATUE OF THE LATE MR. W. E. H. LECKY, TRINITY COLLEGE, DUBLIN.—The statue erected to the memory of the late Mr. W. E. H. Lecky by the graduates of Trinity College and other Honorary degrees unveiled on the 10th inst. by the Right Honourable Lord Rathmore. The commission for the work was given to Mr. W. Goscombe John, A.R.A., and the statue has been placed in the open space between the library and the examination hall. Cast in bronze, it stands on a pedestal of Irish limestone. It is more than life-size, and represents Mr. Lecky seated in an easy attitude, an open book lying on his knees, and his left arm resting on the arm of the chair.

PROPOSED COAST PROTECTION WORKS, BOURNEMOUTH.—The Bournemouth County Borough Council having made application for sanction to borrow 18,000l. for the purpose of constructing an undercliff drive and works of

cliff preservation and protection between the Bournemouth Pier and Myrick-road, and 6,100 ft. for the purchase of certain properties known as "Elmhurst" and "Leyton Mount," for the purpose of a museum, etc., Mr. P. M. Crosthwaite, M.Inst.C.E., held, on behalf of the Local Government Board, an inquiry into the subject matter of such application at the Council Chamber on the 3rd inst. Mr. F. W. Lacey, M.Inst.C.E., the Borough Surveyor of Bournemouth, stated that during the seventeen years he had held his appointment he had watched and studied the condition of the cliffs and had found that they were wearing away through atmospheric influences. He described the scheme in question, submitting that there would not be any interference with the full enjoyment of recreation on the sands or with bathing, and the proposed drive would be well sheltered, being protected from the north winds which generally prevailed. In ordinary circumstances there would not be less than 50 ft. of sand between the sea and the drive, and it was only occasionally that the sea got as far as the foot of the cliffs. The area to be taken up by the drive would be on soft sand. It was proposed that the drive should be 35 ft. wide, and the promenade 20 ft. wide on the seaward side, with an elevation of 10 ft. above mean water mark. The toe of the wall would go down about 2 ft. below water mark, and the level would be of sloping character, two in one, with a flight of steps if required.

GLASGOW SCHOOL OF ARCHITECTURE.—An exhibition of drawings by students who attend at the School of Art and the Technical College the classes that jointly prepare for the diploma and certificate of the Glasgow School of Architecture will be on public view for a few days in the Exhibition Hall of the Technical College. The work comprises original designs for buildings, studies of classic examples pre-Christian and mediæval, measurements and sketches of actual examples—both local and as far afield as Oxford—and problems in constructional design. In all, over a thousand drawings are hung. The prizes awarded have been made by a jury comprised of Mr. Hippolyte J. Blanc, R.S.A.; Mr. T. L. Watson, F.R.I.B.A., one of the College Governors; Mr. David Barclay, F.R.I.B.A.; Mr. James Lindsay, A.R.I.B.A., representing the Glasgow Institute of Architects and the professors of the School and College. The maintenance scholarship of 200 has been gained for the second time by Edward G. Wylie, a day studentship of 150 falls to Wm. Jas. Anderson, travelling scholarships of 100 to William Lindsay and W. Alexander Robb, and the Glasgow Institute of Architects' prize to Thos. C. C. Mackie.—*Glasgow Herald.*

LONDON SQUARES AND ENCLOSURES BILL.—In the House of Lords on Tuesday, on the order for the second reading of this Bill, the Earl of Wemyss moved that the second reading of the Bill, which, he said, embodied a very dangerous and important principle, be postponed for a week. The Bill was proposed by the London County Council to prohibit or restrict the erection of buildings or structures on certain lands in the Administrative County of London, and, as far as he could make out, there was no compensation or purchase proposed. That was a very dangerous principle. The Earl of Onslow mentioned that this Bill was before the House last Session, when it was thrown out by the Committee to whom it was referred. It had been put down for second reading on several occasions, and it was postponed from time to time, so that the noble earl had had ample opportunity of taking objection to it. He would venture to point out that it was not usual to challenge a Bill of this kind on the motion for the second reading. There would be ample opportunities for doing this at subsequent stages. The Earl of Wemyss said he should call attention to the Bill later on, and, meantime, he should strongly advise their lordships to look carefully into the far-reaching principle embodied in it. The motion for postponement was not pressed, and the Bill was read a second time.

Legal.

DISTRICT COUNCIL'S REJECTED AWARD.

The case of the King v. The Colwyn Bay Urban District Council (*ex parte* Ward) came before the Divisional Court of King's Bench, composed of Justices Darling and Chunnell, on the 12th inst. Mr. Macnorrhan, K.C. (with him Mr. C. C. Hutchinson), said he had to show cause against a rule for a mandamus compelling the Council to show cause why they should not take up an award which had been made in the dispute between them and Mrs. Ward. Under an Act of 1902 the Colwyn Bay authority had power to construct certain promenades and similar works in their district, and it was provided that if in doing so any damage was done to property they should pay for it. The Council, in pursuance of their powers, altered the level of an existing street, and, it was alleged, thereby injuriously affected access to the land of Mrs. Ward, and in other ways injured her property. She made a claim for compensation amounting to 3000, and

arbitrators were appointed on each side. They disagreed, and an arbitrator called in under the Public Health Act. He had made his award, and the Council refused to take it up. The learned counsel argued that, though they would have been compelled to take it up had these proceedings been under the Lands Clauses Act, there was nothing to compel them to do so under the Public Health Act.

Mr. P. E. Smith, on behalf of the applicant, argued that the arbitration was under the Lands Clauses Act. He said that what was done was that the level of the road in front of Mrs. Ward's house was raised. It was a main work and not a subsidiary work, and therefore it came under the Lands Clauses Act. Their lordships held that there was nothing inconsistent with the Colwyn Bay Act to say that the Lands Clauses Act applied in connexion with work carried out under it, and therefore made the rule absolute for the Council to take up the award with costs.

Order accordingly.

ACTION AGAINST BUILDERS BY SUB-CONTRACTORS.

THE hearing of the case of Geary, Walker, & Co., Ltd. v. Lawrence & Son concluded in the Court of Appeal before Lords Justices Vaughan Williams, Stirling, and Moulton on the 11th inst. on the defendants' appeal from a judgment of Mr. Justice Kennedy, sitting without a jury in the King's Bench Division.

Mr. G. A. Scott appeared for the appellants, and Mr. J. Eldon Bankes, K.C., and Mr. Lewis Thomas for the respondents.

Mr. Scott, in opening the case, said the action was brought by the plaintiffs, wood flooring contractors, of No. 11, Queen Victoria-street, E.C., against the defendants, Messrs. Walter Lawrence & Son, of Waltham Cross, a firm of builders, to recover a balance alleged to be due under a building contract, the defendants being the main contractors and the plaintiffs the sub-contractors. The question the learned judges had to decide was, whether on May 12, 1904, the sub-contractors were entitled to sue the main contractors for the balance of their account. On that date the plaintiffs issued their writ claiming 106l. 2s. The case for the defendants was that the plaintiffs had commenced their action prematurely. Defendants said that they were entitled to hold the balance until all the work was approved by the architect.

Lord Justice Moulton said he understood the point was, whether the action was ripe at the date of issuing the writ.

Mr. Scott said that that was so. Although the amount sued for was comparatively small, the case raised a question of great importance, with reference to building contracts. The learned counsel went on to state that the defendants on January 23, 1902, entered into a contract with the Edmonton Urban District Council to erect swimming baths, a Council Chamber, Council offices, etc., the contract price working out at something between 30,000, and 40,000. Defendants agreed with the plaintiffs to do the wood flooring, etc., for 1,058l. Of this 952l. had been paid, and the action was brought to recover the balance. The contract between the plaintiffs and the defendants was dated March 11, 1903.

Under that contract the plaintiffs and sub-contractors, agreed that the work should be done and the materials supplied to the satisfaction of the architect, Mr. W. G. Scott, and that they would maintain it for a certain period. Defendants further said that under their own contract with the Edmonton authority they only received 80 per cent. of the amount due for work done until a certain period, and that the plaintiffs were subject to the same terms as to money being retained as security for the work being properly done. Mr. Justice Kennedy held that the retention clause did not apply to the plaintiffs, and gave judgment for them for 88l. 19s. The learned counsel submitted that at the time the plaintiffs issued their writ the money was not due under the contract and that therefore the decision of Mr. Justice Kennedy was wrong. The material clauses in the main contract between the Edmonton authority and the defendants were as follows:—Clause 20: "All specialists, merchants, tradesmen or other excoiting work or supplying any goods for which prime-cost prices or provisional sums are included in the specification, who may at any time be nominated, selected, or approved by the architect, are hereby declared to be sub-contractors employed by the contractor; but no such sub-contractor shall be employed upon other work against whom the contractor shall make what the architect considers reasonable objection, or who will not enter into a contract with the contractor upon terms and conditions consistent with those in this contract and securing the due performance and maintenance of the work supplied or executed by such sub-contractor and indemnifying the contractor against any claims arising out of the misuse by the sub-contractor or his workmen of any scaffold erected or plant employed by the contractor, or that may be made against the contractor in consequence of any act, omission,

or default of the sub-contractor, his servants, or agents, and against any liability under the Workmen's Compensation Act, 1897, or any amendment thereof." Clause 30 ran:—"The contractor shall be entitled under the certificate to be issued by the architect to the contractor and within fourteen days of the date of each certificate, to payment by the employer from time to time by instalments when in the opinion of the architect work to the value of 5000, or less (the reasonable discretion of the architect) has been executed in accordance with the contract, at the rate of 80 per cent. of the value of work so executed in the building until the balance retained in hand amounts to the sum of 2,0000, after which time the instalments shall be up to the full value of the work subsequently executed. The contractor shall be entitled under the certificate to be issued by the architect to receive payment of 1,5000, being a part of the said sum of 2,0000, when the works are practically completed and in like manner to payment of a further sum of 3000 within a further period of three months or as soon after the expiration of such period of three months as the works shall have been finally completed and in like manner to payment of the balance of 2000 within a period of twelve months from final completion and after all defects made good according to the true intent and meaning of the contract. The architect shall issue his certificate in accordance with this clause. No certificate of the architect shall be considered conclusive evidence as to the sufficiency of any work or materials to which it relates nor shall it relieve the contractor from his liability to make good all defects as provided by this agreement. The contractor when applying for a certificate shall if required, as far as practicable, furnish to the architect an approximate statement of the work executed, based on the original estimate. The contract of March 16, 1903, was as follows:—

"We, the undersigned, Messrs. Geary, Walker, & Co., Ltd., of 11, Queen Victoria-street, E.C., have agreed to consider and execute all mosaic and other work at the Town Hall, Baths and Council Chamber Buildings, Lower Edmonton, for Walter Lawrence & Son, of Canal Works, Waltham Cross, and to the architect's entire satisfaction, orders for which have been or will be sent us from time to time by the said Walter Lawrence & Son, the work to be carried out and when required by them, we further agree that no claim shall be made by us for any extras of any kind, unless the same have been ordered in writing by the said Walter Lawrence & Son, and that we will maintain in proper working order the whole of the work executed by us until the expiration of the time for which the said Walter Lawrence & Son are bound by their employment under their contract dated January 23, 1902, and we will also indemnify them against any loss upon any question which may arise under clause 20 of the conditions of the contract above mentioned, and the terms of payment for the work done in pursuance of the contract above mentioned set forth in clause 30 of the said conditions of contract above referred to; and in fact we are willing and hereby agree to be bound in every respect by the whole of the terms, clauses, and conditions as set forth in the contract dated January 23, 1902."

Mr. Eldon Bankes and Mr. Lewis Thomas having supported the judgment of Mr. Justice Kennedy.

Lord Justice Vaughan Williams, in giving judgment, said that, having regard to the documentary evidence, the Court must assume that the parties knew the course of business qualified to the extent that Mr. Walker in his evidence stated that he did not know the details of the retention scheme in the original contract between the defendants and the Edmonton authority. With that exception they must assume that both parties knew the course of business and that certificates were being given. It seemed to his lordship that the intervening certificates of the architect did not on the face of them say that any particular work was included in the amount certified for, and in these circumstances the onus lay on the plaintiffs to show that the certificates did in fact include the work in question. He thought the proper way to construe the documents of March 16, 1903, was to read the contract by *opposita materia* clauses 20 and 30 of the main contract between the contractors and the local authority. He thought the plaintiffs had failed to make out that they were entitled at the time they brought the action to succeed in recovering the balance of their account, and on these grounds he was of opinion that the judgment of Mr. Justice Kennedy should be set aside. Lord Justice Stirling said he always regretted to find himself differing from Mr. Justice Kennedy, but he came to the conclusion that his judgment could not be upheld. He agreed that *prima facie* the covering letter of March 16, 1903, ought to be treated as introducing a new term into the contract which was accepted by the defendants by their making no objection; but as neither side desired in any way to rely upon the letter, it was far better, he thought, that their judgment should not rest upon that, and he was quite content to proceed upon the formal contract of March 16, 1903. The question turned upon these

words: "And the terms of payment for the work in question shall be exactly the same as those set forth in clause 30 of the said conditions of contract above mentioned." It had been said that it was impossible to give effect to that stipulation. His lordship was not persuaded of that. What were the terms of payment as they appeared from clause 30 of the contract? First, that the contractor, meaning there the main contractor, was to be entitled under the certificates to be issued by the architect to him to payment by the employer by instalments at the rate of 80 per cent. of the value of work so executed in the building until the balance retained in hand amounted to 2,000*l.*, after which time the instalments were to be up to the full value of the work subsequently executed. The contract of which clause 30 was a part was a contract to erect buildings at a cost, speaking in round figures, about 28,000*l.*, and 2,000*l.* was to be the fund which was to be kept in hand by the employer by means of deductions from the amounts which appeared by the architect's certificates to be due. The sub-contract with which they had to deal was in comparison a very small contract. The whole sum which was to be received in payment was somewhere about 1,000*l.*, and obviously therefore literally the 2,000*l.* (if that was read as being part of the contract) would make it impossible to work; but what the document of March 16, 1903, said was not that clause 30 was to be in its very language, but that the terms of payment for the work were to be exactly the same as in that document. One of the terms of clause 30 was that a sum of 2,000*l.* of 28,000*l.* was to be retained. It seemed to his lordship that the exactly similar term would be that a like proportion of the 1,000*l.* should be kept in hand, and that the sub-contract should from time to time receive from the main contractor 80 per cent. up to the time when the sum bearing the same proportion as the 2,000*l.* bore to the 28,000*l.* had been accumulated, and after the full payment. Then that being the term of the payment, the instalments in the clause contained no provision as to how the 2,000*l.* which was to be kept in hand was to be dealt with. It provided that the contractor should be entitled, under the certificate to be issued by the architect, to receive a payment of 1,500*l.*, being a part of the 2,000*l.* when the works were practically completed, and in like manner to payments of a further sum of 300*l.* within a further period of three months or as soon after the expiration of such period of three months as the works had been finally completed, and in like manner to payment of the balance of 200*l.*, within the period of twelve months from final completion, and all defects were made good according to the true intent and meaning thereof. Having got over the difficulty as to the 2,000*l.*, it seemed to him that there was no difficulty in saying that the stipulation that the terms for the payment of the retention money should be dealt with in a similar manner, that the fund kept in hand should be divided into three parts, one of which bore the same proportion to the total retention money as the 1,500*l.* did to the 2,000*l.*; then the second part which would be dealt with would be a sum which bore the same proportion to the total amount of the retention money as the 1,500*l.* bore to the 2,000*l.*, and then there would be the ultimate balance a retained. So far it seemed to him that effect could be given to the contract, but then there followed the stipulation which had created a considerable amount of difficulty to him, because there was a positive stipulation that the architect should issue his certificate in accordance with that clause. Then, prior to the contract of March 16, 1903, the architect had positively declined to issue certificates to any sub-contractor under the main contract, and it did seem to his lordship a difficulty which had to be met as to what the effect of that was on the stipulation. He thought that both parties must have been aware of the course of business. In fact Mr. Walker, who was called, really admitted that, although he did not admit that he knew the details as to the distribution of the retention money. It seemed to him that the proper way to deal with the clause in that case was to treat them as being satisfied to deal with the certificates in accordance with which payments were to be made as being those which were to be issued by the architect to the main contractor, and not to treat this clause as introducing a separate bargain for separate certificates between the main contractor and the sub-contractor. That being so, if that was the true construction of the clause, it seemed to him that the plaintiffs failed to make out that they were entitled at the time when they brought the action to succeed in recovering the balance. That appeared to his lordship to be the case, and that was the result of dealing between the parties subsequently. The sub-contractor never made any objection to the deductions in fact being made at the time. They did not amount, it was true, excepting in the first place, to 20 per cent.; but 10 per cent. was always retained. Both parties were perfectly satisfied with that, and by course it was competent for the main contractor to waive his strict rights. No difficulty arose until the final application was made for the payment of the balance, the delay in which was caused, as it

seemed to him, by the delay on the part of the architect in giving to the main contractor a certificate which entitled him to any portion of the 2,000*l.* which was outstanding. He thought it was plain, therefore, that the plaintiffs failed to make out their case, that they were entitled to payment of the balance at the time they brought the action. On these grounds he was of opinion that the judgment of Mr. Justice Kennedy should be reversed.

Lord Justice Moulton gave judgment to the same effect, and the appeal was accordingly allowed, with costs, both in that Court and in the Court below.

THE ACTION AGAINST THE WARBINGTON URBAN DISTRICT COUNCIL.

MR. JUSTICE WALTON, in the King's Bench Division, on the 14th inst., concluded the further hearing of the case of *Foster v. the Urban District Council of Warblington*, in order to assess the damages the plaintiff was entitled to from the defendants.

The plaintiff, Mr. J. D. Foster, the owner of an oyster business at Ensworth, near Chichester, brought the action for an injunction to restrain the defendants from placing or maintaining their sewer outfalls near the plaintiff's oyster storage beds on the foreshore of Ensworth Creek, and from delivering sewage on the foreshore in the neighbourhood of the beds so as to contaminate the same and to render the oysters unsafe for human food. The plaintiff also claimed damages *ltd* at 10,000*l.* for loss and injury to his business caused by the alleged nuisance. The defendants denied liability on various grounds, but Mr. Justice Walton held that the defendants had no prescriptive right to discharge sewage into the sea so as to contaminate the oysters in private oyster beds and gave judgment for the plaintiff for damages to be assessed. From this decision the defendants appealed, but the Court of Appeal affirmed the judgment of Mr. Justice Walton. The case now came on again before his lordship in order to ascertain the damages to which the plaintiff was entitled.

In the result his lordship awarded the plaintiff 85*l.* damages, the plaintiff to have the costs of the former hearing, but each party to bear their own costs of the present hearing.

Mr. W. Willis and Mr. J. G. Pease appeared for the plaintiff; and Mr. Hohler and Mr. Pitman for the defendants.

THE LONDON BUILDING ACT.

MESSRS. HENRY SMITH & SON, builders, of South Kensington, were summoned, at the Thames Police court recently, for contravening the Building Act by erecting a large wooden screen at the rear of houses in Vauxhall-bridge-road without the permission of the London County Council.

The screen was erected, at a cost of 120*l.*, with a view of preserving the right of ancient lights. The owners would not allow the builders to remove the screen after notice from the District Surveyor, and counsel on their behalf stated that the application and plans for approval were twenty-four days at the London County Council offices before a reply was sent. This delay occasioned expense, time being an element of importance.

Mr. Paul Taylor supposed that the London County Council had such an enormous amount of work that a reply could not be expected sooner. There was such a large amount of machinery to be set in motion—he would not say red tape.

On behalf of the defendants it was said that they were ready to accept any reasonable suggestion, but any sort of structure was objected to, the real reason being that the London County Council were intending shortly to apply to Parliament for more stringent powers over light and air spaces.

Mr. Large, the District Surveyor, said that a previous screen erected was blown down. He did not think anything of this sort would be permitted.

Mr. Paul Taylor made an order for the newly-erected screen to be removed within four weeks.—*Morning Advertiser.*

Patents of the Week.

APPLICATIONS PUBLISHED.*

10,952 of 1905.—E. RUCKGAUVER: *Method and Means of Shifting or Removing and Turning Buildings.*

This relates to a method of shifting entire buildings, which consists in mounting in the base or foundation, and in front of the same, a supporting frame or stationary grating chiefly composed of a series of beams at right angles to the line of advance, inserting into the walls a movable upper frame, chiefly composed of a series of longitudinal beams arranged and shaped like the runners of a sledge, and of a main transverse

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

beam placed across the rear ends of the longitudinal beams, mounting behind the building a propelling mechanism adapted to press uniformly on numerous points of the width of the upper frame, detaching the building from the masonry foundation, operating the said propelling mechanism up to the end of its stroke, readjusting the propelling mechanism again operating, and re-adjusting the same alternately, and periodically extending the stationary grating in proportion as the work advances.

11,125 of 1905.—G. J. WILLIAMS: *Casement Stays or Fasteners and Opening Closing Apparatus.*

This relates to casement stays or fasteners, and consists essentially in the employment in combination of a cylindrical bracket secured to the casement, an operating screw carrying a ball located in said bracket and operating in a horizontal slot therein, a vertically pivoted nut on the casement frame, and a knob for rotating the aforesaid screw.

12,502 of 1905.—J. S. PULLAN and W. H. MANN: *Machines for Moulding Facing Tiles.*

This relates to a power machine for moulding facing tiles comprising in combination a press frame provided with a driven crank shaft adapted to operate an upper ram through the medium of toggle levers or cams, a table formed with a mould beneath the upper ram, a reciprocating feed-box on the table adapted to deliver the powdered substance into the mould, a lower ram, consisting of two elastically-connected members adapted to slide vertically on fixed guides, and carried on a strong, spiral spring located in a base box on the bed of the press frame, internal spindles situated within the lower ram adapted to form undercut or depressions in the tile, and a double-headed rocking lever in connexion with the lower ram, operated, through the medium of a two-part elastically-operated rod, by a cam on the crank shaft of the press.

7,752 of 1905.—A. B. C. DASKS: *Hermetically Sealed Doors of Cylinders and Chambers used for Creosoting or Vulcanising Vacuum Pans and Brick Hardening Chambers for High-Pressure, and the like purposes.*

This relates to doors which are sealed and secured by screw applied radiating arms engaging with slots or staples in a cylinder or chamber, and is characterised by a wrought and dished door having an encircling ring, the shoulders of which are provided with a recess containing soft metal, or other suitable packing, in combination with cam-shaped ends to the radial arms, which operate directly upon the ring, and thereby force the packing on to the chisel-edged projection on the shoulder of the cylinder.

8,285 of 1905.—DR. B. BRUHN: *A Process for the Preliminary Treatment of Blast Furnace Slag for the Production of Cementitious Material.*

This relates to a process for the treatment of blast furnace slags or other silicate mixtures for the manufacture of cementitious materials, in which the silicate mixtures are used in a molten state immediately after their burning or melting process with a small per cent. of alkalis or alkaline salts, and are then granulated and ground to a proper grade.

14,576 of 1905.—E. J. PROPPER and F. BACHSCHMID: *Blocks or Tiles for Covering Floors, Walls and Ceilings.*

This relates to blocks for covering floors, walls and ceilings, and consists of cross-shaped wooden tablets, the arms of which are rectangular, and have their angles or inner corners formed with rib-shaped projections, and the outer corners or edges of their end faces formed with corresponding grooves.

16,863 of 1905.—W. T. HARRISON: *Flooring Tiles and Surfaces.*

This relates to an elastic-faced flooring tile having an earthenware or hard grooved base and an applied rubber face consisting of two layers of varying elasticity, the base rubber being harder than the treading face so as to obtain a better effect.

17,015 of 1905.—H. OSBORNE: *Operation Devices for Hinged Fanlights or Windows.*

This relates to an operating device for hinged fanlights or windows, and consists of a transom fitted of the kind comprising a worm, means for pivoting the worm, and a worm wheel having on its shaft a lever for operative engagement with the transom, the provision of coil springs encircling the worm wheel shaft at opposite sides of the worm wheel, having the extremities of each engaged with the supporting fixture, and having their free extremities arranged in opposition, and a bar engaged with said free ends of the springs, and intermediately engaging the toothed edge of the worm wheel.

17,057 of 1905.—J. A. SHEPHERD: *Water-proofing Composition.*

This relates to a chemical proofing apparatus for treating fabrics to render them water-proof, made up of jelly soap, gum, tragacanth, wax and water.

PATENTS.—C continued on page 570.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xvi.; Auction Sales, xxvi.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

Competition.

* JULY 4.—**Warblington**.—SEWERAGE WORK.—The Warblington U.D.C. invite schemes (with plans, specifications, and estimates) for main sewerage and sewage-disposal works for the parish of Warblington (including the town of Emsworth, Hants). Premium of 100*l.* is offered for the scheme, and estimate selected as first, if approved by the Local Government Board. In the event of the scheme being carried out the premium will form part of the engineer's commission: 50*l.* is also offered for the scheme selected as second. Schemes, plans, specifications, and estimates to be addressed to the Clerk, Council Offices, Queen-street, Emsworth, not later than July 4.

Contracts.

BUILDINGS.

MAY 18.—**Manchester**.—OFFICE BUILDING.—A new office building and alterations to adjoining property in Major-street, Manchester. Name and address to Messrs. J. H. Burton & J. A. Percival, architects and surveyors, 150A, Stamford-street, Ashton-under-Lyne, not later than May 18.

MAY 18.—**Newport**.—CLASS ROOM.—For erection of parish room, Newport, Sillon. Apply to Mr. Oswell, architect, Dane-chambers, Shrewsbury, not later than May 18. Quantities will be supplied on payment of 1*l.* Plans will be deposited with the Rev. W. Hedges, Newport Rectory.

MAY 19.—**Nottingham**.—WALL.—Nottingham Improvement Committee invite tenders for the erection of a brick retaining wall at the junction of London-road and Station-street. Drawings may be seen, and copy of the specification, bill of quantities, and form of tender may be obtained, on applying to Mr. Arthur Brown, M.Inst.C.E., City Engineer, Guildhall, on payment of a deposit of 1*l.* Sealed tenders, endorsed "Wall, Junction of London-road and Station-street," are to be delivered to Mr. Samuel G. Johnson, Town Clerk, Guildhall, Nottingham, on or before May 19.

MAY 19.—**Warley**.—SCHOOL.—Oldbury Urban District Education Committee invite tender for the erection of an infant school at Castle-road, Warley, to accommodate about 250 children. Particulars can be obtained on payment of 1*l.* deposit. Applications to be sent in on or before May 19. Mr. Sidney Vernon, Secretary, Public Buildings, Oldbury.

MAY 20.—**Ballynacash**.—MANSE.—The erection of a manse for the R.P. Church, Ballynacash, Killybegs. Plans and specifications may be had at office of Mr. James Scott, B.E., civil engineer and architect, Ocean-buildings, Belfast. Sealed tenders to be lodged not later than May 20.

* MAY 20.—**Crews**.—SCHOOLS.—The Crews Education Committee invite tenders for schools of Earle-street for 1,350 children. Names to be sent, with deposit of 2*l.*, to Mr. H. D. Struthers, Director of Education, Municipal Buildings, Crews, before May 20. Quantities and other information will be supplied by the architect to those tendering.

MAY 21.—**Batley**.—HOUSES.—The erection of two houses and boundary walls, in Deighton-lane, Batley. Plans and specifications may be seen, and bills of quantities obtained, at office of Mr. John H. Brovley, architect, Commercial-street, Batley, from Monday, May 14 to 21, on which latter date sealed and endorsed tenders are to be sent in.

MAY 21.—**Byfleet**.—HOUSE AND PREMISES.—For the erection of a house and premises to be built in Church-road, Byfleet, Surrey, for Mr. Arthur Sharp. The plans, elevations, sections, details, and specifications can be seen at office of Mr. D. G. Andrews, architect, Bridge-road, East Molesey. Tenders to be sent by post or delivered by 8 p.m., May 21, marked "Tender for House."

MAY 21.—**Fochabers**.—DWELLING-HOUSE.—Mason, carpenter, slater, plaster, plumber, and painter work of new dwelling-house and offices, to be erected at Fochabers, Gordon-Richmond Estates. Plans and specifications may be seen at the Estates office, Fochabers, and tenders will be received by Mr. D. J. Cunningham, Factor, up to 2 o'clock, on May 21.

MAY 21.—**Hinckley**.—SCHOOLS.—The erection of science buildings at the grammar school, Hinckley, for the Governors of the Schools. Conditions of contract, quantities, and form of tender may be obtained, and plans inspected, upon application to the architects, Messrs. Barrowcliff & Alcock, Town Hall-chambers, Loughborough, on payment of a sum of 1*l.* Sealed tenders, upon the forms supplied, to be delivered at office of Messrs. S. & S. H. Pilgrim, Solicitors to the Governors, Hinckley, not later than 11 a.m., May 21, endorsed, "Grammar School Extension." The successful contractor will be required to find two securities in one sum amounting to 20 per cent. of the total amount of the contract.

MAY 21.—**Raila**.—VILLA.—Mason, carpenter, slater, plumber, plasterer, painter, and glazier works of new villa at Raila, near Newtonmore. Plans and specifications may be seen with the architect, Mr. Alexander Mackenzie, C.E., Ringussie, who will receive offers up to May 21.

MAY 22.—**Halifax**.—REPAIRING ROOF.—The Improvement Committee of the Halifax Corporation invite tenders for repairing roof, etc., at Messrs. Holmes Foundry, Booth Fold. Quantities and forms of tender may be obtained on application to Mr. James Lord, M.Inst.C.E., Borough Engineer, Town Hall, Halifax, upon payment of the sum of 1*l.* Tenders, endorsed "Roof, Booth Fold," must be sent to Mr. Keighley Walton, Town Clerk, not later than 12 o'clock noon on May 22.

MAY 22.—**Newcastle**.—North-Eastern Railway Directors invite tenders for rebuilding of horse stables, Waverley-street, 11411. Plans and specification may be seen, and quantities and further information obtained, upon application to Mr. William Bell, the Company's architect, at York. Duplicate plans may also be seen upon application to the Clerk of Works' office, Barrington Station, Hull. Quantities supplied on persons applying for tenders, and pricing for the whole of the works. Sealed tenders marked "Stables, Waverley-street, Hull," to be sent to the Secretary, at York, not later than noon on May 22.

MAY 22.—**Newcastle**.—CONVERTING BUILDINGS INTO OFFICES.—North-Eastern Railway Directors invite tenders for converting old business premises at New Bridge-street, Newcastle, into offices and stores. Plans and specification may be seen, and further information obtained, upon application to Mr. William Bell, the Company's architect, Central Station, Newcastle-on-Tyne. Copies will be required to take their own quantities. Sealed tenders, marked "Offices, New Bridge-street, Newcastle," to be sent to the Secretary, at York, not later than noon on May 22.

MAY 23.—**Aquhorsk**.—RESTORATION OF DWELLING HOUSE.—The mason, carpenter, slater, and plaster works of restoration of dwelling-house at Aquhorsk, Kinellar, Glascoford Estate, Mr. William Ogg, ground officer, Glascoford, will show plans and specifications, and Messrs. Chalmers, advocates, 28, Golden-square, Aberdeen, will receive offers up to May 23.

MAY 23.—**Cardiff**.—PUMPING STATION.—Cardiff Corporation invite tenders for the erection of a pumping station and chimney stacks at Pontard-rhod, for Western District Sewer, Contract No. 7. Plans, specification, and conditions of contract may be seen, and bills of quantities obtained, at the office of Mr. W. Harpur, M.Inst.C.E., City Engineer, Cardiff, upon deposit of 3*l.* Tenders, on the prescribed form, and accompanied by the bills of quantities, and under separate cover, sealed and endorsed "Tender for Pumping Station, Penarth-road," to be delivered at office of Mr. J. L. Wheatley, Town Clerk, Town Hall, Cardiff, on or before May 23.

MAY 23.—**Carlisle**.—WESLEYAN CHURCH.—The erection of proposed new Wesleyan church in Lowther-street, Carlisle. Names to Messrs. Johnston Bros., architects and surveyors, 10, Lowther-street, Carlisle, before May 23, together with a deposit of 10*s.* 6*d.*

MAY 23.—**vedham**.—FACTORY.—For erection of a saw factory in Ervesham for Messrs. T. W. Beach & Sons, Ltd. Names and addresses to the architect, Mr. F. Foster, Masonic-buildings, Coventry, on or before May 23.

MAY 23.—**Kilcoleman**.—RESLATING ROOF.—For reslating the roof and executing other improvements at Kilcoleman Desert, Co. Cork, for Capt. J. E. Longfield, J.P., in accordance with plans and specification prepared by Messrs. W. H. Hill & Son, architects, 28, South-mall, Cork, with whom tenders are to be lodged on or before May 23.

MAY 23.—**Larne**.—SCHOOL.—Building additions and alterations to the Larne Grammar School. Plans, specification, and conditions of contract can be seen at office of Mr. William J. Fennell, architect, 2, Wellington-place, Belfast. Bills of quantities can be obtained from Mr. W. J. M. Carthy, surveyor, Scottish Provident-buildings, Belfast. Tenders to be sent to the Rev. J. Kennedy, Larne, on or before May 23.

MAY 23.—**Mirfield**.—HOUSES AND SHOPS.—The erection of two houses and shops at Lezard Bridge, Mirfield. The drawings and specifications may be seen, and bills of quantities obtained, at Dewsbury offices of Messrs. John Kirk & Sons, architects, Huddersfield and Dewsbury, from May 16 to May 23, on which latter day tenders are to be delivered at Dewsbury before 3 o'clock p.m., free of charge.

MAY 23.—**Netherton**.—ADDITIONS TO HOUSE.—Carpenter, slater, and plaster works of additions to dwelling-house at Netherton (Mrs. Fensholt, Glascoford Estate). The plans and specifications may be seen in the hands of Mr. William Ogg, ground officer. Offers will be received by Messrs. Chalmers, advocates, 18, Gukien-square, Aberdeen, up to May 23.

MAY 23.—**Strata Florida**.—HOUSE.—The erection of a house at Fair-rhos, near Strata Florida, for Miss Thomas, M.Inst.C.E. Plans and specification may be seen on application to Capt. J. Williams, Pretoria House, Pontrhydfryd, or to the architect, Tenders should be sealed and enclosed and delivered to the architect, Mr. G. T. Bassett, A.R.I.B.A., architect and surveyor, Aberystwyth, by May 23.

* MAY 24.—**Maldon**.—SCHOOL, ETC.—The Essex Education Committee invite tenders for new secondary school and pupil teachers' centre shortly to be

erected at Maldon. Names to the architect, Mr. P. M. Beaumont, High-street, Maldon, on or before May 24.

MAY 24.—**Slaithwaite**.—RESIDENCE, WAREHOUSE, ETC.—The erection of a residence, warehouse, etc., in Union-street, Slaithwaite. Plans may be seen, and quantities obtained, at office of Mr. Arthur Shaw, architect, Golear, from May 17 to May 24, on which latter date sealed and endorsed tenders must be delivered not later than 6.30 p.m.

MAY 25.—**Livwoodcoed**.—HOUSES.—Tenders are invited for the erection of fourteen houses in Thwaite-street and Brewery-street, Barrow-in-Furness, for the Barrow Co-operative Society, Ltd. Bills of quantities may be obtained at the office of the architect, Mr. Henry T. Fowler, A.R.I.B.A., 6, Cornwallis-street, Barrow. Tenders to be forwarded to Mr. James Clarkson, Barrow Co-operative Society, Ltd., Abbey-road, not later than 12 o'clock noon on May 25.

MAY 25.—**Livwoodcoed**.—VILLA RESIDENCE.—The erection of a villa residence at Livwoodcoed, Aberdare, on deposit of 1*l.* is at office of Mr. J. Llewellyn Smith, architect, Aberdare. Sealed, endorsed tenders to be sent to Mr. W. M. Jones, 2, Victoria-square, Aberdare, not later than May 25.

MAY 25.—**Navara**.—COTTAGES.—Navara U.D.C. invite tenders for erecting fourteen two-story cottages on the Kells-road, Navara, in accordance with plans and specification prepared by Mr. R. Barnes, A.M.Inst.C.E., which may be inspected at "Tranacra-street, Navara. Copies of specification, bill of quantities, and form of tender are to be had from Mr. James Lawler, Clerk of the Council, Council Offices, Navara, Co. Meath, on payment of 1*l.* Scaled tenders, covering prices of contract, are to be endorsed "Tender for Cottages," addressed to the Chairman of the Council, and delivered to the Clerk of the Council, not later than 12 o'clock noon, on May 25.

* MAY 25.—**Palmer's Green**.—SORTING OFFICE.—For the erection of sorting office at Palmer's Green for H.M. Office of Works. Drawings, specifications, and conditions of contract, can be seen on application to Mr. Wagner, I.L.M. Office of Works, Westminster, S.W. Bill of quantities and form of tender are also to be obtained at the above offices, on deposit of 1*l.* Tenders, endorsed "Tender for Palmer's Green Sorting Office," and addressed to the Secretary, to be delivered at H.M. Office of Works, Storey's Gate, S.W., before 12 o'clock noon on May 25.

MAY 26.—**Chingford**.—IRON SCHOOL BUILDING.—Essex Education Committee (Epping Local Advisory Sub-Committee) invite tenders and specifications for the erection and completion of a temporary iron school building to accommodate 200 children, with necessary out-offices, at Chingford, Essex. Proposed plan of buildings can be seen, and form of tender, on deposit of 1*l.* at the offices of Mr. Frank Whitmore, Chelmsford. Sealed tenders, endorsed "Tender for Temporary Iron School, Chingford," to be sent not later than May 26 to Mr. J. Herliet, Sec. Clerk to the Committee, Office, Louzton, Essex.

MAY 26.—**Boisover**.—SCHOOL.—Derbyshire Education Committee invite tenders for the erection of Old Boisover School to accommodate about 60 children. Drawings, specification, agreement, etc., at the office of the Architect to the Committee, St. Mary's-site, West Ferry-road, Ponlar E., for sixty men, 4 p.m., except on Saturday, when they will be on view from 10 a.m. to 12 noon. A copy of the bill of quantities, specification, conditions of contract, and form of tender can be obtained at the Architect's office upon payment of 1*l.* is. Sealed tenders in envelopes provided for the purpose, and endorsed "Tender for New Council School, Old Boisover," must be delivered to Mr. George H. Widdows, A.R.I.B.A., Architect to the Committee, County Education Offices, St. Mary's-gate, Derby, not later than 5 p.m. on May 26. The C.C. will receive sealed tenders and bills of quantities for the due and proper performance of the contract.

* MAY 29.—**Poplar**.—SCHOOL.—The L.C.C. invites tenders for erecting a school on the Janet-street site, West Ferry-road, Ponlar E., for sixty mentally defective children. Drawings and specification may be seen, and bills of quantities, form of tender, and other particulars obtained, at the Education Offices (Architects), Dept. of Education, embankment, W.C., on payment of 3*l.* Tenders in envelope provided, to be delivered at Education Offices (Room 149, Victoria-embankment, W.C., before 11 a.m., May 29.

MAY 29.—**Senghenydd**.—HOUSES.—The erection of sixty houses and road-making, etc., at Senghenydd, for Lewis Merthyr Consolidated Collieries, Ltd. Drawings and specifications can be seen at office of Mr. John H. Phillips, F.R.I.B.A., Clive chambers, Windsor-place, Cardiff, and sealed tenders, endorsed "Senghenydd," are to be delivered on or before May 29.

MAY 30.—**Abram**.—SCHOOL.—Lancashire Education Committee invite tenders for the erection of a new public elementary school at Lily-lane, Bryn Gates, Abram, near Leigh. The plans may be seen and bills of quantities obtained at the office of the County Architect, Mr. Henry Littler, 16, Ribblesdale-place, Preston, on payment of a deposit of 2*l.* Tenders must be delivered before 12 o'clock noon on

May 30, sealed and endorsed, to Mr. W. Aspinall, Rockleigh, Ashlon-in-Makerfield.

MAY 30.—Colchester.—SCHOOL.—The Corporation invite tenders for the erection of a school in Greenstead-road, to be known as the East Ward Council School. Plans and specifications may be seen, and bills of quantities obtained from the architect, Messrs. Godley & Cressall, Victoria-chambers, Colchester, on payment of a deposit of 5l. Tenders, under seal, must be on the form supplied, endorsed "Tender for School, East Ward Colchester," and delivered at the offices of the Committee not later than 12 o'clock noon on May 30.

MAY 30.—Durham.—PREMIERS.—For rebuilding premises at the rear of 61, Scauder-street, Durham. Plans and specifications may be seen, and quantities obtained, at Rensworth's Art Gallery. Sealed and endorsed tenders to be delivered to Messrs. Rensworth & Son not later than May 30.

MAY 31.—Sudbury.—HOSPITAL ADDITIONS.—The Committee of Management of St. Leonard's Hospital invite tenders for the erection of additional accommodation, consisting of nurses' bedrooms, isolation ward, etc. Drawings, specification, and conditions may be seen at the office of the architect, Mr. Alfred Howard, Coventry-road, Sudbury. Tenders, which are to be sent in by May 31, should be sealed and endorsed "Tender for Additional Accommodation at St. Leonard's Hospital," and addressed to Mr. Joseph Alexander, Secretary of the St. Leonard's Hospital, Sudbury.

JUNE 1.—Port Patrick.—DWELLING-HOUSE.—The erection of a dwelling-house at Port Patrick, in the County of Down. Plans and specifications will be supplied on application to the Superintendent Engineer, H.M. Naval Establishment, Rosyth, Inverkeithing, N.B. The drawings, specification, and conditions may also be seen there, and at Port Patrick Coastguard Station, and at the office of Director of Works Department, Admiralty, where tenders are to be delivered not later than May 31.

JUNE 2.—Leigh.—SCHOOL.—Corporation of Leigh invite tenders for the erection of a new school in Windermere-road, Leigh. Names to the architects, Messrs. C. French & Co., 10, Broad-church-lane, Leamington Spa, Leamington, Warwickshire. Plans and specifications may be seen, and the bill of quantities with the form of tender annexed, obtained at the office of the architect, Mr. J. H. G. Balfour, Town Hall, Leigh. Tenders, which are to be sent in by the Chairman, School Buildings Committee, Town Hall, Leigh, and endorsed "Tender for Council School, Leigh," must be sent to Mr. Stanley Wilson, Town Clerk, Town Hall, Leigh, before 12 o'clock on June 2.

JUNE 4.—Kilross and Findhorn.—ALTERATIONS TO SCHOOLS.—The mason, carpenter, slater, plumber, plasterer, and painter works of alterations and additions to the schools at Kilross and Findhorn. Plans and specifications may be seen with Mr. Peter Fulton, architect and surveyor, North of Scotland Bank Buildings, Forbes, who will receive sealed tenders on an envelope as follows:—

MAY 31.—Little Heath.—SCHOOLS, ETC.—The Hertfordshire C.C. Education Committee invite tenders for new elementary school and teacher's residence at Little Heath. Drawings, specification, agreement, etc., can be seen at the County Surveyor's Office, Hatfield, on and after May 28, between 10 and 4 (Saturdays 10 and 12). A copy of schedule of work and prices (quantities), and form of tender can be obtained at County Surveyor's office on payment of 2s. Sealed tenders, endorsed "Tender for School and Teacher's Residence, Little Heath," to Mr. Frank Smith, County Surveyor, Hatfield, before 5 p.m., June 11.

MAY 31.—Battersea.—BOAT STORE.—The L.C.C. invite tenders for erection of a boat-store for the London Battersea Boat Club. Drawings may be inspected, and specifications, bills of quantities, form of tender, and other particulars obtained, at the Architect's Department, 10, Abchurch-lane, London, E.C. 4. Tenders to be delivered at the County Hall, Spring-gardens, S.W., and marked "Tenders for the Erection of a Boat-house at Battersea Park, S.W.," before 10 a.m., June 12.

JUNE 14.—Antrim.—COTTAGES.—Antrim R.D.C. invite tenders for the erection of laborers' cottages in the rural district, in accordance with plans and specifications, which can be seen at the office of the Clerk of the Council, or at the office of the architect, Mr. W. D. R. Taggart, Scottish Provident-buildings, Belfast, as follows:—One cottage at Killybeg, Randalstown, on the lands of Mr. John Fulton; one cottage at Anaghmore, Toomebridge, on the lands of Mr. B. O'Boyle; one cottage at Belleek, Toomebridge, on the lands of Mr. McCann; one cottage at Portliss, Toomebridge, on the lands of Mr. John O'Boyle; two cottages at Ballymannel, Toomebridge, on the lands of Mr. G. M. G. O'Connell; one cottage at Tammederry, Randalstown, on the lands of Mr. James Gilbert; four cottages at Cranfield, Randalstown, on the lands of Mr. James Cranfield; two cottages at Cranfield, Randalstown, on the lands of Mr. Bernard O'Kane; one cottage at Cranfield, Randalstown, on the lands of Mrs. Hume; two cottages at Redmore, Randalstown, on the lands of Lord O'Neill; four cottages at Lurgan West, Randalstown, on the lands of Lord O'Neill; one cottage at Ballygrooby, Randalstown, on the lands of Mr. G. M. G. O'Connell; two cottages at Cranmore, Randalstown, on the lands of Mr. J. H. Mulligan. Persons tendering may do so for any or all of the different blocks; but they must name the particular site or sites on their tenders. Tenders are to be lodged with Mr. J. Clark, Clerk of Council, Union Office, Antrim, not later than 10 o'clock a.m. on June 14.

NO DATE.—Bradford.—The Joiners', Plumbers', and Slaters' work necessary for the erection of a pair of semi-detached villas, Bolton-road, Bradford. Apply for quantities to Messrs. James Young & Co., architects, 62, Market-street, Bradford.

NO DATE.—Hatfield.—LAUNDRY.—Hatfield Guardians invite tenders for the erection of a new laundry at the Union Workhouse, Hatfield. Names

to Messrs. Charles Smith & Son, architects, Reading, together with a deposit of 1l. 1s. when bills of quantities and other information will be supplied.

NO DATE.—Kendal.—ADDITIONS.—Re-modelling, building addition, new bathroom, etc., to house, No. 31, Louth-street, Kendal, for Mr. Henry Hogarth. Plans can now be inspected, and bills of quantities may be obtained, on application to the office of Mr. John Hutton, M.P.S.I., architect, Kendal.

NO DATE.—Langley Park.—SCHOOL.—For new Wesleyan school, Langley Park, Co. Durham. Names and addresses to Mr. James W. Thompson, architect, 63, Grey-street, Newcastle-on-Tyne. Bills of quantities, prepared by Mr. Geo. Bell, will be forwarded, when ready, on receipt of a deposit of 1l.

NO DATE.—North Wingfield.—COTTAGE HOUSES.—Four cottage houses, at North Wingfield. May be applied for by Mr. Tom S. Wilcockson, architect and surveyor, Knitelmith Gate, Chesterfield.

NO DATE.—Rothwell.—VILLA RESIDENCE.—The erection of a villa residence, Roundhay, for Mrs. C. R. Bullock. Names and addresses to Mr. G. Fredk. Bowman, architect, 5, Greek-street, Leeds, when quantities will be forwarded in due course.

NO DATE.—Sleaford.—CHAPEL.—For Primitive Methodist chapel, assembly hall, and schools, Sleaford. Names and addresses to Messrs. Herbert Walker & Son, architects, Nottingham and Sleaford.

NO DATE.—South Kirby.—HOUSES AND SHOPS.—For the several tenements required in the erection of two houses, 22, South Kirby, near Wakefield. Names to Mr. W. E. Richardson, architect, Rothwell, near Leeds, when quantities will be forwarded.

ENGINEERING, IRON, AND STEEL.

MAY 21.—Bosaton.—WATER SUPPLY.—Cutting and lining pipe tracks, supplying and laying 4-in. and 3-in. cast-iron pipes, erecting reservoir and gathering weirs, etc., of water supply, Bosaton, Co. Durham. Plans and specifications may be seen with, and schedules of quantities obtained from, Mr. James Gilbert, engineer, The Square, Grantown, and sealed offers, marked "Bosaton Water Supply," must be lodged with Mr. John Grant, Royal Bank, Grantown, on or before May 21.

MAY 21.—Barnest.—WATER SUPPLY.—The Baccarat Municipality invites tenders for cast-iron pipes for water distribution, namely:—(1) Spigot and socket pipes in the usual lengths: (a) main pipes, 1,750 metres 300 millimetres in diameter; 1,020 metres 400 millimetres in diameter; 8,400 metres 700 millimetres in diameter; 100 metres 650 millimetres in diameter; 9,450 metres 600 millimetres in diameter; 2,400 metres 500 millimetres in diameter; 1,300 metres 450 millimetres in diameter; 1,200 metres 400 millimetres in diameter; 4,460 metres 350 millimetres in diameter; 2,400 metres 300 millimetres in diameter; 18,500 metres 250 millimetres in diameter; (b) distribution pipes, 3,500 metres 150 millimetres in diameter; 7,600 metres 125 millimetres in diameter; 300 millimetres in diameter. (2) Fittings for main pipes, 315 tons; for distribution pipes, 110 tons. Further information may be obtained from the Bureau d'Alimentation en eau de la Commune de la Ville, rue Scaume No. 45, whence will be supplied, against payment of 4s., the specification and form of tender in French, Roumania, or German. Tenders to be handed in on said form, under registered and stamped envelope, not later than 11 a.m. on 22/23rd May. The envelope to state "Soumission pour la fourniture de tuyaux et de raccords No. 1" and to enclose the receipt for the deposit made with the Municipality.

MAY 22.—Manchester.—BRIDGE WORKS.—Manchester Improvement and Buildings Committee invite tenders for the strengthening of Smedley-lane Bridge, over the river Irk, and Irwell-street Bridge, over the river Irwell. Drawings may be seen, and quantities, and form of tender obtained, on application at the City Surveyor's office, Town Hall, Manchester, on payment to the City Treasurer of 2l. 2s. All cheques or postal orders are to be made payable to the order of "The Corporation of Manchester." Tenders, enclosed in the official envelope, and addressed to the Chairman of the Improvement, etc., Committee, to be delivered at the City Surveyor's office not later than 10 a.m. on May 22.

MAY 22.—Manchester.—CABLES.—Manchester Electricity Committee invite tenders for the supply of E.H.T. three-core three-phase feeder, cables and 1 sq. in. L.F. concentric cable and tail-end boxes. Specifications and forms of tender may be obtained on application to Mr. F. E. O'Connell, Electricity Department, Town Hall, Manchester. Tenders, duly endorsed and addressed to the Chairman of the Electricity Committee, must be delivered not later than noon on May 22.

MAY 23.—Hambleton.—WATER MAIN.—Hambleton R.D.C. invite tenders for supplying, laying, and installing 2 1/2 cast-iron socketed water main to extend from the reservoir on St. Martha's Hill to Tyng Lodge, White-lane. A specification of the proposed works can be seen on application to Mr. Arthur Shelley, Town Clerk, 36, High-street, Guildford. Sealed and endorsed tenders are to be sent in to Mr. Ferdinand Smallpeice, Clerk to the said Council, 138, High-street, Guildford.

MAY 23.—Littlehampton.—WATER MAINS.—Littlehampton U.D.C. invite tenders for the providing and laying-down of about 279 yds. of 3-in. diameter cast-iron water main, together with sluice valves, fire hydrants, etc., on East Ham Estate and in Granville-road. Specification of work can be seen, and form of tender and schedule obtained, on application to the Council's Surveyor, Mr. H. Howard, F.S.I., Town Offices, Tenders, under cover, and marked "Water Mains," to be delivered at office of Mr. Arthur Shelley, Clerk to the Council, Littlehampton, not later than May 23.

MAY 24.—Coventry.—ELECTRICITY WORKS.—Coventry Corporation invite tenders for the supply and erection of Lancashire boilers, economiser, steam and water pipes, mechanical pumps, centrifugal pumps, and one 200 k.w. alternators, two-phase motors. Copies of specification may be obtained from Mr. Joseph A. Jeckell, City Electrical Engineer, Corporation Electricity Works, Sandycroft, Coventry, on receipt of 5l. 5s. Tenders will only be considered for a section or sections, and not for part of a section. Tenders to be addressed to the Town Clerk, Hay-lane, Coventry, and must be sealed and endorsed "Tender for Electricity Works."

MAY 25.—Manchester.—GIRDERS.—Manchester Corporation Gas Committee invite tenders for the supply, delivery, and erection of thirty-seven steel girders over the river Medlock at their Gaythorn Station. Specification and drawings can be obtained from Mr. C. Nickson, Superintendent, Gas Department, Town Hall, on payment of 1l. 1s. Any further particulars required may be had on application to Mr. J. G. Newbrough, M.Inst.C.E., his office, Rochdale-road, Gasworks. Sealed tenders, addressed to the Chairman of the Gas Committee, and endorsed "Steel Girders, Gaythorn," must be delivered at the Gas Offices, Town Hall, not later than 2 p.m. on May 25.

MAY 26.—Bradford.—GIRDERS.—Bradford Corporation invite tenders for the supply and delivery at Bradford of 500 tons of steel girder, 22 in. deep, 12 in. fish-plates, and 32 tons of joint pieces. Drawings, conditions, specifications, and form of tender may be obtained at the office of Mr. J. H. Cox, M.Inst.C.E., City Surveyor, Town Hall, Bradford. Sealed tenders, endorsed "Tender—Steel Rails," to be sent to Mr. Frederick Stevens, Town Clerk, Town Hall, Bradford, on or before May 26.

MAY 26.—Nottingham.—VALVES, HYDRAULIC ETC.—The Water Committee of the Corporation invite tenders for the supply of the undermentioned goods for the ensuing year:—1, cast-iron double-faced sluice valves and hydrants; 2, cast-iron gate valves; 3, lead piping, lead joints; 4, zinc metal taps and ferrule fittings. Specifications and drawings, together with samples, weights, etc., may be seen and other information obtained, at the office of the Water Engineer, Mr. F. W. Davies, St. Peter's Church-side, and forms of tender may be obtained at that office on payment of one guinea. Tenders, which are to be sealed and endorsed "Tender for Pipes," "Tender for Lead," "Tender for Taps," to be delivered to Mr. Samuel G. Johnson, Town Clerk, Guildhall, Nottingham, on or before June 1.

MAY 26.—Beckenham.—STEEL FOOTBRIDGE.—Beckenham U.D.C. invite tenders for the supply and erection of a steel footbridge, 6 ft. wide and 31 ft. long, over the Norwood Spur Railway in Avenue road, Beckenham. Preliminary plans and sections may be seen, and specifications and forms of tender obtained, on application to Mr. John Arnold, surveyor, on the production of a receipt from the collector for a deposit of 1l. Tenders, duly sealed, and endorsed "Tenders for Footbridge," to reach Mr. F. Stevens, Clerk to the Council, not later than 4 p.m. on May 26.

MAY 29.—India.—ROOFING.—The South Indian Railway Company, Limited, invite tenders for the supply of roofing complete for platform forms of new station in Madras, with sheltering shed and footbridge. Specifications and forms of tender may be obtained at the Company's office. Tenders addressed to the Company, endorsed "Tender for Roofing," must be left with Mr. Henry W. Notman, Managing Director, 55, Gracechurch-street, London, E.C., not later than 12 o'clock noon, May 29. A cheque which will not be returned, will be made of 1l. for each copy of the specification. Copies of the drawings may be obtained at the office of Sir George B. Vigney, Victoria-street, Westminster, on payment of 5s. per sheet.

MAY 29.—London.—HOT-WATER HEATING.—The Metropolitan Asylums Board invite tenders for the hot-water heating apparatus in the Lower Administration Block at the South-Western Fever Hospital, Landor-road, Stockwell, S.W. E. in accordance with drawing and specifications prepared by the Engineer-in-Chief, H. Hatch, M.Inst.C.E., M.I.Mech.E., Engineer-in-Chief. Drawings, specification, conditions of contract, and form of tender may be inspected at the office of the Board, Embankment, Cannon, E.C., and may be obtained upon payment of a deposit of 1l. Tenders, addressed as noted on the form, must be delivered at the office of the Board not later than 10 a.m. on May 29.

MAY 30.—Handsworth.—PUMPING MACHINERY.—The U.D.C. of Handsworth invite tenders for a horse-pump, electric motor, etc., for their Green-hall Baths. Tenders will only be considered for the whole of the work covered by the specification, and not for any part thereof. Copies of the specification, drawings, and conditions of contract can be obtained from Mr. H. Richardson, the Surveyor to the Council, on payment of three guineas for the same. Tenders on the prescribed form, in sealed envelopes, endorsed on the outside "Tenders for Handsworth Baths," must be delivered at the office of Mr. H. Ward, Clerk, the Council House, Handsworth, near Birmingham before noon on May 30.

MAY 30.—London.—PUMPING.—The Metropolitan Water Board invite tenders for the laying of 2 1/2-in. and 30-in. water mains in Harrow-road, Hammersmith, Putnam, and Kensington. In the Western District, the Board invite tenders for the supply and installation of pumps, and conditions of contract can be obtained from Mr. A. B. Pilling, Clerk of the Board, offices of the Board, Savoy-court, Strand, W.C., by personal application, or on receipt of a receipt in sealed envelopes; and tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, and endorsed "Tender for Pipe Laying, Western District," must be delivered at the offices of the Board not later than 10 a.m. on May 30. Further particulars obtained at the office of the Engineer, Western District, Commercial-road, Brixton, S.W.

JUNE 1.—Leith.—TOWERS.—The Commissioners for the Harbour and Docks of Leith invite designs and tenders for a movable hydraulic coil hoist, capable of lifting and tipping a waggon load of 30 tons at a height of 14 ft. above the level of the

quay, complete with crane, shoot, anti-breakage crane, and other appliances. A plan of the site, with information as to the requirements, the conditions of contract, and other particulars, may be seen on application to the Engineer, Mr. J. Whyte, M.Inst.C.E., Dock Offices, Tower-place, Leith. The tenders are to be delivered to Mr. Victor A. Noel Paton, Clerk to the Commission, 31, Melville-street, Edinburgh, on or before June 1.

JUNE 2.—Chingford.—STREET WORKS.—Chingford U.D.C. invite tenders for making-up and paving certain portions of the Station-road within the district, and for certain other works in connexion therewith, in accordance with plans and specifications prepared by the Council's Surveyor, copies of which may be obtained on application, and upon payment of a deposit of 2l. 2s. Tenders, which are to be sealed and endorsed "Tender for Street Improvements," to be delivered to Mr. Leonard C. Bowen, Clerk to the Council, at the Council Offices, Chingford, on or before 12 o'clock noon on June 2.

JUNE 4.—Barham.—IRON STAIRCASES.—The Guardians of the Bosmere and Claydon Union invite tenders for the completion of a partly-executed contract for the supply and fixing of three iron staircases, in the Union Workhouse, at Barham, to the outside faces of the wings. Specifications, etc., and the form of contract may be inspected at the offices of the Guardians, 6, Providence-street, Ipswich. Orders to view the premises will be forwarded on application to Mr. R. M. Cook, Clerk, Union Offices, 6, Providence-street, Ipswich. Tenders should reach the offices of the Guardians by June 6.

JUNE 11.—Burnham.—GAS PLANT, ETC.—U.D.C. of Burnham (Somerset) invites tenders for the supply, delivery, and erection of a suction gas plant, gas engine, and in connexion with their waterworks. Specification and drawings may be obtained from the waterworks engineer, Mr. H. H. Chovins, Manor-gardens, Burnham, on payment of 2l. 2s. Tenders on the prescribed form only, endorsed "Tender for Machinery," must be delivered to Mr. D. S. Watson, Clerk, Town Hall, Burnham, Somerset, on or before June 11.

JUNE 16.—North Shields.—MACHINERY.—Tyne and Wear Guardians invite tenders with plans and specifications, for supplying, fitting, and fixing complete to their satisfaction an installation of machinery for the wash-house and laundry of the Workhouse at North Shields. Tenders must include alternative quotations for steam or electric motive power. For particulars, personal application should be made at the Workhouse by appointment with the master. Sealed tenders to be delivered at the office of Mr. Septimus Scott, Clerk to the Guardians, Guardians' Hall, North Shields, not later than June 19.

NO DATE.—Rochdale.—PIPES.—Rochdale Guardians invite tenders for the supply of about 1,400 yds. of 4-in. cast-iron pipes for water mains, and for a number of valves, hydrants, etc. Full information to be obtained by direct address to Mr. R. A. Leach, Union Clerk, Union Offices, Rochdale.

MISCELLANEOUS.

MAY 21.—Islington.—ROAD ROLLER.—Metropolitan Borough of Islington invite tenders for the supply and delivery of a 10-ton steam road-roller and scarifier. Form of tender and particulars can be obtained upon application to the Borough Engineer, Mr. J. Patten Barber, at the Town Hall Upper-street, Islington, N. Sealed tenders, endorsed "Tender for Steam Road Roller and Scarifier," must be received by Mr. Wm. F. Dewey, Town Clerk, Town Hall, Upper-street, Islington, N., not later than May 21.

MAY 21.—West Riding.—FURNITURE.—West Riding C.C. Education Committee invite tenders for certain furniture required at Balby Provided (Temporary) School, Stanley West-riding, and at the School (class-room), Bolton-on-Deane Golf-Provided School (class-room). Full particulars may be obtained from the Education Department (Elementary Branch), County Hall, Wakefield. Tenders must reach the County Hall not later than 9 a.m., May 21.

MAY 22.—Belfast.—PLUMBER'S WORK.—Belfast Works Committee invite tenders for the supply of plumber's work and materials for the year ending March 31, 1907. Forms of tender and particulars may be obtained at the Superintendent of Works Office, Down-hall-street. Sealed tenders on official forms only, endorsed "Tenders for Plumber's Work," to be lodged in office of Mr. Samuel Black, Town Clerk, before 10 a.m. on May 22.

MAY 23.—Barrow.—FURNITURE.—Barrow-in-Furness Guardians invite tenders for the supply of twelve tables, ten forms, seventy-two chairs, also blinds for 100 windows for the Receiving and Cottage Homes, Roose-road, Barrow. Specification and samples may be seen at the workhouse on application to the master. Tenders to be enclosed in a sealed envelope, marked "Tenders for Furniture," and delivered at the Parish Offices, Harrison-street, before May 23, at 10 a.m.

MAY 23.—Manchester.—TRANSFORMERS, ETC.—Manchester Electricity Committee invite tenders for the supply, delivery, and erection of the following: Specification No. 6, seven 250 K.W. single-phase transformers; specification No. 7, high and low tension switchboards, for sub-stations. Specifications and forms of tender may be obtained on application to Mr. F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester. Tenders duly endorsed and addressed to the Chairman of the Electricity Committee, must be delivered at the Town Hall not later than noon on May 23.

MAY 23.—Oswestry.—LIGHT RAILWAY.—The New Sweeney Brick, etc. Company, Ltd., invite tenders for the construction of about 1,100 yds. light railway, 4 ft. 8 in. gauge. Particulars may be seen at the offices of the Company's Secretary. Tenders to be in by May 23. Mr. F. Williamson, Secretary.

MAY 23.—Stanwix.—SCAVENGING.—Carlisle R.D.C. invite tenders for the removal of the contents of the ashpits, etc. in Stanwix Township for the period

from June 7, 1906, to February 7, 1907, the contractor to find a place for disposal of refuse, etc. Further particulars can be had from the Clerk, with whom tenders, endorsed "Ashes Tender," are to be deposited at 7, Victoria-place, Carlisle, before noon on May 23.

MAY 24.—Sunderland.—FIREGUARDS.—The Corporation of Sunderland invite tenders for the provision and maintenance of fire guards in the various schools in the borough. Copies of drawing, specification, and schedule of quantities may be obtained at the Borough Surveyor's Office, Town Hall, sealed tenders and addresses to be sent to the Chairman of the Education Works Sub-Committee, and endorsed "Tender for Fireguards," must be delivered at the Town Clerk's Office, Town Hall, before 12 o'clock noon on May 24.

MAY 25.—Waterford.—FURNISHING.—Waterford Technical Instruction Committee invite tenders for the furnishing of the chemical laboratory at the Waterford Central Technical School. All particulars can be had on application to Mr. J. J. Fleming, C.E., 4, Lady-lane, Waterford. Tenders, addressed to Mr. James J. Feely, Secretary, Town Hall, Waterford, and endorsed "Tender for Furniture," will be received up to 1 o'clock on May 25.

MAY 28.—Chertsey.—HEATING.—Sobems and builders' works (inclusive of all engineers and builders' works) invited to tender for Heating, including only Chertsey, for the committee. Sealed tenders to be sent by 12 o'clock on May 28 to Mr. Bartholomew, Holy Bank.

MAY 28.—Dublin.—FIRE SIGNALING APPARATUS.—Dublin Waterworks Committee invite tenders for fire signalling apparatus, annunciator, switchboard, internal wiring, and fire alarm bells, to be provided and fitted up in connexion with the new Central Fire Brigade Station, Grosvenor-street. All particulars, specifications, condition of contract, and form of tender may be inspected at the office of the City Architect, Municipal Buildings, Cork Hill, between the hours of 10 a.m. and 4 p.m. daily (Saturdays excepted), and copies of specification and form of tender may be obtained in the office of the City Treasurer, Municipal Buildings, Cork Hill, on payment of 1l. Tenders, under seal, addressed to "Chairman Waterworks Committee," and endorsed "Tender for Fire Signalling Apparatus, Switchboard, Internal Wiring, etc.," must be delivered at the Waterworks Office, City Hall, Cork Hill, Dublin, not later than 4 o'clock on May 28.

MAY 28.—Dublin.—SWITCHBOARDS, ETC.—Dublin Lighting Committee invite tenders for the supply of sub-station switchboards and accessories, and transformer pillars. Specifications, with general conditions and form of tender, can be obtained from the City Electrical Engineer, Fleet-street, Dublin, on payment of one guinea for each specification. Tenders, addressed "Chairman of the Lighting Committee, 3, Cork Hill, Dublin," and marked "Tender for Sub-Station Switchboards, Transformer Pillars, etc.," to be delivered not later than May 28, at 4 p.m.

MAY 29.—Southampton.—COPPER PLATES.—The Director-General, Ordnance Survey, invites tender for the supply of copper plates for photo-engraving. Applications for forms of tender and specification should be made to the Office-in-charge of Ordnance Survey Office, Southampton. All tenders must be submitted before noon on May 29.

MAY 31.—London.—FENCE.—St. Pancras Guardians invite tenders for supplying and fixing a barbed wire fence on the boundary walls of the Casual Wards, Holmes-road, as indicated on the plans to be seen upon application to Mr. W. Saxby, Superintendent of the Wards. Tenders should be delivered to Mr. Alfred A. Millard, Clerk to the Guardians, Town Hall, Pancras-road, N.W., not later than noon on May 31.

*** JUNE 1.—Southampton.—DEALS, ETC.**—The Director-General, Ordnance Survey, invites tenders for supply of deals and matched boarding. Applications for form of tender and specification should be made to the Office-in-charge of Ordnance Survey Office, Southampton. Tenders to be submitted before noon, June 1.

JUNE 2.—South Hetton.—TIMBER.—The South Hetton Coal Company, Ltd., invite tenders for the supply of all kinds of timber for the year ending 1906, to June 30, 1907. Forms of tender, with full conditions, may be obtained on application to Mr. J. R. Lambert, South Hetton, near Sunderland. Tenders addressed to the South Hetton Coal Company, Ltd., South Hetton, near Sunderland, will be received up to June 2.

JUNE 11.—Lymington.—QUARRING.—The Governors of the Harvey School Foundation, Folkestone, the owners of Combe Farm, Lymington, invite tenders for excavating the stone on the farm and depositing same on the surface of the land adjoining the proposed quarry, at per cubic yard of stone so worked and deposited, the necessary haulage, and the stone being furnished by the owners. Inspection of the trial hole on the site of the proposed quarry which quarry may be five acres in extent) can be had on application to the Lymington Railway Station at the farm. Tenders, marked "Tenders for Quarrying Stone," to be sent not later than June 11 to the Clerk, Folkestone Borough Education Committee, Radnor-chambers, Folkestone.

JUNE 12 AND SEPTEMBER 4.—Sims.—CARRIAGES AND VANS.—For the supply of sixty-seven passenger carriages, seven guards' and luggage vans, 265 wagons (25 iron trucks and 120 ballast trucks), for the Royal Somerset and Dorset Railways, Drawings and conditions may be obtained, for a payment of 15s. per set, from Mr. W. A. Evans, Acting Financial Agent, at the Lymington, 23, Ashburn-place, S.W. Sealed tenders, with the inscription, "Tender for Rolling Stock," must be forwarded to Mr. L. Weller, Director-General, Railway Department, 1, Bankers' Buildings, in an office they will be publicly opened. For the 15s. per set (items 15 and 16), tenders to be submitted by wire (A.B.C. code, fifth edition to be used) or letter, not later than June 12. Tenders for passenger carriages, guards' and luggage vans, to be submitted not later than September 4.

NO DATE.—Chesterfield.—SINKING A PIT.—For sinking a pit, 11 ft. diameter, finished 5-in. brick-

work from the top hard to the deep soft seam, 210 yds. approximately. Work to be continued at week-ends. No water. Apply William Humble, Oxcroft Colliery, Bolsover, Chesterfield.

NO DATE.—Dronfield.—SLATING.—Tenders wanted for slating of works at Dronfield. Plans and particulars may be seen, Mr. Ridgill, architect, Green-lane, Dronfield.

PAINTING, etc.

MAY 21.—Plymouth.—PAINTING.—Plymouth Corporation invite tenders for painting a ward pavilion at the borough hospital. Specifications for the work can be seen at the office of Dr. F. M. Williams, Medical Officer of Health, Health Department, 19, Whimple-street, Plymouth. Sealed tenders, endorsed "Tender for Painting," to be sent to Dr. Williams on or before May 21.

MAY 22.—Selby and Market Weighton.—PAINTING.—North-Eastern Railway Directors invite tenders for painting the company's property upon the Selby and Market Weighton Branch. Specification may be seen and further information obtained on application to Mr. E. Smith, the company's district engineer, Hull. Sealed tenders, marked "Tenders for Painting Selby and Market Weighton Branch," to be sent to the Secretary at York not later than noon on May 22.

MAY 23.—Nottingham.—WHITEWASHING, ETC.—City of Nottingham Education Committee invite tenders for cleaning, painting, and whitewashing the out-offices at the various Council and Trust schools in the following districts, viz.—Contract No. 1, Bulwell and Basford district; contract No. 2, Hyson Green, Basford, and Radford district; contract No. 3, Carrington, Mapperley, and Sherwood district; contract No. 4, Lenton, Radford, and Central district. Specifications and forms of tender may be obtained from Mr. Frank B. Lewis, City Architect, Council-hall, on payment of a deposit of 1l. 18s. Sealed tenders to be delivered to the City Architect at or before 10 a.m. on May 23.

MAY 24.—Chesterfield.—PAINTING AND CLEANING.—Chesterfield Education Committee invite tenders for painting and cleaning the Christ Church National School, Chesterfield. Specification and form of application to Mr. C. J. Kerslake, Secretary, Education Office, by whom tenders should be received not later than May 24.

MAY 24.—Chesterfield.—PAINTING AND CLEANING.—Chesterfield Education Committee invite tenders for painting and cleaning the cookery and laundry departments of the Central School. Specification and form of application to Mr. C. J. Kerslake, Secretary, Education Office, by whom tenders should be received not later than May 24.

MAY 25.—Cardiff.—PAINTING, ETC.—Painting, decorating, papering, etc., to the Awoodale and Lord of Wimbome Hotels, Cardiff, for Messrs. Crosswell's Brewery Company, Ltd. Particulars and specification can be obtained at offices of Messrs. A. O. Evans, Williams, and Evans, architects, Pontypridd. Sealed and endorsed tenders to reach them on or before May 25.

MAY 26.—Birmingham.—CLEANING AND PAINTING.—The Birmingham Guardians invite tenders for cleaning and painting the main corridor of the workhouse, Western-road. Specifications and all information can be obtained on application to the Master, Mr. F. C. Mitchell, Workhouse, Western-road, Birmingham. Sealed tenders, endorsed "Tender for Painting Corridor," to be delivered to Mr. Charles Fletcher, Clerk to the Guardians, not later than May 26.

MAY 26.—West Bromwich.—CLEANING AND PAINTING.—West Bromwich Corporation invite tenders for the painting of the interior of the Town Hall and Offices, in accordance with specifications and conditions of contract, to be seen on application to Mr. Albert B. Groatore, M.Inst.C.E., Borough Engineer and Surveyor, Borough Surveyor's Office, Town Hall, West Bromwich. Sealed tenders, properly endorsed "Tender for Painting Town Hall," to be in the form provided, to be forwarded not later than noon on May 26.

MAY 28.—Govan.—PAINTING.—The Govan Combination Parish Council invite tenders for the painter work required for new laundry block at Merryflatts, Govan. Plans can be seen, and copies of schedules had, on application to the architects, Messrs. Thomson & Sandilands, 4, Jane-street, Blythwood-square, on payment of 1l. 18s. Schedules to be filled up and returned, sealed, and marked "Offer for Painter Work, New Laundry Block," to Mr. John Thomson, Governor, Merryflatts, Govan, not later than 12 noon on May 28.

*** MAY 28.—Rendon.—PAINTING, ETC.**—Painting and other works at the Asylum, Cleveland-street, W., and Colindale-avenue, Hendon, N.W., for the Managers of the Central London Sick Asylum District. Specifications may be seen by appointment with Mr. William Lockwood, 12, Sherwood-street, Piccadilly-circus, W., upon deposit of 2l. 2s. Tenders, addressed to the Board of Management, to be delivered at the Clerk's office, Cleveland-street Asylum, not later than 2 p.m. Monday, May 28.

MAY 30.—Whiston.—CLEANING, PAINTING, ETC.—Frescot Guardians invite tenders for cleaning, painting, and decorating the chapel at Whiston Workhouse. Specification and particulars may be obtained at the office of Mr. Jas. Gandy, architect, St. Helens, on a deposit of 10s. Sealed tenders to be sent to the Clerk, Whiston, Union Clerk, Union Offices, Whiston, not later than May 30.

*** JUNE 5.—Lambeth.—PAINTING.**—The Guardians of Lambeth invite tenders for painting at their infirmary. Forms of tender may be obtained, and contracts inspected, at the Guardians' Offices, Brook-street, Kennington-road, S.E., between 10 a.m. and 5 p.m. Tenders on the printed form, endorsed "Tender for Painting at Infirmary," by post to the Clerk, Lambeth Guardians, Brook-street, Kennington-road, S.E., before June 5.

NO DATE.—Alderley.—RENOVATIONS.—For the renovation of Alderley Church. Apply, in the first

two standards red deals, and one standard pine deals. Specifications and particulars may be obtained upon application to Mr. E. Williamson, Superintendent of the Cleansing Department, Town Hall, Manchester, and must be sent in before 10 o'clock on May 23.

MAY 24.—TOPPOINT.—STONE.—Toppoint U.D.C. invite tenders for the undermentioned quantities of stone (be the same, more or less), to be delivered on the beach at Toppoint when required—500 tons Notter stones, machine broken; 80 tons gravel. For Mr. F. A. Clark, Surveyor to the Council, 83, Old Town-street, Plymouth, to whom tenders should be sent by 12 o'clock noon on May 24.

MAY 28.—BURGESS HILL.—FINITS AND GRANITE.—The Burgess Hill U.D.C. require tenders for the supply of 200 yds. of surface dug flints, 650 tons of 1 1/2 in. granite, and 40 tons of dust granite, for the repair of highways, to be delivered as required by September 29 next. Delivery may be either at Burgess Hill Railway Station, or on such of the roads within the district as may be directed by the surveyor. Persons tendering must state at which place they propose to deliver. Tenders, on forms to be obtained of the Clerk, sealed, and endorsed "Tender for Finits," or "Tender for Granite," as the case may be, and accompanied by samples, to be delivered to the Clerk to the Council, Burgess Hill, on or before May 28.

MAY 28.—FARNBOROUGH.—ROAD MATERIALS.—Farnborough U.D.C. invite tenders for the supply of the following materials and work—Tarmac, Rhinish local, local gravel, Hungry Hill flints, steam rolling. Specifications and form of tender may be obtained upon application to Mr. J. E. Hargreaves, Surveyor, Town Hall, Farnborough, Hants. Tenders, sealed and endorsed, to be sent to Mr. Jno. A. Kingsdon, Clerk to the Council, Town Hall, Farnborough, on or before May 28.

MAY 28.—WITHAM.—GRANITE AND SLAG.—Witham U.D.C. invite tenders for the supply of 500 tons of good granite, uniformly broken to 4 in. gauge, also for 300 tons of blast-furnace slag, uniformly broken to 2 in. gauge, to be delivered in equal quantities weekly, carriage free, at the Witham Station

of the Great Eastern Railway during the months of October, November, December. Tenders, endorsed "Tenders for Granite," or "Tenders for Slag," with samples, to be sent to Mr. Wm. Bindon Blood, Clerk of the Council, at the District Council Offices, William, Essex, on or before May 28.

MAY 29.—ALDERSHOT.—TAR MACADAM.—Aldershot U.D.C. invite tenders for genuine iron slag tar macadam, about 700 tons, more or less, delivered l.o.r. at either of the town stations. Forms of tender and all particulars may be obtained upon application at the offices of the District Surveyor, Mr. E. C. Uren. Tenders, endorsed "Tar Macadam," to be sent to the Clerk, Mr. W. E. Foster, on or before May 29.

MAY 29.—ST. NEOTS.—ROAD MATERIAL.—ST. NEOTS U.D.C. invite tenders for supply of, and delivery to St. Neots Station, G.N.R., of about 1,000 tons broken granite, and 50 tons ironstone slag. Particulars and forms of tender can be obtained on application to Mr. John Eley, surveyor, South-street, St. Neots, Hunts. Sealed and endorsed tenders and samples to be delivered by 4 p.m. May 29.

MAY 30.—KINGSTON-ON-THAMES.—GRANITE.—The Corporation of Kingston-on-Thames invite tenders for supply of 1,500 tons of Queens, Guernsey or other granite, suitable for road-making, to be broken. Forms of tender of Borough Surveyor, Municipal Offices, Kingston-on-Thames, where samples must be left. Sealed tenders to Town Clerk, Municipal Offices, Kingston-on-Thames, before May 30.

JUNE 1.—MIDDLESBROUGH.—STORES.—The Corporation of Middlesbrough invite tenders for the supply of stores for the ensuing twelve months, viz.:—Bolts and nuts, brushes, galvanised buckets, Lawson's black, candles, cord, copper and brass wire and tubes, roofing felt, files, planes, grates, shovels, L. R. tubes, etc., iron bars, sheet steel, lead, leather belting, nails, oils, paints, pliers, screws, tin, spun yarn, twine, shafts, W. I. steam tubes and fittings, varnishes, wash leathers, waste, wire, wicks, washers, etc. Specification and form of tender may be obtained on application to Mr. R. V. Thompson, Jun., Stores Dept., 42, Commercial-street, Middlesbrough. Sealed tenders, endorsed

"Tenders for Stores," to be forwarded to Mr. Alfred Sockett, Town Clerk, Municipal-buildings, Middlesbrough, not later than June 1.

JUNE 2.—CLYDE.—STORES.—The trustees of the Clyde Navigation invite tenders for the supply of the undermentioned stores for the year commencing July 1, 1906:—(1) Arden lime, etc.; (2) asbestos and packing; (3) brass and other castings; (4) brooms, brushes, etc.; (5) coal; (6) cordage, etc.; (7) cotton waste; (8) short link crane chains; (9) crystallines, etc.; (10) electrical stores; (11) files; (12) fireclay drain pipes; (13) glass; (14) hammer handles, etc.; (15) india rubber; (16) iron and steel; (17) iron castings; (18) ironmongery; (19) lead, etc.; (20) leather; (21) nails, etc.; (22) oats; (23) oils, etc.; (24) paints, etc.; (25) pitch, creosote, and lucifer oil; (26) printing, etc.; (27) rivets, etc.; (28) stationery; (29) steam tubing, etc. Specifications and forms of tender may be had on application to the Superintendent of Stores at his office here. Tenders must be lodged with Mr. T. H. Mackenzie, General Manager and Secretary, 15, Robertson-street, Glasgow, not later than 10 a.m. on June 2.

JUNE 2.—CRAMLINGTON.—MATERIALS.—Cramlington U.D.C. invite tenders for the undermentioned materials and work—Contract No. 1, the supply of about 1,500 tons of machine broken whinstone to be delivered at Cramlington Station and Dam Dykes Siding; contract No. 2, the cartage of the above stone on to the highways, and the provision of a horse and man for water-cart; contract No. 3, the hire of a steam roller and water-cart, or carts. Full particulars, specifications, conditions, and forms of tender may be had on application to Mr. W. J. Coulson, Surveyor, Council Office, Cramlington. Sealed tenders, endorsed "Tender," must reach the office of Mr. Robert Nicholson, Solicitor and Notary Public Clerk to the Council, 51, Bridge-street, Morpeth, not later than June 2.

NO DATES.—CALVERLEY.—GRANITE, ETC.—Calverley U.D.C. invite tenders for granite, limestone, dress, etc. Particulars and forms of tender can be obtained from Mr. W. Walker, Surveyor, Council Offices, Calverley.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*CLERK OF WORKS	Lindsey County Council	Not stated	May 25
*BOROUGH SURVEYOR AND ARCHITECT	Kingston-on-Thames Corp.	350l.	May 26
*BUILDING FOREMAN CARPENTERS (TWO) FOR LAGOS	Town Agents for Colonies	250l., etc.	May 28
*SECOND MASTER	Leicester Municipal Corp.	250l.	do.
*ASSISTANT TENCHERS (TWO)	.....	150l. and 100l.	do.
*SUPERINTENDENT PLUMBER WANTED FOR RANGOON	.....	250 rupees per month.	No date.

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*BUILDING SITE, DERING-STREET, OXFORD-STREET, W.—At the Mart	Garrett, White, & Poland	May 22
*BUILDING SITE, BAKER-STREET, SOHO, W.—At the Mart	Garrett, White, & Poland	do.
*BUILDING MATERIALS, TOOTING—At the Grange, Upper Tooting Coll, Trinity-rl., S.W.	Hooker & Webbe	do.
*FREEHOLD BUILDING SITE, HITHER GREEN—At the Mart	H. J. Bromley	do.
*STOCK-IN-TRADE OF WALL PAPER MANUFACTURERS	The Auction Company	do.
*FURNITURE, ETC., GREAT HALL, WINDHOLM HOUSE, OLD BROAD-STREET, E.C.	Churchill & Sims	May 23
*FREEHOLD BUILDING SITE, HANWELL—At the Mart	C. Rawley Cross & Co.	do.
*FREEHOLD BUILDING PLOTS, SOUTH ACTON—At the Mart	C. Rawley Cross & Co.	do.
*FREEHOLD BLDG. LAND, CATFORD—At the Black Horse Hotel, Rushey Green, Collier	Norfolk & Prior	May 24
*FREEHOLD BUILDING LAND, THORNTON HEATH—At the Mart	Daniel Watney & Sons	do.
*FREEHOLD ESTATE, SUNBURY-ON-THAMES—At the Mart	Buckland & Sons	do.
*FREEHOLD BUILDING ESTATE, TEDDINGTON—At the Mart	Edwin Evans	May 28
*FREEHOLD SITE, KENNINGS PARK ROAD—At the Mart	Farnborough, Eliza, Egerton, Brauch, Galsworthy, & Co.	May 30
*B.M.K.G., ETC., PLANT, CURRAGH—Gt. Connell War Dept. Bkws., Newbridge, Co. Kildare	Robert J. Goff & Co.	June 6
*FREEHOLD BUILDING LAND, BEECH HILL PARK—At the Mart	Debenham, Tewson, & Co.	June 14
*FREEHOLDS, WESTMINSTER, BATTERSEA, and HERNE BAY—At the Mart	E. & H. Lumley	June 13
*BUILDING SITE, CHEAPSIDE—At the Mart	G. A. Wilkinson & Son	June 18
*FREEHOLD BUILDING ESTATE, PLYMOUTH—Law chambers, Princess-square, Plymouth	Gilchrist & Bishop	June 14

16,249 of 1905.—P. N. HOOPER and E. A. DUCKHAM: Method of Constructing and Laying Under Ground Mains for the Distribution of Electricity.

This relates to a method of constructing and laying under ground mains for the distribution of electricity, and consists in the conductor or conductors of copper, aluminium or other suitable metal, being supported by insulating rings or bushes in a duct or ducts made of some permanent material such as concrete, ferro-concrete, stoneware, and the like, the insulating material such as bitumen, bituminous compound or other suitable substance, vulcanised or otherwise for its protection, and the exclusion of moisture, being filled to a molten state after the conductor is in place. The whole may be then covered by a guard against mechanical injury by a removable covering or a cover made in situ.

3,960 of 1906.—W. WALLIS and J. WALLIS: Ventilators.

This relates to a ventilator having a central air shaft provided with slots or windows and a partial outer casing, and consists in the formation at the angles of the said outer casing of auxiliary

air shafts of triangular section having openings opposite to each of the said windows.

7,732 of 1905.—P. V. VAUDREY: Means for Electrically Indicating and Recording at a Distance Changes in Level of Liquid in Reservoirs, and for Giving Warning of any Pre-Arranged Maximum or Minimum Level.

This relates to an electrical apparatus for automatically recording or indicating at any distance the variations of level of water in a reservoir and consists of means whereby a wheel in the transmitter part of the apparatus is rotated in harmony and synchronously with the variation of said levels, said rotation causing the intermittent oscillation of a lever bringing into action a reversing commutator so adapted as to change the polarity of the line current, said rotation also setting and then discharging a propelling lever adapted to propel a rolling mass along a movable-inclined plane so as to set in action by the weight of said mass a balanced arm which closes the line circuit.

9,100 of 1905.—G. VERNON: Gully, or like traps.

This relates to a gully or like trap having a removable grid, and consists of a locking device

23,418 of 1905.—A. HERMANN and H. HERZFELDER: Process and Apparatus for the Manufacture of Slabs of Artificial Stone, or the like.

This relates to a process for the production of artificial stone slabs from a mixture of hydraulic cementing materials and filamentous materials in which a woven surface is plunged as deep as possible into the fluid mass, and is there caused to oscillate for the purpose of the uniform distribution of the mass upon the woven surface, and when the woven surface is raised, the material deposited thereon is pressed into a layer and partly deprived of moisture by means of the motion of the woven surface through the mass, and the filaments retain their position in various directions but parallel to the surface of the slab, and the finished slabs possess a uniform consistence and strength in all directions.

358 of 1906.—C. H. R. SCHWARZ: Pile Driving Machine.

This relates to a pile-driving machine with variable gth, provided with a divided front sleeper or outer portions and hinge-jointed to the middle portion, and two front ties, so that by turning back the outer sleeper portions the machine can be used in corners.

formed that the grid may be secured therein by partially turning the latter round by means of a key or other removable instrument.

26, 345 of 1905.—A. J. BOUT (J. J. HAROLD): Piling for Subways, Foundations, Shafts, and Other Structures.

This relates to a piling for subways, foundations, shafts, and other structures, and consists of beam members provided with flanges on opposite sides of one face thereof, planks adapted to engage the channels formed by said flanges, one of the flanges on one beam member being adapted to slide between the flange on another beam member and its plank, a plate at the outer edge of each of said planks extending over the back of the adjoining beam member, the plate being secured to the plank by bolts passing through its beam member.

TERMS OF SUBSCRIPTION.

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SOME RECENT SALES OF PROPERTY:

Table listing real estate transactions with columns for location, agent, and price. Includes entries like '5, By NORRIS & DEVAL at Hereford', '1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100'.

Table listing real estate transactions with columns for location, agent, and price. Includes entries like 'Boswell Park—3, 5, and 7, Natal-rd., ut. 97 1/2 yrs., gr. 200, 56, &c. 102 1/2', '1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100'.

TO CORRESPONDENTS.

W. C. B. (there is no positive limit in law as to the angle of light; 45 deg. is a common requirement, but it has no legal force except as a custom). W. H. R. (too late; next week). NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, photographic manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications. We are compelled to decline pointing out books and giving addresses. Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

FRIDAY, MAY 18. Royal Institution.—Professor A. Schuster on "International Science." 9 p.m. SATURDAY, MAY 19. Royal Institution.—Professor Sir J. Dewar on "The Old and the New Chemistry." 9 p.m. Institute of Sanitary Engineers.—Visit to the Waltham Abbey Sewage Works. Edinburgh Architectural Association.—Visit to Bonnybridge Foundry. Incorporated Association of Municipal and County Engineers.—Metropolitan district meeting, to be held at Battersea. Discussion on the following paper: "Engineering Notes on the Public Works of Metropolitan Borough—Battersea," by Mr. T. W. A. Hayward, Borough Engineer and Surveyor. Junior Institution of Engineers.—Visit to Hornchurch, Essex, for inspection of a wharf being constructed in ferro-concrete. Train leaves Fenchurch-street (London, Tilbury, and Southend Line) at 10 p.m. MONDAY, MAY 21. Royal Institution.—(1) Special General Meeting, to receive the report and recommendations of the Fellowship Procedure Committee. (2) Mr. Paul Waterhouse, M.A., on "The Report of the London Traffic Commission." 8 p.m. Society of Arts (Cantor Lectures).—Mr. G. W. Eve on "Heraklyd in Relation to the Applied Arts"—II. 8 p.m.

TUESDAY, MAY 22. Carpenters' Hall, London Wall. Lectures on Carpentry and Joinery.—Mr. R. Barber on "Setting-out, Preparing and Fixing Joiners' Work." 7.30 p.m. WEDNESDAY, MAY 23. Society of Arts.—Mr. James N. Shoolbred, B.A., M.Inst.C.E., on "The General Supply of Electricity for Power and other Purposes." 8 p.m. THURSDAY, MAY 24. Institution of Electrical Engineers.—Annual General Meeting at the Society of Arts, John-street, Adelphi, W.C., to receive annual report of Council and statement of accounts for the year ending December 31, 1905, and to announce the election of the new Council. 8 p.m. FRIDAY, MAY 25. Royal Institution.—Mr. Leonard Hill on "Compressed Air and its Physiological Effects." 9 p.m. SATURDAY, MAY 26. Royal Institution.—Professor Sir James Dewar on "The Old and the New Chemistry"—II. 8 p.m.

PRICES CURRENT OF MATERIALS.

Table listing prices for various materials. Includes sections for BRICKS, &c., HARD STOCKS, ROUGH STOCKS, GRIZES, PICKED STOCKS, FLETTONS, RED WIRE CUTS, BEST FENCHURCH BED, BEST RED PRESSED, RUBBER FACING, BEST BLUE PRESSED, STAFFORDSHIRE, DO. BULLNOSE, BEST STOURBRIDGE, FIRE BRICKS, GLAZED BRICKS, BEST WHITE AND IVORY GLAZED, STRETCHERS, HOUZERS, QUAINS, BULLNOSE, AND FLATS, DOUBLE STRETCHERS, ONE SIDE AND TWO ENDS, TWO SIDES AND ONE END, SPAYS, CHAMFERED, SQUINTS, BEST DIPPED SALT GLAZED, STRETCHERS AND HEADER, QUAINS, BULLNOSE, AND FLATS, DOUBLE STRETCHERS, ONE SIDE AND TWO ENDS, TWO SIDES AND ONE END, SPAYS, CHAMFERED, SQUINTS, SECOND QUALITY WHITE AND DIPPED SALT GLAZED, THAMES AND PIT SAND, THAMES BALLAST, BEST PORTLAND CEMENT, BEST OROUND BLUE LIAS LIME, STONE, BATH STONE, GONGS, PADDINGTON DEPOT, NINE ELMS DEPOT, PORTLAND STONE, BROWN WHITTED, DELIVERED ON ROAD WAGGONS, PADDINGTON DEPOT, NINE ELMS DEPOT, OR FIMLICO WHARF, WHITE BASED, DELIVERED ON ROAD WAGGONS, PADDINGTON DEPOT, NINE ELMS DEPOT, OR FIMLICO WHARF, AMSTER in blocks, BEER, GREENSHILL, DARLEY DALE in blocks, ROD CORSEHILL, CLOUGHBRIDGE FREESTONE, RED MANSHIELD, YORK STONE—Robin Hood Quality, Scappled random blocks, 6 in. sawn two sides landings to sizes (under 40 ft. super.), 6 in. rubbed two sides ditto, ditto, 3 in. sawn two sides landings to sizes (under 40 ft. super.), 2 in. to 2 1/2 in. sawn one side slabs (random sizes), 1 1/2 in. to 2 in. ditto, ditto, HARD YORK—Scappled random blocks, 3 in. sawn two sides landings to sizes (under 40 ft. super.), 6 in. rubbed two sides ditto.

BANBRIDGE (Ireland).—For erecting a dispensary and dispensary residence, Crossgar, for the Guardians. Mr. W. W. Larmor, architect.— J. Graham £1,240 0 0 J. H. Burns, Dromore, Co. Down £1,228 10

BRIDLINGTON.—For the erection of shop, stables, and premises, Marshall-avenue, for Mr. A. Knaggs. Mr. J. Eamsbaw, architect, Bridlington.— A. A. Booth, Bridlington £263

DYSART.—For supplying and laying in streets about 350 yds. of freelay drain, from 9-in. to 15-in. diameter, and about 120 yds. of 21-in. cast-iron pipe to bench; also supplying and laying about 1,500 super. yds. of caueway on Shore-road, 300 lineal ft. of kerb, and 1,300 lineal ft. of channel, for the Dysart Borough Council, Mr. D. Forbes Smith, surveyor, 210, High-street, Kilmadry. Quantities by surveyor:—

A. Fraser, Sinclairtown £396 16 5 Causeway. A. Fraser, Sinclairtown 973 4 10

EASTBOURNE.—For additions to motor omnibus house at Roselands, for the Motor Omnibus Committee, Mr. A. H. Prescott, Borough Surveyor, Town Hall, Eastbourne.— A. J. White £1,130 10. Hookham £1,059 10. Cornwall 1,112 10. J. Martin 994 C. P. Dennis & Co., 074 [All of Eastbourne.]

FLORE.—For small outfall sewerage works, for Daventry Rural District Council, Mr. J. B. Williams, Engineer, Moot Hall, Daventry.— Holmes & Sons, Leicester £387 2 4 10 Schedule.

GUILDFORD.—For post-office enlargement:— Credit. Copley & Sons £5,200 0 0 A. Johnson 5,075 68 Hyatt & Hammond 4,907 75 T. Robinson 4,950 0 0 D. F. G. Gannon 4,895 15 D. & F. Gannon 4,900 79 A. J. Colborne 4,712 26 D. & F. Gannon 4,747 82 Potter Bros. 4,712 32 F. Deacon & Son 4,467 90 R. Dean & Co. 4,200 94 Haslemere Builders, Ltd. 4,375 144 Crosby & Co. 4,298 150 R. Wood & Son 4,292 160 E. Wells & Son, Ltd. 4,238 199 F. & G. Foster 4,132 75 H. Lindfield & Son 4,188 188 Martin, Wells, & Co., Ltd. 4,229 220 R. Cook & Sons 4,014 115 Rowland Bros. 4,048 239 R. Smith 3,850 25 Mec. E. Pitt 3,965 187

GUILDFORD.—For alterations and repairs to premises, Walnut Tree Close-road, for Messrs. J. H. & E. Billing, Mr. E. Goodham & Co., architect and surveyor, Jenner-road, Guildford. Quantities by the architect:— Mitchell Bros. £369 0 0 Walls & Bennett £278 10 9 A. Johnson 330 0 0 F. Deacon & Son 272 0 0 W. H. Hyde 392 0 0 Martin, Wells, & R. Smith 312 0 0 Co., Ltd. 263 0 0 W. Smith & Sons 238 0 0 Crosby & Co., R. Wood & Son 285 0 0 Farham 232 0 0 Tribe & Robinson 283 0 0

HAINAULT.—For adaptation of buildings at Foxborough Farm, Hainault Forest, for the London County Council:— Partridge Bros. £524 0 Dowling & Dowling £435 0 J. S. Hammond & W. E. Westgate. Son 496 7 Mawney-road, R. Hargrave 425 0 Romford 310 0

HANLEY.—For extension of Glast Stock Warehouses at Irons, Salford, for Messrs. Johnson & Sons, (Hanley), Ltd. Messrs. E. L. Madcock & Sons, architects, Hanley. Quantities by the architects:— T. Godwin £1,130 P. H. Bennion £1,064 T. R. Voxall 1,128 J. Bagnall 1,040 G. Ellis 1,110 Corne & Sons 1,000 Tompkinson & Betterley 1,103

HARROW-ON-THE-HILL.—For making-up private streets for the Urban District Council, Mr. J. Percy Bennetts, Engineer and Surveyor, Harrow:— Shelborne & Co. £6,478 1 7 Miss £5,324 0 0 Wimpey & Co. 5,965 3 3 G. Mann 5,266 2 0 W. H. Worth 5,641 16 0 S. Adams 5,291 2 9 H. Brown 5,591 7 11 Bover Bros. W. Hooster 5,591 4 8 West Brig. E. & E. Lles 5,373 13 6 Fred. Nott-Mowlem & Co. 5,349 0 0ingham 5,175 1 0

HENGED.—For erecting a new English Baptist chapel, for Trustees of the Fabernace English Baptist Church, Henged, Glamorgan, Mr. G. Kenshole, architect and surveyor, Station-road, Bargoed.— R. Jones, Maccyswimmer and Aber £987

HEREFORD.—For erecting a villa residence on the Highfield Building Estate, Tupsley, for Mr. E. C. W. Waterston, Messrs. Groom & Bestington, architects and surveyors, Hereford:— R. Taylor £480 0 W. Powell £389 0 J. T. Jones 434 0 C. Cooke 366 10 E. W. Wills 1,110 [All of Hereford, Architects' estimate, £368.]

LINCOLN.—For erecting Wesleyan School Chapel, West Parade, Messrs. Green, Knowles, & Russell, architects, Adelphi Bank-chambers, South John-street, Liverpool:— W. Whit & Son £2,205 0 Mawer Bros. £1,690 10 Halkes Bros. 1,778 0 R. Marriott, Lansdown Rusden 1,656 0 Son 1,762 16

LONDON.—For providing and laying crossbed deal blocks, Holland Park-avenue, Thurloe-place, and Church-street, for the Royal Borough of Kensington, Mr. A. R. Finch, Borough Engineer and Surveyor, Town Hall, Kensington High-street:—

	Holland Park-avenue.	Thurloe-place.	Church-street.
	Per super. yard.	Per super. yard.	Per super. yard.
J. Mowlem & Co., Ltd.	7 8	7 6	7 6
Improved Wood Pavement Co., Ltd.	7 5	7 6	7 7
Acme Flooring and Paving Co. (1904) Ltd.	7 5	7 5	7 5
W. Griffiths & Co., Ltd.	7 3	7 2 1/2	7 5 1/2

† Including new foundation.

LONG GROVE.—Works at Long Grove, for the London County Council:— Arising Court Fencing. D. Rowell & Co. £1,298 6 8 Baylis, Jones, & Co. 1,199 5 0 Hill & Smith, A. J. 1,117 3 8 Brierley-Hill* 1,071 10 0 G. Wright, Ltd. 1,117 3 8

	Term of guarantee.	Seconds per week.	Amount.
J. W. Benson 50 years	7	5	£135 0
Potts & Sons 3	5	5	109 10
Smith & Sons 2	3	3	86 10
Gillet & Johnston, Croydon* 2	3	3	72 10

Laundry Machinery. Moorwood, Sons, & Co., Ltd. £7,351 10 0 Cherry Tree Machine Co., Ltd. 4,969 12 0 T. Bradford & Co., Ltd. 4,864 11 2 W. Summerscales & Sons, Ltd. 4,833 0 0 D. & J. Tullis, Ltd. 4,244 0 0

Telephones, Fire-alarms, and Tolt-tale Clocks. Strode & Co. £2,309 0 Cox-Walkers, Dartmouth £1,715 L. 2,067 Private Wire & Bromley, Batsmore, Telephone Installation Company, 1,493 & Kirk 1,760 Kitchen Plant. J. & F. May £2,716 0 0 Rillick & Corraan 2,884 0 0 Benham & Sons, Ltd. 2,548 0 0 G. N. Haden & Son, Ltd. 2,076 0 0 W. Summerscales & Sons, Ltd. 1,906 0 0 T. Bradford & Co., London* 1,938 0 0 Moorwood, Sons, & Co., Ltd. 1,578 0 0 McDowall Steven & Co., Ltd. 1,487 12 0

LONGTON.—For erecting a new rectory for the parish of St. James, Messrs. R. Servicer & Sons, architect, Hanley:— Colley & Lindop £1,805 T. Goodwin £1,730 G. Ellis 1,800 Cox-Walkers & Sons 1,793 J. Bagnall 1,795 Tompkinson & P. H. Bennion 1,767 Bettelley, T. R. Voxall 1,769 Longton* 1,687

LONDON.—For roadworks, Sunnyside-street, Sydenham, and Grierson-road, Honor Oak, for Lewisham Borough Council:— Grierson-road (Roadway). B. Martin, Brockley £380 Sunnyside-street (Roadway). B. Martin, Brockley 563 Queensborough Cement Co., Ltd., Lloyd's-avenue, E.C. 161 Sunnyside-street (Footways). Queensborough Cement Co., Ltd., Lloyd's-avenue, E.C. 175

LONDON.—For the reconstruction of premises, Central-street, Finsbury, E., for the London County Council:— W. Grep & Son £3,112 0 L. H. & R. Roberts £2,768 0 W. Shurman & Co., Ltd. 2,697 0 Co., Ltd. 2,724 0 Perry & Co. 2,953 0 E. Lawrence & Son 2,703 0 G. S. Williams 2,930 0 W. M. Dabbs & Son 2,699 0 W. H. Lascelles & Patman & Fotheringham Ltd., E. Tripps 2,554 8 Park-street, J. Grover & Son, 2,846 0 Blington* 2,637 0 [The Architect's (Education) estimate, comparable with these tenders, is £2,761.]

LONDON.—For the supply and erection of wrought-iron boundary fencing at Bethnal Green-gardens, for the London County Council:— A. W. Elwood, 556, 10 11 1/2 M. M. Vevey, 363A, Hill & Smith 447 19 4 Kennington-road, S.W. £404 9 6 L. Faulkner & Son 408 6 0 W. Gratix & Sons* 143 8 0

LONDON.—For the reconstruction of Regent Bridge, carrying Ben Jonson-road over the Regent's Canal, for the London County Council:— Heenan & Co. £6,161 1 3 Bros. £5,600 0 0 J. Cochran & Son 5,807 19 2 A. Facey & Son 5,568 8 3 G. Hay & Co. 5,806 11 10 J. St. John 5,489 0 0 Mithrad 5,442 2 6 Co. 5,605 6 5 [The chief engineer's estimate comparable with the above tenders is £5,591 6s. 9d. A. Thorne to sub-let the manufacture of the steelwork to one of the under-mentioned firms, or to such other person or firm as may be approved by the chief engineer under the contract:— J. Tildesley, Ltd., J. Westwood & Co., Hovey Company, Ltd., Thame's Ironworks, Ltd.]

MORLEY.—For the erection of Tentering House, closets, and alterations of boiler house, boiler setting, etc., at Albert Mills, for the Albert Mills Co., Ltd., Messrs. T. A. Buttery & S. B. Birds, architects, Quorn-street, Morley:— H. Spensley, Morley* £413 12 7 Joiners J. W. Binks & Sons, Morley 85 0 0 Plumber: G. A. Firth, Morley* 53 15 0 Slater: G. Rogerson, Morley* 25 10 0

NEWCASTLE-ON-TYNE.—For the erection of new county offices, for Northumberland County Council, Mr. J. A. Bean, County Surveyor, Moot Hall, Newcastle:— W. Forster £16,558 0 0 J. Parkinson & Sons, Ltd. £11,833 12 1 J. C. Ferguson, 16,209 0 0 J. W. Simpson, 16,600 0 0 son 14,825 0 0 J. L. Miller, 15,941 5 0 J. C. Hope 14,783 5 1 E. & A. Storey, 15,901 0 0 T. Hunter 14,655 0 0 J. Jackson & Son 15,500 0 0 North Durham Stone Co. 14,506 0 0 J. W. White 15,372 10 0 A. Pringle 14,408 0 0 W. R. Duffie & Co. 14,339 0 0 Thompson 15,343 10 4 S. F. David-Kirk & Brown 15,338 15 6 son 14,300 0 0 J. Milne 15,306 9 0 Midfield Press T. Weather 14,250 0 0 it. 15,800 0 0 T. Lundsen 14,280 0 0 E. Henderson 15,203 0 0 G. H. Mauch- S. Easton 14,873 0 0 Elliott Bros* 14,082 19 6

PERTH.—For erecting new church at Fens-road, for St. Mar's congregation, Mr. J. Walker Smart, architect, 28, York-place, Perth:— Messrs. Fraser & Morton, Perth* £1,701 Joiners: Hey & Sims, Perth* 870 Plumbers, Gasfitters, and Ventilation: Frew & Sons, Ltd., Perth* 212 Plaster, Cement, and Plaster Work: J. Sharp, Perth* 203 Slater and Tile Work: A. Drysdale* 193 Glaziers: G. R. Douglas & Son, Perth* 109 Iron Railings: Macgregor, Perth* 95

ROTHWELL HAIG.—For erecting an engineer's house at new workhouse, for Hamlet Guardians, Mr. J. H. Morton, architect, 50, King-street, South Shields:— Buildings. Railings, etc. H. G. Goldthorpe £329 0 0 J. Chapman & Sons 236 5 6 W. Simpkins 283 0 0 43 0 Binks Bros., Outwood, nr. Wakefield 247 5 0 48 10 0

ST. COLUMB MINOR.—For sewerage works, for the St. Columb Major Rural District Council, Mr. R. H. Bagnall, engineer, 42, George-street, Plymouth. Quantities by engineer:— J. Shaddock, £1,861 14 10 R. Hooper, Napier & Sons, 1,655 12 0 S. Adams, T. Shaddock, 1,620 13 2 C. Mervill* £1,430 1 8 F. G. Collingwood 1,459 0 0 Cooper, Weaz, & Co., Plymouth 1,412 7 0

SHANGHAI.—For a country residence in the Avenue Paul Brunat, Shanghai, Mr. W. M. Dowdall, architect, Shanghai:— Fu Ta Kee 49,232 Shanghai Building. Wong Yang Kee, 46,250 etc. Co., Ltd. 39,241 Hong Mow Kee 45,000 Suna De Kee 32,770 Zee Yang Chee, 43,250 Zee Kuen Kee 32,000 [All of Shanghai, China. *Kee is almost equivalent to "Co." The present value of the taels is 2s. 10d.]

SOUTH MOLTON (North Devon).—For erecting new classrooms, etc., at the Wesleyan Sunday Schools, for the Trustees of the Wesleyan Church, Mr. Fred F. J. Sanders, architect and surveyor, 6, New-road, South Molton. Quantities by the architect:— J. Holcombe £613 0 0 W. Sanders & Son 612 10 0 S. O. South H. J. Spiller & Son 595 0 0 Molton* £512 15

SOUTH MOLTON (North Devon).—For the erection and fitting of a brewery at the Barnstaple Inn, South Molton, for Mr. W. Vickery, Mr. Fred F. J. Sanders, architect and surveyor, 6, New-road, South Molton:— For the Buildings. W. Sanders & Son, South Molton* £240 For the Brewing Plant. G. Adlam & Son, Bristol* 230

SOUTH MOLTON (North Devon).—For alterations, additions, and renovations at "Hawthornden," East-street, for Mr. R. L. Riccard, Mr. Fred F. J. Sanders, architect and surveyor, 6, New-road, South Molton:— Interior. Bowden & Son, South Molton* £206 15 0 Exterior. J. Comins, South Molton* 86 15 6

SURBITON.—For construction of a 9-in. sewer and reconstruction of house-drains at Oakhill-grove, for the Urban District Council, Mr. Henry T. Mather, Surveyor, Council Offices, Beal-road, Surbiton. Quantities by Surveyor:— S. Lane £663 7 7 S. Atkins £547 10 0 C. W. Billing, back & Co. 653 0 0 Co. 505 3 4 G. G. Rayner 630 0 0 G. Chessvas 475 10 0 J. Chapman 564 0 0 G. Napier & Sons, H. E. H. Buckingham 557 0 0

TAUNTON.—For erecting a new house, for Mr. C. For, in Greenway-road, Taunton, Mr. F. W. Roberts, architect and surveyor, 2, Hammet-street, Taunton:— Weaver Bros. £935 0 0 H. G. Smith £759 12 0 Hart & Poole 834 17 6 F. Small, Taunton G. Handford 830 0 0 ton* 750 0 0 Manning & Son, 770 0 0

SWAINBY.—For widening, etc., of Swanby Beck Bridge (stone), at Swanby Village, on the Northallerton and Stokesley main road, for the North Riding County Council, County Hall, Northallerton. Mr. W. G. Bryning, County Surveyor, Northallerton. Quantities by Surveyor:—
 J. Kay £310 0 0
 T. Dickinson & Son 295 0 0
 J. Pearson 208 16 2
 G. R. Wade 207 13 0
 R. P. Broton £185 0 0
 G. Dougill & Sons, Aysgarth, R.S.O.* 175 0 0

TAUNTON.—For erecting a new classroom wing at Taunton School, Taunton, with a corridor to connect this extension with the new chapel (given by Lord Winterstoke; Mr. F. W. Willis, architect) in course of erection. Mr. F. W. Roberts, architect, 2, Hammett-street, Taunton. Quantities by the architect:—

	Classroom Wing.		Corridor.	Total.	
	£	s. d.		£	s. d.
W. Cowlin & Son.			370	0	0
Gleed Bros.	2,006	6	289	1	8
Chapman & Poole.	2,089	12	3	8	8
F. Hall	1,994	6	355	17	0
H. J. Spiller	1,948	0	351	0	0
W. Potter	1,941	0	315	0	0
Manning & Son ..	1,930	0	243	0	0
H. G. Smith	1,769	0	319	0	0
T. Moggridge	1,631	0	261	9	6
A. J. Spiller	1,330	0	239	10	0
Taunton*					2,069

TERRINGTON ST. CLEMENT (Norfolk).—For alterations to buildings at Bigh House Farm, for Mr. William Wing, Messrs. Walker & Walker, architects and surveyors, Hill-street, Wisbech, and Terrington:—
 H. W. Reeder, ... £284 10 0
 F. S. Flood, ... 195 0 0
 J. Linder, ... 195 0 0

TERRINGTON ST. CLEMENT (Norfolk).—For additions to houses at Beacou-hill, for Mr. A. Andrews, Messrs. Walker & Walker, architects and surveyors, Wisbech and Terrington:—
 Sleight & Morton, ... £154 0 0
 H. W. Reeder, ... 140 0 0

TONBRIDGE.—For stoneware pipe sewer, 233 yds. in length, near the Green, Leigh, for the Sevenoaks Rural District Council. Mr. A. Fowler, Surveyor, Longford, Sevenoaks:—
 O. Chesswas, Isleworth* £81 10

TOOTING.—For external painting works at Tooting Rec Asylum, S.W., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief. Quantities by Messrs. Fowler & Hugman, 9, Adm-street, Adelphi, W.C.:—

Sabey & Son, Ltd.	£2,363	0	0
J. J. Richards	2,255	6	5
Callow, Wright, & Hewlett, Ltd.	2,230	12	7
H. Hefor & Co.	1,777	0	0
R. Woolleston & Co.	1,750	0	0
H. Line	1,685	0	0
W. A. Kins	1,591	15	0
R. Swan & Son	1,454	0	0
H. Bragg & Sons, Ltd.	1,438	7	5
Woolleston Bros.	1,390	0	0
E. H. Holtham	1,341	17	8
W. H. Lorden & Son	1,297	0	0
A. Herbuter & Co.	1,223	9	6
W. Johnson & Co., Ltd.	1,223	0	0
F. Kinraid	1,209	17	9
A. H. Inns	1,105	0	0
C. A. Adams	1,104	15	0
W. J. Simms & Sons	1,081	0	0
S. F. Wright & Co.	1,061	1	4
R. Proctor & Son	1,040	0	0
M. McCarthy	984	0	0
W. Hussey	874	0	0
L. Kuzak, 3 and 4, Station-road, Belvedere, Kent*	724	8	0
J. Arundel (Exors. of)	723	5	4
J. Walker & Son	597	18	7

WHISSONSETT (Norfolk).—For the erection of house on farm for Mr. J. English, Messrs. Walker & Walker, architects and surveyors, Wisbech and Terrington St. Clement:—
 G. Brown, ... £305 0 0
 C. Tutthill, ... 287 11 0
 W. D. Boddy, ... 286 10 0
 Springall & Son, ... £284 0 0
 J. W. Warne, ... 255 0 0

WELLS-NEXT-SEA (Norfolk).—For the enlargement of school, for the Norfolk Education Committee. Mr. A. F. Scott, architect, Castle Meadow, Norwich:—
 J. Needs, Builder, Fakenham* £1,932
 [Ten tenders were received.]

WIMBLEDON.—For the erection of a gallery round engine-room at Electricity Works Extension, Durand-road, for the Corporation:—
 Edwards & Co. £198 6 0
 Wood & Co. 170 0 0
 S. Wheeler 165 0 0
 Jones & Co. 161 18 6
 Westwood & Co. 164 0 0
 Little & Sons .. 150 0 0
 Pierson & Co. .. 147 12 0
 Greatorex & Son 145 7 0
 Russell & Son .. 130 0 0
 Cross & Cross .. £129 0 0
 Norton Bros. ... 128 7 4
 McGregor Bros. 127 10 0
 Hitchen & Sons 125 10 0
 Hayward Bros. ... 124 0 0
 Watkins, Jones, & Sons 118 0 0
 Jukes, Cousen, Stokes, & Co. 110 0 0

WINCHMORE HILL.—For hot-water heating apparatus for pavilion No. 1 at Northern (Convalescent) Fever Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

R. Dawson & Co., Ltd.	£174	10	0
H. T. Wright Bros., Ltd.	173	0	0
Clark, Hunt, & Co., Ltd.	172	14	6
C. Kite & Co.	165	0	0
Boulton & Paul, Ltd.	165	0	0
Z. D. Berry & Sons	165	0	0
Death & Killwood	162	8	0
Hendry & Pattison, Ltd.	159	0	0
Bolton, Fane, & Co.	150	0	0
Canon & Hefford	149	0	0
M. Duffield & Sons, Ltd.	147	8	0
J. Gray	143	0	0
J. Russell & Sons 140 10 0			
T. Potter & Sons	140	0	0
Ltd.	137	0	0
J. Crispin & Sons 136 0 0			
Watford Engineering Works	130	0	0
Korting Bros., Ltd.	126	0	0
G. & B. Bradley	125	0	0
J. Yetton & Co.	£124	16	0
Brightside Foundry & Engineering Co., Ltd.	123	0	0
T. T. Smith & Co.	121	5	0
Lancaster & Co., Ltd.	120	0	0
Stulbs, Son, & Hall	117	10	0
Darcey, Griffiths, & Co., Ltd.	116	0	0
A. H. Marshall	115	10	0
G. N. Hudson & Sons	115	0	0
J. Boyd & Sons	109	0	0
Moordwood, Sons, & Co., Ltd.	107	0	0
South-Eastern Engineering Co.	99	10	0
W. G. Cannon & Sons, Ltd.	95	0	0
W. Freer	89	0	0
M. Matthews & Yates, Ltd.	88	0	0
CycloWorks, Swinton, Manchester*	83	0	0

WITLEY (Surrey).—For country cottage for Mr. R. C. Garton. Mr. J. H. Howard, architect, Haslemere:—
 Builders £1,210 0 0
 Lowry

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The Builder.

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The New Vauxhall Bridge.



THE new bridge over the Thames at Vauxhall, which will be formally opened this (Saturday) afternoon by the Chairman of the London County Council, is the outward

and visible sign of a very satisfactory termination to a long series of esthetic criticisms and unæsthetic retorts which, however they may have caused some regrettable excess of temper on both sides at the time, are justified in their results. By dint of fighting for it, we have got a new bridge which, in its own method of structure, revives something of the simple, purpose-like, and unpretending character of the older masonry bridges of the Thames, and is in point of design a worthy successor to old Vauxhall bridge, with a wider roadway and a wider water-way.

The printed Report issued by the County Council gives a brief history of the older Vauxhall bridge, and of the reasons which rendered its removal practically necessary. As a roadway the bridge was said to have become inadequate to the traffic, besides being inconvenient in respect of its heavy gradients. The first of these complaints we believe to have been entirely imaginary in regard to any traffic up to this time existing; we never saw the bridge in the slightest degree over-burdened with traffic; in fact, you might stand for some

time and hardly see anything cross it. In future it may become much more fully occupied, especially as it is now prepared for tramway traffic; but there was little real pretext for the old bridge being condemned as insufficient at the time when its demolition was first mooted. Nor did we ever attach much importance to the arguments of the Thames Conservancy, that the arches were dangerously or inconveniently narrow for the river traffic. The river traffic of the Thames, which since the days of Metropolitan railways and trams, and the extension of the City north and south, has long ceased to be the highway of London it once was, is a very small matter, limited to a few barges going up and down, sometimes with a tug and sometimes only with the tide, and it appears that even a passenger steamboat service on the river cannot be made to pay. A more decisive reason for interfering was found, however, in the unsatisfactory condition of the foundations of the piers. The engineer's statement is that the scour of the river due to the high velocity of the current had tended to expose the foundations of the bridge: a mischief which had been met by depositing material from time to time around the foundations. It is suggested that the velocity of the current had been increased by the removal of old London Bridge in 1831, and of old Westminster bridge about thirty years later. That the removal of old London bridge admitted a much larger body of water up the Thames at flood tide, and was mainly the cause of

the frequent flooding of the Lambeth district, there can be no doubt; but it is urged also that the scour, and consequent injury to the foundations, was due very largely to the obstruction caused by the numerous and thick piers of the bridge. This is a logical consideration, and if it became obviously necessary to take steps to render the piers more secure, it was no doubt well to take the opportunity of reconsidering the whole structure and rebuilding it with wider spans so as to cause less scour. This was a definite reason for action, though we do not believe that the inconvenience either to river traffic or land traffic was, at the time, sufficient in itself to justify the building of a new bridge. It may become so, however, and in view of future possibilities the increase in width and decrease in gradient of the roadway no doubt constitute an important public street improvement.

In regard to the construction of the new bridge, the Engineers' Report states that the total length between abutments is 759 ft. 4 in., the total waterway 699 ft. 4 in. The two central piers are each 15 ft. 8 in. wide, the intermediate ones 14 ft. 8 in., at the level of Trinity high water. The central span is 149 ft. 7 in. wide with a headway of 20 ft. above high water; the intermediate spans 144 ft. 4½ in. with 19 ft. headway, and the shore spans are 130 ft. 5½ in. with 14 ft. 11 in. headway. The width of the bridge between the parapets is 80 ft., the carriage-way 50 ft. wide, and a very noble and spacious bridge-road it makes; the gradients are 1 in 40.75 on the Surrey side and 1 in

37.29 on the Middlesex side. Some further particulars we may quote direct from the Report:—

"The superstructure of the bridge is constructed entirely of steel and iron, and consists of five arches each formed of thirteen ribs bearing on steel skewbacks built into the abutments or resting on the piers. The steel plate decking, when it does not rest directly on the ribs, or on the steel framing of the piers, is carried on longitudinal joists supported on stanchions also formed of rolled joists, standing on the ribs. . . . Of the thirteen ribs in each arch, eleven are alike, the two outer ones being somewhat lighter to allow of their showing under the projecting plinth of the parapet (the meaning of this is not very clear). These outer ribs are 2 ft. 9 in. deep at the crown, and 3 ft. deep at the ends, the others varying from 3 ft. 6 in. to 4 ft. in depth. All bear at their ends on hinges formed of cast steel bearings with a forged steel pin 9 in. in diameter between them."

"The erection of the arches themselves was carried out in the following manner:—Three ribs of each span were floated into position, and when these were fixed the remainder of the ribs were successively built on staging supported from the first three. The manner of floating in the ribs was as follows:—They were first erected on a large pontoon moored below the bridge, and when completely riveted up and braced together, the barge was placed at high water, by means of steam tugs, in the span to be erected, the barge being fixed in the exact position by means of hawsers and buffer timbers so that the ribs were immediately over their points of support. The gradual fall of the tide then allowed the ribs to drop on to the hinges prepared for them."

The arch-ribs thus have that appearance, at once light and workmanlike, which is given by the design of a heavy girder resting almost on a point at its bearing, and obviously free to turn on its abutment with changes of temperature; the method of design which had so striking an effect in the immense roof-principals of the Galerie des Machines at Paris. In the case of the Vauxhall bridge the principals are free to rise slightly at the crown with expansion, the steelwork connected with them being designed to allow the necessary play in that case.

Nothing whatever is said in the Report as to the successive stages through which Vauxhall bridge has passed in regard to its proposed character and architectural treatment; but as this is the view of the subject in which we are specially interested, we may briefly recapitulate the history, which is, in a sense, both amusing and instructive. The first proposal made by the County Council's late engineer was almost a repetition of that flagrant piece of vulgarity in design, Blackfriars bridge, with its tawdry ornament and absurd stumpy columns carrying nothing; a design which we believe a good many engineers still consider to be "a very handsome bridge." We may be thankful indeed that we were spared a repetition of that piece of gewgaw. That this design was not carried out was probably mainly due to the Institute of Architects, who memorialised the County Council as to the desirability of having a monumental bridge of granite, and offered them some very good suggestive designs for the piers thereof, of which it was hoped that some use would be made. Eventually it was decided that a solid granite structure was unnecessarily costly, but the bridge was to be of concrete with a granite facing. This was something of a sham, but it offered at least a bridge monumental in appearance and structure, and the decision to use concrete afforded an opportunity for putting in practice a then rather new system of construction by which the concrete arches were to be constructed with

what was practically a joint at their abutment, and another at the crown, not only giving a certain amount of play to the material, but enabling the engineer to control with more certainty the line of pressure in the haunches of the arch. But when the model of the design (illustrated in the *Builder* of January 7, 1899) showing the granite treatment, was produced, there was consternation on the part of those anxious for the architectural result. The sketches and suggestions of the Institute of Architects had been entirely thrown aside. The stumpy columns of Blackfriars bridge still exercised their fascination, and re-appeared on the face of the piers, surmounted each by columns which were made to do duty as lamp-posts, for which they were completely out of scale. The excuse for these was the bridge at Coulommiers, which had apparently been regarded as a kind of model, and which has some columnar erections of this kind, but purely as features to give a certain dignity to the entrance and exit (in the same manner as pylons), not as lamp-posts. A cornice of the coarsest type of moulding was run along the bridge; the granite facing arches were made with immense rusticated voussours of a foot projection, to give an appearance of cyclopean construction to what was really only a facing; and an enormous plinth-moulding, a single moulding 3 ft. deep, put the finishing touch to the destruction of all idea of scale in the details. Criticism and objections were in vain; a representative Committee of the Institute of Architects called on the engineer and endeavoured to explain that some of the points which he most admired in the Coulommiers bridge were exactly what people with an architectural training in design would at once condemn; it was all in vain; Coulommiers was the most beautiful bridge he had ever seen and this was to be like it; as to the vaunted new bridge at Paris, this one at Vauxhall would be far superior to any bridge at Paris (this was an actual statement by the engineer!); and the representatives of the daily press, who of course had no opinions of their own on such a subject, obediently echoed these instructions.

It was only a change of engineers which prevented this preposterous design from being carried out; though, as we shall see, the change was not due to any æsthetic predilections on the part of the new engineer. The County Council had assumed a position of refusal to listen to any further criticism; their engineer, they said, must be protected from the intrusions of people who had no business to interfere in the matter; the idea that they were responsible to the public for a public work carried out with public money not apparently having occurred to them. But the next step was that we learned that the concrete bridge with granite facing must be abandoned, as the ground of the foundations under the piers was not calculated to bear its weight. How it came about that of two engineers sufficiently eminent to be appointed to so important a post, one should have been mistaken on such a practical matter as the adequacy of the foundations, and which of them it was that was mistaken, we shall never know. But the result was that a new design was exhibited at the

Council room for a bridge of steel spans; a design which was typical of all that is worst in engineering ideas of "ornamental" architectural treatment, with immense spandrels of coarse would-be Gothic iron tracery. This design, indirectly, saved the situation; it was too bad to put up with. Sir W. Richmond and the editor of this journal successively addressed letters to the *Times* pointing out its absurdity in terms which were denounced by those directly concerned as harsh and un-measured; but it is necessary to speak strongly sometimes, and the strong speaking had its effect. The County Council, or their Bridges Committee, had turned a deaf ear to private remonstrance in regard to the previous design, but they did not like public ridicule, and it was at last forced upon them that something must be done to satisfy their architectural critics, professional and amateur. What was done is rather *sub rosa*; it is believed that they obtained suggestions and sketches from a very eminent architect who has always been ready to lend his aid in improving public architecture; at all events, the result was the design which was published in our issue of May 23, 1903; a very different thing from anything that had been previously proposed.

With the exception of the pylons at the entry on the bridge, which are still under debate, this bridge has now been carried out pretty nearly as shown in the illustration; and the result is exceedingly satisfactory. We have at last got a modern steel bridge, on the most modern constructional principles, erected over the Thames, in which there is no gewgaw ornament, nothing in bad taste; and this is not only a great gain in itself, but it will unquestionably have its effect upon future erections of the same kind, and will have inaugurated a new era of taste in respect to steel bridges on a large scale, in London at all events. And this result shows that it is worth while to persist in criticism on matters of this kind. The result has been fairly fought for. It is almost amusing to read in the Report that in designing the steelwork, "the avoidance of all ornament, save such as formed part of the structural design of the bridge, was kept steadily in view," as if this were the innate desire of the official constructor and the Committee, whereas it has simply been forced upon them by repeated representations from without. Very probably the architect to the County Council has had his say in the matter, and we surmise that more is due to his collaboration than is allowed to appear in the Report; but if so, it is due to external criticism that he has been able to exercise any influence on the engineer's design.

We should have preferred, as we said at the time the illustration was published, to have seen the parapet carried by a visible corbel construction instead of having this boxed up by a riveted plating, giving it rather the appearance of a long pontoon; but we admit that in execution it looks less objectionable, and catches the eye less prominently, than it did in the drawing. For the rest, all the steel work is admirable; the low simple railing with plain square balusters; the turned steel balusters at intervals,

of very good design, which carry the upper rail; the plain vertical braces on the haunches of the arch, which somewhat recall the similar treatment in the old bridge—all this is excellent and in the best taste. The masonry bases of the piers are well treated, without any immense mouldings to destroy the scale; above these the piers are faced with riveted steel plating so constructed as to leave a sunk panel; these panels, which were the device of the Council's architect, are to be occupied by bronze figures on each face, of heroic scale, to be executed by Mr. A. Drury and Mr. W. Pomeroy, and to represent respectively "Local Government," "Education," "Science," "Fine Arts," "Pottery," "Engineering," "Agriculture," and "Architecture." The lamp-standards at present on the roadway of the bridge are only temporary, the permanent lamp-standards are to be of a graceful design by (we believe) Mr. Drury. There is a little mistake in the masonry design, in the balustrade under the arches adjoining the pylons at the Middlesex end; the balustrade is terminated by piers, similar to those generally interpolated in a continuous balustrade, which are in this position quite unnecessary, either architecturally or constructively; the balustrade should simply have been carried across the arch opening and stopped against the jamb of the arch; there might have been a flat plaster as a respond, but the piers are out of place and come in awkwardly.

In regard to the possible pylons, for which the bases alone at present exist, the County Council architect is desirous to erect a model of the proposed design *in situ*, before carrying out anything permanently. The model would cost about 200*l.*, but it would be quite worth while to spend this in order to see how the thing will look before spending a great deal more in carrying it out.

We ought not to conclude without a word in recognition of the contractor, Mr. Charles Wall, who has carried out this great work, involving no little difficulty and anxiety, with complete success.

NOTES.

The Labour Party and Trade Disputes. VERY little sympathy will be felt with the Labour Members of the House of Commons in their indignation at the rejection by the House of Lords of a Bill introduced by a private member to amend the Aliens Act. The object of the amendment was to exclude an alien "if he is being brought into the United Kingdom under contract to take, or with the intention of taking, the place of a workman during a trade dispute." The Labour Members have expressed themselves over and over again as strongly opposed in principle to the Aliens Act, yet they have not hesitated to at once advocate its extension with the sole object of furthering their own ends. Our readers will no doubt recognise that the Building Trades are more than any other industry affected by this measure. Our present freedom to import manufactured goods does not help us in the case of building operations. It is well to remember that when the present Law Courts were being built in the Strand the stonemasons struck work

because stone arrived from the quarries partly worked, and they demanded that all the stone-cutting should be done on the job in London. The Stonemasons' Union was very strong and persisted in their claim, which, however, was resisted by the masters, and the building operations came to a stand. As a last resource stonemasons were brought over from Holland and lodged in the building enclosure, and after some time the London masons gave way. Although such a remedy may seldom be needed or enforced, the knowledge that it exists is a healthy check on extravagant demands.

Municipal Monopolies. It will be within the recollection of our readers that in the recent case of Atterney-General v. Mersey Railway Company the railway company, at the instance of the Birkenhead Corporation, was restrained from running omnibuses as feeders to their railway system. The railway company have now promoted a Bill to obtain the necessary powers to enable them to run these omnibuses, which were a great convenience to the inhabitants of the district they served. The clause of the Bill which related to these powers was the subject of debate in the House of Commons, and it was not only opposed by the representative of Birkenhead on behalf of the Corporation, but other Corporations who owned tramway systems also were able to bring opposition to bear, and the result was that an instruction was passed directing the Committee to leave out this clause. It would seem that this was a question which might have been left to the discretion of the Parliamentary Committee, where the matter could have been better examined with a view to the necessities of the case, and we would also point out that this is a serious development of municipal trading. The Corporations are seeking protection for their municipal enterprises, the tramways, for which they are anxious to obtain a monopoly; they already possess enormous advantages in having the rates to draw upon, and it is a serious question if they are to be allowed to stifle competition. This is bad for private enterprise and the public alike.

International Science. In his lecture on this subject at the Royal Institution Professor Shuster alluded to the new difficulty found in the fact that international organisations had increased to such an extent that they were beginning to overlap and to present some danger of mutual interference. This may be a correct view of the present position, but we must say that it is not very obvious to men who are engaged in practical applications of science. No doubt the International Catalogue of the World's Scientific Literature and the Astrological Chart, both in course of preparation, are great and praiseworthy undertakings; the Bureau International des Poids et Mesures and the Convention which led to a general agreement on the standards of electrical measurements have done good work, and the International Geodetic Association has made good progress in a gigantic task of the utmost importance. But there is little evidence of activity in more prosaic

directions, such as the establishment of International specifications of structural materials, or the assimilation of practice in the testing of such materials. It is true that the International Association for Testing Materials of Construction still exists, and has branches in Great Britain and the United States. Yet no one ever hears of the British branch, and that in America seems to have become a purely local organisation. There is at the present time a distinct need for general agreement with regard to the design of concrete-steel structures, as also in respect of standards for light, heat, power, and other measurements entering into the daily practice of architects and engineers. Hence, while admitting that the interchange of views between the scientific men of different nations is actually on the increase, we do not observe any striking signs of that congestion which appears to Professor Shuster in the light of a practical difficulty.

Water and Building Operations. A QUESTION of great importance to the public, and to builders in particular, was decided by a London police magistrate in the case of Paine v. The Metropolitan Water Board on May 21. The complainant was a builder who owned certain houses adjoining a road along which a water main had been laid by the East London Water Company, the predecessors of the Water Board. He was carrying on building operations upon a piece of land which had hitherto formed a garden for one of the other houses, and he had applied to the Board for a supply of water by measure for use in his building operations and had tendered the maximum price for the supply. The Water Board neglected to supply him and he was proceeding against them for penalties. The defendants relied upon certain provisions in the East London Waterworks Act, 1853, and contended that the complainant could only be entitled to water by agreement, since he was not the owner or occupier of any "premises" adjoining a street in which a water main was laid. The magistrate held that, as there was no provision in the Act about the supply being upon the premises, the complainant, by virtue of his ownership of the other houses adjoining the main, was entitled to a supply of water for purposes other than those for which the rates provided at a fixed price, as distinguished from owners or occupiers having property not so situated as regards the main, who would have to obtain water by agreement. But apart from this the magistrate also held that if he had to consider the vacant land by itself, it also came within the meaning of the word "premises," and the claimant was entitled to a supply by measure. The exact terms of the East London Waterworks Act are not before us, but unless the word "premises" followed a series of words of more limited meaning, it would seem impossible to construe the word "premises" as meaning only houses or buildings.

"Op., In., or About Engineering Work." TWO DECISIONS under the Workmen's Compensation Act were given by the House of Lords last week. In *Back v. Dick Kerr*

& Co., Ltd., the question was whether a man had been employed "on, in, or about an engineering work," and the House was divided three to two. The engineering work in question was the alteration of the Exeter tramways from horse to electric traction, and the work of taking up the old rails had been commenced near St. David's station, 700 yds. from the place where the man was injured. The man was in the employ of the contractors who were carrying out the work, but he was engaged at the Queen-street station, where the new rails were being received, and by agreement with the railway company they were being stacked in the station-yard of the railway adjoining Queen-street, along which street the tramway also ran. The majority in the House of Lords held that this work of stacking the rails upon which the man was engaged was not work upon the engineering work, the man not being engaged about the area of the engineering work. If the new Bill becomes law the importance of this decision will disappear, since questions of locality will not arise, and the question to be determined will be, whether the man is a "workman" and whether the accident arose "out of and in the course of the employment."

THE second case, Johnson v. Marshall, Sons, & Co., Ltd., turned upon the question whether a man had been guilty of "serious and wilful misconduct," and this question is preserved in the new Bill. The evidence was very slender; the man, who was killed, was a joiner in the respondents' works, and at work in the gallery; there were good means of approach to the gallery, but also a lift, and a notice was upon this lift that no man should use it unless in charge of a load. The breakfast hour was at 8 a.m., and the man, who had previously been seen working with his coat off, was found crushed in the lift with his coat on and without a load. The lift was obviously safe for use, as the men might use it with a load; and the House of Lords, reversing the Court of Appeal, held that the man had not been guilty of "serious" misconduct, a word which qualifies "wilful misconduct." "Serious wilful misconduct" has been held incapable of exact definition, but depends upon the facts of each case; when the misconduct endangers the safety or lives of others, then there is no doubt; and even if a man wilfully and unnecessarily endangered his own safety by obvious rashness or disobedience to orders it would probably fall within the definition, but it must be remembered that this question only arises if the misconduct takes place in the course of the employment—if it is outside the scope of the employment, then the man is outside the Act.

WHATEVER may be the ultimate decision of the Parliamentary Committee with regard to the London County Council (Electric Power) Bill, we hope the construction of the great power house at Battersea will not be sanctioned. At that establishment it is proposed to consume some 240,000 tons of coal annually, and as every ton may be

expected to generate fully 20 lb. of sulphurous acid, to say nothing of other deleterious products, the prospect is by no means an alluring one. To whatever height the chimneys might be carried, the gases evolved must be brought down by rain, and floating particles of carbon and ash by gravitation, thus counterbalancing much of the benefit claimed for electric light and power as substitutes for gas and steam. In his evidence given on Friday last week before the Committee, Professor Thorpe suggested that to minimise the quantity of sulphurous acid emitted, the coal might be carefully screened, hand-picked, and treated with lime-water. These palliative measures, however, could only serve to mitigate the proposed nuisance; and, from experience of the ways of steam users, we do not for a moment believe that they would ever be carried out in a really efficient manner. No doubt the huge Battersea power house would take the place of numerous smaller installations and abolish many boiler chimneys in the Metropolis, but the generation of gaseous products would be concentrated and their effects so intensified as to constitute an intolerable nuisance, and a serious menace to vegetation in the surrounding districts. As we have said before, large generating stations of the kind should be established quite outside the Metropolitan area.

PARTICULARS of another test of fire-resisting floor construction are given in the report issued this month by the British Fire Prevention Committee. The test in question was conducted in February last upon a floor consisting of rolled steel joists, expanded metal, and concrete, the latter material being mixed with aggregate consisting of old firebrick for one bay of the floor, and of broken stock brick for the two other bays. Most of the plaster covering the concrete fell during the earlier stages of the test, and some portions of the concrete fell from one of the joists, a circumstance which, in view of similar experience in previous tests, indicates that large masses of metal are far less desirable in fire-resisting construction than a well-distributed system of small bars. As for the concrete in the bays, reinforced by expanded metal sheets, little damage was done beyond a few small cracks chiefly in the vicinity of the steel joists. Apart from demonstrating the value of Portland cement concrete as a fire-resisting material and the superiority of distributed over-massed reinforcement, the test does not convey any very direct lesson. But it is worthy of note that the stock brick concrete seems to have shown to slightly better advantage than the concrete, made with old fire bricks which have been used in boiler furnaces. Thus, the test furnishes an additional reason for the faith justly reposed by architects in stock bricks.

DISCUSSION upon the paper read last December before the American Society of Civil Engineers is continued by letters published in the last two issues of the *Proceedings*. Several members refer to the relative merits of high and low carbon steel and of distorted bars as reinforcement.

Mr. W. J. Watson, being sceptical as to the safety of permitting such stresses as will produce hair cracks in the concrete, considers low unit stresses only should be allowed in the reinforcement, and consequently that very little advantage is to be gained in using high carbon steel. He mentions also the fact that high carbon steel is less reliable than mild steel, and moreover cannot be safely bent on the site of works under execution. Mr. Clarence Noble quotes authorities to support the view that under no circumstances need the adhesion between concrete and plain steel bars be taken at less than 250 lb. per square inch, and disputes the argument brought forward by the advocates of deformed bars that the lengthening of a plain bar under tension tends to relieve the grip of the concrete. By a simple calculation he shows that even if a $\frac{1}{2}$ -in. diameter bar were stressed up to 50,000 lb. per square inch, the reduction of area would only be 0.000,215 in., an amount too small to have any appreciable effect. Mr. C. A. P. Turner refers to the same point, saying that when the longitudinal reinforcements in continuous beams is bent towards each support as usual, this simple bend gives an anchorage which from his experience appears to discount any form of mechanical bond yet invented. These are only one or two notes from the voluminous discussion mentioned above, and which should be read by all who are interested in the economical design of reinforced concrete floor systems.

OWING to the rapid development of electric tramways and light railways in the United States many highway bridges have become seriously overloaded, and the occasional collapse of railway bridges in the same country shows that a similar state of things has arisen from the increased weight of modern rolling stock. Comparatively little trouble and expense have been caused so far in Great Britain by the steadily increasing loads imposed upon highway and railway bridges, partly because masonry construction of superabundant strength has prevailed so largely, and partly for the reason that iron and steel bridges have almost invariably been designed with most liberal factors of safety. Still, it is always necessary for public authorities and railway companies to consider from time to time the stresses occasioned in their bridges under modern conditions of traffic, and for this reason the paper by Mr. Wilbur J. Watson in the *Proceedings* of the American Society of Civil Engineers is one which deserves attention. The author has been engaged for some years in the investigation of existing iron and steel bridges which are subjected to loads greater than those for which they were originally designed, and his paper makes clear the point that the rules for designing new structures are quite different from those for investigating old ones. One circumstance particularly worthy of note is that in old bridges of iron and steel the construction of the compression members should be carefully examined. Speaking from personal experience, the author states that he has found more failures to occur in compression members than in

"Serious and Wilful Misconduct."

Fire Tests with Floors.

The Investigation of Overloaded Bridges.

The Proposed Power House at Battersea.

Reinforced Concrete Floors.

tension members, owing to the insufficient stiffening originally provided. This may be a useful hint for people who are inclined to think that tie-bars constitute the chief source of risk in early structures of iron and steel.

ALTHOUGH it is now fifty years since Lord Kelvin showed how the electric intensity of the atmosphere can be measured, yet it is only recently that meteorologists have begun to take regular records. In his paper on "Measurements of Atmospheric Electric Potential," read to the Royal Society on March 15, Dr. Charles Chree, the superintendent of Kew Observatory, makes some notable additions to our knowledge. For the last six years careful records have been taken of the electric intensity of the atmosphere outside the Observatory by means of a Kelvin "water-dropping" electrometer. By analysing these records Dr. Chree proves conclusively that there is a regular rise and fall of the electric intensity twice a day. It is a minimum at four o'clock in the morning and again at two o'clock in the afternoon. The times at which the maximum values occur are, however, not so definite, the interval between the two maximum values being greater in summer than in winter. The electric intensity is greatest in the month of December, but the amplitude of the diurnal inequality is greatest in February. The possible influence of various meteorological elements is considered from several standpoints. The influence of temperature is found to be by far the most important. With the exception of July, it is found that in every month of the year a low temperature coincides with a high value of the mean electric intensity and with a large diurnal variation. We have now data by means of which we can check the scientific guesses—which are often quoted in this country as if they were absolute laws—of several German physicists. Elster and Geitel found that the air which escaped from the soil was strongly ionised. They therefore suggested that a low barometric pressure would cause an increased escape of air from the soil, and thus increase the electric intensity, and a high barometric pressure retarding this escape would diminish the intensity. Unfortunately, however, for this ingenious suggestion Dr. Chree's curves prove conclusively that if there is any "cause and effect" relation between the height of the barometer and the electricity in the air it must be the latter that produces the change in the former, and not *vice versa*.

THE collection of engraved portraits from the Royal Collection of Windsor Castle, now on view at Messrs. Agnew's Gallery, illustrates a great deal of fine mezzotint engraving, and is exceedingly interesting in a historical sense, as bringing before us in one room the portraits of a number of people eminent in the XVIIIth and early XIXth centuries; statesmen, authors and artists. Collectors of prints, and special connoisseurs in "states" and "impressions," may no doubt find another and higher interest in it.

Illustrations of Glacier and Moraine.

At the Fine Art Society there is a collection of water-colours by Mr. Ernest George, under the title "Glacier and Moraine about Arolla, Saas Féc, and Bel Alp." We have been familiar for many years with Mr. George's picturesque water-colours and etchings of architectural subjects; the present collection is of a kind new to us from him, the result of several holidays spent in the neighbourhood illustrated. It is quite a success, and shows that this artist can handle other subjects besides architecture; and yet there is something of the intuition of the architectural observer in the manner in which the construction of moraine and glacier is indicated in some of these sketches; in No. 27, "Moraine of Zigiorenove Glacier," for instance, and in "The Long Moraine leading to the Pigne d'Arolla" (45), we seem to see quite clearly how the moraine has built itself up as the rampart or retaining wall of the glacier; in other drawings we see the line of the crest of the glacier curving away into the distance like the backbone of a huge serpent; while in various pictures of the "snouts" or lower ends of the glaciers we have their constructional section. This is a kind of landscape sketching which has something of scientific observation as well as mere effect. There are some interesting bits of architectural picturesque also in the sketches of various chalets and villages, the group at "Grimentz" especially (51), where the chalets are piled one above the other on the face of the rock. This is altogether a very interesting little exhibition, and ought to be especially so to our readers, as the work of an architect.

The Baillie Gallery.

THE Baillie Gallery appears to be the special home of "sketchiness" in painting—what the President of the Royal Academy characterised as "the art of leaving off where the difficulties begin." Some of Mr. Studd's paintings of Venetian subjects contain really good pieces of colour effect, such as the "Red Brick House" (24), a Venetian canal scene; "Venice in Summer" (58), and "The Great White Dome" (3), that of La Salute seen in a misty light; but when he invites us to accept, under the magnificent title "The Glorious Temple" (17), a shapeless smudge of colour as the front of St. Mark's, we can only repeat what we have said before, that painters who can do nothing better with a great piece of architecture than reduce it to a colour smudge, had better let it alone. Mr. J. D. Fergusson, in another room, takes us into his confidence, and tells us that "the painter having found the beauty of nature ceases to be interested in the traditional beauty, the beauty of art," which is obviously true as far as he is concerned, but is hardly to be accepted as a general dictum *sans phrase*. Also we learn that "to be true to an emotion, is to deal with that impression only which has caused the emotion," which is the reason, no doubt, why in some views of "Paris Plage" the surf is represented only by a formless wavy band of white pigment, and the figures are nearly as formless. Painters who go on this principle seem

to forget that the "impression" produced by the real scene is the result of combined detail, and that to try to paint the impression itself only without anything behind to back it up is to produce merely a visionary unreality. Messrs. Dikkers & Co., of Helgelo (Holland), who have a collection here of brass *repeussé* work, seem to think that they also have a mission—viz.: to explain to us the nature and artistic value of this class of work, of which they appear to believe they are the special exponents. Their small exhibition contains fairly good work, but we have seen better from English hands.

Messrs. Dickinsons' Gallery.

At Messrs. Dickinsons' Gallery there is on view a collection of water-colour sketches, by Miss Agnes Turner, of London's River and Byways, and other drawings. The large pictures, of buildings seen from the river, are not very successful, in some there is rather a lack of composition, and the treatment of the water is not always good. There are some very effective little paintings of narrow, picturesque alleys, in "Farringdon-street" (31), the effect of lighted stalls at night is well treated, and in the sketches of the "Cloth Fair" (7, 13, and 14) the colour is good. The style of the paintings varies a great deal, among the best of the landscapes are the two sketches of "Bog Ennis, co. Clare" (15 and 23).

Trade Commissions to Architects.

AN architect sends us a letter that he has received from a firm of billiard-table makers, on this wise:—

"We note you are the architect for alterations and additions to the licensed premises in street. We shall be glad to know if there is likely to be a new billiard-room built; if so, if you will kindly favour us with full particulars, we shall be glad to allow you a commission on any business that may result."

Very likely the writers of this letter think that they are only taking a legitimate way of trying to extend their business, but all tradesmen ought to be made to understand that an architect is bound to consult only his client's interests in regard to any order, and not his own, and that such an offer is exceedingly improper, and could have no influence with a respectable architect, except to prevent his having any further dealings with the firm that had made it.

NOTES FROM ROME.

An important paper has recently appeared from the pen of Professor Mau, of the German Archaeological Institute, on the "Rostra Casaris" (*Römische Mitteilungen*, XX., 1905, 250-266). He follows Richter (*Beiträge zur Römischen Topographie*, ii., 1903) in reaffirming Nichols' view, expressed in his *Notizie dei Rostrî del Foro romano* (Rome, 1885), that the hemicycle, so called (for the curve is really only about one-sixth of a circle), behind the rectangular Rostra of *opus quadratum* is earlier in date than the structure in front of it; and he follows Richter also in his advance on Nichols' view—namely, that the curved structure was itself the Rostra of Julius Cæsar, and that the rectangular structure in front of it belongs to a later period.* In so doing he meets, and in my opinion successfully, the objections of Hülsen to Richter's theory

* Nichols held that the curved structure was the *Græco-stasis*, and that the rectangular structure was the Rostra. A good plan will be found in Hülsen's "Roman Forum," page 73, Fig. 30.

(*Römische Mitteilungen*, XX., 1905, 16 sqq.). According to Hülsen's view, we have to suppose that in the reign of Septimius Severus a triangular courtyard was cut out of the northern half of the Rostra, and the curved west wall of this court ornamented with slabs of red marble (Porta Santa) and pillars of *marmo africano*. . . . On the side towards the arch of Severus the wall was broken away, and the courtyard seems to have been shut off merely by a simple gate* ("Roman Forum," page 76 and Fig. 33). Hülsen's theory, which until 1903 was held by Richter also, does not commend itself at first sight as the most natural explanation of the facts, and would therefore require strong arguments to support it; and these hardly seem to be forthcoming.

Professor Mau points out that at the points of contact the hemicycle is seen to be certainly the older building of the two; the question is practically decided by the relation of the travertine foundation blocks on the north. He also proves that the existence of a gate or railing on this side is not vouched for by the holes in the marble plinth of the rectangular structure, but that some are for bolts to join the blocks together and to the wall (now no longer existing) behind them, others for lifting the blocks, while others, of later date, are present in other places where the wall is still preserved. He also remarks that the fact that the sides of the rectangular structure end, and must always have ended, precisely where the curve begins is easily explicable under the supposition that the latter is posterior in date to the former, while otherwise it is an almost incredible coincidence.

Another new point that he raises is the existence of the concrete upon which the travertine foundation of the plinth of the hemicycle rested all along the curved front, and of layers of travertine chips at different levels, corresponding with those of the foundation of the plinth and the plinth itself—layers which are not found in the concrete at the back of the brick wall,† which, according to either theory, formed the back wall of the chamber under the rectangular Rostra at the period of their original construction. Finally, a study of the marble facing of the hemicycle as far as preserved shows (1) that it is so arranged as to postulate a large central slab, and a corresponding series of slabs and pilasters on the other side of the curve; (2) that the holes in the slabs may quite possibly have supported rostra of some sort.

It must be admitted that the moulding of the plinth of the hemicycle is not good; the profile is flat and weak. As to the objection, however, that the summit of the hemicycle as it stands is far too narrow ever to have served as the Rostra, the answer is that it was originally a good deal wider, and was only made narrower when it was transformed into a mere approach to the rectangular structure which was placed in front of it.

At a recent meeting of the German Institute Professor Hülsen spoke of an inscription in large letters about 1 ft. 4 in. high (the letters were originally of bronze) cut in the travertine pavement of the Forum close to the Lacus Curtius, recently brought to light by the removal of the late steps round the column of Phocas, which preserves the name of L. Nævius Sardinus, the same man who set up an inscription, in which he appears as *praetor peregrinus* (in the time of Tiberius), which was found close to the Lacus Curtius in 1552 or 1553.‡ Near the same spot was found in 1817 another inscription of a man who gives himself the title of praetor only,§ and Professor Hülsen inclines to conjecture

* The theory is, that the marble plinth blocks alone were left, and that the gate or railing was fixed in them.

† An objection may be raised that this wall must belong to the early portion of the 1st century, A.D., inasmuch as it is not built of regular triangular bricks, but of irregular fragments of roof tiles, broken to the required shape (Hülsen, *op. cit.*, page 20, n. 1). But as Mau notices, similar materials, though far less carefully laid, are employed in the walls of the newly-excavated building near the Lacus Curtius (the so-called imperial tribunal), which must be later than the time of Domitian.

‡ Upon the back of the slab was afterwards cut the remarkable relief of Curtius; the slab is built into the staircase of the Palazzo dei Conservatori so that both sides are visible. See *Römische Mitteilungen*, 1902, 32.

§ C.T.L., vi, 1278.

that not the imperial,* but the praetorian tribunal, stood near the Lacus Curtius.

Not far off is a small square enclosure, which from its position may have contained the statue of Marsyas and the fig-tree, olive, and vine, which stood at or near this point.† The statue of Marsyas and the fig-tree occur in the well-known reliefs depicting episodes in the reign of Trajan, which stand close by.

Recent additions to the municipal collections of antiquities have necessitated the enlargement of the Antiquarium, near the Arch of Constantine, both the museums on the Capitol being already full, and on the 24th ult. a new room was opened, which contains the more important sculptures, among them some interesting specimens from the tunnel under the Quirinal Hill. Their removal from the place they formerly occupied has permitted of a general rearrangement of the contents of the Antiquarium, and of the exhibition in a room to itself, where it is hung on the walls in sections, of a large coloured mosaic of the IIIrd century A.D. representing hunting scenes, which was discovered not long ago in the goods yard of the central station. Professor Lanciani spoke at the opening ceremony, devoting a portion of his discourse to the memory of Marchese Vitesleschi, who had been, until his death a few weeks ago, one of the original members of the municipal Archaeological Commission, which was founded in 1872. He then went on to speak of Julius Caesar's project for changing the course of the Tiber by taking it in a straight line from the Ponte Molle below the hills of Monte Mario and the Vatican (which in his time formed a single range), so as to add the Campus Vaticanus (now the Prati di Castello) to the Campi Martius. The scheme reappeared in the XVIIth century, when it was proposed by one Antonio Treviso, of Lecce. Two letters of his, with details of the project, dated November 16, 1560, and addressed, one to Pope Pius IV., the other to the Conservators of the city of Rome, are printed upon the plan of Bufalini (the first issue of which dates from 1551); and Professor Lanciani exhibited a tracing of this plan, made no doubt by Treviso himself, on which a strip of paper shows the proposed course of the river. The project was even recommended by a Departmental Committee of the Ministry of Public Works as lately as 1879.‡ It was claimed that the cost would be only just over a million sterling, that the city would be protected from floods, and that expansion would be rendered easy when the old bed was filled up, and so much land on the right bank joined to that on the left. But the construction of the popular quarter of the Prati di Castello in recent years has dealt a death blow to any possibility of its being carried out in the near future.

THOMAS ASHBY, JUN.

BURLINGTON FINE ARTS CLUB.

The collection of early German art at the Burlington Fine Arts Club is a very interesting one, and affords opportunity for a great deal of study of the styles and methods of various schools of early German painting. Those who obtain access to it, which is generously accorded by the Committee or by members of the club on application, will probably find occasion for more than one visit before they have extracted from the exhibition, and from the excellent introductory essays to the catalogue by Mr. Peartree, Mr. Alban Head, and Mr. Campbell Dodgson, all the information which can be obtained. We have only space here to notice a few of the most interesting objects.

In regard to the pictures, by "a self-denying ordinance" it was decided to exclude Holbein and his immediate followers who worked in England, as the number of their works obtainable in England is so large that it seemed best to leave them in reserve for a future exhibition. It is not claimed that the

* He does not accept Comm. Boni's identification of the building recently discovered close to the statue of Domitian, with the imperial tribunal of Trajan; and I, too, am unable to do so. I have discussed the question in the *Times* (January 12) and the *Classical Review*, 1906, 132.

† Pliny, *Historia Naturalis*, xv, 78.

‡ *Relazione che accompagna il progetto di una nuova inalveazione del Tevere attraverso i Prati di Castello della risvolta della Farnesina a valle di Ponte Molle fino a quella di S. Spirito a valle di Ponte Elio.*

exhibition represents really primitive German art of the XIVth and XVth centuries, such works hardly existing in British private collections. The majority of the works exhibited are of the XVIIth century, the list ending at Elsheimer, with whom the modern German schools may be said to have begun, and whose beautiful little picture of the Death of Procris, hung on the stairs leading up to the large room, is in fact very modern in style and feeling. As to the general run of the pictures exhibited, they illustrate very well the remark in the prefatory note to the catalogue, that if we do not meet here with the tender idealism of Italian or the grace of French art, "we receive compensation in a certain masculine force and directness, which possesses a charm of its own, and appeals strongly to those to whom it appeals at all." None of the works exhibited so well illustrate this as those which are classed as of the "School of Westphalia"; more particularly the "Christ on the Road to Calvary" (8), "Plate Washing His Hands" (12), lent by the Royal Institution of Liverpool (which has one of the best collections of early art in this country), and the large picture of the "Procession to Calvary" (25), lent by Mr. Sulley. In these, in the two last named especially, there is more freedom of action and drawing than in the works of the Cologne school; and in spite of the hardness of style and execution and the entirely mediæval conception of the scenes and characters, there is in these works a vigour and dramatic force of expression and action which is most remarkable. Among the other pictures is the wonderful little grey-toned picture crowded with small and highly finished figures, of the "Procession to Calvary" (35), lent by Sir F. Cook; this is attributed to Albert Dürer, though not with entire consensus of opinion; if not his, it is certainly the work of some one upon whom Dürer's mantle had fallen. The same owner's large painting "The Virgin with the Iris" (36), on the other hand, we should feel very doubtful of attributing to Dürer as far as regards actual execution, though there appears to be definite reason for attributing the design at all events to him.

A small half-length portrait of a lady (42), mentioned doubtfully as the possible work of Lucas Cranach, is remarkable for the exceedingly fine design and execution of the head. Among others to be specially noticed are the portrait of a lady by Mark Huber or Hauher (53); that of a young man with a rosary (54) by Baldung Grien, a remarkably fine work in regard to colour; the Duke of Devonshire's curious design of the "Wheel of Fortune," attributed to Dürer's pupil Schüßlein; and Mr. Buxton's "Portrait of a Jeweller" (62), credited to the "School of Saxony," with a head almost worthy of Holbein in force and finish of execution.

There are among the cases of "objects of art" many works of rich and fine execution and curious fancy, though not generally remarkable for grace or delicacy of design. In case A is a small bowl with four deep depressions in it (looking rather like a scent-bowl or something of that kind) with a flat open-work handle in which figures of Adam and Eve in a bower are worked with great delicacy and minuteness; but this is rather exceptional in character. In the same case a curious folding pocket dial is worth notice, and a gummer's level of gilt bronze, with a little plummet worked in at one side of it. Medals were very numerous, and a case with a few carved reliefs of figure subjects in hone-stone should be looked at (Case H), especially the remarkable and elaborate small carved panel representing "The Triumph of Charles V.," lent by Mr. Pierpont Morgan. In case E a "biberon" of rock crystal, in the form of a dragon, the property of Mr. Wertheimer, though certainly not beautiful in line, is a most sumptuous piece of work of its class. In the same case is a beautiful little cylindrical cup, silver-gilt, by Kossman, of Nuremberg, with low relief medallions of scenes from the Old Testament; and a remarkable gilt bronze table clock, lent by Mr. Morgan; it is surmounted by a dome with a figure playing a violin, and has five dials, unsymmetrically arranged, on the front, and two at the back; each dial intended to show different things—the months, the days of the week, the hours, etc.; whether it actually showed them all faithfully when in working order is another matter; if so, it was as remarkable for

mechanism as for design. It is late XVIII century work, and bears the inscription "Me. tecti Chasparus Bohemus in Vienna, Austria."

COMPETITION FOR NEW PREMISES FOR THE BRITISH MEDICAL ASSOCIATION.

CONSEQUENT upon the ever-increasing work of the British Medical Association both with regard to its general work and in connection with the publication of the Journal, the Committee recently decided upon pulling down the present somewhat unsuitable premises and rebuilding over the whole site owned by the Association at the corner of the Strand and Agar-street. For this purpose a limited competition was promoted, and six architects were selected by the Committee and invited to send in drawings. These were on view last week to members of the Association and others interested.

In the conditions and outline of general requirements issued to competitors attention was called, among other points, to the necessity of placing the new entrance in the centre of the Agar-street frontage and to the desirability of taking special care to guard against the noise of street traffic. As the reports presumably sent in with each design were not available it is impossible to say how the latter requirement was to be fulfilled, nor was there any special information to be gathered from the drawings.

Of the six sets of designs submitted, the first promiated scheme, that by Mr. H. Percy Adams, is in many respects the best. The plan very nearly follows, as, indeed, it could hardly help doing, the general arrangements indicated by the instructions, the greater part of the ground and basement floors being devoted to shops, which it is intended to let off. A good square entrance-hall is provided with a subsidiary entrance for the use of the compositors; for them, too, Mr. Adams has provided an open iron staircase at the back, which serves both as access to their workroom on the fifth floor and also as an escape staircase for the rest of the building. This is an economical way of dealing with the separate staircase required by the Building Act, and at the same time procures a certain amount of supervision over the incomings and outgoings of the compositors. The main staircase is rather cleverly contrived in one straight length of two or more flights, divided from the hall and corridors by arched screens; a double row of columns supports the arches on the first floor. On this floor are placed the general offices and the library and council-room. The latter is a large room covering nearly half the available space on the site, and capable, no doubt, of good architectural treatment; but one cannot help regretting the presence of the light area at the back, which cuts badly into the room, and is unnecessary, for the front windows appear ample to light a room only 32 ft. wide with a height of about 16 ft. This contraction on one side, with its accompanying feature opposite, would also be detrimental to the acoustic properties of the room—a point which the competitors were instructed to bear in mind.

The elevation to Agar-street is well arranged, with a small central portion supported by plain and solid pieces of masonry; the shops on the ground floor are to have flat, segmental arches over the openings, and ranging over these are large semi-circular-headed windows to the principal floor with frieze and cornice carried across as the springing line, the lower light being divided into three by Ionic columns. Above is a tier of square-headed openings flanked by sculptured figures slightly larger than life-size. The absence of a large cornice, the steeply-pitched roof, and the general "blockiness" of the treatment, helped by the severe and bulky stacks, go to the building up of an individual design, which is not detracted from by the slight affectation of simplicity that is displayed.

Apart from certain meritorious features in the plan, such as the small amount of space devoted to passages, the large general offices, and the skillful disposition of the lavatories, it is difficult to appreciate the reason for the award of second place to the late Mr. Woodthorpe's design. The elevation has a very commonplace order of Ionic pilasters running

through the second and third stories, and a segmental bay, corbelled out on the first floor on the cant angle of the site, and carried up as a turret above the roof, and finished with a cupola, is an unsatisfactory feature.

Of the four sets that receive no mention, that by Mr. W. Curtis Green deserves attention for its straightforward and workable plan. It is the only scheme in which a real attempt has been made in the hall and staircase, as well as in the principal rooms on the first floor, to get a good architectural effect out of the plan itself. This is specially marked in the library and council-room, which would have made a fine unobstructed chamber the full width of the site. On the second floor, which is chiefly made up of small rooms, the awkwardness of the canted front wall is cleverly minimised by the insertion of bay-windows round the entire frontage. There also are a useful feature in the scheme of the elevations, which in other ways are admirable; the general effect produced by the severe and heavy lower portion and the elaboration of the bays and cornice above would be very good.

Mr. Paul Waterhouse sent a plan with many good points. His staircase, oval on plan, is a nice feature, but his entrance-hall is not very well managed. The large committee-room across the Strand front would make a good room, and the composing-room is well arranged, but there does not appear to be any means of access to the roof. The elevations are interesting, though somewhat marred by the very flat pediments over the windows and the rather useless interpolation of brickwork on the third story.

Mr. G. Hornblower's set has an excellent entrance-hall, but his library is spoilt by the large area cutting into it, and the general office is obviously too small; there does not appear to be a separate staircase for the compositors. The elevations have a good deal of merit, though the weak semi-elliptical arch over the front door is unfortunate.

Mr. W. Campbell Jones was the other competitor.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Sir John Taylor in the chair.

Fellowship Procedure Committee.

The Chairman announced that the meeting would, in the first place, be special for the acceptance of the recommendations of the Fellowship Procedure Committee, which were as follows:—(1) That the regulations under by-law 9 be amended by omitting all words after 'respective proposers,' and adding the year in which the candidate was article, and in the case of a candidate for Fellowship the year in which he commenced practice; the regulations further to state that the voting-papers shall be in the form of the papers issued for the election of the Council. (2) That the directions to voters printed at the foot of the voting-paper should read as follows—(a) the voter (Fellow or Associate) is to strike out in ink the name of any candidate for whom he does not wish to vote; all names not so struck out will be counted as voted for. (3) That a notice be printed in bold type at the head of the voting-paper urging the importance of the papers being returned.

It was moved by the Chairman that the regulation under by-law 9 be amended so as to read as follows:—'The voting-papers, which shall be in the form of the voting-papers issued for the election of the Council, shall state the name and address of every candidate, with the names of his respective proposers, the year in which he was article, and, in the case of a candidate for Fellowship, the year in which he became engaged as a principal in the practice of architecture.'

The resolution was carried.

The International Congress.

The Chairman announced that a further special meeting was convened by the Council in order to get confirmation of the resolution already passed to the effect that the President and members of the Council for the

current session should retain office until the conclusion of the International Congress of Architects.

This was formally moved and carried.

The Late Mr. Salomons.

Mr. Graham said he regretted to announce the decease of Mr. E. Salomons, elected an Associate in 1851 and a Fellow in 1860. Mr. Salomons, as all of them knew, was an architect of very high repute in Manchester, where he had a very large practice. He was President of the Manchester Society of Architects on two occasions, and many years ago he represented that Society on the Council of the Institute. He formally moved that a letter of condolence be forwarded to the relatives of their deceased colleague.

This was carried in silence.

London Traffic.

A paper by Mr. Paul Waterhouse on "London Traffic Commission Report" was then read, the following being an abstract:—

The author centred his attention chiefly on the proposal of the Commission that the traffic congestion of London should be relieved by certain alterations of existing streets, and notably by the construction of two new thoroughfares, one traversing the town from north to south, the other linking Bayswater with Whitechapel. The architectural problems connected with these new streets he put briefly in the form of three questions, viz.:—(1) Granting the necessity for two new thoroughfares more or less in localities selected by the Commission, what attempt, if any, should be made to control the architectural treatment of the new buildings which will form their frontages; (2) what relations should these new roads bear to existing roads, streets, and squares; and (3) what shall be their effect as regards the destruction and retention of existing buildings of value or interest? Alluding to the question of locomotion, the author noted that the Commissioners' proposals were based on the continued use and development of surface tramways. Recent experience of the motor-omnibus, however, had upset the Commissioners' decision, "that tramways would continue to be the most efficient and the cheapest means of street conveyance." This question of locomotion affected the architectural problem in two points. In the first place, there were objections to the direction and position chosen for portions of the new avenues, the choice of which had been regulated by the location of existing lines of tramway. Secondly, the width recommended for the main avenues—viz., 140 ft.—was obviously an outcome of the proposal that each avenue should be encumbered with four lines of tramways. If these lines were given up wholly or partially a less width—say, 100 ft.—would be acceptable. Discussing the Commissioners' plan, the author pointed out that the map the Commissioners had made use of was not a scale map, and his intentions were not very clear. He had, therefore, transferred the problem to a survey drawn strictly to scale, and he presented for consideration, not the Commissioners' authentic plan, but his own interpretation (drawn to true scale) of their intentions.

Dealing first with the west-to-east avenue, which it was proposed to strike north-eastward from Hyde Park at a point adjoining Victoria Gate, forming at that point a continuation of the Bayswater-road, which it was intended to widen all the way from Shepherd's Bush Station, the author pointed out the undesirable oblique junction of two important thoroughfares which would take place, and showed how by a slight deviation it could be overcome. As to the question whether in adopting the line of an existing street the widening should be effected by the abolition of the existing buildings on both sides, or by the pulling down of one side only, leaving the remaining frontage to form the building line of the new street, the author recommended, in the case of Connaught-street, the destruction of both sides, so that Hyde Park-square might indicate the axis of the first straight length. At Connaught-square he would appropriate the north portion of the garden, leaving the south of the square intact; and in Portman and Manchester squares the new street would follow respectively the north and south sides. Coming to the junction of Regent-street and

Portland-place, he proposed the removal of Queen's Hall, and the formation of a circular roadway round All Souls' Church. At this point he offered for consideration a route alternative to that of the Commission, giving reasons for its adoption and illustrating by means of a specially-prepared plan showing the route proposed. Passing through East Marylebone, the avenue, he said, could glide between the Churches of St. Andrew and All Saints, and cross Berners-street nearly at right angles. Touching on the absorption of square gardens which the adoption of either the Commissioners' scheme or his own would entail, the author observed that the loss of air-space would be nil; the ground would be absorbed, not by inhabited buildings, but by houseless space. The avenues themselves would be substantial additions to the breathing-ducts of London. He proposed also that at certain points in the route new open spaces should be formed. The route he suggested would lead through Russell-square and run parallel past the Foundling Hospital. Here, explained the author, contact was rapidly being approached with the great north and south avenue—a feature of the Commissioners' scheme most open to criticism. Assuming that the official lines were accepted, the abrupt changes of level which characterised Mount Pleasant would lend themselves admirably to what was undoubtedly desirable at the intersection of two such gigantic roads, viz., an "over-and-under" or viaduct treatment. At the eastern end of the avenue there was a problem which the Commissioners seemed hardly sufficiently to have considered. The plunge through the Finsbury district, cutting through Finsbury Pavement House and the site of the displaced Roman Catholic Church, involved the destruction of a mass of very costly new buildings and the mutilation of an attractive formation of frontage—the curve of Finsbury-circus—which seemed likely to result in a very heavy expenditure, not sufficiently balanced by compensating advantages. Might not the avenue, instead of passing along the south of Liverpool-street and Broad-street stations, cross the rails at a point north of the station buildings, where a road bridge already exists? If this proposal were adopted, the avenue would connect with Whitechapel-road and Commercial-road at the same point as is intended by the Commission; but it would fall in from a more northerly direction, and would face the end of Leman-street.

As regards the north and south avenue, the author pointed out the very serious difficulties in the way of adopting the route proposed by the Commissioners, owing to the many important buildings between Holborn and the river, and suggested an entire change. Assuming that the Temple Pier was the point at or near which a new bridge was wanted, why not strike a nearly straight line for a magnificent street running from the great entrance of the Law Courts to the dome of Bethlem Hospital? This street would, of course, be treated as regards level in the same way as Waterloo-bridge-road. That is to say, it would not descend to the level of the Embankment, but, retaining the high level secured at the Fleet-street or Strand end, it would pass over the Embankment-road, and would only descend on the south side of the river to pass under the railway lines near Waterloo Junction Station. It would, in fact, pass over Commercial-road, which would not need to be slightly dipped, and, getting level with Stamford-street, would pursue the existing roadway levels under the railway. The south end was sufficiently near the "Elephant" (the southern haven of the Commissioners), and the junction with the Strand was an approximation to the eastern horn of Aldwych. From Aldwych northward the avenue was ready made to Theobald's-road, and thence the bargain already effected between the London County Council and the Duke of Bedford for the widening of Southampton-row seemed to suggest that the avenue should take that line to Russell-square, where the author proposed the two great avenues should intersect. This intersection would be in a sense the most important street centre in London. It was essential that it should be an "over-and-under" intersection, an engineering feat which, if steep gradients were to be avoided, must influence, as far as levels were concerned, some hundreds of yards of

roadway on each side of the intersection. If it were possible to acquire enough land to extend the open space some 300 ft. eastward the inconvenience of the changes of level by making the intersection, so to speak, in the open would be minimised. To avoid robbing Bloomsbury of its best breathing-space, the author suggested the open ground being left free of building. The cutting and viaduct proposed would meet, not in a huddle of shops, but in an open pleasure of grass and green trees, nearly all the best of the present noble trees remaining undisturbed. North of Russell-square the line of route might continue along Woburn-place—effecting the widening on the left-hand side so as to avoid injury to St. Pancras Church, and taking beyond the Euston-road the track of Seymour-street. But here, again, the author suggested an alternative going east of St. Pancras Church. Assuming that the Commissioners were right in their idea that Upper Holloway was the district with which connexion must be made, it seemed obvious that the Camden-road was an existing thoroughfare of which advantage should be taken. The author claimed that by carrying the avenue up to his proposed termination near Camden Town Station he had not only brought it within touch of a ready-made avenue to Holloway, but had put it into a position from which connexion could at once be made with Highgate and Hampstead trams, and in the future avenues could be prolonged thence to either or both of these places.

The author claimed for his new north and south route that it performed its purpose with more dignity, at less cost, and with far fuller efficiency than the Holloway-to-Elephant route of the Commissioners. It collected traffic from Euston, King's Cross, and St. Pancras Stations with much more impartiality than theirs. It utilised a mile and a half of existing roadway almost unaltered (in Camden-road and Kingsway), and avoided a mass of interference with sentimental and other interests by abandoning the hopeless attempt to get from Holborn Bars direct to the river.

As regards the question of architectural design in the streets themselves, the author deprecated any insistence upon uniformity of design on a large scale, referring to the failure of recent attempts to dispose of valuable frontage sites under conditions which debarred the free exercise of personal architectural wishes and commercial requirements. Individualism in street architecture in London was by no means unsuccessful. Our atmosphere, again, rendered ineffectual that long-drawn straightness and uniformity which in Continental cities had an intrinsic merit. The author assumed, however, that if his or a similar scheme were eventually adopted certain points would be selected as demanding homogeneous and continuous design. For instance, the first departure from the Bayswater-road, the All Souls' circle, the "place" opposite the British Museum, Russell-square, the bridge over the Thames, and the viaduct over the Embankment, with their immediate approaches, would necessarily be committed each to an architect (not necessarily all to one man) for continuous connected treatment. If the proposed Traffic Board were appointed, it must certainly have as one of its chief duties the safeguarding and promoting of a concrete and definite plan of street improvement, and this could only be carried out in consultation with one or more who were architectural artists in the best sense. He suggested the appointment of an architectural adviser to the Board (or, if preferred, three architectural assessors); that the architectural adviser should not himself design any portion of the new streets, unless in the matter of bare plan; that for each building centre demanding continuous treatment a separate architect should be appointed, and that on no consideration whatever should individual licence on the part of lessees or purchasers be allowed to prevail within the boundaries of such prescribed portions; finally, that on all parts of the new frontages perfect liberty of design and choice of architect should be allowed, subject to the control of the Board's architectural assessor or assessors, who should have absolute powers of censorship over all designs submitted. The author, in conclusion, pointed out some of the difficulties in the way of the Commissioners' projected device for crossing

Piccadilly, and put forward an alternative route.

Sir R. Melville Beachcroft, in proposing a vote of thanks to the reader of the paper, said he took it that the reason why he had been asked to do this was because he had been a member of the London County Council for seventeen years, and had served on the Improvements Committee of that body during the period when they were considering the great scheme of the street from Holborn to the Strand. He also remembered some thirty-four years ago he had something to do in opposing a scheme for carrying a new thoroughfare from the Marble Arch to Whitechapel. That was a scheme brought before the then Metropolitan Board of Works, to cost some 3,000,000, or 4,000,000, and the Board were asked to contribute about 1,500,000, but did not see their way to do it. He had listened to the paper with the greatest possible interest. Mr. Waterhouse had asked what they were aiming for, and he supposed they hoped that a scheme, such as that suggested that night, would be possible some day, but, of course, Mr. Waterhouse had said nothing about the cost. Mr. Waterhouse simply put it out in anticipation of the recommendations of the Royal Commission being given effect to, and urged that they must take into account the architectural effect of any scheme. Speaking as an overburdened payer of taxes in London, he could not help feeling that it would be some time before they saw such a scheme undertaken. He had heard a sum of 25,000,000 mentioned as the cost which would be involved, and he thought it would be some time before an expense of that kind was embarked upon. At the same time he agreed with what Mr. Waterhouse had said as to the Royal Commission having seemed to have gone mad on tramways. In believing that tramways were going to occupy the whole of the streets of London he thought they were rather counting their chickens before they were hatched. There was the motor-bus, which they heard and smelt so much about, and which, although at present in an infantile state, undoubtedly would in course of years, if not months, throw a different complexion on the matter. He certainly believed that, as regarded the cross-traffic, the motor-bus would meet all the wants of the day. With regard to the Bill which Mr. Waterhouse had mentioned, he learned that day that the Government were opposing it, and so he was afraid that the chances of its passing were very remote. The Bill was not one favoured by Mr. John Burns, who, in a letter to the *Times* that day, said that there was no necessity for an Advisory Board, as one already existed at Spring-gardens, whose achievements were seen in the street improvements which had been completed by the London County Council in the last eighteen years. Although a member of the London County Council he could not help saying that he agreed with the Royal Commission that if there was to be a Board it should be an independent one. If the London County Council gave up its trade enterprises and its house-building, and so on, then it would be right that they should be the body selected. His feeling was that it was the duty of the London County Council to supervise only, and if they occupied themselves with that he would not say that they would not be a good tribunal. He agreed that the architectural treatment of all new streets was of momentous importance to London. They had no Architectural Minister or anyone even to direct the London County Council when they made new streets, and it was left to accident. He was much interested in what Mr. Waterhouse had said about a line of straight houses not being desirable, yet, if their streets were left haphazard he was sure the result would not be a good one, and he hoped there would be in the future some authority which would exercise some supervision over the streets. He endorsed what had been said about having too wide streets, for when they were over 100 ft. wide they were not only a detriment but a positive danger to traffic. How Mr. Waterhouse had managed to glide through London avoiding this and avoiding that was a positive miracle to him. He well remembered that when Mr. Fredk. Harrison was advising the scheme from Holborn to the Strand he took up a ruler and ruled

a line on the map, and said, "That is our new street," and that was how the plan was carried out. Possibly Mr. Hanson was right, but it certainly was an unusual course to take in planning out a new thoroughfare. As regarded the tramways, they naturally followed what were called radical lines. Unfortunately, they were now built, and they could not prevent them, and the difficulty was to connect them with belt lines when they got to the outskirts of London. They had designs at Spring-gardens for 11 route miles of tramways, at a cost of 8,000,000. or 9,000,000., and that was nothing to what they could do. If the London County Council were given another ten years it might be that the great proposal of Mr. Waterhouse would be carried out.

Sir Geo. T. Bartley, in seconding the resolution, said that, although a member of the Royal Commission which had been criticised, he should not enter at length on the subject, but it must be remembered that the subject the Commission had to consider was the traffic of London. While he acknowledged the great importance of architecture in changes which were made, still it was not their business to go into the architectural question very fully. Of course, that came in, and showed the difficulty of dealing with a question where one subject ran into another. The conclusion that the Royal Commission adopted the idea of these two new thoroughfares was hardly correct. The Commission had an Advisory Board, which recommended the thoroughfares, and what they recommended were merely what he might call broad outlines of a scheme. The Commission in its report was not bold enough to adopt these two thoroughfares, and he dissented from that. He believed that the whole solution of the traffic difficulty was in the creation of some large new streets. It was shown before the Commission that the traffic multiplied fivefold every ten or fifteen years, and this showed that new thoroughfares were needed to solve the problem for at least a century. It was a question which, he supposed, would never really be solved in one sense, as in ten years there might be things better than motors to give them travelling facilities. He would like to defend the Commission on the charge of having gone mad on tramways. He agreed that some of those who gave evidence appeared to have gone mad on this subject, for one suggested a tramway in Lombard street, and another a tramway going across a piece of Hyde Park. In his supplemental report he did suggest that they ought to wait and see if motor-buses would not do even more than tramways. At present motor-buses were in their infancy, but there was no doubt they would be a great advantage. The fact that they did not move on a rigid line was a great advantage in narrow streets, and when they got rid of the noise and smell he hoped they would be substituted for many of the tramways. They must remember, however, that the problem was the rapid locomotion of people for business purposes, and, to his mind, these avenues led to the solution, and particularly the east to west street, which was by far the most important of the two. Although motor-buses might take the place of many tramways, yet he thought that a subway under these great thoroughfares through which light railways or tramways would run would be an enormous advantage in the bringing of hundreds of thousands of people into London from the suburbs. As regarded an Advisory Board, he would resent the London County Council being made the tribunal, as he feared they would be under present circumstances. Not only did he think the London County Council had enough to do, but they must remember that the area which the Council governed was but a fraction of the area concerned in the locomotion of London. It would be monstrously unfair to make the London County Council the judge and jury when Middlesex, Surrey, Essex, and Hertford were all intimately connected with the question, and so the tribunal should be an absolutely impartial one, appointed by the Government of the day. The paper raised the architectural question, which was not specially before the Royal Commission. He felt its great importance, and he believed that if the avenues were ever made there was the chance of making London even more beautiful than it was. He was a Cockney,

and was proud of it, and he agreed with Mr. Waterhouse that the view of absolutely straight streets, as in New York, was not the pleasant form of architectural treatment of a street. He thought that turns and bends did enhance the beauty, and it was less fatiguing to walk along a curved street than a straight one, and if architects paid attention to that these thoroughfares, if ever constructed, would be not only commodious for traffic, but would give them a fine architectural city, as he believed of late years they had shown they were desirous of seeing London made.

Mr. H. H. Statham, in supporting the vote of thanks, said he was a little sorry to hear Mr. Waterhouse rather sum up against the idea of symmetry in the architectural treatment of great streets, although he noticed that he recommended it at certain points. It had been remarked by Mr. Grant Allen, the novelist, that Paris was a city, but London was a collection of villages. If they wanted a city to look like a great city it seemed to him its great thoroughfares should be treated with a certain degree of symmetry. He did not say that they should make the whole thing one design from end to end, but it should be divided up into blocks, which should have a certain harmony with each other. In regard to a single block, like a terrace, he had always thought that there should be symmetry of general treatment with perhaps differences in detail which did not affect the general design, but which gave each owner a little personal interest in his own house. He must say that he thought the argument that it was difficult to let or get rid of sites unless they allowed a free hand to the individual owner was made too much of. Something must be sacrificed for the public dignity of a city, and individual owners ought to be a little less selfish. They ought to consider that it was their duty to the public to give up something of their individual tastes for the sake of the grandeur of the city. In Paris they had to do so. They tried to alter some of the houses in the Place Vendôme, but it was not allowed, and he thought for a great city like London, with thoroughfares on such a large scale, that was a very important point. It was especially important when they came to anything like geometrical curves and crescents. The moment he saw the plans for the crescent road at the end of Kingsway he said that it should be treated as one design, and in the competitive drawings sent in as suggestions all the competitors, he believed, had so treated it. Of course, it was not going to be treated so, and they had lost it, but he could not help thinking that they had lost a great opportunity. Then, with regard to Mr. Waterhouse's proposition for a small circus round All Souls' Church, he quite agreed that All Souls' Church was a building worth preserving, but, in regard to circuses of too small a scale, they must remember that if they had several wide streets coming into such circuses they never realised to the eye that it was a circus. To make circuses was introducing rather an awkward shape for planning the houses, and he would rather say they should keep the open space as a square, as it would look better and be more convenient. He admired the way that Mr. Waterhouse had dealt with the question of "dressing up" streets in passing great buildings, and also the remarks he made as to the inconvenience of oblique streets. That was rather the pet fad of America, and they had already got a plan out for rebuilding San Francisco on that scheme. They knew what the effect of that was from the illustrations they saw in the architectural journals of America—the Grid-iron plan and the Flat-iron buildings. They could not have a worse architectural form for appearance or a worse and more inconvenient site for planning. He thought that was a point which Mr. Waterhouse had brought out exceedingly well. With regard to the scheme of the Royal Commission for cutting across the Green Park and through Devonshire House, he would say that, while Devonshire House was not beautiful architecture and was very old, still it was what was known as a historical London house, and they must judge such monuments not solely for architectural value but for their historical interest also. Therefore, a proposal to drive right through that house was a vandalism.

Sir Geo. Bartley pointed out that the idea was to tunnel under Devonshire House.

Mr. W. D. Caroe said it was rather distinctive of the feeling towards architecture in this country that the instructions to the Royal Commission did not make the slightest reference to architecture as even having any part in the question of traffic. If the instructions to the Commission had been to deal with the traffic of London consistently with making a dignified addition to the architecture of London that would have been better, and that would have been done in Paris or Berlin. He had looked at the report of the Royal Commission, and found that there was not a single reference to architecture in it. There was just one point Mr. Statham had mentioned as to symmetry through the whole course of a street of this kind as opposed to picturesque treatment. It had often struck him that the treatment of Regent-street by which each block between the cross-streets was treated as a single symmetrical block could not possibly have been improved upon. They secured a sufficient element of the picturesque and an essentially monumental treatment. Comparing Regent-street with Brompton-road they had a sufficient object lesson as to which was the better treatment.

Professor Beresford Pite proposed, in view of the importance and interest of the subject, that the discussion be adjourned till June 11.

Mr. Hudson seconded the motion, and it was carried.

Mr. Waterhouse briefly thanked the mover and seconder of the vote of thanks.

The Chairman announced that a business meeting would be held on June 11 to receive the Report of the scrutineers, the election of Council and Standing Committee for next session and to elect members. Mr. G. A. T. Middleton has given notice of his intention to move at the meeting, "That the Council be instructed to consider the practicability of including all architects practising in the United Kingdom within the scope of the Institute."

THE SOCIETY OF ARTS.

On Monday evening Mr. George W. Eve gave his second lecture on "Heraldry in Relation to the Applied Arts."

The first part was devoted to imaginary heraldic creatures such as the unicorn, griffin, and dragon, considered from both the symbolic and decorative standpoint, and all illustrated by curious fact and fable of the Middle Ages. Thus the unicorn, with head and body of the horse, legs and hoofs of the stag, and tail of lion, symbolised untamed natural vigour, and none could ever be captured save in one particular way—the method being that the hunters chased the unicorn towards a maiden who sat in the forest, and he, running towards her, laid his head on her lap and slept, whereupon his pursuers crept up and made him prisoner.

The griffin has the eagle's head, but with large ears, and the body of a lion—and the audience were reminded of the fact that the Temple Bar "Griffin" is a dragon. The latter, the symbol of evil terrible but overcome, is generally associated with St. Michael and St. George. The dragon varies in appearance according to the result desired, but in English practice always has four legs, as opposed to the wyvern, which has two.

Among heraldic birds, the eagle, holding the first place, is more important even than the lion, and generally symbolises imperial rule. This use dates from very early times; and later, as the badge of the Byzantine emperors, the eagle was woven in silk and textiles, and so, by way of Sicily, came into Western Europe. In mediæval times it was shown very conventionally and always "displayed," appearing as a bird soaring towards one, but in later practice it follows classical models, becomes more natural, and is often shown in profile. Among other birds were the peacock and pelican, symbols of immortality and eternal love, and the phoenix, one of the most beautiful, with crested head, and all coloured blue and gold.

Diapers were next considered, and are valuable when a rich effect is desired. They should, however, be introduced with discretion, and when used in connexion with a coat of arms, must bear no resemblance to a

"powder of charges." However, in the treatment of surfaces, such as wall hangings, it is legitimate to use diapers of badges or other heraldic elements.

In the choice of colours a good deal of freedom is allowable, always provided they are kept distinct and clear, and it should be remembered that the brightness of the mediæval examples was the necessary result of development in the open air.

Next in importance to the shield is the crest, which, at first of a fan shape, with the arms painted on, was later modelled in leather in the round. Crests were little used in the rough-and-tumble of actual battle, since they gave a dangerous handle for pulling down, but they became very important in the artificial and strictly-regulated tournament, and latterly grew to an enormous size. They were laced or bolted on to the helm, and tilted slightly back, to allow for the bearer's bending forward. Needless to say, they should always face to the front, in spite of modern examples to the contrary.

In conclusion, it was suggested that the use of models as an aid to designing would help to prevent such mistakes as that mentioned above.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A METROPOLITAN district meeting of the members of the Association of Municipal and County Engineers was held at Battersea on Saturday. The presence of the President of the Local Government Board brought together an unusually large gathering of members from all parts of the country. Mr. A. E. Collins, M.Inst.C.E., President, occupied the chair, and there were present:—Messrs. W. Weaver (London), N. Scorgie (Hackney), T. W. A. Hayward (Battersea), O. E. Winter (Hampstead), P. Dodd (Wandsworth), J. Rush Dixon (Woolwich), B. J. Angel (Bermundsey), J. P. Norrington (London), W. Nisbet Blair (St. Pancras), W. Brooke (Strood), J. T. Eavrs (Birmingham), A. D. Greatorex (West Bromwich), J. S. Pickering (Cheltenham), T. Caink (Worcester), J. Lobley (Hanley), A. H. Campbell (East Ham), A. M. Fowler (Manchester), C. H. Cooper (Wimbledon), W. Harpur (Cardiff), W. Howard Smith (London), W. H. Prescott (Tottenham), A. H. Prescott (Eastbourne), J. W. Walshaw (Peterborough), and many others.

The Mayor (Councillor W. Rines) offered the Association a hearty welcome to Battersea.

Mr. Burns on Public Health and Sanitation.

The President of the Local Government Board (Mr. John Burns, M.P.) welcomed the members in the three-fold capacity of an engineer, the Member of Parliament for the constituency, and their official chief as President of the Local Government Board. Their work, with that of the medical officer, was the basis of that public health without which large communities could not exist. He congratulated the English engineers and surveyors on the excellent strides they were making through their profession to raise British municipal sanitation, not only to the first place, but to maintain the best traditions that the English people had of being the pioneers of health and sanitation for the rest of the world. Municipal engineers were often criticised by the indignant ratepayer, by the uninformed journalist, and frequently by public men who did not understand, and therefore could not appreciate the difficulties under which they carried on their fruitful labours. The council, in the first instance, decided what should be done, the ratepayer sometimes cheerfully assented, but more frequently grumblingly paid, but it was on the engineers' shoulders and through their hands that the work was carried out, and in their slow, stable, and enduring way they were straightening the crooked path for the rest of mankind to follow in every town and city in the country. They were always combating dirt, disease, and death in the interest, he was glad to say, of an increasingly-sober and educated democracy. London had many things to inspire the engineer, and to evoke both his scientific and artistic admiration. Cavour said it was worth coming from Italy to see the arch of Waterloo Bridge. No one could look at the Tower Bridge and not feel proud of that structure. No one could look at Blackwall tunnel completed, and the larger

Rotherhithe tunnel in construction, without having object lessons of solid, useful engineering triumphs for the health and convenience of that large city. There had recently been a wave of self-depreciation, and they had Paris idolised, and Berlin idealised, and were told to go to America, Vienna, and other places where they would find their municipal guides, philosophers, and friends. He did not share that depreciation, or identify himself with that criticism. On the contrary, he said, with the pride of a Londoner, that, taking into consideration its great size, its density of population, its physical and other difficulties, he knew no city in the world where the triumphs of the surveyor, the architect, and the engineer were so conspicuous. London was to him the most interesting, as he believed everyone would admit, the most fascinating gathering of mankind. If they could keep up the rate of progress of the last eighteen years, London, apart from being the most interesting and fascinating city, would begin to be as he wanted it to be, the most beautiful city in Europe. No city in the world had shown the progress in sanitary improvements that London had done, and the test of this was the low death rate. In 1870, with only 54,000 people, Battersea had a death rate of twenty-six per 1,000. In thirty years the population had grown to 175,000, or more than three times, and yet the death rate had dropped from twenty-six to fourteen per 1,000. What was more, infantile mortality had dropped in ten years from 176 to 131 per 1,000, and on the Battersea artisan estate, known as Latchmere Estate, the death rate was as low as eleven per thousand, almost equal to Brighton or Bournemouth, and the infantile mortality seventy-seven per 1,000, or twenty per 1,000 less than in the servant-keeping class of the West-end of London. What was true of Battersea was true of London, and also of the country.

The Litter of London Streets.

London had got a variety no other city could show. It had still left much picturesque. But it had still got a good deal of the cheap and nasty about it. In his opinion—and they saw it perhaps better than he did—London had got too many squalid, ugly, cheap, and nasty shops; too many ugly advertisements on flank walls, obtruding themselves everywhere. And, what was more, the streets of London were too often occupied by obstructions which impeded traffic, destroyed the decent appearance of the streets, and added to the litter and avoidable dirt that was too conspicuous in their public thoroughfares. They had got rid of the foul and noxious nuisances which used to be in London streets twenty-five to thirty years ago. What was the pest of London streets to-day? It was the trade litter; it was the shop refuse; it was the flying newspaper placard; it was the refuse from barrows, and the refuse from shops, and the daily dirt and litter in itself not particularly offensive or insanitary, was to the eye particularly repugnant to one who had a love of the tidy street.

What was more, there was no need for it. The borough councils were rapidly abolishing the system which made the shopkeeper pay for the removal of trade refuse. Now that the councils were removing trade refuse without payment, the cheesemongers and the egg seller should not take the opportunity, when no one was looking, of jerking that which he ought to save for election times under the passing tramcar or the fleeting horses' feet. They had no right to have their streets the repository of election eggs, rotten bananas, and decaying tomatoes, and he hoped the day was not far distant when they would see a conference of borough surveyors, with the Chief Commissioner of Police, the officers of the London County Council, and representatives of the shopkeepers and the costermongers all making up their minds to co-operate together to prevent the untidy refuse and litter in the streets of London being continued, and what was more, taking drastic steps to bring its abolition about as early as possible. He knew such a conference would be difficult to arrange, but he did not mind, as an impartial man, taking the chair. And he would even go further and suggest that, where the borough councils did not provide bins, the railway companies might provide large bins in the yards of railway stations into which cab-drivers and busmen and newspaper boys could put their

litter, instead of putting it down in the streets as they did now, to the indignation of every surveyor in the neighbourhood of large railway stations. He thought the time had arrived when a person like himself should tell the public that if they were as energetic for street tidiness as they were in blaming the surveyors for not bringing it about, it would be astonishing what an improvement would take place in the streets of London. They could see well-dressed men walking along the street throw away a newspaper, and, though he could understand some men wanting to get rid of some newspapers, no man had a right to take a four, six, or eight page paper open and extended, and, because he had done with it, throw it away on the side walk, and be a positive danger to any young and restive horse under whose nose the wind blew it. He believed, if the ordinary foot-passenger were to select the gutter for the discarded paper, and roll it up before he cast it down, it would add enormously to the tidiness and appearance of the streets of London. The untidiness of the individual citizen was often attributed to the neglect of the surveyor and his staff, and he sincerely trusted, if the newspaper men did not report anything else, they would report his suggestions to his fellow-citizens on how to make London litter less conspicuous than it was.

The President, on behalf of the Association, thanked Mr. Burns for the kind way in which he had received them. It was only the second time they had been honoured by the presence of the President of the Local Government Board. Ever since the Association was formed, municipal engineers had felt that, in many ways, they had not been fairly dealt with by the powers that be. He felt sure Mr. Burns would receive a deputation from their Association, and if they had any grievances he would put them right.

On the proposition of Mr. T. W. A. Hayward (Battersea), seconded by Mr. C. Jones (Ealing), Mr. J. Rush Dixon (Woolwich), was re-elected Hon. Secretary for the metropolitan district.

Battersea Public Works.

Mr. T. W. A. Hayward, Assoc.M.Inst.C.E., Borough Engineer and Surveyor, read a paper entitled "Engineering Notes on the Public Works of a Metropolitan Borough—Battersea." He said Battersea was in many respects a most interesting district of the metropolis. Originally a marsh-covered area, swamped by the river Thames at times of flood or high water, it had now, owing to the energy and enterprise of the several governing bodies who had from time to time had control of its municipal affairs, become one of the most healthy boroughs in London. The borough was 2,307 acres in area. The population was estimated at 200,000, and the rateable value was 1,163,119*l.* The rate for the current half year was 4*s.* 2*d.* in the pound. The general district rate was only 1*s.* 5*d.* in the pound.

The health of the district was exceptionally good, as the death rate for the year ending December, 1905, was only 14*·*4 per 1,000, as against 17*·*2 per 1,000 for the metropolis.

Battersea had been described in the past (and that description holds good to-day) as a high of industry.

The total number of streets in Battersea was 461, while the length when last recorded was approximately eighty miles. The widest street was 80 ft., and the lowest 20 ft., but more than 90 per cent. of the whole were 40 ft. wide. The proportion of ordinary macadam unfortunately ranked rather high, but the Council now recognised the advisability of paving the streets with more durable and economical material.

Battersea had adopted tarred-slag macadam to a considerable extent, with a view to obtaining a more impervious paving. The results obtained after two-years' wear had been most satisfactory, both in streets used mainly for vehicular traffic, and also in some of the by-streets, which were largely used as playgrounds by the children. In the latter case, it had been much appreciated, and medical evidence was strongly of opinion that it conduced to the better health of the inhabitants. Altogether about five and a half miles of streets had been paved with this material, several of which were main thoroughfares subjected to omnibus and other heavy traffic. In adopting this material for road-making, the principal point to bear in

mind was that the slag must be of the best quality. All honeycombed or otherwise defective material must be rejected. The mixing with tar should also be scientifically carried out, so as to ensure the right amount of tar only being used. This was essential, as, if too much were used, the road would not consolidate, and would only bring discredit upon all concerned. On the other hand, if too little tar was used, the surface became dry, and would readily break up. Subject to the material being properly selected and mixed in the right proportions, there was no doubt, in the author's opinion, that it would prove to be one of the best substitutes for ordinary macadam on our public highways. The cost worked out very favourably in London, as compared with Guernsey granite or similar material.

In side streets, where the traffic was only light, 3 in. or 3½ in. of material was ample, and could be laid at a cost of 3s. to 3s. 6d. per super. yard, whereas, on the more busy thoroughfares, where the traffic was heavy and concentrated, the thickness should be not less than 3½ in. to 4½ in. when rolled, in which case the cost would be from 3s. 6d. to 4s. 6d. per super. yard.

All the footpaths in the borough, with the exception of those in main streets, had been allowed during the existence of the late vestry to get into very bad condition. They were mostly paved with tar-paving made from the clinker refuse obtained from the destructor, and it was not until the year 1902 that the Borough Council took the matter seriously in hand. It was then decided to expend a sum of 50,000l., spread over a period of five years, or about 10,000l. per annum, provided a loan could be obtained for the work, and this scheme was now being carried out.

In Battersea, as in other boroughs, the havoc played with the carriageways and footways by the incessant openings for gas, water, electric light, telegraph, telephone, and other purposes had to be borne in mind, and to give some idea as to what this meant it might be mentioned that no less than 4,241 openings were made in the streets of Battersea during the year ending March, 1905.

Practically the whole of the land in Battersea available for building purposes was now built over. It was only when any of the few remaining old houses with large grounds came into the market that new streets were laid out.

Battersea had been alive to the importance of wide thoroughfares, and during the past twenty-five years a sum of about 100,000l. had been expended in street and bridge improvement works. This did not include the improvements carried out in conjunction with the London County Council, and to which that body had contributed. The cost of the latter improvements had amounted to an additional sum of 135,000l.

Battersea was well supplied with parks and open spaces, which no doubt partly accounted for the very low death rate. The chief of these was Battersea Park, abutting upon the river Thames, and comprising some 200 acres. It was laid out partly as a recreation ground and partly as an artificial lake for boating.

Wandsworth and Chapin commons, 200 acres of which were in Battersea, had also been greatly improved during recent years, accommodation being provided for cricket, football, etc., as in Battersea Park.

In addition to these, the Borough Council maintained a recreation ground at Christ Church-gardens, also a small recreation ground in Vicarage-road, formed partly by reclaiming waste land from the foreshore of the river Thames, and partly in connexion with an important street widening in that district. At the present time the Council were laying-out a recreation ground on the northern portion of their housing estate in the Latchmere district. This work was being done partly by help received from the Central (unemployed) Body of London, and partly by loan. Trees had been planted in the streets of Battersea to the number of 2,170.

At the present time 60,000 tons of house and trade refuse were being collected in Battersea per annum. Of this about one-third, which included garbage and trade refuse, was burnt in the destructor, the remaining two-thirds being sent away by barge. The destructor, which was of an early type, was erected some twenty years ago by Messrs. Manlove, Alliott, & Co., of Nottingham, and

was without forced draught. The destructor consisted of twelve cells constructed back to back, with one common flue midway between the two rows of cells, and although it was now out of date, it had done good work in the past. The Council had the question of the erection of an up-to-date destructor now under consideration.

The question of how often the refuse should be collected was a very wide one. In Battersea endeavours had been made to meet the wishes of the whole community, and in some cases the collection was made daily, except Sundays, in some three times and in others once a week, according to requirements.

A large quantity of artificial paving had been made by the works department from destructor clinker.

The Council, in 1904, purchased and erected one of Messrs. Musker's (Liverpool) three-mould hydraulic flag-making machines, and had since made the stones by machinery. The press was provided with three sets of moulds and dies to make slabs, 3 ft. by 2 ft., 2 ft. by 2 ft. 6 in., and 2 ft. by 2 ft. The machine worked at a pressure of 2,000 lb. to the square inch, and exerted a pressure of 500 tons on the slabs. The total cost of the plant was about 1,800l. Since its erection the machine had been in constant use, and at present worked by two shifts of men; at present a ganger and thirteen men were engaged in working the machine, and these turned out about 600 yds. per week.

The material used for the base of the slabs was composed of crushed clinker from the destructor, and Portland cement in the proportion of three to one, about 1½ in. thick, and the face was composed of ¾-in. granite grit and Portland cement in equal proportions. Several kinds of granite grit had been tried for this purpose, and experience had decided in favour of Norwegian washed grit not exceeding ¼ in. in size.

The cost of making the slabs and stacking complete, including all charges, was less than 2s. per yard; 64,000 yds. of machine-made slabs had been made and laid in the borough during the past two or three years.

In Battersea there were many instances where originally "premises within the same curtilage" were now premises not in the same curtilage. The total cost to Battersea during the last nine years of reconstructing drains which had become sewers had amounted to nearly 20,000l., and the liability of maintaining these sewers still continued.

The London County Council had, on several occasions, endeavoured to obtain Parliamentary powers to deal with this unjust state of affairs, and some time ago Battersea, in conjunction with other metropolitan borough councils, appointed a deputation to wait upon the President of the Local Government Board, but up to the present the desired relief had not been obtained.

Battersea was so intersected with railways that it had been necessary to construct a large number of bridges, both over and under such railways. These bridges were originally narrow brick arches, which had now nearly all been reconstructed, widened, and converted into steel girder bridges. This had invariably been accomplished by imposing the condition when the railway companies had promoted Parliamentary Bills for widening their lines, etc.

The great undertaking of electrifying the tramways south of the Thames by the London County Council was commenced in 1900, and up to date over forty miles of route had been converted. The Battersea lines were left undisturbed until last year, when negotiations were advanced sufficiently to permit contracts to be concluded for the conversion of the Westminster and Wandsworth tramways. The total extent of lines comprised in this scheme was slightly over six miles, of which considerably more than half was situated in the borough of Battersea. The most difficult portion to deal with in respect of widenings for tramways had been in Nine Elms lane. A considerable section of this road had a carriageway under 30 ft. in width, whereas, when the improvement had been completed, the least width would be 33 ft., and this only for a short distance. The operations in effecting this change had involved pulling down and rebuilding various warehouses and other buildings, and setting back of long lengths of boundary walls, and shifting a large number of mains from under-

neath the tramway area to the side of the widened roadway.

In no other part of London had the obstructions been so numerous, and it was expected, when the works were completed, that over 50,000l. would have been expended in removing obstructions for the six miles of route.

It might be very interesting to know that the Battersea Borough Council had been enterprising in respect of water supply. The cost of water for baths and other purposes was so excessive that the Council decided to attempt to obtain a supply of its own.

Four artesian wells were sunk on the site of the Latchmere baths to a depth of about 520 ft., and two of similar depth at Nine Elms baths, and one at the electric generating-station.

The pumps delivered into tanks, and were capable of lifting 10,000 gals. of water each per hour, so that, if need be, 60,000 gals. per hour could be pumped.

A tank was provided at each establishment for storage purposes, and in order to more rapidly fill the swimming-baths.

The greatest quantity of water pumped in any one day since the wells had been in operation was 400,000 gals., but considerably more could be obtained, particularly at Nine Elms, where the supply appeared most prolific, the level of the water in the boreholes never having been lowered.

The supplies were used for the swimming-baths, slipper-baths, public wash-houses, street watering, and the artisans' dwellings on the Latchmere Estate. The cost worked out at 3d. per 1,000 gals., but it should be pointed out that steam was already generated on the premises, and only a proportion of this was charged to the pumping account.

The town hall and municipal buildings were originally designed by Mr. E. W. Mountford, F.R.I.B.A., and were built by Mr. W. Wallis, the foundation-stone being laid on November 15, 1895, by the Right Hon. the Earl of Rosebery, K.G. The buildings had a frontage of 110 ft. to Lavender-hill, and a return frontage to Town Hall-road of 295 ft.

The style of the town hall and municipal buildings was Renaissance, and the facings were of red Suffolk brick, relieved with Bath stone, the roofs being covered with Westmorland slates. The cost of the buildings, including the recent alterations, new organ, etc., totalled 45,000l.

The borough possessed three libraries, the central library, Lavender-hill, in close proximity to the town hall, and branches at Lurline-gardens and Lamma Hall, Bridge-road West.

The electricity generating-station had an area of about 5,500 sq. yds., of which 2,900 sq. yds. were covered by buildings, leaving ample room for future extensions.

The maximum load registered on the station during 1905 was 1,515 k.w., and at the present moment, over thirty miles of mains were laid.

The whole of the work of erection of building, etc., was carried out by the Council's Works Department, under the direction of the Borough Engineer, at a cost of approximately 55,000l.

The Latchmere-road baths contained three swimming-baths, with a full complement of slipper-baths.

The ladies' swimming-baths, Burns-road, adjoined the existing Latchmere-road baths. They comprised swimming-bath, waiting-hall, dressing-room, six first-class and three second-class slipper-baths.

The whole of the work, including the ornamental wrought-iron gates and railings, and the steel roof trusses, was carried out by the Works Department at a cost of 8,100l.

The baths and wash-houses, Battersea Park-road, were in the Renaissance style of architecture, plainly treated, and had a frontage to Battersea Park-road of 137 ft., and a depth to Cringle-street of 265 ft.

They comprised swimming-bath, six men's first-class slipper-baths, thirty-two men's second-class slipper-baths, three women's first-class slipper-baths, nine women's second-class slipper-baths, public wash-houses and ironing-room, establishment laundry, boiler-house, and engine-room.

The buildings were erected with stock bricks, with red brick facings, relieved with Portland stone dressings, the whole of the work having been carried out by the Council's Works Department at a cost of 45,000l.

The swimming-bath was covered over in the winter, and the buildings were used for public meetings, dances, concerts, etc.

There were upon the estate 138 three-roomed tenements, 146 four-roomed tenements, twenty-eight five-roomed houses, one four-roomed house, and one three-roomed house, providing in all accommodation for 314 families. The height of all rooms was 8 ft. 9 in. in the clear.

The whole of the tenements and houses were fitted with kitchen, copper, bath, and sink, and the tenements on the first floor were provided with teak staircases, giving access to the back gardens.

An interesting feature in the living-room and scullery bath-room was the "Model Cottager" combined kitchen range, copper, and bath arrangements, which were manufactured and installed by Ellkay & Cornes, Ltd.

Each tenement had its own separate entrance and back garden, and the whole of the floors were fireproof throughout, being constructed of coke breeze, cement-concrete, and steel joists.

The houses were provided with electric-light fittings, and electrical energy was supplied on the penny-in-the-slot system.

The rents of the various houses and tenements were as follows:—Five-roomed houses, 11s. 6d. per week; four four-roomed tenements to Sheepcote-lane, 10s. 6d.; other four-roomed tenements, 10s. per week; three-roomed tenements, 7s. 6d. per week, which worked out at 2s. 6d. per room, exclusive of bathroom scullery.

The area of the land occupied by streets and buildings was 7 acres 3 roods $2\frac{1}{2}$ poles; the remainder, 3 acres 3 roods 35 poles, being built upon, but it was hoped that before long a portion of this would be available for the erection of three-roomed tenements, the remaining portion being left as a recreation ground, which was now being laid out.

The estate (although the buildings were not all completed at the time) was formally opened by the Right Hon. John Burns, M.P., who stated that, in his opinion, "by building this colony Battersea had contributed more to meet the alleged decadence of physique than all the articles that had ever been written in the newspapers, and the result of their scheme was a tribute to the unity of Parliament with other bodies."

The scheme on the Latchmere Estate proving so successful, the Council, having regard to the great necessity which existed for further working-class houses in Battersea (915 applications, in addition to those accommodated, having been received at that time for the tenancy of the houses and tenements on the Latchmere Estate), and to the fact that there was practically no other available housing land in the borough, decided to take the necessary steps to appropriate for such purposes certain surplus land at the rear of the town hall and municipal buildings, and which had been used by the Council chiefly as a depot.

Fourteen houses, each containing two three-roomed tenements, and four houses, each containing two two-roomed tenements, had been erected, accommodating in all thirty-six families. A new street, in continuation of Town Hall-road was also formed through a portion of the land. The living-rooms measured 14 ft. 7 in. by 10 ft. 7 in., bathroom scullery 8 ft. 9 in. by 7 ft. 3 in., and bedrooms 15 ft. by 8 ft. 9 in. One bedroom to each first-floor tenement was slightly larger, and measured 15 ft. by 11 ft. 6 in., exclusive of space over staircase.

The rents charged were 6s. 6d. per week for two-roomed tenements, and 8s. 6d. per week for three-roomed tenements.

The capital expenditure was 114,185/., which amount included 5 per cent. for establishment charges.

With the exception of the first year the estates had been self-supporting, and as the loan was paid off, and a consequent reduction in the interest, a substantial income would be derived.

Mr. J. Lemon (Southampton), in moving a vote of thanks to Mr. Hayward for his paper, said they could not find fault with the variety of paving in London, for they had something of everything. He thought they could get better results if they had a little

more uniformity in their roads. He had recently been visiting Berlin, and was much struck with the streets, which were all made of asphalt. Horses did not slip and fall down there, which he attributed to the fact that they were always travelling on the same material.

Mr. J. Lobley (Hanley) seconded the vote of thanks.

Mr. A. M. Fowler (Manchester) considered the tar-macadam roads at Scarborough the best he had ever seen.

Mr. O. E. Winter (Hampstead) was of opinion that in London refuse should be collected at least twice a week, and he was rather surprised that Battersea had not come up to date in that particular.

Mr. R. J. Angel (Barnes) did not think sufficient work could be secured from men working in the streets at an advanced stage of life. Instead of men going to the Union, they were pushed on to the Surveyor, who had to put up with a very inferior class of workman. As a member of the Royal Institute of British Architects, he very much objected to a statement in the paper as to the artisans' dwellings. It was stated that the Borough Engineer was asked to prepare plans for the artisans' dwellings, but, having failed to obtain a satisfactory design, a competition was inaugurated, plans were invited, and the designs chosen. Having got the successful architect's plans, the Borough Engineer was instructed to prepare revised plans based upon the premiated design. That he regarded as a very retrograde proceeding, and one which ought to be discouraged in any council which aimed at purity in commercial life.

Mr. Norman Scorgie (Hackney) pointed out how small a proportion of the rates the borough councils were responsible for. In Battersea, of the total rate of 4s. 2d., only 1s. 5d. was for expenditure over which the Borough Council had control. He could not congratulate Battersea that no man was employed on the roads under forty years of age. He regarded it as wrong to the men, as they could not put in sufficient years of service to get proper superannuation. Battersea was suffering, as they were all suffering, from the confusion in the law as to sewers *versus* drains. Battersea's contribution to the property owners had exceeded 2,200. per annum for the last nine years. His experience was the same, and it might safely be said that the ratepayers of London were paying 50,000. a year which the owners should morally and equitably, if not legally, undertake.

Mr. A. H. Campbell (East Ham) was of opinion that a Works Department, given plenty to do, and not tied up with red tape, would give good results to the district it served. But until such time as the councils made up their own minds, these Works Departments would not be the success they could otherwise attain.

The President remarked that he found the proper addition for establishment charges was 10 per cent.

The vote of thanks, having been passed, Mr. Hayward, in reply, referred to the experiment in tar-macadam made by the London County Council on the Thames-embankment after inspecting the roads at Battersea. They put down three sections—slag, granite, and limestone. After four months the limestone was worn through, the granite broke all to pieces, but the slag was as good to-day as when it was put down.

The members were then entertained to luncheon in the grand hall by Mr. Hayward, and in the afternoon proceeded in motor-omnibuses to inspect the artisans' dwellings in Latchmere-road, the swimming-baths, the works' depot, and other public works. On returning to the municipal buildings tea was served.

SURVEYORS' INSTITUTION JUNIOR MEETING.—The annual dinner held in connexion with the junior meetings of the Surveyors' Institution took place at the Trocadero Restaurant on May 16, the chair being taken by Mr. G. P. Knowles. There was a large attendance of members, and the invited guests included Messrs. Howard Martin, A. R. Stenning, E. B. Tanson, H. Chatfield, Clarke, C. Longridge, J. H. Townsend Green, M. C. Elwell, W. H. Elwell, H. Courthorne Munro, W. A. Hawes, A. Goddard (Secretary of the Surveyors' Institution), S. Cutler, and Adam Hunter. During the course of the evening a presentation was made to Mr. Sydney A. Smith, the Hon. Sec., by the members of the Committee to commemorate his term of office.

THE ARCHITECTURAL ASSOCIATION: ANNUAL DINNER.

THE members' dinner of the Architectural Association took place on Thursday last week at the Georgian Hall, Gaiety Restaurant, Strand, Mr. E. Guy Dawber, President, in the chair. There were also present—Sir Henry Tanner, and Messrs. R. S. Balfour, President-Elect, Arthur Bolton, Cole A. Adams, Louis Ambler, A. H. Belcher, Walter Cave, Basil Champneys, J. D. Crace, Owen Fleming, W. A. Forsyth, K. Gammell, E. Greenop, Alexander Graham, Leslie W. Green, H. A. Hall, E. T. Hall, H. T. Hare, F. Hooper, Arthur Keen, H. Lovegrove, G. H. Lovegrove, John Murray, J. Douglass Mathews, H. P. G. Maule, G. Northover, M. G. Pechell, W. A. Pite, Ernest Runtz, J. Osborne Smith, H. Tanner, jun., A. H. Ryan Tenison, Maurice E. Webb, W. Wonnacott, D. G. Driver, Secretary, and others.

The toasts of "The King" and "The Queen and Royal Family" having been honoured.

Mr. Arthur Keen proposed "The Royal Institute of British Architects," coupled with the name of Mr. Hall. He said that for them to honour that toast was almost akin to proposing their own health, as so many members of the Association were members of both societies. He was sure that they would accept the toast with enthusiasm, for he thought that all of them believed that the Institute represented the best interests of the profession. The Council were alive to what was taking place around them, and were doing their best for the profession, and the Association wished them every success in their work. The Institute took a great interest in the Association, and the Association was grateful to them for doing so.

Mr. Edwin P. Hall, in reply, said that the Institute felt the keenest sympathy with all that was done in the Association, and they admired its spirit, ability, and, above all, its enthusiasm. Youth, it was said, was the father of man, and we the older sons had to borrow from them, hoping to retain that enthusiasm which prevailed in the junior society. It was in that way only that the elder men could hope to hold their places, for it was astonishing, when they walked through the Association rooms, to see the excellent work which was done, and which made one feel that one would have to take a back seat in the competitions of the future. That state of affairs was largely due to the active interest the Committee took in the Association; but there was one man he should like specially to mention—i.e., Mr. Maule, who so ably directed the day school, for Mr. Maule and his assistants were keenly interested in everything which was done in the schools, and the young men who went there owed the gentlemen a debt of gratitude for the interest they took in them. The Board of Education connected with the Royal Institute of British Architects took the greatest interest in the schools, and Sir Aston Webb and Mr. Basil Champneys both took an active share in their work, and had the best interests of architecture at heart. As was generally known, the Board of Examiners of the Institute had decided, with the concurrence of the Council, that the four years' course in the schools of the Association should exempt men from the Intermediate examination. There had been rather exciting times at the Institute lately. The burning question of registration had been before them, but he thought they would all agree that the best register they could have was that of earnest work, zealously and strenuously achieved, and to that alone should a man owe the reputation he might make in the world.

Mr. Ryan Tenison then proposed "The Architectural Association," and in the course of his remarks he referred to the great progress which the Association had made within his recollection—more lectures, much finer premises, and a rapidly-increasing membership. Anyone seeing the work done in the classes and the schools, and knowing the work which had been accomplished by the Association, must be proud of what had been done, and he hoped that the progress would be as rapid in the future as in the past. With the toast he coupled the name of the President, Mr. Guy Dawber.

Mr. Dawber, who was very heartily received, in acknowledgment, said he felt very deeply the kindness and help which the

Council of the Association during the last two years had given him. Without that help the duties of the President of such a large body would be most difficult to carry out successfully. The President, the Council, and all the members of the Association were under a debt of gratitude to the Hon. Secretaries and the Secretary, Mr. Driver, and they would unite with him in offering their best thanks to their Secretary for all he had done, and was likely to do. The position of the Association in the architectural world was well assured, and they were well established in their new home in Tufon street. Every year the membership was increasing, and he was glad to say that the building debt had been greatly reduced, and it did not want much to relieve them of it altogether. Educationally, they had progressed by leaps and bounds, and the Association could now fairly claim to be the chief architectural educational body in the country, and the work the students did in the schools was equal to anything done in any other architectural educational body in the country. As had been said, they were under a deep debt of gratitude to Mr. Maule, the master of the day school, but they must not let the occasion pass without expressing their gratitude to Mr. F. T. Green for the way he is working the evening school; the two masters, with their friend, Mr. Lewis, had done all that could possibly be done to make the educational work of the Association the great success that it is. Last year, he said he trusted that the social side of the Association would not be neglected, and he was glad that, during the past session, they had established an athletic club and a social and dramatic club, and he felt sure that this would tend to unite and bind together the members of the Association in a way which would conduce to a spirit of good fellowship. He desired to introduce to them their new President, Mr. Balfour, whose work as an architect they knew. Mr. Balfour had been Hon. Secretary for four years, and he had also been Vice-President. The welfare and honour of the Association would be well maintained in his hands.

Mr. Cave then briefly proposed the toast of "Our Guests," coupled with the name of Professor Hume, who replied, remarking that one of the pleasures of this annual meeting was to meet old students, and put aside for a short time the burden and turmoil of life. An informal toast was then proposed by Mr. Clapham. He said that the building debt was still 8000*l.*, and it was a disgrace to the profession that they had not wiped it off long ago. The Purple Patch had started a shilling fund in aid of the debt, and he desired to bring this to the notice of the 1,500 members of the Association. Every shilling given to the fund would be doubly given—it would be a parting tribute to a hard-working President, and the best compliment they could show to the incoming President was to let him take office with the debt removed. The toast he proposed was, "Death to the Building Debt."

The toast having been drunk, the proceedings terminated.

THE SURVEYORS' INSTITUTION: COUNTRY MEETING AT BIRMINGHAM.

The Council accepted an invitation from the Warwick and Worcester Provincial Committee to hold their Country Meeting this year at Birmingham, on May 24 and 25.

The Right Honourable the Lord Mayor of Birmingham (Councillor Alfred John Reynolds) received the visiting members at the Council House on the 24th inst., and delivered an address of welcome on behalf of the Corporation.

By the courtesy of the Lord Mayor and Corporation the general meeting of the Institution was also held in the Council House. Immediately after the reception by the Lord Mayor the chair was taken by the President of the Institution.

The business of the morning sitting consisted of the reading and discussion of the following papers:—

- (1) An address by Sir Oliver Lodge, F.R.S.
- (2) "The History of Birmingham," by Mr. H. A. Pritchard.
- (3) "The Economic Geology of the Birmingham Country," by Professor Charles Lapworth, F.R.S.
- (4) "Proposed Legislation affecting Real Estate," by Mr. John Willmot (Fellow).

At the conclusion of the morning meeting the members of the Warwick and Worcester Provincial Committee entertained the visiting members at luncheon at the Grand Hotel.

After the luncheon arrangements had been made to enable members to visit places of interest in and near Birmingham. Visits were also to be made to:—Messrs. Callery's model village at Bourville; the Wolseley Tool and Motor-Car Company's Works, Salley; Messrs. Eldington's Electro-Plate Works; and Messrs. Osler's Glass Works; the generating station of the City Electric Supply Department in Summer-lane; and the New University.

The dinner was to be held at the Grand Hotel on the 24th inst.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, Alderman Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Islington Borough Council 2,000*l.* for works at public baths, 2,000*l.* for site for public library, and 1,776*l.* for street lighting and pipe sewers; and Lewisham Borough Council 25,554*l.* for paving works, etc.

Main Drainage Extension: Middle Level Sewer.—The Main Drainage Committee recommended:—

"That the estimate of expenditure on capital account of 16,600*l.* submitted by the Finance Committee for the construction of the portion of the middle level sewer No. 2 from Old Ford to Queen's road, Shoreditch, and of a branch sewer across London-fields connecting this sewer with the existing high-level sewer, such estimate including the cost of supervision, general incidents, etc., be approved."

List of Contractors Selected to Tender.—The Education Committee recommended, and it was agreed:—

"That, subject to the conditions specified hereunder, the names of the undermentioned firms be added to the list of contractors to be invited to tender for structural alterations, repairs to buildings, etc.—H. Brazg & Sons, 19, Rolsart-street, Brixton-road, works not exceeding 1,000*l.* in value; P. J. Gerrard, Point-hill, Greenwich, works not exceeding 2,000*l.* in value.

That the names of the undermentioned contractors be retained on the list of contractors to be invited to tender for works in connexion with schools on probation for a further period of one year as from May 16, 1906:—Balfour, Fane, & Co., 298 and 300, Goswell-road, Islington; W. & J. Freys & Co., 11, Old Queen-street, Westminster, heating works; R. Harding & Son, 75, Aroldene-road, Brixton, cleaning, painting, etc.; J. Banks, 2, Howard's-lane, Islington, repairs to buildings, cleaning, and painting; W. Penn & Co., 5, The Broadway, Highbury-park, cleaning and repairing blinds.

That the names of the undermentioned contractors be retained on the list of contractors to be invited to tender for works in connexion with Council schools, on probation for a further period of six months as from May 16, 1906:—Prait Bros., Bradford-street, Birmingham, supply of ironmongery; J. Knight & Sons, 24, Gertrude-street, Chelsea, repairs to buildings and cleaning and painting.

That Palowkar & Sons, of 50 and 51, Queen-street, Clerkenwell, Manchester, firms who have recently been re-constituted, be allowed to tender for heating works. That J. Esson & Son, Ltd., of 102, 7, Peter-lane; W. H. Lascelles & Co., Ltd., of Binhill-row; L. Teale & Co., of 48, Woodhouse-lane, Leeds; Stevens & Sons, of 14, Yonge-park, Seven Sisters-road; and the Lancashire Heating Company, Ltd., of 11, Temple-street, Manchester, firms who have recently been re-constituted, be allowed to tender as heretofore.

That the names of the undermentioned firms who do not desire to tender for cleaning and painting work be removed from the list of contractors to be invited to tender for such work in connexion with Council schools:—W. & B. H. Davey, Ruskin-lane, Victoria-avenue, South-end-on-Sea; H. Lovatt, Ltd., Darlington-street, Wolverhampton; Waring White Building Company, Ltd., 14, Cockspur-street; T. Whitehead & Co., Ltd., Portland-place North, Clapham-road."

Cooking-grates.—The Public Health Committee reported as follows on the recommendations of the Inter-Departmental Committee on Physical Deterioration:—

"The Committee point out that 'in tenement houses often only one room in the whole house contains a grate of proper service for cooking, with the result that a large number of tenements do not contain the requisite apparatus for the preparation of food.' We have had before us a report by Dr. Young, who until recently was in the service of the Council, on 'Houses Adapted as Tenement Houses,' in which the question was considered. The medical officer, in presenting Dr. Young's report, stated that, as the result of inquiry made by the Council's inspectors, it was found that 'of 739 tenements of one, two, three, and four rooms, a third of the tenements there was no oven in which food could be baked, the fire-grate being the same as that provided when the house was originally constructed, or of the same kind, and not more

adapted for cooking purposes than an ordinary bed-room grate. This condition was found especially in tenements of one room, more than half of which were so circumstanced; in tenements of two rooms about a quarter were without coal fire or gas oven for cooking purposes, but in tenements of three or four rooms (all oven) heated in one or other of these ways was always found to be provided. In tenements of one room in which an oven was provided this oven was always heated by a coal fire, in exceptional instances the oven was associated with a gas stove, and in one or two instances the tenement had both. In tenements of two rooms provided with an oven, in about 85 per cent. the oven was heated by the fire-grate, in about 2 per cent. there was a gas cooking stove, and in about 12 per cent. there were both. In tenements of three or four rooms an oven was found, with a single exception, in association with the coal fire-grate, and in 16 per cent. of these tenements there was also a gas cooking stove. It was often found that no provision had been made for carrying off the products of combustion of such gas stoves. In giving evidence before the Committee, the medical officer drew attention to this subject, and that Committee has arrived at the conclusion that the law should require a grate suitable for cooking to be provided in every tenement let for the occupation of a family. We propose to meet with this point when submitting our recommendations as to public health legislation to be sought in the session of 1907."

Fire-resisting Scenery.—The Theatres and Music-halls Committee reported as follows:—

"The Council on March 1, 1904, included in the rules to be observed by licensees of premises licensed by the Council for public entertainments, one requiring that "All scenery, wings, sky borders, cloths, draperies, gauze cloths, floral decorations, properties, hangings, curtains, etc., whether on the stages in the auditorium, or in other parts of the premises, must be rendered and maintained non-inflammable. The Lord Chamberlain subsequently issued a similar rule with regard to the use of scenery in his jurisdiction. Before March, 1904, it had only been necessary to render fire-resisting the hangings, curtains, and draperies used in places of public entertainment, and not the scenery. It was to be expected, in view of the considerable trouble and expense which it occasions theatre managers, that the rule made in March, 1904, would at once meet with general acceptance, and until recently reports made to us by the chief officer of the fire brigade of non-compliance with the rule were very numerous, more especially in the case of scenery brought into theatres by touring companies. The practice which is generally adopted for complying with the rule is to dip the lighter fabrics in a solution made from one or more of the chemical salts technically known as 'antipyres' (ammonium phosphate, borax, alum, etc.), and as regards the scenery generally, to brush over the back of the canvas and woodwork with this solution.

The method adopted by the Council's officers for testing whether the scenery is fire-resisting is to obtain samples, selected at random in the presence of the manager, from the scenery to be tested, and to subject these samples to the headquarters of the fire brigade to the flame from a plumber's portable lamp, the temperature of the flame being about 1,000 deg. F. If when subjected to this test the samples do not support flame, the scenery is deemed to possess the requisite degree of resistance to fire. Complaints have been made from time to time to the Council and the Lord Chamberlain that the superficial treatment of the scenery with fire-resisting solution is of little, if any, use in making it fire-resisting, and it has been urged that only scenery formed of wood and canvas which has been thoroughly impregnated with fire-resisting solution should be allowed to be used in theatres and music-halls.

We have accordingly given careful consideration to the question whether it is necessary and practicable to insist upon the adoption of some more thorough method than is generally employed for rendering scenery fire-resisting, and to this end in arriving at a decision on this point we arranged for the chief officer of the fire brigade to submit in our presence to the usual test imposed by him samples of materials which had been treated with fire-resisting solution and similar portions of materials which had not been so treated. In all thirty-three tests were made, the articles tested consisting of scenery cloth, profile boards, wooden scenery battens, artificial flowers and palms, hay, straw, gauze cloths, muslin, chintz cloth, flannel, etc., and linen.

As a result of the tests, we are of opinion that the degree of fire-resistance obtained by dipping light fabrics in the fire-resisting solutions usually employed is quite satisfactory, and that as regards the scenery generally the degree of the safety which is attained by brushing over the back of the canvas and the woodwork with fire-resisting solution is all that can reasonably be required. It is therefore, in our opinion, unnecessary to insist that the woodwork and canvas of scenery which has been so treated should be thoroughly impregnated with fire-resisting solution.

It appeared to us probable, however, that as regards the canvas and woodwork of scenery, which has only been treated superficially, the efficacy of the treatment might be impaired when the scenery was in constant use, but we are not in a position to form an opinion as to the extent of the deterioration likely to take place, or consequently, as to the frequency with which scenery in such a position should be re-treated. We have, therefore, instructed the chief officer of the fire brigade to collect evidence on this point and report to us thereon in six months' time. We report the course taken for the information of the Council."

Proposed New Asylum.—The Asylums Committee reported as follows:—

"The number of lunatics on January 1, 1906, for whom the Council was responsible under the Lunacy Acts to provide accommodation (including patients on the private list and private patients at

the Manor Asylum and Claybury Hall), was 18,598. The total beds in the London asylums on that date was 17,078, showing a deficiency of 1,520. The average annual increase of lunatics in the County of London since 1880 is 527, but the average for the past five years is 614. The preparation of plans and estimates, and their approval, and the subsequent erection and equipment of an asylum will cover a period of at least five years. At the estimated rate of annual increase (550 a year) the number of lunatics for whom the Council will be responsible to find accommodation on January 1, 1911, will amount to 21,348.

The accommodation in course of erection, or contemplated, is as follows—Longgrove Asylum, Epsom, 2,015 beds (superstructure now being erected); Bexley Asylum (additional villa), 50 beds (in course of completion); addition to Colney Hatch Asylum, 315 beds (in place of buildings destroyed by fire); addition to Manor Asylum, 240 beds—total, 2,617. Add present accommodation, 17,078—total accommodation on January 1, 1911, 19,695.

If by this date an additional asylum for 2,000 patients were provided, the total accommodation would be 21,695 beds. This would be more than sufficient to meet the estimated patient population on that date (21,348) but with a continuation of the increase of patients the vacant beds would be filled during the year 1911.

It is, therefore, apparent that the commencement of a new asylum should be no longer delayed. There are many points to be taken into consideration in the choice of a site for an asylum, e.g., its accessibility for patients and their friends, the soil and contiguity to the building proposed, and the proximity of a railway, which would considerably affect both the cost of the building and thereafter the cost of coal and other supplies. We have mentioned these facts as a justification of our proposal to recommend the purchase of a new site whilst some 350 acres on the Horton Estate remained unappropriated for asylum purposes. Having regard to the views of the Finance Committee, we now recommend the Council to utilise the unappropriated area of the Horton Estate for the new asylum.

The asylum which it is proposed to erect will be a departure from the present type of building, being designed entirely upon the villa principle. It will be divided into two sections, i.e., a hospital section and a chronic section, and in connexion therewith there will be provided a chapel, recreation hall, administrative centre, stores, kitchen, boiler-house, bath-house, workshops, laundry, isolation hospital, and staff quarters, all to be covered by the buildings will be approximately 40 acres. We are not at present in a position to give any estimate as to the cost of construction of an asylum built upon the lines suggested, as it is entirely a new departure in asylum construction so far as Great Britain is concerned, although the villa principle is adopted to some extent in other countries, notably in the County of London, and we believe that the more home-like surroundings of an asylum built upon these lines, as compared with the usual "barrack" type of building, will have a beneficial effect upon the patients. Facilities will also be afforded for a more extended classification of patients than is possible in an ordinary asylum. Another advantage of this scheme of asylum construction is that it lends itself readily to reduction or extension. Before we are in a position to inform the Council of the probable cost of this building, it will be necessary for a detailed scheme, working drawings, and estimate based on bills of quantities to be prepared, and for this purpose it is estimated that a sum of 9,000 will be required. We recommend (a) That the estimate of expenditure on capital account of 9,000, submitted by the Finance Committee in respect of the preparation of plans, estimates, etc., in connexion with the proposed erection of a new asylum on the Horton Estate, be approved. (b) That an expenditure not exceeding 9,000 on capital account, be sanctioned for the purposes referred to in recommendation (a).

The consideration of the matter was deferred.

Colney Hatch Asylum: Erection of Additional Buildings.—The same Committee reported as follows:—

On March 1, 1904, the Council authorised an expenditure of 1,500, for the preparation of plans, etc., of permanent buildings to be erected at Colney Hatch Asylum to accommodate 310 patients and the necessary staff in place of the temporary buildings (which housed 320 patients and staff) which were destroyed by fire in 1903. We then reported that the cost of the proposed buildings was estimated at from 60,000 to 70,000, exclusive of equipment.

We are now in a position to submit an estimate of the total cost of erecting and equipping these buildings, which, as regards the cost of erection, is based on priced bills prepared by a firm of quantity surveyors.

The scheme for the accommodation, set out in preliminary sketch plans, has received the informal approval of the Commissioners in Lunacy. It provides for the erection of seven buildings, five being connected with a covered way open at the sides on the site of the late temporary buildings, and two detached buildings on other suitable sites. These buildings will provide accommodation as follows:—

	Dormitory.	Single Staff room.	
One villa for boys	36	4	3
One block for phthisical cases	20	4	2
One infirmary block	42	6	4
One infirmary block	42	6	4
One block for chronic cases	54	6	3
One block for acute cases	54	6	3
One block for dysentery cases	26	2	1

A mess-room, general bathroom, and accommodation for head attendant will also be provided in connexion with these blocks. The buildings of ground floor height, and the estimated cost of their erection, and the engineering works involved, is as follows:—Building work (quantity surveyors' priced bills, 1902), including the covering of the building, 750; padded rooms, 675; engineering works (heating, lighting, hot and cold water services, telephones, fire-alarms and a local boiler for the public hospitals and boys' villa, which are detached from the other buildings), 6,650; paths and drainage for airing courts, tar-paving, and fencing, 1,750—total, 55,207.

The estimated cost of the equipment of the buildings, including the cost of laying out and planting airing courts around them, is 5,500, the total cost of the buildings and equipment being (say) 62,000, or 197l. 3s. per bed. We would remind the Council that the original equipment of the temporary buildings was lost when they were burned down, otherwise this would have been available for transfer to the new buildings. The money recovered from the insurance companies in respect of the buildings destroyed, including equipment and fixtures, was 17,700, and this sum was paid over to the Council. We propose to have the necessary erection of the superstructure, which will be carried out under the supervision of the asylums engineer, whilst the foundations will be put in by men directly employed under the Council's office. We recommend (a) That the estimate of expenditure on capital account of 62,000, submitted by the Finance Committee, in respect of the erection and equipment of additional buildings at Colney Hatch Asylum, be approved. (b) That expenditure, not exceeding 62,000, on capital account, be sanctioned for the purposes referred to in recommendation (a).

The consideration of this matter was also deferred.

Manor Asylum: Erection of Additional Buildings.—The Committee also reported:—

On June 28, 1904, the Council authorised an expenditure of 1,300 for the erection of villas, etc., of two villas to be erected at the Manor Asylum, each to accommodate sixty female patients and the necessary staff. The asylum at present accommodates 472 patients (222 females and sixty males), and it is proposed to increase the numbers to 1,000. The scheme of enlargement allows of it being gradually carried out so as to minimise the difficulties which will consequently arise in the administration. Part of the work in connexion with the scheme has already been executed, i.e., the laundry, bakery, and main kitchen have been extended to meet the requirements of the extra patients eventually to be accommodated, a disinfecting house and apparatus have been provided, and an isolation hospital is in course of construction. The Council having voted the necessary money for these works, we now propose to continue the enlargement by erecting two blocks, each to accommodate sixty-four patients (female) and a block to accommodate two head attendants and twenty-six nurses (to replace an existing block, which accommodates nine nurses and one head attendant, part of the temporary structure).

Preliminary plans of the buildings referred to have been prepared and informally submitted to the Commissioners in Lunacy. The buildings will be similar in character to the villa now accommodating male patients, and those for the patients are of ground floor height only. Although primarily designed for acute cases, the blocks will be so constructed as to enable them to be utilised, if necessary, for infirmary cases. The walls are to be brickwork throughout and the flooring of deal battens on sleeper walls. The heating will be by low-pressure steam (as in existing structures) and the buildings will be lighted by gas. The estimate of cost of erection and equipment of the buildings, drainage, heating, hot and cold water supplies, gas services, telephones, etc., systems, airing court paths and fencing, and the making up of a road 10 ft. wide to connect the road outside the present airing courts and the main drive. The total estimated cost of the work now proposed to be proceeded with is 22,000, made up as follows:—Quantity surveyors' estimate, including drawings, 16,870; padded rooms, 150; road, paths, drains, and gullies (including tar-paving), 860; engineering work (which includes heating, lighting, hot and cold water services, telephones, fire-alarms, etc.), 1,920; equipment at 15l. 10s. per bed, 1,984—total, 21,824, (say 22,000).

The total cost per bed for building and equipment is, therefore, approximately 172l. We would point out, however, that the nurses' block to be erected provides accommodation for a larger number of nurses than is required for the patients to be immediately accommodated, although not for the total number for the completed scheme.

The mains included in the engineering works are of sufficient capacity to meet the requirements of the further buildings to be erected later on to complete the scheme.

We propose to invite tenders for the works, which will be carried out under the supervision of the asylums engineer. We recommend (a) That the estimate of expenditure on capital account of 22,000, submitted by the Finance Committee in respect of the erection and equipment of two new blocks, staff quarters, etc., at the Manor Asylum, be approved. (b) That expenditure not exceeding 22,000, on capital account be sanctioned for the purposes referred to in recommendation (a).

The consideration of this matter was also postponed.

Victoria Embankment.—The Highways Committee recommended, and it was agreed:— That expenditure, on maintenance account, not exceeding 5,000, be sanctioned for re-metalling the carriageway of the Victoria Embankment; that it be referred to the Works Committee to execute the work generally as a jobbing work; that the Highways Committee be authorised to arrange for experimental

lengths of special paving to be laid; and that the seal of the Council be affixed to any necessary documents relating to such experimental paving works.

Totterdown Fields Estate: Erection of Cottages and Shops on Section B.—The Housing of the Working Classes Committee reported that, on July 12, 1904, the Council accepted the tender of Messrs. F. & F. Higgs for the erection of cottages on section B of the Totterdown Fields Estate, Tooting, and on July 25, 1905, approved a variation of the contract so as to allow of the erection of blocks Nos. 46 to 54 in accordance with a modified specification. Several blocks of cottages either have been or are about to be completed, but five blocks, included in the original contract and consisting of twenty-one cottages and two shops, still remain to be commenced. The contractors have offered to erect these five blocks in accordance with a modified specification for the sum of 9,650, including 275, as provision money, and to undertake the work upon terms and conditions of contract similar to those adopted for blocks Nos. 46 to 54. The Committee recommended:—

That the contract with Messrs. F. & F. Higgs, for the erection of cottages on section B, of the Totterdown Fields Estate, be varied to allow of the erection of blocks Nos. 55 to 59, both inclusive, in accordance with a modified specification, at a cost of 9,650, inclusive of 275, set apart as provision money for the work, and that the contractor do prepare and obtain the execution of a supplemental agreement to give effect to such arrangement, and that the seal of the Council be affixed to such agreement when ready.

Fulham Palace-road and High-street: King's Head Public-house.—The Finance Committee reported as follows:—

In accordance with the instructions of the Council on November 28, 1905, passed upon the recommendation of the Improvements Committee, we are arranging for the payment to Messrs. Harrington & Co., of 4,000, being part of the consideration for the settlement of their claim in respect of the freehold interest in and (by an acre of land which it was found necessary to acquire by agreement with the Council) the site of the public-house, a sum of 60,000, making a total expenditure of 64,000, exclusive of legal and other incidental costs. The only return for this expenditure is that the Council has obtained the (by an acre of land which is needed for the widening. The licence of the public-house has not been extinguished, the benefit of such licence having been conveyed to the freeholders—this being a condition attached by them to their acceptance of the 4,000, above mentioned. The net result of the transaction is, therefore, that the Council has paid more than 64,000 for about 1/4th of an acre of land which, considering the locality and the fact that the licence has not been extinguished, appears to us a very expensive transaction. We understand, however, that connected with the present case, there were exceptional circumstances which, in the opinion of the Improvements Committee will explain to the Council.

Improvements.—The following recommendations were made by the Improvements Committee:—

That the estimate of expenditure on capital account of 1,150, submitted by the Finance Committee in respect of the widening of Darimouth-road, Fore-st-hill be approved.

That the estimate of expenditure on capital account of 1,441, submitted by the Finance Committee, in respect of the widening of Putney-hill and Upper Richmond-road, be approved.

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

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

Lines of Frontage and Projections.

Clapham.—Buildings on the southern side of High-street, Clapham, to abut also upon Aristotole-road and Cato-road (Mr. J. Donkin for the Trustees of the Pease Estate).—Consent.

Hammersmith.—Retention of a show case in front of No. 340, King-street West, Hammersmith (Mr. G. H. Varnell).—Consent.

Holborn.—A projecting clock in front of Messrs. Griffin & Sons' premises, Kemble-street, Holborn (Messrs. J. J. Griffin & Sons, Ltd.).—Consent.

Kenington, South.—Retention of a wooden oriel window at No. 3, Holland-lane, Kenington, abutting upon Holland Park-road (Mr. J. A. Minty for Mr. W. T. Lord).—Consent.

Lewisham.—Projecting porches over the doorways of Nos. 32 and 34, Oakcroft-road, Lewisham (Messrs. Kennard Brothers).—Consent.

Lewisham.—A projecting porch in front of No. 16, Oakcroft-road, Lewisham (Messrs. Kennard Brothers).—Consent.

Lewisham.—An addition at the rear of No. 33, Vancouver-road, to abut upon Hurstbourne-road, Lewisham (Mr. T. Harris for Dr. C. E. Bennett).—Consent.

Lewisham.—Porches and bargeboards to twelve houses on the eastern side of Cranston-road, Forest-hill, southward of No. 12 (Mr. A. R. Westworth).—Consent.

St. George, Hanover-square.—A projecting oriel window to a building in course of erection at the corner of Oxford-street and Davies-street, and projecting shop fronts to the Oxford-street and Davies-street frontages of such building (Mr. W. A. Lewis for Messrs. Perry Brothers).—Consent.

St. George, Hanover-square.—A one-story shop on the forecourt of Victoria Station, Pimlico (Mr. L. W. Livesey for the London, Chatham, and Dover Railway Company).—Consent.

Strand.—An addition over the existing porch in front of No. 10, Carlton House-terrace, Westminster (Messrs. D. Blow and F. Billery for the Right Honourable the Viscount Ridley).—Consent.

Strand.—A projecting clock and sign in front of the Lyceum Tavern, No. 354, Strand (Messrs. Brown and Barrow for Messrs. Heneky).—Refused.

Battersea.—Station buildings on the northern side of St. John's-hill, Battersea (Mr. C. L. Morgan for the London, Brighton, and South Coast Railway Company).—Consent.

Clapham.—The completion of a one-story shop connected to be erected on the forecourt of No. 850, Wandsworth-road, Clapham, abutting upon Queen's-road (Mr. W. C. Poole for Mr. M. Jones).—Consent.

Width of Way.

Strand.—A showcase at No. 224, Regent-street, at less than the prescribed distance from the centre of the roadway of Argyle-place (Messrs. F. Sage & Co. (1905), Ltd., for Messrs. T. & J. Perry).—Consent.

Hackney, Central.—That the application of Mr. G. H. Lovegrove, on behalf of Messrs. J. King & Co., Ltd., for an extension of the periods within which the erection of a warehouse building on the site of Nos. 74 and 76, De Beauvoir-crescent, Kingsland, with external walls at less than the prescribed distance from the centre of the roadway of Hertford-road, was required to be commenced and completed, be granted.—Consent.

Westminster.—An addition to the Newport Market Army Training School, Coburg-row, Westminster (Mr. E. T. Hall for the Committee of the Newport Market Army Training School).—Consent.

Hampstead.—An addition to a coach-house on the eastern side of Shepherd's-walk, Rosslyn-hill, Hampstead, with a boundary wall at less than the prescribed distance from the centre of Shepherd's-walk (Mr. F. R. Hasluck for Mr. W. Clark).—Consent.

St. Pancras, East.—A building at the rear of No. 168, Camden-road, St. Pancras, at less than the prescribed distance from the centre of the roadway of Camden-mews (Mr. G. Stapley for Mr. J. Boulting).—Consent.

Width of Way and Lines of Frontage.

Lewisham.—A projecting one-story shop in front of No. 14, Montpelier-vaie, Blackheath (Mr. A. Roberts for Mr. E. F. Blow).—Consent.

Lewisham.—An addition with half-timber work, in front of "West Lodge," Love-lane, Blackheath, with a forecourt fence at less than the prescribed distance from the centre of the roadway of Love-lane (Mr. G. F. Havell for Mrs. Penn).—Consent.

Wandsworth.—An addition at the side of No. 90, St. Ann's-hill, to abut upon All Farthing-lane (Mr. W. West for Mr. F. R. Turtle).—Refused.

Hackney, Central.—Retention of a greenhouse and covered way at the rear of No. 33, Middleton-road, Hackney, abutting upon Mayfield-road (Mr. J. Hamilton for Mr. A. Miskall).—Consent.

Lines of Frontage and Construction.

Rotherhithe.—One-story stables and water-closets on the western side of Raynuth-road, Rotherhithe, in front of railway arch No. 28 (Mr. J. Barrett).—Refused.

Formation of Streets.

Woolwich.—That an order be issued to Mr. W. B. Sheppard sanctioning the formation or laying out of two new streets for carriage traffic, one to lead out of the northern side of McLeod-road and the other to be in continuation eastward of Blithdale-road, Bostall Estate, Abbey-wood, Plumstead (for the Royal Arsenal Co-operative Society, Ltd.).—Consent.

Wandsworth.—A deviation from the plans approved for the formation or laying out of new streets for carriage traffic on the Furze-down-park Estate, Back (or Rectory) lane,

Streatham, so far as relates to an alteration in the direction of a portion of the road (Mr. W. J. Janes for Mr. R. H. Miller).—Consent.

Lewisham.—That an order be issued to Mr. R. Stewart refusing to sanction the formation or laying out for carriage traffic of a street out of the southern side of Downhill-road, Hither-green, Lewisham.—Refused.

Space at Rear.

Lewisham.—A modification of the provisions of sect. 41 with regard to open spaces about buildings, so far as relates to the erection of No. 29, Brightside-road, Hither-green, with an irregular open space at the rear (Messrs. Norfolk & Prior for Mr. J. Laird).—Consent.

Space at Rear and Height of Buildings.

Strand.—A building, to be known as the Piccadilly Hotel, on a site abutting upon Piccadilly-place, Piccadilly, Vine-street, Regent-street, and Air-street (Messrs. W. Woodward and W. Emden).—Refused.

Cubical Extent.

Hackney, Central.—The erection on land at the rear of Shrubland-road, Hackney, of a building to exceed in extent 250,000 cubic feet and to be used for the purposes of a garage for motor omnibuses (Messrs. F. Borham & Son for the Motor Bus Company, Ltd.).—Refused.

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

Architectural Societies.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting of this Society was held in their room, Leopold-street, on the 17th inst., Mr. E. Holmes, President, in the chair. The Treasurer's statement of accounts and the Auditors' report, which showed a satisfactory increase of the balance in hand to last year, were adopted, with thanks to the Auditors. The annual report of the Council, which showed a membership of 122, being the highest number in the Society's record, was read and adopted. A ballot was taken, and the following gentlemen were elected officers:—President—Mr. E. Holmes; Vice-President—Mr. W. C. Fenton; Treasurer—Mr. F. Fowler; Secretary—Mr. J. R. Wigfull; Council—Fellows: Messrs. H. Coverdale, C. B. Flockton, W. J. Hale, H. L. Paterson, A. E. Turnell, and J. B. Mitchell Withers; Associates: Messrs. W. G. Buck, C. F. Innocent, and H. I. Potter. A prize of 5l. 5s. for the best set of measured drawings was awarded to Mr. A. W. Kenyon. The Society's prizes for the best work in the designing class were awarded as follows:—1l. 1s. to Mr. J. M. Jenkinson, and 1l. 11s. 6d. was equally divided between Mr. J. W. Green and Mr. G. R. Bower. A hearty vote of thanks was accorded to the President and Hon. Secretary for their work during the year.

Archaeological Societies.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—A meeting was held on Wednesday, May 16, when Mr. C. H. Compton, Vice-President, occupied the chair. Dr. Winstone exhibited a fine copy in black letter of a book of sermons, or homilies, printed in 1587, in original binding, but with the clasps missing. The Rev. W. S. Lach-Szyrma read a paper entitled "Relics of the Cornish Language," in which he described the relics of an ancient language as belonging to a class of antiquities in England of a philological nature which is almost unique in Europe. Nowhere, he believed, except in England, could we fix any death place of a language, one of the reasons European language besides the Cornish that had died out in modern Europe, he believed, was the Prussian, and he questioned if we could fix the time or place of its expiration. Most of the lesser languages of Europe which 100 years ago it might have been prophesied could not last much longer, instead of dying out were more vigorous now than in the middle of the XIXth century. Although Cornish as a spoken language was dead, we yet possessed quite a little literature in it for academic and philological purposes preserved for us (like a mummy in a glass case in a museum) in the MSS. of the Cornish dramas, some of which had been published, and in

other writings, some in print, some still in MS.; in the names of places, in the names of families, in the tradition of the numerals and some words, and in Jordan's "Creagon," the last Cornish drama of 1611. The Cornish MSS. as yet unprinted in the British Museum and elsewhere were of more special interest to archaeologists than the published works in and on the old language. It was very desirable that these MSS. should be printed, with proper editing and translation, that they might be available to all Celtic scholars throughout Europe.—A very interesting discussion followed, in which it appeared from the remarks of Mr. Jenner, Mr. Hall (a Cornishman), and others that there were still some fifty actual Cornish words in use with the miners; the numerals were also extant, and probably there were between 300 and 400 words still in use. Mr. Jenner considered that Cornish was not a dialect at all, but a distinct language, but if it should be a dialect, then more so of Breton than of Welsh.

WESTMINSTER CITY COUNCIL.

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

Water Circulators for Boilers.—The Baths and Washhouses Committee reported that they had considered the advisability of fitting circulators to the boilers at the various baths and washhouses belonging to the Council, and had received a report from the City Engineer in which he recommended that circulators should be fitted to all boilers having Cross or Galloway tubes, such boilers being of the Lancashire or Cornish type. The Committee recommended, and it was agreed, that circulators be fitted to nine of the boilers at the Buckingham Palace-road, Davies-street, and Marshall-street baths, at a cost not exceeding 225l.

Workmen's Dwellings, Marshall-street.—The Housing Committee reported that good progress was being made with the erection of those dwellings, and that the buildings would be roofed in very shortly.

Wardour-street Widening.—Some discussion took place on a recommendation by the Improvements Committee that Messrs. Ferbrother, Ellis, & Co. be informed that the Council were prepared to pay the sum of 660l. for the land required for the widening of this street at No. 107 to 40 ft. Ultimately the recommendation was agreed to, but a proposal to negotiate for further land and to ask the London County Council to contribute to the cost was referred back.

North-West London Railway Bill.—The Law and Parliamentary Committee reported that they had instructed the City solicitors to withdraw the Council's petition against this Bill, the promoters having agreed to satisfactory clauses for the protection of the Council.

Prince Consort-road: Paving Works.—The Works Committee brought up a report dealing with the paving of Prince Consort-road and other roads adjoining the Albert Hall. It was agreed that, subject to the formal dedication to the public of certain of the roads, and the payment by the Commissioners of the Exhibition of 1881 of the sum of 11,000l., the Council should pave the carriage-way of Prince Consort-road, and maintain the paving, and should undertake the maintenance of certain of the other roads for the sum of 8d. per yard super. per annum, to be paid by the Commissioners.

Having transacted other business the Council adjourned.

THE INCORPORATED CHURCH-BUILDING SOCIETY.

This Society held its annual general meeting at the Church House, Dean's-yard, on Thursday, the 17th inst. The eighty-eighth annual report, which was presented at the meeting, shows that last year's income of the Society was 16,168l., as against 7,878l. the previous year; the increase being principally due to "Legacies," but not entirely so, as the amount received under every head except one is more, and in one instance considerably more than in the previous year.

The Committee were not in a position to make any further report on the progress made in the account of the churches to which the Society voted grants of 1,000l. each under the name of "Wheatley Balme Grants." As stated in the last annual report, all the thirteen churches are now consecrated, and three are finished in accordance with the sealed plans, and the grant of 1,000l. has been paid in full in each case; the other ten churches have received a payment on account, varying in amount according to the different circumstances of each case. Of the 13,000l. voted by the Society for these special cases, where a large, serviceable, but inexpensive church was a felt want, a sum of 9,100l. has been paid on account. When all these churches have been finished, the total free accommodation

provided will be 10,645, at an estimated cost of 111,772, making an average cost of 102. 10s. per sitting. It had been a matter of great satisfaction to the Committee, in dealing with the munificence of the late Mr. E. H. Wharley Baine to the Society, to perpetuate his memory by associating these thirteen churches with his name and placing in them memorial tablets, and the Committee hoped that other friends of the Society might be encouraged to imitate his example.

The past history of the Society showed that it had been instrumental in aiding in the erection of no less than 2,482 additional new churches, and in assisting in rebuilding, enlarging, or otherwise improving the accommodation in 6,426 other churches or consecrated chapels of ease. By these means more than two million additional seats had been secured, by far the greater part of which were for the free use of the parishioners according to law. The actual amount of money entrusted to the Society and used in making grants toward the objects named had reached 912,761.

The Committee took this opportunity of thanking the members of the Committee of Honorary Consulting Architects, who gave their services so ungrudgingly to the Society by examining with the greatest care the designs submitted to them at their monthly meetings. By the recent death of Mr. J. P. Seddon the Society had lost an able and conscientious architect, and the Committee of Architects their President and Secretary. The following was the text of the resolution of sympathy it was unanimously agreed should be forwarded to the widow and family:—

"That the committee of the Incorporated Church-Building Society, having deep regret of the decease of John P. Seddon, Esq. for many years a member of the committee of Honorary Consulting Architects, desire to record their sense of the loss they and the church have experienced by his death, and to bear testimony to the very careful and thorough way in which he rendered most valuable service to the Society; and they further desire to express their sympathy with the widow and family of the deceased gentleman, who was so universally respected by those who knew him."

Mr. Temple Moore, in moving the adoption of the report, gave from an architect's point of view a few thoughts and suggestions on the relations between the honorary advising architects for the Society and the architects of the various proposed works. The work of the honorary advising architects might be thus defined:—To criticise and advise on plans submitted of works proposed: First, as to construction; secondly, as to convenience and suitability of arrangement; thirdly, as to architectural design; fourthly, as to restoration of ancient churches. He assumed that one of the objects of the Society was to raise the standard of design in church architecture, so that (so far as lay in their power) not only solid and suitable, but also architectural church buildings might become traditional of the work which passed through the Society's hands. It was obvious that no rules except of a general nature could be laid down on the subject of design, and hitherto the honorary advising architects had refrained from interference, except where the design had been flagrantly bad or unworthy. He felt, however, that they should no longer be content to leave the matter like that. He granted that design was indeed a matter of personal taste and preference, but there was a certain correct and appropriate feeling in design upon the broad lines of which, despite diverse personalities, their advising architects could agree. If the Society was to have any real influence towards the raising of the standard of church work in building, the hon. architects clearly *must* criticise the designing, and make suggestions wherever such were felt to be needed. He regretted that, generally speaking, the standard of design in the new church work brought before the Society's hon. architects was often very inferior, and did not appear to improve. Perhaps, after all, this was not very surprising, for in these days of hurry and many special architectural needs not known formerly, church design had become very largely a special branch of architecture. The busy general architect, though an able practitioner, had not the time, or, it may be, the opportunity, to devote himself seriously to this study. Therefore, he suggested that the hon. architects should, sitting as a committee for the purpose, criticise and make suggestions on the design outside the printed rules. It might be objected that his proposal would have the effect of discouraging originality or novelty in design, but he did not think so; for novelty, when good, had a certain recognisable appropriateness and fitness. It was only when it was novelty for the sake of novelty that it became a defect. He believed that in most cases architects whose training, experience, and general practice had not been in church work especially would welcome the suggestions of the Committee. In schemes for restoration there was some improvement; the great importance of the more careful preservation of their ancient churches was generally beginning to be felt, but here again they had a special branch of architecture, requiring very much experience, which did not fall in the way of all architects. He considered that the role of the Society which gave the advising architects power to ask one or more

of the members to visit the proposed work should be more frequently exercised even in the case of less important churches. It was sometimes difficult to make any really useful suggestions by merely inspecting drawings or even photographs of the building in its actual state. In conclusion, if the hon. architects could be put into direct communication with the architects for the works, it would materially assist the good understanding between them. He ventured to make these suggestions in view of the great importance of the work which the Society sought to promote, with the hope that they might point to a means of increasing its popularity and adding to its already considerable influence in helping to make their churches, whether in the restoration of ancient ones, or in the building of new, in some measure more worthy of their sacred purpose.

The Society held its usual monthly meeting on Thursday, the 17th inst., at 7, Dean's-yard, the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building a new church at South Tiverton, Church of the Ascension, Somerset, 250*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Ashbury, S. Mary, near Ipswich, 100*l.*; Ickford, S. Nicolas, near Thame, Oxon, 30*l.*; Kilnington, S. Mary, near Bath, 10*l.*; Radlett, Christ Church, Herts, 100*l.*; South Perrott, S. Mary, near Crewkerne, Dorset, 30*l.*; Weston-in-Gordano, S. Peter and S. Paul, near Bristol, 15*l.*; and Egg Buckland, S. Erasmus, Devon, 20*l.*, in lieu of a former grant of 10*l.* Grants were also made towards the Spence Mission Buildings Fund towards building Mission Churches at Fochriw, near Cardiff, 35*l.*; and the Heads Nook, Wetheral, near Carlisle, 20*l.* The following grants were also paid for works completed:—Keelby, S. Bartholomew, Lincs., 15*l.*; Lower Guiting, S. Michael, near Cheltenham, 15*l.*, making in all 500*l.*; Seaton Hirst, S. John, near Morpeth, 100*l.*; Heigham, S. Barnabas, near Norwich, 180*l.*; and Upper Edmonton, S. John, Middlesex, 250*l.* In addition to this the sum of 325*l.* was paid towards the repairs of twelve churches from Trust Funds held by the Society.

Fifty Years Ago.

FROM THE BUILDER OF MAY 24, 1855.

ARCHITECTS AND DECORATION.

THE decorator by trade contrives to get a degree of license, which it seems never the system to give to architects. We hear of those who are generally quite unlimited as to expense, and who will submit to no dictation. They *supply* everything; and they design all new fittings, such as gas-lights, just as may seem to them requisite. In one house at Manchester, the gaseliers alone have cost as much as a fair-sized house. When the work is done the bill is sent in, and paid without complaint. What, we ask, is the position of the architect's profession compared to this? How does the difference arise? Is the architect to be positively the worse off for the maintenance of a professional status?

Whilst his proper position is that of chief artist of a building, and sole controller of the works, is he thus to be made to resign really the bulk of his real duties to one who, whatever his merits, is, after all, tradesman and contractor, as well as artist? The question involves the very existence of our profession. We crave, rather than express, opinion on the subject. We only point to what seems a strange anomaly.

Our own doctrine as to the importance of interior decoration as a positive branch of professional architecture, has been adhered to from a very early period in the course of this journal. We contended for the comprehensiveness of architecture as a subject, and in favour of attention to decorative art by architects; and in our pages it was shown that the forms and principles of decorative art, and art-manufacture, were to be, and had ever been, deduced from architecture and structure; and that we said long before such views were given forth by their present chief promoters, and, of course, before a Department of Art had been dreamed of. We claim no merit for any discovery; no one assuming to have the slightest insight into architectural principles, or art-history, could do so; but it does seem, that even yet the application of structural principles, no less than the true relation of nature to art, requires to be pressed upon the attention of many persons.

To apprehend, as some appear to do—even yet—that mechanical resources and new inventions are antagonistic to art, would betray a crudeness of judgment, which no educated architect should be guilty of. What is done

in cast work, may be inferior to what has been done in wrought; but surely that is by those who have not invented designs suited to casting, but have preferred to promulgate that certain things their new process could not do. It is this very "confession of weakness," as we have heretofore called it, that has been the error in all that has been done in interior decoration, with the aid of manufactures; and it is most erroneous to disclaim against the manufacture, simply because some have chosen to turn it to a wrong account.

That which it is most important just now to do, is to moderate the desire for excessive ornamentation, or the imitation of it, in every article of furniture or decoration.

Illustrations.

PARK STRUCTURE, LANCASTER.

HIS MODEL, now exhibited at the Royal Academy, represents the new structure in the Williamson Park, Lancaster, presented to the town by Lord Ashton.

The building will be reached from the lower level of the park by flights of steps. It will be surrounded by a terrace set up about 70 ft. above the lower level. This terrace will communicate with the lower hall, 42 ft. in diameter and of similar height. From this hall there are two staircases leading to a stage or outlook around the building and into the main domed chamber. Another staircase will lead from the main chamber to higher galleries and to the angle turrets. A third gallery will run above the upper colonnade surrounding the drum of the dome. There will be four groups of statuary at this level, representing Commerce, Industry, Science, and Art.

The total height of the building to the vane will be 220 ft. from the ground below the main stairway. There are six stages, from which views of different parts of the country can be obtained. At the base of the main steps, enclosed by two semicircular flights, will be an ornamental water 51 ft. long by 20 ft. wide, with a niche under the landing for a sculptured figure.

The lower hall will suitably serve as a museum, and the upper hall as a reading-room and lounge. The external parts of the main building will be constructed of Portland stone.

The figure seen in the recess between the steps of the steps is a rough indication in the model for a design for a fountain, the detail of which is still under consideration.

Mr. John Belcher, A.R.A., is the architect.

HYES, RUDGWICK, SUSSEX.

THIS is an illustration of an additional wing to an old Sussex manor-house, connecting it to the old tide barn, and bringing the latter into domestic use.

The work has been built in local brindle bricks. Old hanging tiles and Housham stone slates have been obtained and used in the additions, and every endeavour has been made to assimilate and harmonise with the existing house.

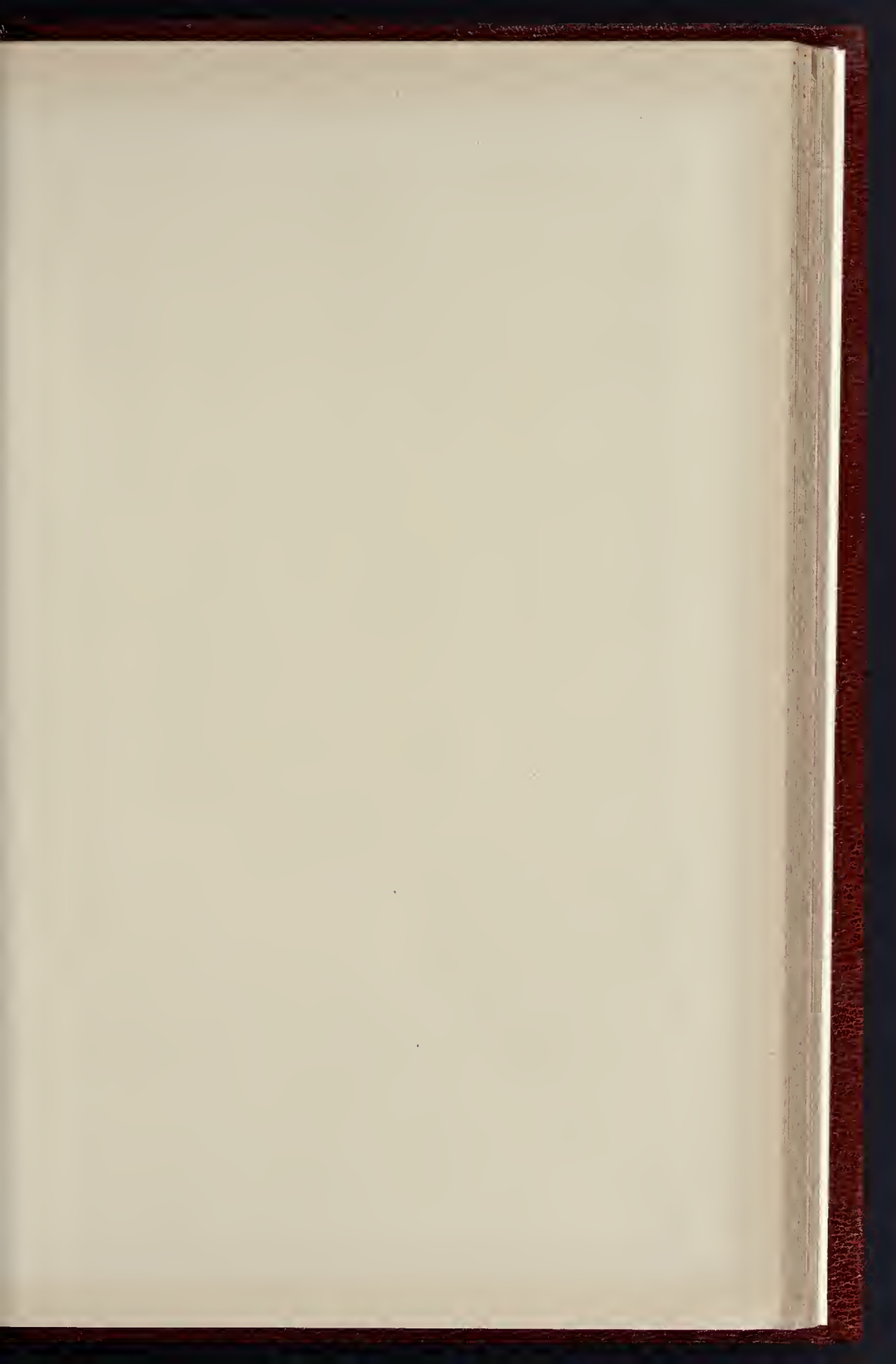
The work has been executed by Messrs. Reeves & Port, builders, of Rudgwick, from the designs of Mr. Fredk. G. Knight, of Westminster.

INGRAVE RECTORY, NEAR BRENTWOOD, ESSEX.

THIS house is to be built in brick and coated with cement rough-cast, and colour-washed. It is to be roofed with Broseley tiles, and the overhang on north side will be supported on Portland stone columns. The builders are Messrs. W. H. Archer & Son, of Gravesend, and the architect Mr. A. H. Skipworth.

HILL CHURCH, SUTTON COLDFIELD, WARWICKSHIRE.

THIS illustration is taken from a drawing exhibited in the architectural room of the Royal Academy, and shows the appearance of the church from the south-west when completed. At the present time it is proposed to build the church vestries and one bay of the nave on the site of the existing church, which is to be taken down, and the nave is to be extended westwards as funds admit, accommodation being provided for about 520 chairs. The external facing is to



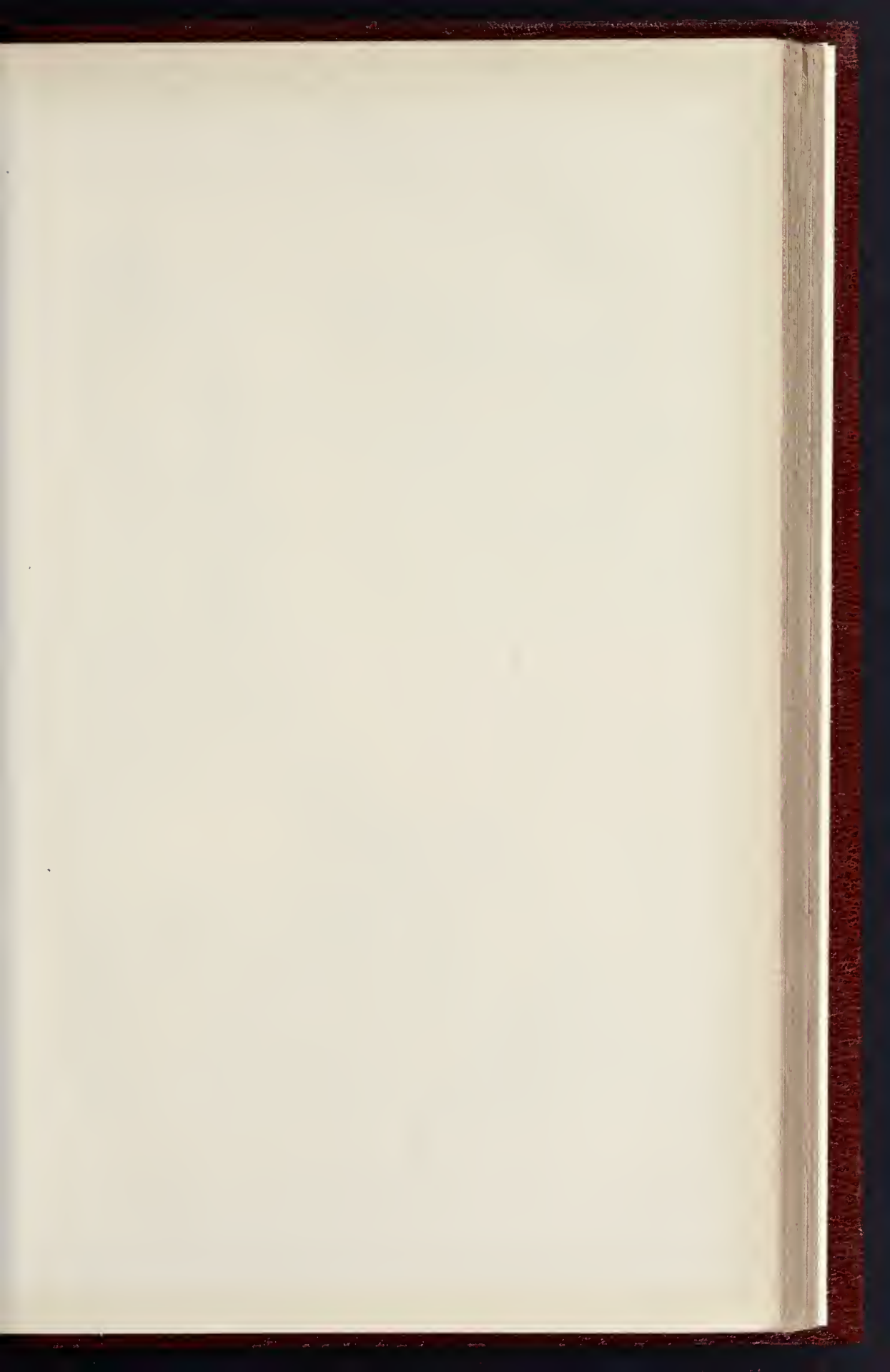


MODEL OF NEW STRUCTURE, WILLIAMSON P



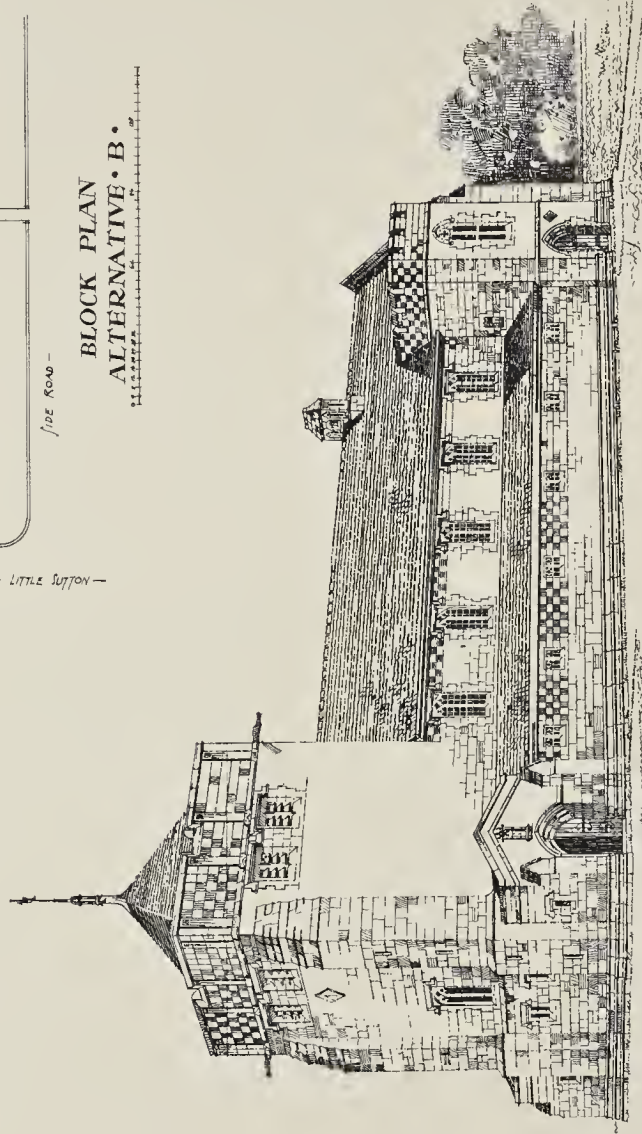
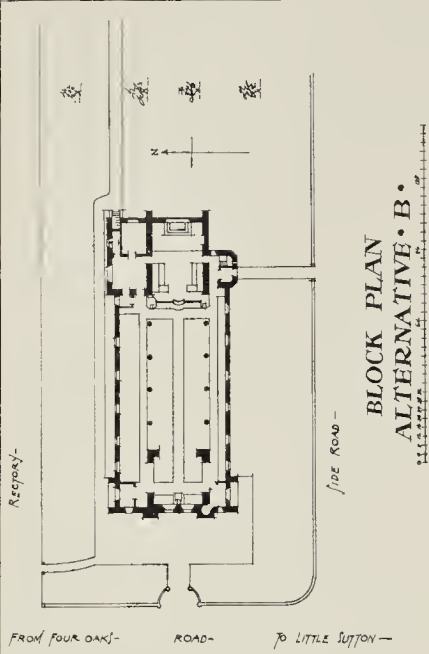
INK PHOTO, SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

LNCASTER.—MR. JOHN BELCHER, A.R.A., ARCHITECT.



THE BUILDER, MAY 26, 1906.

HILL CHURCH SUTTON COLDFIELD

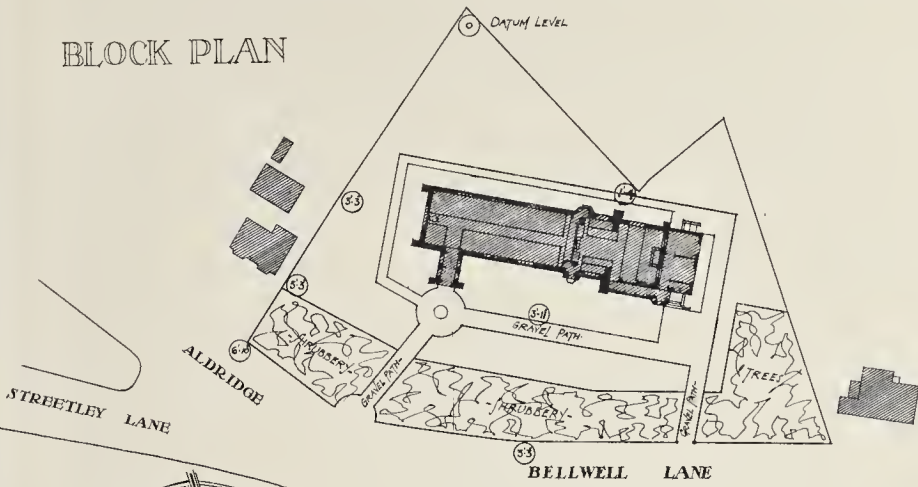


Mr C. E. Baconian F.R.I.B.A.
Architect.

VIEW FROM SW

Mr C. E. Baconian
Architect
Sutton Coldfield
Birmingham
1906

BLOCK PLAN

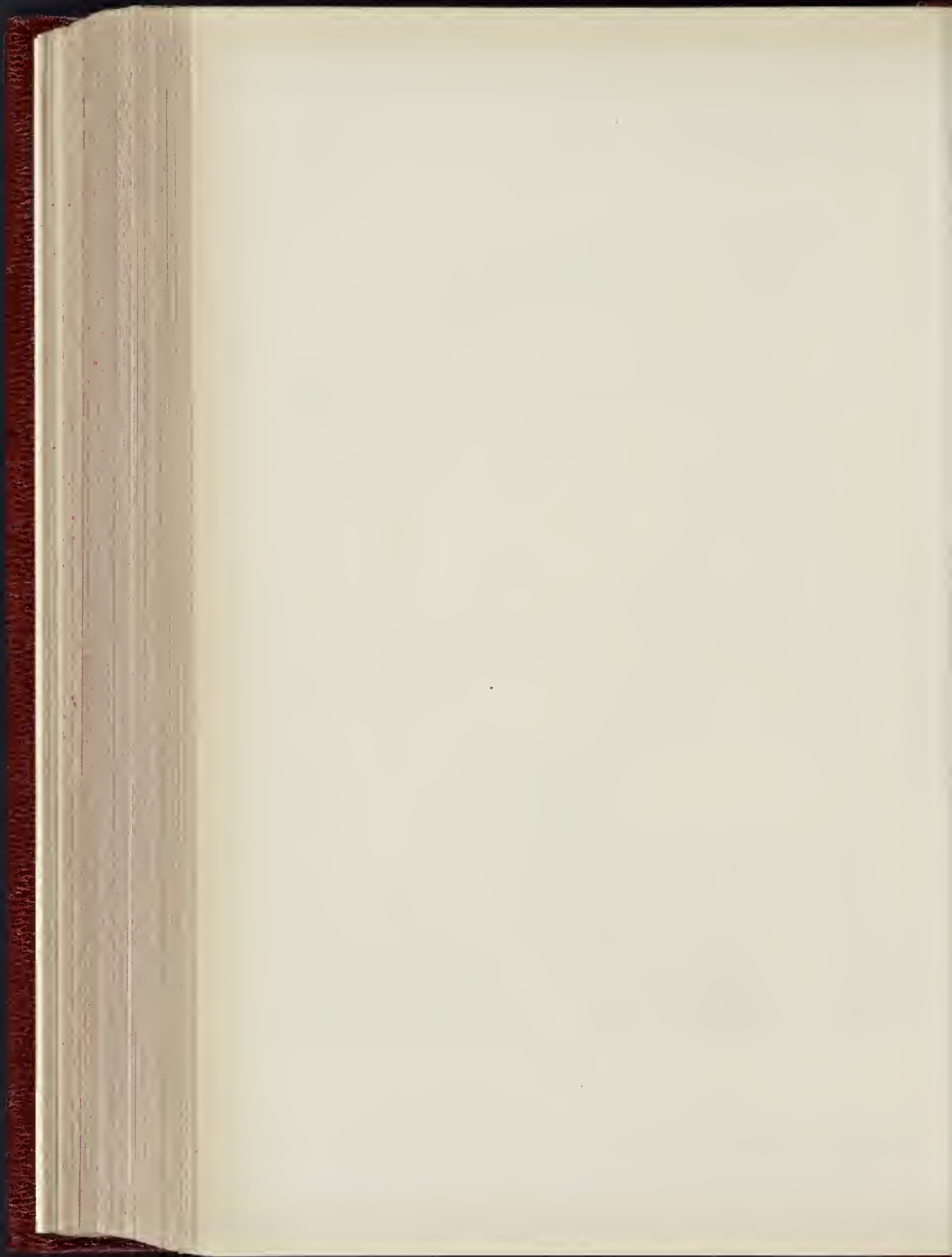


NEW CHURCH FOUR OAKS



VIEW FROM SW

MFC E Bateman, FRIBA
Architect.



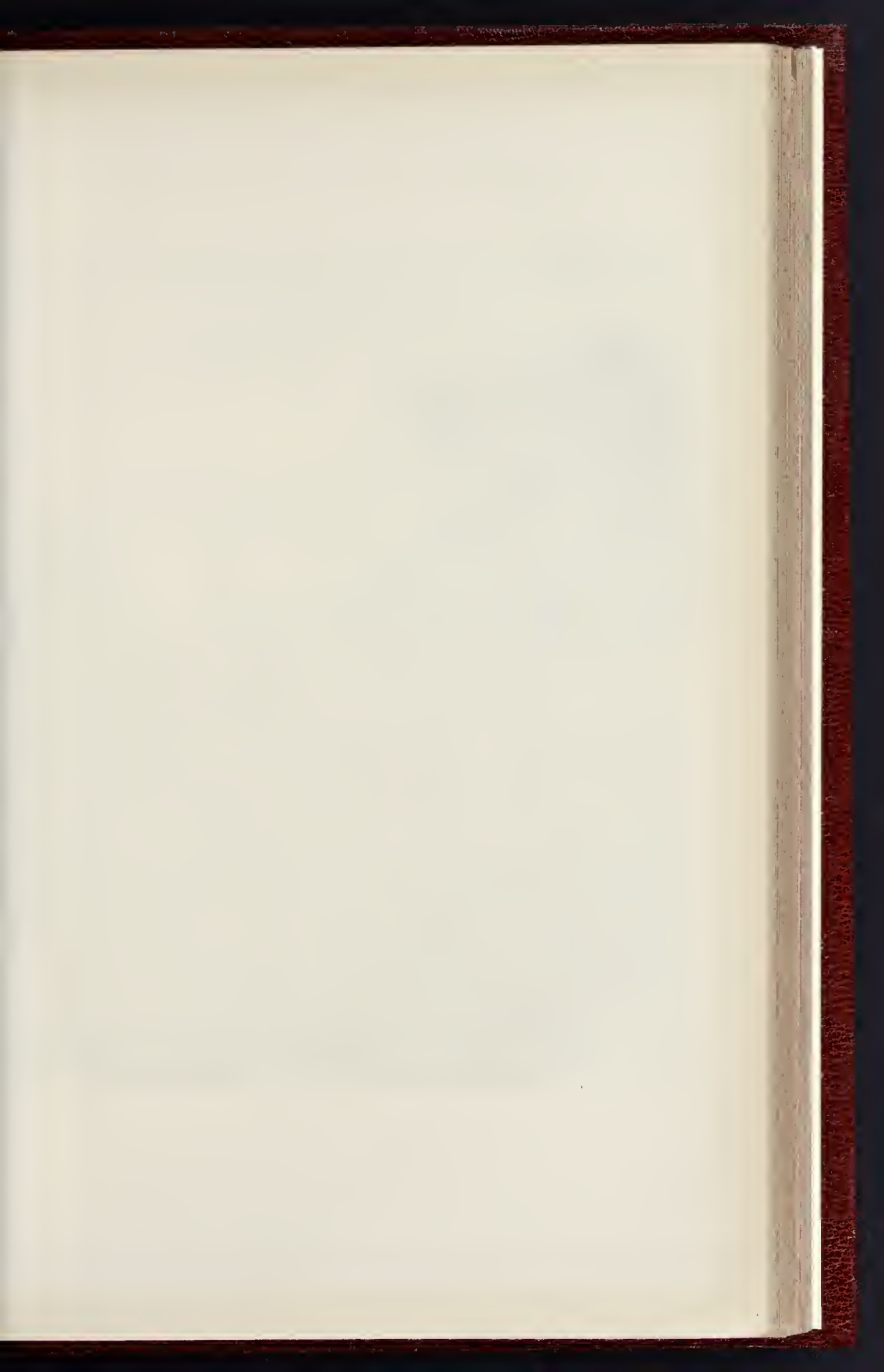
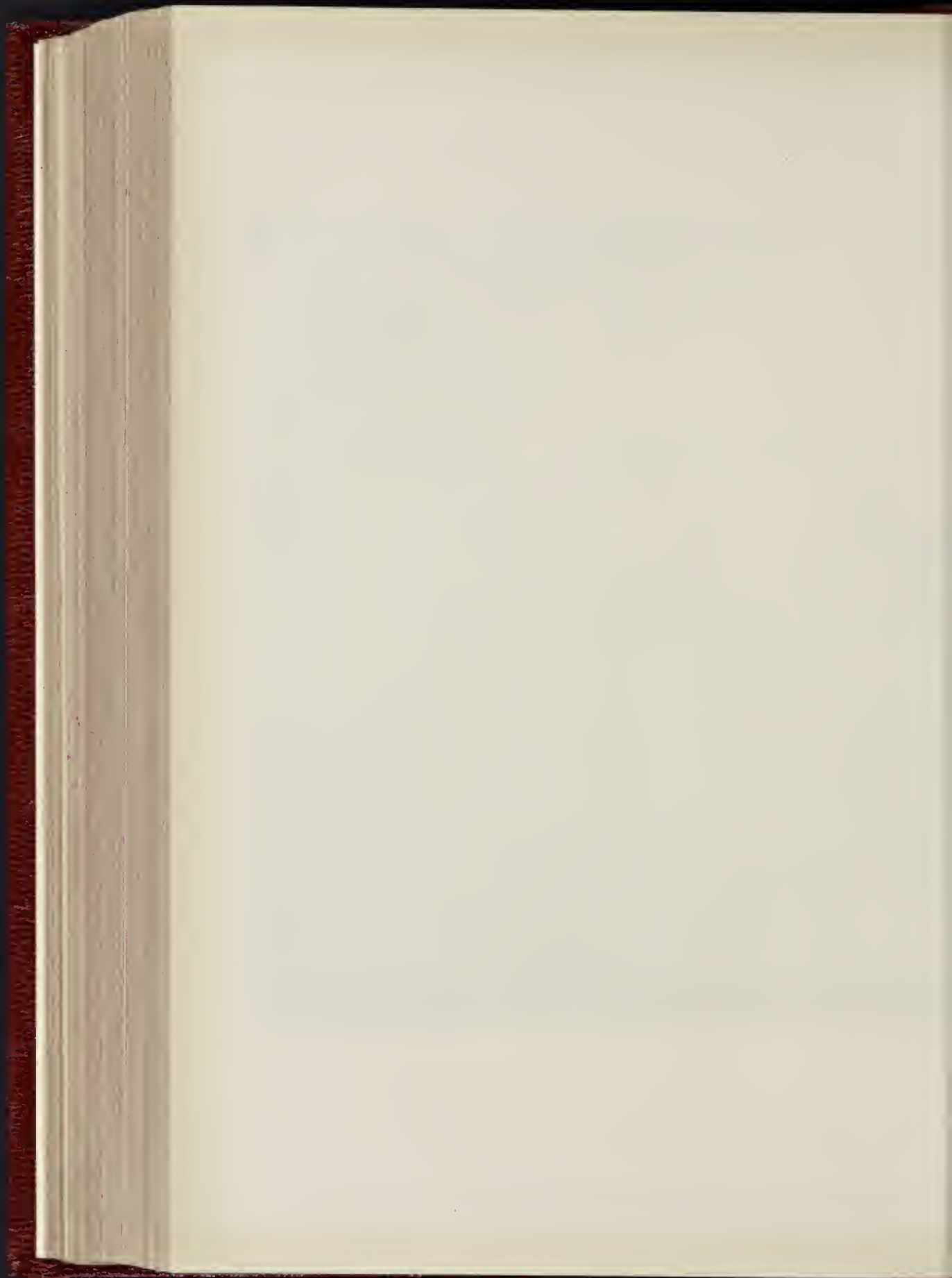






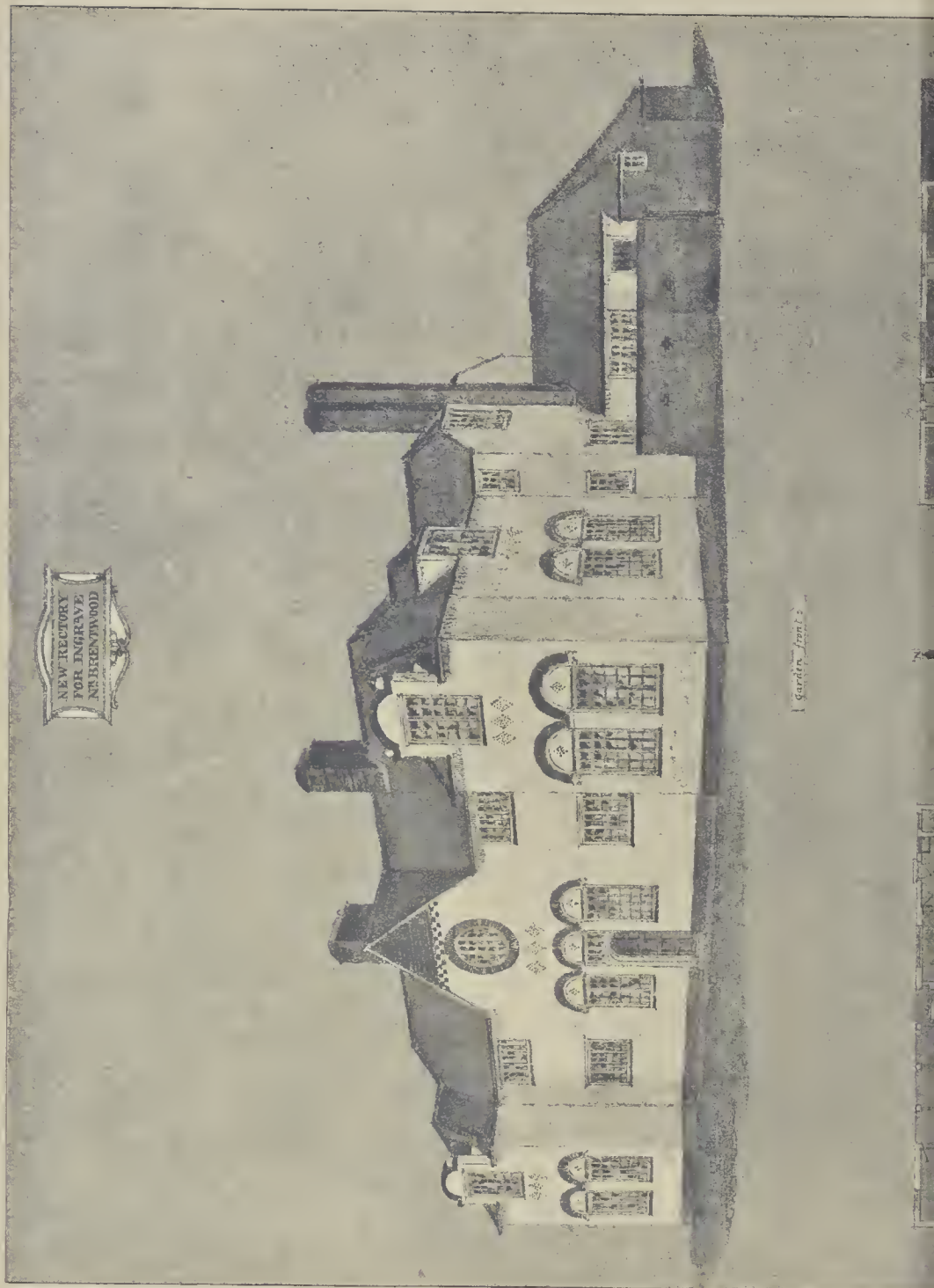
PHOTO LITHO SPRAGUE & CO. 43, EAST HARDING STREET, FETTER LANE, E.C.



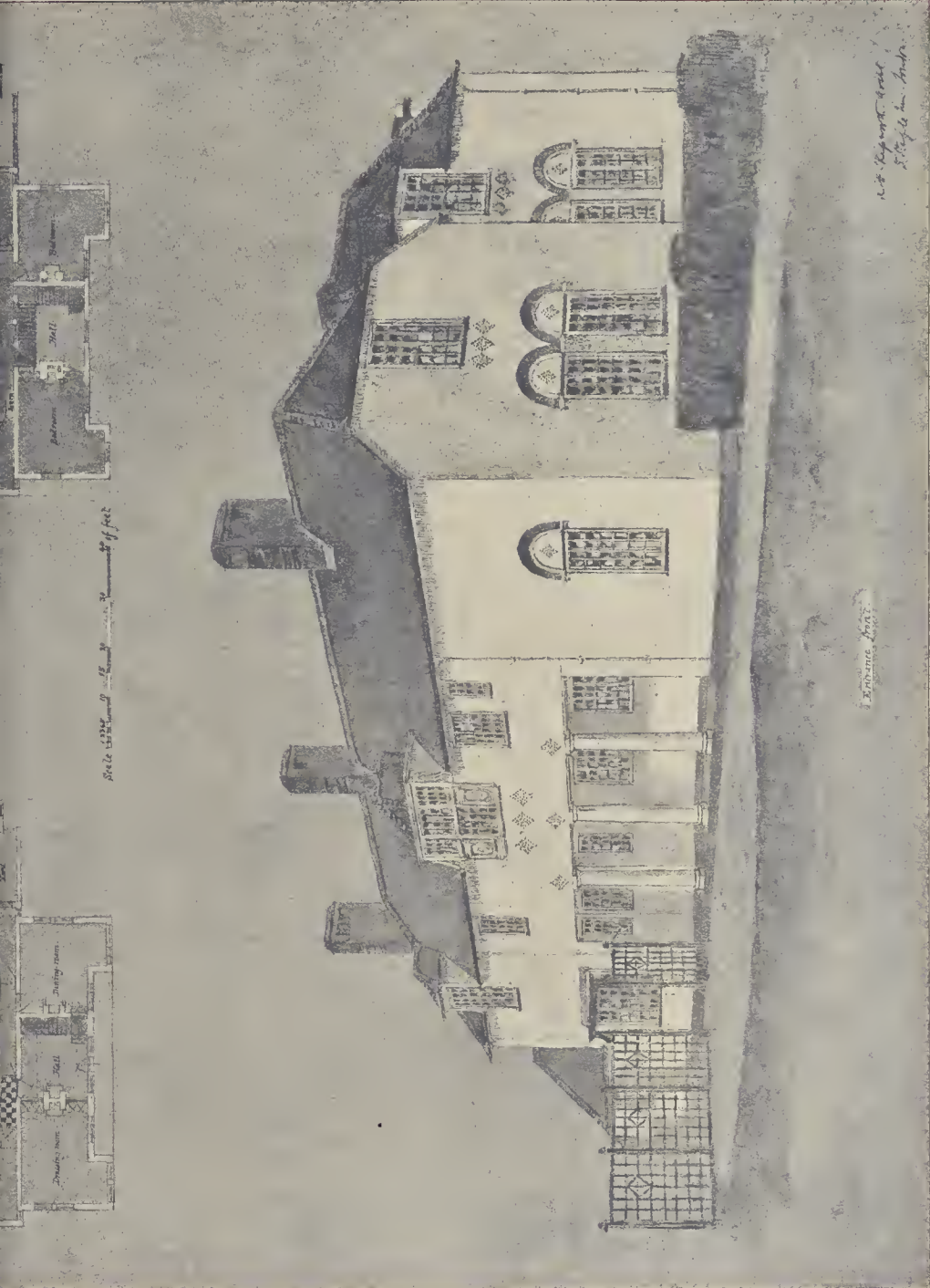


THE BUILDER. MAY 26, 1906

NEW RECTORY
FOR IMPROVE
NEWBENTWOOD



Garden Front



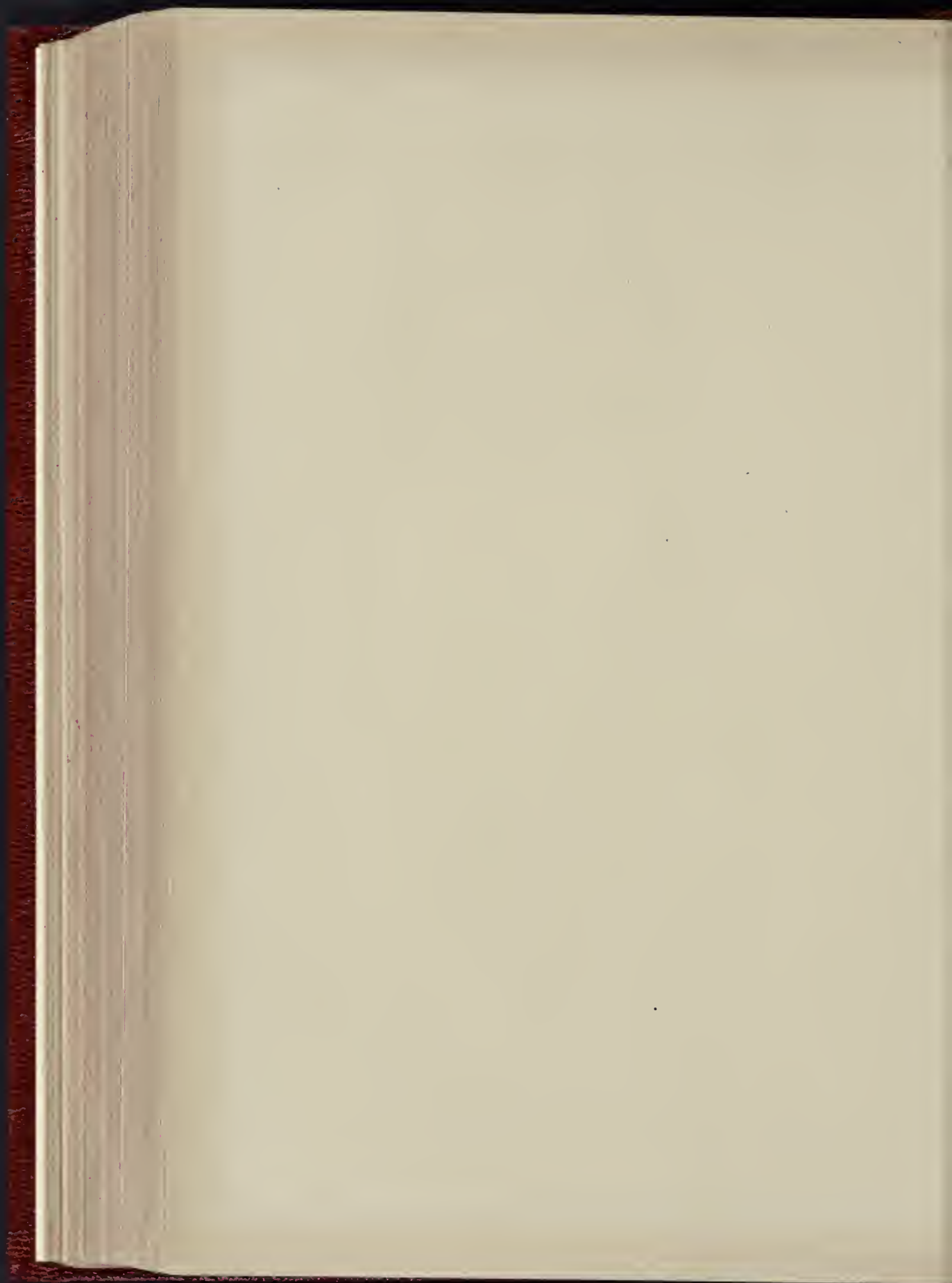
Scale 1/32nd of feet



Architect's Office

W. H. ...
 ...

1/4 PHOTO SPRAGUE E.C. L.N. 4.4.5 EAST WARDING STREET FETTER LANE E.C.



of red sandstone, and the roofs covered with stone slates, the interior being plastered with a barrel ceiling continuous from east to west.

Mr. Bateman's design was selected in a limited competition by Mr. W. H. Bidlake, who acted as assessor.

DESIGN FOR FOUR OAKS CHURCH, SUTTON COLDFIELD, WARWICKSHIRE.

This design, by Mr. C. E. Bateman, for a hall church to seat 300, was submitted at a recent competition, when Mr. W. H. Bidlake acted as assessor. The external design was to be of red sandstone bricks with stone dressings, and stone steps for the roofs. The organ was to be placed upon a screen, and an external pulpit as suggested, in addition to the one inside, to use on Sunday evenings in summer when large numbers of people congregate in Sutton Park, which is adjacent to the site.

BOOKS RECEIVED.

THE SLIDE-RULE: A PRACTICAL MANUAL. By Charles N. Pickworth. Tenth Edition. Emmott & Co. 2s.)

ELECTRIC-WIRING, DIAGRAMS, AND SWITCHBOARDS. By Newton Harrison. E.E. (Crosby Lockwood & Son.)

PRACTICAL PATTERN-MAKING. By F. W. Arnoux. (Crosby Lockwood & Son.)

A PRECIS OF THE ENGLISH LAW AFFECTING ANDLOIRD AND TENANT. By Lawrence Duckworth, Barrister-at-Law. (Edgingham Wilson. 5s.)

Trade Catalogues.

The Saxon Portland Cement Company, of Cambridge, send us a neatly-produced little pamphlet describing in detail the process of manufacture conducted at their Saxon works, where Schneider continuous kilns are employed, and at their newly-built Norman works, equipped with rotary kilns and other plant of the most modern types. The raw material used in the production of Saxon cement is the Cambridgeshire marl, a deposit of chalk mixed with clay, and combining all the chemical elements necessary for the manufacture of Portland cement. When the marl was first employed for cement-making, the practice was simply to calcine the material as it came from the quarry without any correction of its chemical composition. The result of this "natural" cement of varying and unreliable character, and although this method has long been abandoned, there still lingers a little suspicion as to the quality of the cement produced in the Cambridgeshire district. No justification of any uncertainty exists as to the thorough reliability of the Saxon cement, which is made from material carefully mixed so as to insure the correct proportions, and is a genuine Portland cement produced in accordance with the specification of the Engineering Standards Committee, and capable of passing successfully the most stringent tests. While not prepared to endorse the opinion of the company that their cement is the best, we quite believe it to be fully equal to any other on the market at the present time.

The Stanhope Water Engineering Company send us their latest catalogue of apparatus for the softening and purification of water for industrial purposes. The troubles occasioned by hard and impure water are sufficiently known, but there still remain some people who have not been convinced that such difficulties can easily be got over, and probably there are more who do not know that greasy water can be purified at small cost. The apparatus illustrated and described in the present catalogue includes Jolle-Stanhope softeners of rectangular and cylindrical types for small establishments, and automatic softeners in sizes up to 10,000 gallons per hour capacity, all of these being provided with sand filters for removing any minute particles of material which have not been deposited in the clarification vessel. Apparatus for the purification of water without softening is not illustrated separately, but a brief summary is given of the different methods of treatment advocated by the firm.

Messrs. Arthur Cort & Co. send us their wholesale price list of hard and flexible

insulating vulcanised fibre in sheets, tubes, rods, washers, and other forms, as a substitute for leather and indiarubber in various branches of electrical and mechanical apparatus. Material of this kind possesses great tensile strength, and, owing to the fact that it is not affected by hot or cold water, oils, and spirits, it can be applied to many uses where ordinary packing and insulating materials would be unsatisfactory. It is also recommended as an efficient insulator in dynamos and electrical apparatus of all kinds.

Correspondence.

PALACE OF PEACE, THE HAGUE.

SIR.—It must be with some dismay that architects in England realise that not one of their compatriots has found favour with the judges, and that dismay is not lightened when the English architects contemplate the selected design.

In a Palace of Peace we expect to see a building which shall be reposeful and strong, and the essence of the selected design should interpret that sentiment, but what do we find? A design which is both fretful and feeble and more suited for a Palace in the Isle of Unrest.

It is said on the Continent that "The Englishman takes his joys sadly." Perhaps we may retort to our friends on the other side that they treat serious affairs with levity.

GEORGE HUBBARD.

FERRO-CONCRETE.

SIR.—In your issue of the 19th inst. I notice that the remarks made by myself at the discussion of Mr. Bylander's paper on "Ferro-concrete" at the Architectural Association Discussion Section on the 16th inst., have been incorrectly reported, and as at present stand are quite useless.

From my notes I find that the following is what I said:—

"Speaking more particularly of places abroad, viz., in the Colonies, the materials required—cement, steel rods, sand, and stone—were more easily obtained than structural steelwork, which has generally to be sent from England.

"As to formwork, it was pretty well understood on the Continent and in America that a concrete of 1-2-4, viz., 1 part cement, 2 sand, and 4 broken stone to pass a 3-in. ring, was strong enough to take sheering stress up to 50 lb. per square inch for a load causing vibration, and up to 80 lb. per square inch for a steady load. Any further stress caused in the beam would have to be taken up by the steel reinforcement."

May I ask for the favour of the insertion of this letter in your next issue?

R. GRAHAM KEVILL, A.M.I.Mech.E.

Ordinarily proofs of their remarks would have been sent to the several speakers, but the meeting being on a Wednesday evening there was not time for this. We were puzzled at this report, especially at the phrase "one in twenty-four," but not having been present at the meeting we were not in a position to revise it. It is, of course, difficult for a reporter to follow correctly technical details in which he is not himself an expert; but there is also sometimes difficulty from the speaking not being clear.—Ed.

RE GEARY, WALKER, & CO., LTD. v. LAURENCE & SON.

SIR.—With reference to this matter—reported at length in your last issue—we wish to state that we have no connexion whatever with the appellant firm.

The use of the name Geary by the above-named firm is our justification for calling attention to the matter. ELLIS, GEARY, & CO.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XX.

THE ORDINARY SLIDE-RULE—CONSTRUCTION AND NOTATION.

HAVING explained the mechanical and mathematical principles embodied in the slide-rule, we have now to deal with the construction and notation of the most generally-used form of the instrument.

Fig. 16 is an illustration showing the face of the ordinary slide-rule sold by all the leading makers of mathematical instruments. Several special types of slide-rule are made by various firms, but for the moment we leave these alone, as their characteristics will be better understood after the essential features of the usual type have been considered.

The rule illustrated in Fig. 16 is frequently termed the Gravet slide-rule, having been made originally by Tavernier-Gravet, of Paris, in accordance with the specification of M. Mannheim, of *l'Ecole Polytechnique*. Similar instruments are made in Germany and Austria, and, as a matter of fact, most of the ordinary slide-rules sold in this country are of Continental manufacture.

A slide-rule such as we now have in view consists of three parts:—

- (1) The body.
(2) The slide.
(3) The cursor.

(1) The body is a grooved frame, sometimes made entirely of boxwood as a practical tool for the workshop, but for office use the frame is of mahogany, and to 11 six celluloid strips are secured, as shown in the cross-section (Fig. 17). On strips 1 and 2 are engraved the logarithmic scales A and D (Fig. 16); on strip 3 is a metric scale, 25 centimetres long; on strip 4 is a scale of inches, 10½ in. long; on strip 5 is a continuation of the centimetre or the inch scale, by the aid of which a total length of about 50 centimetres, or of 20 in., may be measured. Strip 6 is intended to equalise strains due to atmospheric variations, and so to obviate the warping of the wood which frequently occurs in rules where celluloid strips are fixed on one side only of the body.

(2) The slide, as made for office use, is a tongued strip of mahogany faced on each side with celluloid. On the upper face are engraved the logarithmic scales B and C (Fig. 16), and on the under face are engraved three scales—one at the top marked S, by which may be obtained the sines of angles; one at the bottom marked T, by which may be obtained the tangents of angles; and one in the middle, by which the mantissæ of logarithms may be obtained.

(3) The cursor, sometimes consisting of an I-shaped metal frame with index points, is more generally a light frame of metal fitted with a glass panel on which a hair-line is drawn, the object of the cursor being to facilitate readings, and particularly to facilitate reference of the graduations on scale A to those on scale D, and vice versa.

Denoting the scales on the upper face of the rule, illustrated in Fig. 16 by the same letters as those employed in Fig. 14, it will be found that scale A apparently comprises two exactly similar logarithmic scales from 1 to 10, the latter number being represented in each case by the figure 1.

As a matter of fact, however, the right-hand portion of scale A is a continuation of the left-hand portion, and others should be added mentally to the significant figures in the former, thus making the entire scale read from 1 to 100. On the Faber slide-rule the scale is figured in this manner, thus making clear the real character of the numbers represented.

No practical inconvenience arises from the method of notation usually adopted, for in all computations made with the aid of the slide-rule the significant figures of a result are sufficient, the operator assigning proper values by adjustment of the decimal place in accordance with the rules given in Article XIX. The chief advantages of the Faber system of notation are that beginners obtain a more correct idea of the value of the numbers indicated, and that confusion may be avoided when square roots are being read.

On the other hand, the customary method of numbering the divisions is not without compensating conveniences. As illustrated in Fig. 16, the two halves of scales A and B are precisely similar, and in complex calculations it frequently becomes necessary to employ the scales as if the figures engraved upon one half were equal in value to those upon the other half.

Referring to scales C and D, we find that the interval between the left-hand index 1 and the figure 2 is of sufficient length to permit of ten subdivisions figured 1 to 9 in small characters.

When read in conjunction with the large figure at the index, and taking 1.0 as the value of that figure, the intermediate small figures give the values 1.1, 1.2, 1.3, and so on.

Each of the ten subdivisions is further divided into two parts, enabling us to read 1.15, 1.25, 1.35, and so on; and each of these two parts is further divided into five smaller



FIG. 17



FIG. 16



FIG. 18

Illustrations to Student's Column.

spaces permitting decimal readings in two figures at intervals of one-hundredth from '01 to '99, giving values, intermediate between 100 and 200, from 101 to 199.

The smallest of the spaces mentioned can be further subdivided by the eye with more or less accuracy so as to give a third, and sometimes a fourth, decimal place, the correctness of which depends upon the judgment of the operator and the part of the main division 1-2 where any value in question may happen to be.

Thus, it is not very difficult to read such values as 1.055, 1.0525, and 1.0575 almost exactly, but such values as 1.746, 1.833, and 1.964 cannot be obtained with any certainty as to the last figure, while the attempt to introduce a fourth decimal place, as in the values 1.7425, 1.8325, and 1.9675, could not possibly be attended with numerical success, although the assigned positions might be fairly near the correct values.

In each of the two succeeding main divisions, 2-3 and 3-4, there are ten subdivisions, each further divided into five spaces. Hence, exact readings are only possible to two places of decimals at intervals of one-fiftieth from '02 to '98, enabling us to obtain intermediate values from 2.02 to 2.98, and from 3.02 to 3.98, respectively.

For the remainder of the scales each main division is divided into ten subdivisions, and each subdivision into two spaces only. Therefore, exact readings are obtainable only at intervals of one-twentieth, as '05, '10, '15, '20, and so on.

On the upper scales A and B, the shorter length of the main divisions makes it impracticable to subdivide them to the same extent as in the lower scales C and D. Thus, the interval 1-2 contains ten subdivisions, each divided into five parts only; the intervals 2-3, 3-4, and 4-5 have ten subdivisions with two spaces each, and in the remaining intervals of each half of the scales, the main divisions have simply the ten subdivisions.

Consequently, exact readings can only be obtained between 1 and 2, and 10 and 20, to two places of decimals at intervals of one-fiftieth; between 2 and 5, and 20 and 50, only at intervals of one-twentieth; and for the remainder of the scales only at intervals of one-tenth.

Notwithstanding the paucity of subdivisions at the right-hand end of scales C and D, and throughout the greater part of scales A and B, the operator who has a fairly correct eye can soon learn to estimate intermediate values with a very fair approximation to accuracy, and quite closely enough for all practical work.

For the purpose of saving time, and also of insuring accuracy, it is customary for makers of slide-rules to engrave on the scales some special division lines representing certain constants.

It is curious that the meanings and uses of these special marks are not properly explained in the instruction books supplied with slide-rules by makers of mathematical instruments. Even in text-books on the slide-rule explanatory references to the marks in question are not always made in a convenient manner, being buried in the middle of

calculations and not set forth clearly, as they should be, at the very beginning.

Makers of slide-rules probably know what the special divisions on their rules really mean, but we know, as a matter of fact, that some dealers are quite ignorant on the point, or have only just enough information to put them in the position of being able to mislead inquirers.

To make matters perfectly clear we give in Table XVI. a list and explanation of the special marks on the slide-rule illustrated in Fig. 16, which represents the arrangement adopted by A. G. Thornton, of Manchester.

marked on one or both of the scales A and B, and in others they are indicated on the scale of sines S, at the back of the slide.

There now remain to be mentioned two markings on the front of the rule, illustrated in Fig. 16, one being Q+1 at the left-hand of scale D, and the other P-1, at the right-hand of the same scale.

These marks are simply intended as a reminder to the operator that quotients read with the slide projecting to the right hand must contain one digit more than the difference between the number of digits in the dividend and divisor respectively, and that

TABLE XVI.—SPECIAL CONSTANTS INDICATED ON SLIDE-RULE.

Scale.	Mark.	Signification.	Position on Scale.	Value to be Read.
A and B	π	(see def. p. 49)	3.1415	3.1416
A and B	(no symbol)	$\frac{\pi}{4}$	78.5400	0.7854
C	c	$\sqrt{\frac{3}{\pi}}$	1.128	1.128
C	c_1	$c \times \sqrt{10}$	3.568	3.568
C	ρ'	$(90^\circ)^2 \times 3,600 = \frac{1}{\sin 1^\circ}$	2.06234	206,264
C	π	(see def. p. 49)	3.1416	3.1416
C	ρ'	$(90^\circ)^2 \times 60 = \frac{1}{\sin 1'$	3.438	3438
C	ρ_1	$\frac{2}{\pi}$	6.3662	0.63662
D	ρ''	$(90^\circ)^2 \times 3,600 = \frac{1}{\sin 1^\circ}$	2.06234	206,264
D	π	(see def. p. 49)	3.1415	3.1416
D	ρ_1	$\frac{2}{\pi}$	6.3662	0.63662

The constants π and $\frac{\pi}{4}$ are chiefly used for determining the circumferences and areas of circles, and the cubic contents of cylinders.

The constant c, being the square root of the reciprocal of $\frac{3}{4}$, affords a still more ready

means of finding the areas of circles by the slide-rule and the cubic contents of cylinders.

The constant c_1 is used in the same manner as c, when the slide has to be moved towards the left hand, and, being situated at exactly the same distance from the centre of scale C as c is situated from the left-hand index of the same scale, it gives readings on scale A having the same nominal value as those given by c.

The constants ρ' and ρ_1 are used for finding the sines of small angles expressed in seconds and minutes, respectively.

The constant ρ_1 , being the reciprocal of 1.571—the measure of a right angle in radians—is of general utility, and also serves as a ready means of determining the relative areas of circles and inscribed squares.

In one form of slide-rule the constant $\frac{4}{\pi}$

= 1.273 is indicated on the cursor by two lines separated by an interval equal to 1.273 on scale A. By setting the right-hand line of this special cursor opposite to the diameter of a circle on scale D, the area can be read on scale A at the left-hand line of the cursor.

In some rules the constants ρ'' and ρ_1 are

products read with the slide projecting to the right hand must contain one digit fewer than the number of digits in the sum of the factors.

Before referring to the scales at the back of the slide a few words are desirable with regard to the assignment of values to the figures marked on the ordinary scales. As previously stated, these characters can be considered simply as significant figures which may stand for units, tens, hundreds, thousands, or for tenths, hundredths, thousandths, and so on, the correct position of the decimal point being settled at the end of all calculations, in accordance with the rules already given. Only when square roots and cube roots have to be ascertained is it necessary to take into account, during the progress of calculation, the actual values of the numbers.

Thus, such a calculation as $(100 \times 500 \times 760) \div 10,000 = 3,800$, can just as well be worked in the form $(1.5 \times 7.6) \div 1 = 38$ and completed by the addition of two ciphers. But it will not do when dealing with square roots to consider the characters on the right-hand portion of scales A and B to be of equal value with those on the left-hand portion of the same scales.

Below 4 on the left-hand part of scale A we have 2 on scale D, and below 4 on the right-hand part of scale A we find 632.

In the first case, 2 is a significant figure representing the square root of 4, 400, 40,000, 4,000,000, and so on, while, in the second

case, 632 are significant figures representing the square root of 40, 4,000, 400,000, 40,000,000, and so on.

Similar distinctions occur in the case of decimal fractions, and neglect of them will inevitably lead to serious errors.

The scales at the back of the slide are represented in Fig. 18, which also shows the under side of the rule with the slide withdrawn.

Scale S is marked with divisions representing the logarithms of the sines of angles from 34° to 90°. The main divisions on this scale—numbered 1, 2, 3, and so on—indicate degrees, and the subdivisions vary according to the available space. Thus, each of the main intervals from 1° to 10° is divided into six groups of 10', and each group into two units of 5'. Between 10° and 20°, each degree is divided into two groups of 30', and each group into three units of 10'. The scale is read by aid of the upper index mark, shown in Fig. 18, at the top of the right-hand slot in the body. Between 20° and 30°, each degree is divided into three intervals of 20'; between 30° and 40°, each degree is divided into two intervals of 50'. Between 40° and 70° each division represents 1°, between 70° and 80° each division represents 2°, and between 80° and 90° there are no subdivisions.

Scale T is marked with divisions indicating angles from 5° 42', whose tangent = 0.1, to 45°, whose tangent = 1.0. The graduations are generally similar to those in scale S, but are less crowded, as the range is not so long.

The centre scale at the back of the slide is divided into ten equal spaces, each subdivided into smaller spaces, and these in turn divided into five spaces. This scale can be used to obtain the mantisse of logarithms by placing the slide in an inverted position in the body, when the instrument becomes a complete table of logarithms. For ordinary calculations it is more convenient to leave the slide in its normal position, reading the values at the lower index mark, shown in Fig. 18, on the right-hand slot in the body.

LONDON BUILDING ACT TRIBUNAL OF APPEAL:

MARWOOD v. SUPERINTENDING ARCHITECT OF THE LONDON COUNTY COUNCIL.

ON Friday last week the Tribunal of Appeal sat at the Surveyors' Institution to hear an appeal by Mr. Francis O. Marwood against the certificate of the Superintending Architect dated February 10, defining the general line of buildings on the east side of Cliddon-road, Fulham, between Edith-road and the Metropolitan District Railway, and further defining the general line of buildings on the south side of Talgarth-road, Fulham, between the building known as No. 83 in that road and Gliddon-road. Mr. Schiller was counsel for the appellants, and Mr. A. Moresby White appeared for the London County Council.

Mr. Schiller said that in the seventies the whole of the district was undeveloped land. The land belonged to various persons, and interchanges of land took place owing to the building of St. Paul's School. In 1879 Talgarth-road was made, and there was a retaining wall for the Metropolitan Railway, along the whole of that road, which ran across the mouth of what was now Gliddon-road. Talgarth-road ran at right angles with the Gliddon-road. In 1881 Gliddon-road came into existence, and a house was built at the Edith-road end of the road, and the road for a short distance was kerbed and channelled. In 1882 a house was built at the other end of Gliddon-road, where it met the Talgarth-road. At this time the retaining wall of the railway was still across the mouth of Gliddon-road, which formed, of course, a barrier to the road. In 1883 the idea of developing the land on the other side of the railway occurred, and to do this a bridge across the railway was projected, and contributions for such bridge were made by the Metropolitan Board of Works and the Fulham Vestry. The bridge was finished in 1885, but before it was finished houses were built on the west side of Talgarth-road. No one at the time dreamed that Gliddon-road was further than the old retaining wall, and it had been left to the ingenuity of the Superintending Architect to find that the bridge was part of Gliddon-road. It was formerly known as St. Paul's Bridge, and had only lately been christened by the London County Council "Gliddon-road Bridge." In 1905 Mr. Marwood prepared plans for blocks of flats to be built at the corner of the east side of Gliddon-road, and these plans were passed by the District Surveyor, and were proceeded with. It was not until October 25, 1905, that the District Surveyor raised the question of balconies and bays, and other matters, and mentioned the building line in a tentative manner. Mr. Marwood

then made formal application to the London County Council with regard to the question of balconies, etc., and hearing nothing from the Council he proceeded with the building of the flats, and practically completed them. Then the Superintending Architect defined the building line now appealed against.

Mr. Hudson asked what the position was with regard to Talgarth-road.

Mr. Schiller said the flats were built between the Gliddon-road and the Talgarth-road. If the County Council allowed the bay windows on the Talgarth-road frontage, he was satisfied with the line as fixed by the Superintending Architect as far as the Talgarth-road was concerned, but if they did not consent then he wanted the Talgarth-road line defined.

Mr. White said the County Council did not consent to the bay windows.

Mr. Schiller argued that the line fixed by the Superintending Architect which ran from the house built at the Edith-road end of Gliddon-road could not be mentioned, inasmuch as the plot of land on which the appellant had erected the block of flats was part of the bridge, and was not a continuation of Gliddon-road. If such a line was upheld it meant pulling down the block of buildings and inflicting serious loss on his clients. After evidence had been called for the appellant, the Tribunal adjourned, May 28 being provisionally fixed for the continued hearing of the case.

Obituary.

MR. A. J. HAMILTON-SMYTHE.—Mr. A. J. Hamilton-Smythe, B.A., M.Inst.C.E., who was appointed chief of the staff at the County Surveyor's office at Hatfield last October, died suddenly on the 15th inst.

General Building News.

NEW CHURCH, EDMONTON.—The foundation-stone of a new church, to be dedicated to St. Stephen, has been laid at Bush Hill-park, in the northern portion of the parish of Edmonton. It is proposed at first to erect the chancel and side chapel, organ aisle, and three bays of the nave and aisles, accommodation being thus provided for 500 persons at a cost of 6,347l. The style of the church will be Late Decorated Gothic. The architect is Mr. J. S. Aldor.

METHODIST FREE CHURCH, NEWCASTLE-ON-TYNE.—The foundation-stones have just been laid of the new Methodist Free Church which is being erected in Sandford-road, Newcastle. The church is part of the extension scheme in connexion with the Prudhoe-street Church, and the premises it is estimated will cost at least 18,000l. when completed. The plans have been designed by Mr. W. H. Knowles, F.S.A., and the contract has been let to Mr. W. T. Wear. The total area of the site is about 2,466 sq. yds., of which about 825 sq. yds. in front of the church are to be kept in perpetuity as an enclosed shrubbery. The main entrance to the church will be by a Benton-terrace, with a central vestibule lobby with open doors, cloak-room and staircase to a gallery over the lobby. There will be an arched recess with choir seats, pulpit, communion-table, and organ-chamber, and the body of the church divided by a centre and side aisles. The church will accommodate 600. To the school premises the main entrance is from Grautham-road. On the ground-floor there will be a corridor or crush lobby, 13 ft. wide; a lecture-hall, 27 ft. by 30 ft.; infants-room, 24 ft. 3 in. by 20 ft.; ministers' and stewards' vestries, etc. The main school hall will be 45 ft. wide by 48 ft. 6 in. long, square at platform and circular at the opposite end, with a gallery carried round three sides and divisions for classes. On the first floor there will be a secretary and librarians' vestry, church parlour, ladies' vestry and cloak-room, caretaker's self-contained residence with two bedrooms on second floor. Below the level of the church and school hall, but on the level of back Portland-road there will be a room, the size of school hall, which can be used as gymnasium or be divided into classrooms; heating apparatus room, boys' and girls' lavatories, service lift to upper floors, etc. The buildings will be of stone, with green slate roofs, and the church, in the interior, will be divided into bays with traceried windows; the ceilings being of wood in arched form.

CHURCH RESTORATION, WARRFORD.—Warrford Church has just been reopened after having been restored at a cost of 1,250l. The work has been carried out under the personal superintendence of Mr. G. Weeks, builder, of Winchester, in accordance with the instructions and under the direction of Mr. N. C. H. Nisbett, of Colson, Farrow, & Nisbett, architects, Winchester.

CHURCH RESTORATION, CHILDEWALL.—Childewall Church has recently undergone considerable alteration and improvement in its fabric. Messrs. J. F. and S. Doyle were the architects, and Messrs. Tavis & Wevil the builders.

WESLEYAN CHAPEL, CASTLE DONNINGTON.—A new Wesleyan Methodist Chapel, costing upwards of 6,000l., was opened at Castle Donnington on the 16th inst. The new building occupies a position in the centre of the town, its front elevation covering nearly the whole of the south side of the Market-place. The vestibule at the main entrance is divided into three sections, separated by panelled screens carrying leaded lights of stained glass, whilst the balconies are approached from either side of the building by stone stairways, protected by iron balustrades. A feature of the chapel is the oak pulpit with rostrum. To the rear of the pulpit is a chancel for the accommodation of the organ and choir. The building operations have been conducted by Mr. Wm. Evans (Nottingham), the architect, being Mr. A. E. Lambert (Nottingham), and the contractor Mr. Thos. Barlow (Nottingham).

BAPTIST CHAPEL, EASTVILLE, BRISTOL.—The foundation-stones of a new Baptist mission chapel at Eastville were laid on the 10th inst. The plans were prepared by Mr. E. Wakefield, Bristol, and the contract has been let to Alfred Dowling, of Bishopcote. The new building, which is arranged to accommodate a mixed congregation of 250, and has four classrooms, in addition, will consist mainly of brick. The external walls will be lime-whitened and relieved by cherry-red sand-faced bricks for arches, sills, and copings. The roofs will be tiled. The hall will have an open-timbered roof, stained a green shade and varnished; the floors will be of pitch-pine wood blocks, and the walls will be plastered with a hard patent plaster. The hall will be heated by gas hot-water radiators, and the lighting will be by gas with incandescent lamps. The cost of the scheme is estimated at 1,700l., and this total includes 400l. for site and 1,200l. building contract.

MEMORIAL CHAPEL, LIVERPOOL.—The memorial chapel of the Bluecoat Hospital, Liverpool, was opened on the 18th inst. The structure is octagonal, with transepts on three sides, and a semi-dome, the walls being of Bath stone, and the whole of the fittings of oak. There is seating accommodation for 570. The architects were Messrs. A. Thornley, F. G. Briggs, and F. B. Hobbs.

SCHOOL CHAPEL, TAUNTON.—The foundation-stone was recently laid of the new chapel which is being erected in connexion with Taunton School. It is Early English in character. The main entrance is at the west end, and the vestibule is separated from the chapel by an oak traceried screen. There is a gallery over this portion, approached by a staircase in the bell turret on the north side. The seats in the nave and choir are arranged facing each other, and are ascending, finished in oak, with high dado panelling on either wall. On either side of the choir are transepts—one used for the organ, which is placed over the heating chamber, and the other used as vestry, with gallery over. The eastern end is finished in assial form, with ascending, pierced with small windows on the upper part, and the lower portion is to be lined with marble dado. The aisle and apse floors also are to be laid in marble. The accommodation is calculated for about 300. Mr. Frank Wills, of Bristol, is the architect; Messrs. W. Cowin & Son, of Bristol, are the general contractors; Messrs. J. Crispin & Sons, of Bristol, are carrying out the heating arrangements; and Mr. E. Turner is acting as clerk of works.

SCHOOLS, GLOUCESTER.—The memorial stone of the new Council schools to serve the Derby-road district of the city was laid recently by Councillor W. Colwell. The schools are being erected in Derby-road, opposite the Alington Hall, on a site acquired by the late School Board, and containing 6,216 sq. yds. The new buildings will include a two-storied block to accommodate 350 boys and 350 girls, and a separate one-storied block to accommodate 400 infants, with floor space for 50 additional infants, should future requirements demand extension. There will be three central halls—boys' hall, 50 ft. by 28 ft.; girls' hall, 50 ft. by 28 ft.; infants' hall, 58 ft. by 25 ft.—from which all classrooms will be visible and accessible. The buildings are being erected with local Severn side bricks, with Bath stone dressings, while the floors, ceilings, and staircases will be of Hennebique's ferro-concrete construction. The roofs will be covered with slates. In the boys' department there will be five classrooms to accommodate 60 scholars each, and one classroom to accommodate 50. A similar number of classrooms are provided for in the girls' department. In the infants' block there will be five classrooms for 60 scholars, and two for 50 scholars. All classrooms will be carried up square to the ceiling. Teachers' rooms, with lavatories and stores, are provided for in each of the three departments, the teachers' rooms being so placed that they overlook the entrances and playgrounds. Shelters and sanitary conveniences will also be provided externally for each department. The contractor is Mr. J. C. Norman, of Swindon. The architect is Mr. J. Fletcher Trew, of Gloucester, and the clerk of works, Mr. W. H. Bush.

The contract price is 11,908*l.*, being about 10*l.* per scholar.

SCHOOL-ROOM, RUSTHALL.—A new room has been added to the Rusthall Infants' School. Mr. E. Cronk prepared the plans.

ENLARGEMENT OF THE MUNICIPAL TECHNICAL SCHOOL, LINCOLN.—At a special meeting held on the 7th inst., the Lincoln City Council decided to carry out extensions at the Municipal Technical School at an estimated cost of 7,000*l.*, and to take steps to obtain the sanction of the Local Government Board for the raising of a loan. The plans provide for four new classrooms, a new lecture-room for demonstration in physics and general science work, a new physics laboratory, a new ordinary electrical laboratory, an open-air space for physical exercises, cloak-rooms, etc. A number of rearrangements are proposed. The additional classroom accommodation would be 120. The plans have been prepared by Messrs. W. Watkins & Son.

CO-OPERATIVE PREMISES, PERTH.—The new premises of the City of Perth Co-operative Society, Ltd., erected on the site of the old gas-works, were opened recently. The building, which is four stories in height, occupies a corner site in Scott-street and Canal-street. The principal elevation, with main entrances, is to Scott-street, along which it extends about 150 ft. The elevation to Canal-street extends to over 70 ft., and contains the goods entrances and access to workrooms. The building is of Palmaria stone and is fireproof throughout, with automatic door arrangements for the isolation of each floor in case of fire. An electric hoist is provided for conveying goods and passengers to the several floors. The heating of the premises is by steam pipes and radiators. The boilers are placed in the heating chamber situated in the basement. Each floor has lavatory and cloak-room accommodation. The whole building has been fitted up with a system of electric lighting. The structure was erected from plans prepared by Messrs. Maclaren & Mackay, architects, and the works were carried through under their superintendence. The clerk of works was Mr. John W. Penney, and the various contracts are as follows:—Mason and brickwork, Messrs. B. Brant & Sons; carpenter and joiner work, Messrs. Thos. Leith & Co., Ltd.; plumber work, Messrs. MacLeish, Morrison, & Co., Ltd.; plaster work, Mr. John Sharp; slater work, Mr. Thomas Taylor; all of Perth. Steel and iron work, Messrs. Redpath, Brown, & Co., Ltd.; fireproof floors, Messrs. William Little & Sons, Ltd.; heating engineers, Messrs. Henry Walker & Sons; electric lighting, Messrs. Campbell & Borthwick, Perth; blinds and sunshades, Messrs. A. Westwood & Sons, Perth.

BEDWELLY WORKHOUSE EXTENSIONS.—The Guardians of the Bedwelly Union Workhouse have had to provide extensive additions to the workhouse at Fredegar. Cottage homes were recently erected at a cost of about 8,000*l.*, and the addition to the workhouse itself will cost between 27,000*l.* and 28,000*l.* The work is being carried out by Mr. D. W. Davies, contractor, Cardiff, from plans prepared by Messrs. James & Morgan, Cardiff. Messrs. Bradford & Co., London, supplied all the machinery, and the electrical plant was erected by Messrs. Edwards & Armstrong, Cardiff, and the wiring was carried out by Messrs. Vaughan & Co., Bristol, the whole of the electric installation being carried out from plans and under the superintendence of Messrs. Herbert Lewis & Fletcher, Cardiff. The administrative block has just been opened. The whole of the machinery in the different departments is driven by electric power.

PUBLIC LIBRARY, KELSO.—The opening of Kelso Public Library took place on the 16th inst. The building occupies a frontage of about 45 ft., and is some 40 ft. in length. The front building is two stories in height, the features on the ground floors being the public doorway with carved panels over the lintel bearing the Burgh Arms, and two mullioned and transomed windows lighting the reading-room. The vestibule leading from the entrance has a vaulted ceiling and is paved with black-and-white marble squares. On the right of this vestibule is the reading-room, affording accommodation for fifty readers. This room is lined with wood panelling to the height of 9 ft. The walls above the panelling are painted a pea-green colour, the cornice, in which is incorporated the Burgh Arms, being in white, as is also the ceiling. Behind the reading-room is the lending library, the walls of which have been similarly treated. The reference-rooms, entered from the public space, and situated at the back of the building, will accommodate ten readers. Above the reading-room is the librarian's house. The roofing has been done with rustic slates. Messrs. Peattie & Washington Browne (Edinburgh) were the architects of the building, and the principal contractors were—Messrs. Inglis & Bruce & Son, builders (Kelso); Messrs. A. Inglis & Son, joiners (Havick); Messrs. P. Bell & Son, smiths (Edinburgh); and Messrs. MacKenzie & Moncur, heating engineers (Edinburgh); Mr. A. R. Burns, plumber (Kelso); Mr. W. Bryce, plasterer, (Kelso); Mr. W. W. Bain, slater (Kelso); and Messrs. A. Hogarth & Son, painters (Kelso). Mr. Thomas Scott (Edinburgh) acted as clerk of works.

FALKIRK GASWORKS.—Mr. William McCrae, gas manager and engineer, Burgh of Falkirk, made the plans and designs for the new corporation gasworks which were opened a few days ago at a total cost of some 2,000*l.* The works will enable 1,500,000 cubic ft. of gas to be made each day; the retort-house contains eight 20-ft. through-retorts and a stage for twelve ovens, of which only nine are fitted as yet. The two charging and discharging machines are of a novel kind, and electrical motors are used for driving all the stoking machinery, and the plant for dealing with coal and coke. The site extends over 12 acres, with storage room for 3,000 tons of coal.

BUSINESS PREMISES, DEVIZES.—New business premises have just been completed for Messrs. Stratton, Sons, & Mead, Ltd., in Monday Market-street, Devizes. Mr. E. C. Isborn, architect, of Devizes, prepared the plans, and the contractors were Messrs. Bigwood & Co., of Melksham.

FREE LIBRARY AND PUBLIC HALL, MEXBOROUGH.—The Carnegie Free Library was formally opened at Mexborough on the 21st inst. The general contractors who have carried out the work are Messrs. George Sauls Exors, of Rotherham. The design was prepared by Messrs. C. E. Deacon and Horsburgh, architects, of Liverpool.

NEW WING, KEYSHAM WORKHOUSE INFIRMARY.—The new wing of Keysham Workhouse Infirmary was opened on the 19th inst. by Mr. W. B. Bennett, M.P. Mr. H. M. Bennett, the architect, gave details of the dimensions and equipment of the wards. The cost of the building was 1,422*l.*, apart from furniture—40*l.* a bed.

LIBRARY EXTENSION, RICHMOND.—The opening of the new reference-room adjoining the old Free Library buildings, Richmond-green, took place on the 15th inst. The addition consists of a room 45 ft. long by 18 ft. wide, and has accommodation for about fifty persons, and has been constructed out of a portion of "The Cottage," the remainder being devoted to the uses of the librarian as a dwelling-house. The plans were prepared by Mr. J. H. Brierley, the Borough Surveyor.

VALLEY QUARTERS, CHRISTCHURCH.—The foundation-stone of the new armoury and drill hall for the Christchurch Company of the 4th V.B. Hants Regiment was laid recently by Lady Meyrick. The new premises are situated in Portfield-road. It is proposed to erect at present only the armoury and quarters, and for this part of the work a contract has been entered into with Mr. Thomas Hill, builder, of Christchurch, at 1,990*l.* The plans for the work have been prepared by Mr. Fogarty, architect. Electric light is to be installed by Mr. G. Bryant, of Bournemouth.

HEARTS OF OAK NEW OFFICES.—The first section of the Hearts of Oak buildings in the Euston-road, which is to be opened by His Majesty King Edward VII. on Saturday, May 26, is the central block of the complete scheme. It has on the ground floor a large general office, and on the mezzanine level are the secretary's rooms in the front, with a gallery for clerks around the general office in the rear. The approach to the delegates hall, which is on the first floor, is by means of the grand staircase in the centre of the building, separated only by a columned screen from the general office, and surmounted by a large domed light. The delegate hall is seated for 210 delegates, exclusive of platform and gallery; it has an Ionic order on the walls, and is roofed with a dome; the decorations consist of modelled plaster enrichments, an oak panelled dado, coloured glass in the windows representing the various towns and counties represented by delegates, and painted decorations in some of the bays. The suite of committee-rooms next the Euston-road have the walls panelled in oak and rich chimney pieces. The public offices, staircases, etc., are lined with a cream-coloured Doulton ware, richly modelled and inlaid with colour. The façades are of Portland stone. The internal fittings, screens, etc., are all of oak, inlaid with mahogany and ebony, and the metal work being mostly of bronze. The architects were Messrs. Essex, Nicol, & Goodman, of Birmingham. The contractor is Mr. C. Gray Hill.

BISHOP'S PALACE, SOUTHWELL.—The new residence for the Bishop of Southwell is now in course of erection on the site of the ancient palace of the Archbishops of York. The contract is in the hands of Messrs. Fish & Son, of Nottingham, and will amount to about 7,000*l.* Mr. W. D. Caröe prepared the designs of the work.

DISTRICT LIBRARY, GLASGOW.—The Bridgeton District Library was opened on the 17th inst., making the twelfth district library which has been opened in the city out of a total of eighteen provided for in the Corporation scheme. The building has been designed by Mr. J. B. Rhind, architect, and including the larger fittings, is estimated to cost 8,500*l.*

PROPOSED PUBLIC OFFICES, BURSCOUGH.—At Burcoough, on the 10th inst., in the Stanley Institute, Mr. M. K. North, M.Inst.C.E., Local Government Board Inspector, held an inquiry respecting an application by the Lathom and Burcoough Urban District Council for sanction to borrow the sum of 2,000*l.* for the erection of

public offices, etc., at Mill-lane, Burcoough. In the course of the inquiry Mr. Charles Samuel Beeston, Ormskirk, the architect of the scheme, stated that the site was an exceptionally good one. A part of the buildings would be used as a mortuary and for post-mortem examinations. He was of opinion that if the work was carried out according to the plans it would not cost more than 2,000*l.*

NEW CLUB ROOMS, KIRKINTILLOCH.—The Committee of Kirkintilloch Conservative Association have selected from the thirty-one designs submitted in competition that of Mr. Wm. Baillie, architect, of Glasgow. The building, which is to be of three stories, with basement, will occupy a prominent site at the corner of the High-street and the Backcausway. The front facing the High-street will be built of square dressed rubble, with dressings of polished sandstone. The main entrance is from the street, and gives access to a large entrance-hall and staircase, from which all the floors are approached. On the ground floor there is a reading-room and two large committee-rooms. These rooms are divided with folding partitions, so that the whole of the ground floor may be thrown into one large hall to accommodate about 300 persons, with anteroom and lavatories adjoining, and an exit from the hall to the street. The first floor consists of a summer ice-room for two tables, and a large card-room, as well as a room and kitchen-house for the caretaker. On the upper floor there is a billiard-room having accommodation for four tables, with a bay window at either end, and lighted also from the roof, which will be entirely open to the apex. Suitable lavatory accommodation has been provided on each floor. The building will be heated throughout by means of hot-water pipes and radiators connected to a boiler in the basement.

HOTEL, LONDON.—A private and residential hotel with public restaurant is to be erected on the site of Wellington-house, Buckingham-gate, recently vacated by the War Office. The building will have a frontage of 177 ft. to Buckingham-gate, with a return frontage to York-street of 144 ft. The public restaurant will be entered from the apex of the site, which is triangular—and the hotel proper from Buckingham-gate. The hotel will be provided with three electric passenger lifts, goods and service lifts. The elevations will be carried out in cherry red bricks and terra-cotta dressings, and enrichments with a dressed surface. The cost of the scheme—including the site—will be 100,000*l.* Mr. Charles Gray, of Kensington and Shepherd's Bush, is the contractor for the works, and Messrs. Palgrave & Co. have been appointed architects.

Stained Glass & Decoration.

MEMORIAL WINDOW, OXFORD.—The west window of St. Philip and St. James's Church, Oxford, has just been filled with stained glass. It was designed, and the work carried out, by Mr. C. E. Kempe, M.A.

Sanitary and Engineering News.

GASWORKS, TAVISTOCK.—The opening of the new gasworks which have been erected at Tavistock took place on the 16th inst. The new works are situated about half a mile from the centre of the town, and occupy about 12 acres. Throughout they are constructed of local stone, relieved by red and buff bricks. The retort-house and coal store are of equal size, 70 ft. by 30 ft. and 20 ft. high at the ends. The former contains, at present, three settings of retorts, with one additional arch empty, and with room for two further arches to be built when required. Adjoining the retort-houses a line of buildings has been erected for the housing of the boilers, pumps, and exhaustor, and to serve as a workshop and mess-room for the employees. The retort-house adjoining contains three purifiers. The two gasholders are erected in steel tanks on the ground level, and are of 50 ft. diameter and 20 ft. deep, both prepared for telescoping, and having at present a storage capacity of 80,000 cubic ft., and an ultimate capacity of 150,000 cubic ft. Situated immediately in front of the mess-rooms is the meter and governor house. The pipes and connections throughout the works are of 10-in. diameter. The manager's house, with offices and showroom, adjoin the works, and the whole is enclosed by a stone boundary wall 8 ft. high. The work was carried out according to the designs, and under the superintendence of Mr. W. Packley, M.Inst.C.E., Devonport, and the contract was placed with Messrs. Willey & Co. (Ltd.), of Exeter, for the engineering work, and Mr. Brealy, of Exeter, for the buildings.

SEWERAGE WORKS, SILEBY.—The opening of the new sewerage works for the parish of Sibley took place recently. The scheme provides for a

population of 3,000. The dry weather flow is only 45,000 gallons, and the pumping plant is capable of dealing with three times this amount. The pumping-station is of brick, and attached to it there is a workshop. The settling tank has a capacity of 118,000 gallons. The works, which have been carried out by Mr. J. T. Ball, of Barrow-on-Soar, were designed by Mr. W. H. Simpson, of Leicester. The cost is estimated at 12,000l.

SEWERAGE WORKS, SOMERLEYTON.—The Sewage Disposal Works at Somerleyton have now been completed. They are designed upon the bacterial system, and comprise a septic and storage tanks and six contact beds, arranged in two series of three each. The works, which have been carried out according to the directions of Mr. Kerry Rix, were designed by Messrs. Anson & Shepton, of Westminster. The contractors were Messrs. Youngs & Son, of Norwich; and the manufacturers of the automatic apparatus were Messrs. A. G. Enock & Co., Ltd., of London.

SEWERAGE SCHEME, FRODSHAM.—On the 17th inst. Mr. W. O. Meade King, an Inspector of the Local Government Board, held an inquiry at Frodsam Town Hall into the application of the Runcorn Rural District Council for sanction to borrow 4,500l. for works of sewerage for Frodsam. Mr. James Diggle, Engineer to the Council, explained that the present application had arisen in consequence of the passing of the Manchester Ship Canal Act, 1904, under the provisions of which the Canal Company are granted power to raise the height of the water in the canal 2 ft. above the level sanctioned by their original Act of 1885. In consequence of this the sewerage in Frodsam would be submersed, and rendered inoperative. The Council have a protective clause in the Act of 1904, and the Ship Canal Company had entered into an agreement under which the Council would carry out the necessary works, and the company contribute 7,500l. towards the cost of the works, and lay a cable and provide electric energy to pump the sewage to a syphon under the canal, and into the river Mersey at Holpop-gutter, in the parish of Helsby. The total estimated cost of the scheme was 12,000l. There would thus be 4,500l. to be provided by the Council. Mr. W. H. Hunter, Engineer to the Manchester Ship Canal Company, stated that in consequence of raising the water in the canal from 26 ft. to 28 ft., it was necessary to convey Holpop-gutter under the canal, and it was proposed to do this and also carry the sewage by means of a syphon underneath the canal. The syphon was double-barrelled, and 250 ft. long, each pipe was 3 ft. internal diameter. The canal pipes were provided with electric power to pump sewage up to 750,000 gallons; above that quantity they would charge the District Council.

ROYAL SANITARY INSTITUTE.—At an exhibition in Hygiene in its bearing on school life, held in Edinburgh on May 18 and 19, five candidates presented themselves. Four certificates were awarded, as follows:—A. McKinna (Edinburgh); Ethel A. Roberts (Dumfermline); A. Small (Edinburgh); E. O. Vulliamy (Edinburgh). The following candidate was successful in Part II. only:—Katherine Vulliamy (Edinburgh). At an examination in Sanitary Science as applied to buildings and public works, held in Edinburgh on the same dates, four candidates presented themselves, and the following two were awarded certificates:—P. J. O'Brien (Edinburgh); F. C. Tweedie (Edinburgh).

Foreign.

FRANCE.—The ancient convent of the Abbaye aux Bois, at the angle of the Rue de Sèvres and Rue de Raspail, where Mme. Récamier lived and died, is to be pulled down for the erection of business premises on the site.—The "Association Provinciale des Architectes Français" will hold its annual Congress this year at Marseilles and Avignon, from June 1 to 15.—The Municipality of Lyons is about to spend over half a million francs on street improvements and sanitation.—The "Conseil Général des Bouches de Rhône" has voted 7 million francs towards the construction of a canal from Marseilles to Lyons.—The Municipality of Monton will shortly commence the necessary operations for the improvement of the sanitation of the town, at an estimated cost of 600,000 francs.—A Society for the protection of monuments and picturesque sites of Savoy has been formed at Chambéry.—A new fountain is to be inaugurated at Beauvais by M. Gréard (sculptor), which was in the Salon of 1905, and has been commissioned by the Société des Amis des Arts de Poise.—A monument to Gréard, former Rector of the University of Paris, will be erected this summer in the square of the Sorbonne. This monument, the work of M. Nénot, is composed of an architectural section surmounted by a bust of Gréard, and decorated with a bas-relief illustrating his life.—The monument to Cornéille in the Place du Panthéon,

adjoining the Ste. Gèneviève Library, is to be inaugurated in a few days. The sculptural work is by M. Allouard, and the architectural portion the design by M. Latour.—M. Guadet, in restoring, at the Palais Royal, the ancient apartments of the Regent, has discovered two splendid columns and some fragments of woodcarving, formerly part of the decoration of the Salons de Reception of the Duc d'Orléans. They have been placed in the Musée des Arts Décoratifs.—The old church of Sarlat (Dordogne), at present serving as a post-office, and which is classed among the "Monuments Historiques," is to be restored at the cost of the State.—An asylum for 1,200 patients is to be built at Orléans.—The jury in the competition for a new Hôtel de Ville at Troyes have awarded the first premium to a design the author of which is still anonymous. The second premium has been awarded to MM. Balley and Gustave Monceaux, and the third to MM. Emile Hochereau and Gabriel Brun.—On June 2 the monument to Dumas fils, on the Place Malherbe, is to be inaugurated. M. Saint-Mars is the sculptor.—The "Société d'Encouragement à l'Art et à l'Industrie" has founded two prizes which are to be awarded annually to decorative artists belonging respectively to the Société des Artistes Français and to the Société Nationale des Beaux-Arts.—As a memorial of the visit of the King of Spain a certain number of Spanish residents in Paris have founded, at Ville d'Avray, a dispensary for consumptive patients. The establishment has been very well planned and installed by M. Saint-Père, the architect.—The Académie des Beaux-Arts has elected, as Corresponding Member in the section of Architecture, M. Famin, of Chartres, in place of M. Martenot, of Rennes, recently deceased. M. Famin, a Corresponding Member is ninety-seven years of age; he had quite passed out of notice; but he obtained the Grand Prix de Rome in 1835. This venerable architect, who had been supposed to be dead, addressed recently to the Académie a remarkable study on the degeneration of the Cathedral of Chartres, and it was this work that led to his receiving this tardy honour at his hands.—The next Sunday, at Algiers, will be inaugurated the monument to the memory of Commandant Lamy, the explorer of the Sahara. The monument, of which M. Gaudissart is the sculptor, consists of a bronze bust carried on a column, the pedestal of which was ornamented with military emblems.—The death is announced, at the age of sixty-three, of M. Charles Abrizio, member of the Société Centrale des Architectes, and a pupil of M. Vaudremer. He had been for a long time attached to the architectural services of the Paris Hôtel de Ville and of the Department of the Seine, and was commissioned, as the result of a competition, with the carrying out of the parish church of St. Mandé.—The death is also announced, at the age of fifty-eight, of M. Felix Le Névé, a former pupil of Questel, and architect-expert to the Council of the Préfecture of the Seine. He was also a member of the Société Centrale. He had executed numerous private commissions—residences, offices, etc.; among them the fine Hôtel, 64, Avenue du Bois de Boulogne, and the Château de St. Maigrin, in the Department of the Charente.

EGYPT.—H.M. Consul at Cairo (Mr. A. D. Alban) has forwarded copy of the conditions of an international competition for the construction of a "Bourse Khédiviale du Caire," in connexion with which a first prize of 250EL is offered and a second of 100EL. Designs must be submitted to the "Corporation des Agents de Change," Cairo, before October 31.—Board of Trade Journal.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The partnership between Mr. James Henderson, jun., and Mr. John Hall, architects and surveyors, 28, John-street, Sanderland, has been dissolved, Mr. Henderson being about to leave England. Mr. John Hall will continue to carry on the business in the same style at the above address.—Mr. Max Clarke, architect, of 4, Queen-square, Bloomsbury, has taken into partnership Mr. Matt Garbutt, at present the architect to the Metropolitan Railway Company. The style of the firm will be "Max Clarke & Garbutt," to whom all professional communications are to be addressed in the same style as the above, which date the partnership will commence.

THE RUSKIN MUSEUM, SHEFFIELD.—The annual report of the Ruskin Museum states that this year the total number of visitors was 43,659, as against 50,736 in the year 1904-5, a difference accounted for by the fact that in the preceding year a special exhibition was held, consisting of etchings and engravings illustrating the history and processes of these arts, which alone attracted several thousands of visitors. The Museum Lectures were continued this season in connexion with the Free Public Lecture Scheme inaugurated four years ago, and embraced examples of Italian art, which had occupied special attention during their connexion with the objects of the museum,

particularly illustrating them. The lectures were illustrated by specially prepared lantern slides of the edifices, monuments, and paintings dealt with, and were considered in their special relation to the criticisms and teachings of Ruskin. The lecture-room previously used proved too small, and a fresh departure had to be made in order to provide accommodation; the larger picture gallery was therefore fitted up and used for the purpose, the improved conditions being much appreciated by the audiences. Two hundred tickets were issued for the lectures and the gallery was well filled on each occasion. The tickets are issued to any visitor who makes application for them, and to students at the principal educational institutions. The Sheffield Ruskin Club held its monthly meetings of the Meersbrook Circle at the Museum, as in previous years, and about thirty meetings in the different circles have been held in the city during the year. The members of the club meet to read and discuss the Works of Ruskin, with the view of ascertaining how his teachings may be applied for the betterment of social relations and conduct at the present day. The museum is open to the public free every week-day, except Friday, from 10 a.m. until sunset, and from 2 p.m. to 5 on Sunday afternoons.

DAMAGE TO BUILDINGS FROM SUBSIDENCE.—The important decisions have recently been given in the Courts relating to the right to support which is given to those in possession of lands under which are mines. In Butterknowle Colliery Company v. Bishop Auckland Industrial Co-operative Flour and Provision Society, Ltd., the plaintiffs, the owners of certain lands and buildings, claimed damages for subsidence caused by the appellants in the working of their mines. The defendants' predecessors in title had been the Lords Bishops of Durham, who had owned the mines and the lands, subject only to certain rights of common and pasturage. The rights had been extinguished by an Enclosure Act in the reign of George II., when allotments had been granted amongst the commoners, to some of which the plaintiffs had become entitled. This Act contained provisions enabling the mine owners to work and win the mines "as fully and freely" as they might have done "in this case Act had not been made." This, amongst other provisions of the Act, was relied upon by the defendants as giving them the right to work the mines so as to lower the surface. The House of Lords negatived this contention, and the judgments contained a valuable exposition of the law governing this subject. The right to support is rigidly presumed, and this presumption can only be removed by unequivocal and express words, and in the interpretation of such instruments if the introduction of a clause regulating the working of the mines so as not to lower the surface can be read into any document regulating the rights of the parties without causing inconsistency, this is the proper interpretation to be placed on such instruments. The second case, Tunncliffe & Thompson, Ltd., v. West Leigh Colliery Company, Ltd., turns on the damages recoverable where buildings have been damaged by a subsidence caused by the working of mines. Certain mills had been damaged by subsidence, and besides the actual structural damage present at the time of the inquiry into the damages, there was a fear that further damage to the buildings would ensue, and the question, shortly stated, was whether the depreciation in the property consequent upon this fear could be taken into consideration. The majority of the Court of Appeal, reversing the Court below, have held that, since the measure of damage is the difference in the selling value of the property before and after the inquiry, this item should be taken into consideration. Lord Justice Romer however considered it too remote, and the case is likely to go to the House of Lords.

HOLIDAY RESORTS.—The Health Resorts Development Association send us copies of illustrated booklets giving information as to the attractions, as holiday places, of Southampton, Weston-super-Mare, Deal, Bournemouth, and Woodhall Spa. One of these booklets will be sent free on receipt of a request on a postcard to the town clerk of any of the places named.

MR. BROCK'S STUDIOS.—In the House of Commons few days ago, Mr. Harcourt, having been asked by Sir W. Collins whether his attention had been called to the objection in the neighbourhood to the erection of a studio for Mr. Brock, R.A., on Primrose-hill, whether he will state what are the height, length, and breadth of the proposed building; and whether the dimensions were indicated on the plan to which he gave his approval, and on the strength of which he considers that the building in question is not likely to injure the surrounding scenery, says:—My attention has been drawn to this building, the site for which was determined under the late Government. The dimensions of the building are:—Height to eaves, 25 ft.; breadth, 50 ft.; length, 100 ft.; and appeared upon the plan approved by me. The building will be removed as soon as Mr. Brock's work on the Queen Victoria Memorial is completed. I will endeavour by some external decoration to make the building as little unsightly as possible.

STOCKTON HOUSE, WILTSHIRE.—The fine

collection of XVIII.-XVIIIth century furniture at Stockton House, near Heytesbury, has been placed in the market. The items include a XVIIIth century oaken bedstead, illustrated in Nash's "Mansions," and a Queen Anne pulpit, formerly in Wimborne Minster. The main portion of the house was erected by John Topp, woolstapler, who founded the almshouse in 1857. The house was carefully restored some years ago by a brother of the Bishop of Worcester, to whose family the property has belonged during a long period.

MEMORIAL IN WHIPPINGHAM CHURCH, I.W.—The Landgraf of Hesse has placed a tablet in St. Michael's Church in memory of eighty-four men of the Hessian contingent who were quartered in the Isle of Wight in 1794. The tablet, designed by Mr. A. Y. Nutt, resident architect at Windsor Castle, consists of a marble panel in a frame of moulded Staffordshire alabaster, with a trefoil cusped head; above is a shield bearing the lion of Hesse, and surmounting a crown.

ARTISTS' GENERAL BENEVOLENT INSTITUTION.—Lord Claud Hamilton presided over the ninety-first anniversary dinner of this institution on May 12 at the Hotel Métropole. The chairman stated that during ninety-one years past a total sum of 152,260l. had been distributed in 8,495 separate donations. The income from invested funds is about 8,000l.; during the year 3,000l. had been given in grants of from 10l. to 100l. Donations and subscriptions were announced to the amount of 2,829l.—Mr. C. Morland Agnew contributing 1,097l., mainly derived from the exhibition of the "Rokeby" Velasquez. The company included Sir Aston Webb, R.A. (Treasurer), Sir W. Emerson, Mr. Hans Thorey, Mr. R. A. B. Joy, Sir Charles Holroyd, Mr. Pomeroy, A.R.A., Mr. W. Oulss, R.A. (Honorary Secretary), Mr. Alfred East, A.R.A., Mr. J. S. Sargent, R.A., and Mr. Solomon J. Solomon, R.A.

A SEPARATE DIOCESE FOR ESSEX.—Proposals are made for setting up a separate diocese for Essex, with a cathedral and bishop's palace in Chelmsford. Subscriptions to the requisite total of about 50,000l. are already promised to an amount of 20,000l. The scheme provides for a rearrangement of the dioceses of St. Albans, Ely, and Norwich, whereby that of St. Albans would consist of Hertfordshire and Bedfordshire.

AMERICAN SOCIETY OF ENGINEERS.—An executive committee of the Iron and Steel Institute are making arrangements for entertaining the American Society of Engineers who will visit England in July. The programme comprises a reception by the Lord Mayor at the Mansion House on July 24, and visits to the Crystal Palace and the Imperial Austrian Exhibition, Tottenham Court. The American Society will visit the chief centres of manufacturing industry in the midlands and northern counties.

LONDON OUTER CIRCLE RAILWAY.—A Committee of the House of Commons, presided over by Sir G. Doughty, has under consideration a Bill for the construction of a line 32 miles in length through the northern suburbs to be worked by electricity under the single-phase system. Sir J. Wolfe Barry and partners are appointed engineers for the railway; the estimate for the actual construction, equipment excepted, is 3,320,000l. The track proposed starts from West Ham, taking in its course Barking, Tottenham, London, Kingsbury, Wembley, Harrow, Northolt, Southall, Edmonston, Finchley, and so to a junction at Feltham with the London and South-Western line, affording numerous connexions on the way with existing railways, as well as with Tilbury Docks.

AN ELASTIC PAINT.—"Velure" is the name of a paint which is said to possess remarkable elastic and weather-resisting properties. As is usual in the case of paints which after becoming dry remain elastic and do not crack, this paint does not become thoroughly hardened until it has been exposed to the air for several days. The paint is prepared in all colours, and samples of the white variety which have been submitted to us by the manufacturers, Messrs. Chancellor & Co., lead us to regard "Velure" as an excellent paint for use in those cases where rapid drying is not of the first importance.

MILAN FIRE SERVICE CONGRESS.—The biennial International Fire Service Congress will be held at Milan next week, and a Special Commission of Executive Officers of the British Fire Prevention Committee have left London to attend this Congress (including their Chairman and Honorary Secretary). Some eight other members of the Committee are also attending the Conference, which has been organised under the auspices of the International Fire Service Council and at the invitation of the Italian authorities. Among papers that will be read by members of the British Fire Prevention Committee are one by Mr. Edwin O. Sachs entitled, "International Relations in the Fire Service and the International Fire Service Council"; one by Mr. Ellis Marsland entitled, "The Different Systems of Fire-resisting Shutters, etc.," in Fire-resisting Doors and Windows"; one by Mr. James Sheppard entitled, "Fire Resistance of Buildings Constructed with Reinforced Concrete"; and one by Mr. Percy Collins entitled, "Fire Risks Due to New Industries and the Motor Industry in Particular."

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of Miss A. K. Harris as sanitary inspector in the Metropolitan Borough of Bethnal Green; also of Mr. T. W. Dee as sanitary inspector in the Metropolitan Borough of Stepney, in the place of Mr. A. W. Willey, deceased.

Capital and Labour.

CONDITION OF THE BUILDING TRADES.—Employment in the building trades continued to show a general improvement. It was better than a year ago on the whole. Returns received through the trade correspondent from fifty-nine London employers showed that in the last week of April they paid wages to 11,306 workpeople of all classes, compared with 11,487 in March, and 12,792 in April, 1905. Employment generally was much the same as a month ago, but worse than a year ago. Painters and decorators were fairly busy. Other branches were very quiet. Returns received from Employers' Associations in sixty districts outside London. In rather more than half of these employment was dull generally. At Burnley it was good; at Ashton, Stratford-on-Avon, Exeter, and Taunton it was fairly good; and at the remaining towns (rather more than a third of the total) it was moderate or fair. Compared with a month ago, no change was reported in forty-five towns. At Nuneaton and Cheltenham employment was worse, and at thirteen towns, including Burnley, Bury, Birkenhead, Stockport, Swansea, and Dublin, it was better. Compared with a year ago no change was shown in thirty-six towns, in seven employment was better, in seventeen worse.—*Labour Gazette.*

Legal.

POWERS OF A DISTRICT COUNCIL.

IN the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Cozens-Hardy, on the 23rd inst., the hearing of the case of the Attorney-General v. the Pontypridd Urban District Council was concluded on the defendants' appeal from a judgment of Mr. Justice Farwell in the Chancery Division. (The case was reported in the *Builder* of August 19, 1905.)

The action was brought by the Attorney-General at the relation of the trustees of the Baroness Llanover, deceased, against the defendants, to restrain them, their contractors, servants, and workmen, from erecting or permitting to remain upon any portion of the land at Gwynygerwn, Treforest, near Pontypridd, which was purchased from the trustees in 1902, any building or works not required or intended for the purposes of the defendants' electric lighting undertaking, and from permanently using the land, or any part of it, for any other purpose than that for which it was acquired, viz., the production and supply of electricity. The relator trustees, on their own behalf, claimed an injunction to restrain the defendants from using any part of the land or any building on it in such a manner as to create a nuisance or cause damage to the Llanover estate. It appeared that after the purchase of the land by the defendants in April 1902, application to the Local Government Board for permission to use a part of the land for the purpose of a refuse destructor, but were told that the Board had no power to sanction the use of the land for any other purpose than that for which it had been acquired. In the following April the trustees were applied to to accept a re-conveyance of the part of the land on which it was proposed to erect the destructor, and then to convey it back again to the defendants, the latter paying the costs, but the trustees declined to accede to the application. Failing in both quarters, the defendants went through the form of conveying this part of the land to a Mr. Davis, and taking a re-conveyance from him, the undertaking to re-convey being a condition of the conveyance to Davis, and although informed by the trustees that they objected to the refuse destructor being built there, the defendants commenced the construction of the destructor, although no sanction had been obtained for it from the Local Government Board. The trustees' view was that the destruction of dust and refuse on any portion of the land in question would cause a serious nuisance, and would materially diminish the value of the trust property in the neighbourhood. The nature of the defence was that the scheme of the Council for establishing their works for generating electrical energy included a scheme, which was not uncommon in practice, for utilising the heat derived from a refuse destructor for working the electric generating machinery. This plan they had for reasons of economy adopted in 1901, on the advice of their electrical engineer. Mr. Justice Farwell held that the proposition put forward by the defendants, that they had the powers of user over the land as suggested, was entirely contrary to the

powers given to the Council in regard to the supply of electricity. He held that the defendants acquired the land in question under the Electric Lighting Acts for the purpose of electric lighting only, and that they had no power to erect upon it a dust destructor. His lordship accordingly decided that the action of the defendants was *ultra vires*, and granted an injunction with costs. Hence the present appeal of the defendants.

Mr. Danckwerts, K.C., and Mr. R. J. Parker appeared for the appellants; and Mr. W. H. Upjohn, K.C., and Mr. Hornell for the respondents.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, said the question to be decided was whether or not the defendants' Council were authorised under their powers in using the plot of land they had bought from the trustees for the purpose of building and using a dust destructor. The learned judge had come to the conclusion that the powers conferred upon the authority by the Electric Lighting Acts, under which the plot of land was acquired, did not embrace the right of the defendants to use the land so acquired for the purpose of a dust destructor. The first question was, under what powers did the local authority acquire the site in question? Mr. Justice Farwell had found that they unquestionably acquired the land under their powers under the Electric Lighting Acts. He (the Master of the Rolls) entirely concurred with Mr. Justice Farwell in the conclusion that the action of the dust destructor was authorised under those powers by coming to the conclusion that the dust destructor was necessary and incidental to such supply. Mr. Justice Farwell had found that the dust destructor was not necessary or incidental to the supply of electricity, but was to enable the defendants to carry out their obligations in getting rid of the dust. He was of opinion that Mr. Justice Farwell was right in the conclusions he had come to, both of fact and law, and that what the defendants proposed to do was *ultra vires* their powers. He thought, therefore, the appeal failed, and should be dismissed with costs. The Lords Justices concurred.

ACTION BY BUILDERS AND CONTRACTORS.

The case of Neale and others, the Corporation of South Shields case before Mr. Justice Buckley on the 18th inst. on a motion on behalf of the plaintiffs for an order that the Corporation of South Shields might be restrained until judgment from acting upon a notice of March 24, 1906.

Mr. Astbury, K.C., who appeared in support of the notice, said his learned friend, Mr. Buckmaster, K.C., who appeared for the defendants, had a cross-motion to stay the proceedings under an arbitration clause, and that the matters in dispute other than certain excluded matters might go to arbitration. He said the case was a very serious and complicated one. The plaintiffs were large builders and contractors in Manchester, who some time ago entered into a contract with the Corporation of South Shields to build some municipal buildings at a large cost. The arbitrator was a gentleman of the name of Fitch, in London, and the architect and he had a number of discretionary and absolute powers to reject and order things to be re-opened up, and so on. Unfortunately for the parties there had been constant friction from the commencement between the plaintiff and this architect. Up to the present time buildings to the extent of about 10,000l. had been completed, and the architect's certificate given. Under the specification the plaintiffs were bound to put in mortar of a certain kind. They said they had done that, and that the mortar had from time to time been passed by the architect. They had a large body of evidence that the proportion of sand and cement was a very unwise one to take. The architect said they had not done that, and that the defects in the mortar which he complained had arisen from other causes. The architect had ordered the plaintiffs to remove forthwith from the works the whole of the mortar and concrete, which could not be done without pulling the building down. The notice said that this was to be done at the cost of the plaintiffs, who were to substitute therefor mortar and concrete in accordance with the specification. That was the notice the plaintiffs sought to restrain the defendants acting upon, and their writ asked that the notice might be declared invalid and not authorised by the contract. The plaintiffs asked for arbitration as well as the defendants. They said they had not ordered the mortar to be pulled down, for many reasons, amongst them being that the mortar and concrete had been passed by the architect, and that he had not exercised a *bona-fide* discretion or come to a reasonable decision. There was a

Patents of the Week.

APPLICATIONS PUBLISHED.*

8,804 of 1905.—T. M. THOM: *Manufacture of Artificial Stone and Marble.*

This relates to a process of manufacturing artificial marble and stone which consists in submitting the slabs to the action of carbonic acid gas in a special manner; that is to say, the slabs being placed in a vacuum, carbonic acid gas is admitted thereto until the vacuum is largely reduced by the presence of gas, the admission of gas being repeated if necessary to maintain the reduced vacuum constant as the carbonation progresses and the carbonic acid gas is taken up by the slabs.

9,017 of 1905.—E. CHATILLON: *Process for the Preparation of Antimoniai Substances Used for Painting and other Purposes and the Products thereof.*

This relates to a process for the manufacture of antimoniai substances, and is characterised by the employment of a first cupola charged with ore and combustible, and, if necessary, substances rich in sulphur, a vapourising chamber supplied with water, a second cupola charged with combustible, and a second chamber where water is injected and atomised by means of exhaust ventilators; the injected water holding in solution or suspension alkaline earth sulphides, carbonates, sulphites, hydrates, or a mixture of these substances.

9,017A of 1905.—E. CHATILLON: *Process for the Preparation of Products of Antimony for Painting and other Purposes.*

This relates to a process for the preparation of antimony for painting and other purposes, and is particularly applicable for the preparation of antimony of violet colour. Black antimony is obtained as hitherto by distilling sulphide ores containing antimony in a cupola with a restricted supply of air for supporting combustion. For this purpose a cupola furnace with relatively small ventilators is used, either a cupola of wide section and great depth filled with coke and ore on the grating, and a small ventilator which is a fan revolving at high speed, exhausting or forcing such a quantity of gas that the oxidation will be little or nothing, the combustion of the coke merely evolving CO and not CO₂, or the ventilators may be dispensed with and a draught from chimney at the end of the long condensation chambers may be substituted. For antimony violet the installation for the blacks is employed, but on emerging from the cupola the gases will pass on to a specially heated hearth, where they will be further heated to a red cherry heat—that is to say, to a temperature of about 800 to 900° C., and afterwards condensed by the ventilators or in a tower.

9,694 of 1905.—W. LITTLE: *Cooking or Water-heating Boxes Especially Suitable for Field Use.*

This relates to a cooking or water-heating apparatus having a protective casing with air inlet, and consists in the construction wherein said casing, which is double walled, extends around both the vessel and the heating space, leaving a narrow space around said vessel, the inner wall of said casing being provided with upper and lower guides or inward projections.

9,984 of 1905.—R. LEGGOTT and W. R. LEGGOTT, LTD: *Opening and Closing of Fan-lights and Pivoted Windows.*

In carrying this invention into effect an attachment of the ordinary description may be made with the fan-light or window frame, and a vertical rod extend to said attachment, and held in line by a series of guides secured in a rigid manner. Engaging with the vertical rod and clamping one of the before-mentioned guides is a swivelling bracket, to which a lever is jointed, and on another portion of the vertical rod is a collar, held but capable of rotation or like swivelling to some extent, around the vertical rod. The connexion is made between the collar and lever by a link jointed in such a manner that when the vertical rod is raised to the full the lever and link are so engaged that the fan-light or pivoted window is securely held in position without the aid of a nipping screw or the like.

10,592 of 1905.—J. MADDER: *Apparatus for Cleaning Windows, and for Brushing, Washing, and Painting the Fronts of Buildings.*

This relates to an apparatus for cleaning windows and for other purposes, and consists in the combination of a rotary brush mounted upon a shaft journaled in a bearing at the upper end of an extensible rod or long arm, sprocket wheels mounted on said shaft, and towards the lower end of said rod or long arm respectively a crank handle for rotating the latter sprocket wheel and an extensible endless band passing over both

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

said sprocket wheels for conveying motion from one to the other.

12,310 of 1905.—J. WEIR: *Door Lock.*

This relates to a door lock having in combination a bolt, a pin which is prevented from revolving, and has a hollowed part internally screwed, said pin being adapted to engage the bolt, and a screw or equivalent arranged within a pin in such manner that, when it is turned by a key, it causes the pin to engage with or disengage itself from the bolt.

16,790 of 1905.—J. E. H. PADDON: *Radiators for Heating Buildings.*

This relates to a radiator for heating buildings, comprising a series of hollow vertical sections arranged parallel to each other and communicating with each other at their upper and lower ends by means of horizontal ducts, and having flow and return connexions in the opposite end-sections, such radiator being characterised by a vertical partition closing the portion of the horizontal duct between the lower ends of the intake end-section and that next to it, and a horizontal operating valve, controlling the communication between the upper ends of the said intake end-section and the section next to it.

13,450 of 1905.—G. LANGFIELD & Co., LTD., and J. D. P. ASHWORTH: *Humidifying of Air in Air Heating Stoves.*

This relates to air heating stoves and consists in the combination with air heating tubes connecting a through air chamber with a hot air delivery chamber, of a valve chest connected to the lower end of one of said tubes, said valve chest being controlled by a valve or valves so as to allow either air or water to enter this tube.

19,145 of 1905.—E. W. DENNISON and R. F. TOWLER: *Metal Collapsible Screens, Guards, Gates, Shutters, and the like.*

This relates to metal collapsible gates, screens, guards, shutters, and the like, and consists in the application and use of gaurds, each of which has its two shoes or runners cast or otherwise formed in one piece with a connecting cross-web.

20,309 of 1905.—J. H. HOPE, JR.: *Adjustable Frames for Door Locks and Latches.*

This relates to a lock or latch frame provided with an outer plate, a front plate extending across the edge of the door, an inner plate secured to the flanged end of the front plate, and a tie piece arranged to hold the inner and outer plates in rigid connexion with each other, and to support the front plate against the action of the fastening screws.

15,634 of 1905.—F. TRIER: *Means for Cutting Stone and the like.*

This consists of an apparatus for cutting stone and the like by means of magnetisable abradant material magnetically held to the circumference by a revolving disc, which is magnetised by passing electric current through coils encircling the shaft encircling the disc and preferably on both sides of the disc, so that the disc is rendered free to cut to the maximum diameter allowed by the diameter of the coils on the shaft.

23,136 of 1906.—A. COWINGS: *Door Closing Apparatus.*

This relates to a door closing apparatus of the kind having a spindle carrying a roller, inclined planes mounted on a weighted lever, and adapted to rise and fall vertically, and to bear against said roller, and an additional weighted arm adapted to bring the roller to a central position.

102 of 1906.—D. A. HARRIS: *Adjustable Supports for Shelves, Display Tods, and the like.*

This relates to an adjustable support for shelves and the like, having the bracket or the like provided with a downwardly directed hook projecting therefrom, adapted to engage an elongated hole in the standard, and consists in the construction wherein a plurality of said hooks are used, having their downwardly projecting portions parallel to the contact face or edge of the bracket, and in line with the holes in the standard.

1,922 of 1906.—A. A. PAULY: *Concrete Block-forming Machines.*

This relates to concrete block-forming machines, and consists in the combination with a frame work having rollers journaled therein of standards carried by said frame work, a plate connecting said standards together, a frame slidably mounted upon said standards, a plunger carried by said frame, a shaft journaled in said frame, and having suitable crank handles, a toothed wheel mounted upon said shaft, a rack carried by said plate, and meshing with said toothed wheel, and a pawl pivotally mounted upon said frame and normally engaging said toothed wheel.

8,432 of 1906.—J. COLLIER: *Stairs.*

This relates to stairs constructed of a winding and inclined arch formed of two or more thicknesses of brushes, with broken or crossed joints united

great deal to be tried, and he asked that the trial of the action be expedited.

Mr. Buckmaster, for the defendants, said that so far as the question involved whether this mortar was right or wrong, that was a matter in the discretion of the architect.

His lordship:—Supposing that for twelve months he has passed the material, and it has been put in the building, and then he turns round and says, "This mortar is all wrong—pull the building down!"

Mr. Buckmaster said that under the contract the parties had agreed that the architect should be the final judge of the matter.

His lordship: If he acted reasonably.

Mr. Buckmaster admitted that the architect's capacity as a judge could be questioned, but he failed to see on what ground the exercise of his authority could be questioned.

His lordship then, by consent, made no order on the motion except that the costs be costs in the work again at his own cost?

Mr. Buckmaster said he did not intend to give up whatever rights the defendants had in the arbitration.

His lordship suggested that the proper course would be to make the costs of the motions costs in the action, and let the case go to trial without prejudice to any application either party might make to refer any of the questions to arbitration.

Mr. Buckmaster said defendants were prepared to give an undertaking until the hearing of the action not to interfere with the buildings, the plaintiffs giving a cross undertaking in damages.

Mr. Astbury said he could not give an undertaking in damages, as he did not know what it would involve—the liability might be enormous.

His lordship then, by consent, made no order on the motion except that the costs be costs in the action, reserving to either party liberty to say that something ought to go to arbitration.

It was agreed that pleadings should be delivered as soon as possible, and leave to apply to advance the trial was given.

HEAVY DAMAGES AGAINST A BUILDER.

The case of Ward v. Green came before the Court of Appeal, consisting of Lords Justices Vaughan Williams, Stirling, and Fletcher Moulton, on the 21st inst., on the defendant's application for a stay of execution pending appeal.

Mr. Shearman, K.C., in support of the application, said the action was brought by the plaintiff, a widow, to recover from the defendant, a builder, damages under Lord Campbell's Act, plaintiff's husband having lost his life in an accident in a building in Camberwell some time ago. The action had had to be tried three times before a result could be arrived at, the jury having disagreed on two occasions. At the last trial, before Mr. Justice Phillimore, the jury returned a verdict in the plaintiff's favour for 500l. damages, and judgment was entered accordingly.

After the verdict he (counsel) asked the learned judge for a stay of execution on the defendant agreeing to pay the plaintiff 2l. a week until the appeal was heard, the money so paid not to be returned if the appeal proved successful, the defendant also to bring the amount of the damages into Court and paying the costs to the plaintiff's solicitor on his giving an undertaking to return them if the appeal was allowed. Mr. Justice Phillimore, however, refused to grant a stay.

After hearing Mr. McCall, K.C., on behalf of the plaintiff, in opposition to the application, Lord Justice Vaughan Williams said he considered the defendant's offer a very handsome and proper one, and in the result a stay was granted on the terms that defendant paid the plaintiff, pending the hearing of the appeal, 2l. a week, brought 450l. into Court within seven days, and paid the taxed costs on the usual undertaking.

The costs of the application was made costs in the appeal.

ACTION ON A BUILDING CONTRACT.

A DIVISIONAL COURT of King's Bench, composed of Justices Ridley and Darling, on the 19th inst., concluded the hearing of the case of Williams v. Griffiths, on a motion on behalf of the plaintiff to set aside the award of an arbitrator on the ground of excess of jurisdiction.

Mr. J. Jones appeared for the plaintiff, and Mr. McCarthy for the defendant.

It appeared that the arbitration was held in common form and was on the question of the construction of a building contract in which the builder was entitled, in the event of the architect refusing a progress certificate, to go to arbitration upon that amongst other disputes. The defendant was the builder of a villa in Morriston, Swansea, and during the course of the work he claimed a progress certificate, which was refused by the architect. The builder then claimed an arbitration, and the arbitration was held to determine whether he was entitled to the certificate, and, if so, for how much. The result of the arbitration was that an award was made whereby the builder was awarded a larger sum than he claimed. The plaintiff now moved to set the award aside on the ground of excess of jurisdiction.

At the conclusion of the arguments of counsel their lordships set the award aside.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxx. Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

Contracts.

BUILDING.

May 16.—**Aughton**.—REBUILDING INN.—The rebuilding of the Black Bull Inn at Aughton, for Messrs. Mappin's Masboro' Old Brewery, Ltd. Names and addresses to Mr. J. E. Knight, architect, 35, College-street, Rotherham, on or before May 26, along with a deposit of 1*l.* 1*s.* for quantities.

May 26.—**Callington**.—HOUSE.—A dwelling-house at Callington, for Mr. T. H. Luxton. Plans, specifications, etc., may be seen by applying to Mr. Lawrence Scantbury, architect, Callington. Tenders to be delivered at the architect's office on or before May 26.

May 26.—**Cookstown**.—LABOURERS' HOUSES.—Cooks town R.D.C. invite tenders for the building of twenty-six labourers' houses, in six single houses and ten double house blocks. Plans and specifications can be seen at the office of Mr. Henry Shillington, M.A., M.E., Lutran, or at the office of the Clerk of the Council, Cookstown. Tenders will be received and considered for one or more single houses, also for one or more double house blocks, but in no case for six houses being part of double house blocks. Tenders to be lodged with Mr. Henry Alfred Mann, Clerk of Council, Board-room, Cookstown, not later than 10 o'clock a.m. on May 26.

May 26.—**Idle**.—HOUSES.—Two houses at Bradford, Idle. Plans and specifications may be seen, and bills of quantities obtained, at offices of Mr. Benjn. Dobson, architect, 5, Claires-street, Bradford, from Tuesday, May 22, to Saturday, May 26, inclusive.

May 26.—**Swann**.—HOUSE.—House at Swann, Clymore road, near Post Linn, for Mr. Evan E. Evans. Plans and specifications may be inspected at the above address. Tenders to be delivered to Mr. Evans by 12 noon on May 26. Mr. Henry Thomas, architect and surveyor, Castle Buildings, Carnarvon.

May 28.—**Crawcrook**.—COTTAGES.—Building six cottages at Crawcrook. Plans, specifications may be seen at house of Mr. J. Harkness, East View, Fradlow. All tenders must be in on May 28.

May 28.—**Harrogate**.—ERECTION OF TWO HOUSES, stable, and greenhouse at Harlow Moor House, Harrogate, for Mr. W. H. Waddington. Drawings may be seen at offices of Mr. J. W. C. Atkinson, architect, 1, Pavilion, Bradford, from Monday, May 28, to Wednesday, May 30. Quantities will be forwarded if applied for before May 28.

May 28.—**Kirkbride**.—CHURCH.—The erection and completion of a Primitive Methodist Church at Kirkbride. Plans and specifications can be seen upon application to Messrs. J. Stornomth & Sons, Kirkbride, and at the offices of the architects, Messrs. W. G. Scott & Co., architects and surveyors, Workington. Tenders, endorsed "Kirkbride P.M. Church," will be received by the architects up to 5 p.m. on May 28.

May 28.—**New Sawley**.—SCHOOL.—Derbyshire Education Committee invite tenders for the erection of Council School, New Sawley, to accommodate about 156 children. Drawings, specification, agreement, and the office of the architect, to be sent to the Committee, St. Mary's Gate, Derby, between the hours of 10 a.m. and 4 p.m., except on Saturday, when they will be on view from 10 a.m. to 12 noon. A copy of the bill of quantities, specification, conditions of contract, and form of tender can be obtained at the architect's office upon payment of 1*l.* 1*s.* Sealed tenders in envelopes provided for the purpose, and endorsed "Tender for New Council School, New Sawley," must be delivered to Mr. George H. Widdows, A.R.I.B.A., Architect to the Committee, County Education Offices, St. Mary's Gate, Derby, not later than 5 p.m. on May 28.

May 28.—**Wakefield**.—SHOPS.—Shops and offices in Market-place and Cross-square, Wakefield. Names to Mr. Percy Robinson, F.R.I.B.A., Yorkshire Post Chambers, 53, Albion-street, Leeds, not later than May 28.

May 30.—**Barnoldswick**.—BRICK CHIMNEY.—Barnoldswick U.D.C. Gas Committee invite tenders for the erection of a circular brick chimney, 80 ft. high, and for the dismantling of the existing chimney, with sundry repairs and alterations to retort-house. General conditions of contract, specification, and form of tender may be obtained from Mr. J. W. Thompson, Manager Gas and Water Department, Town Hall, Barnoldswick, on payment of 10*s.* 6*d.* Drawings may be seen at the Town Hall, Barnoldswick. Tenders, endorsed "Tender for Chimney," to be forwarded to Mr. J. M. Edmondson, Chairman Gas Committee, Town Hall, Barnoldswick, not later than 4 p.m., on May 30.

May 30.—**Burley-in-Wharfedale**.—EXTENSION OF SHOP.—The extension of a shed at Burley-in-Wharfedale. Plans, specifications, conditions of contract, and quantities at offices of Messrs. Milnes & France, architects, 2, Swan-arcade, Bradford. Sealed tenders, properly endorsed, are to be delivered not later than May 30.

May 30.—**Craigievar Estate**.—BUILDING WORK.—The mason and slater works of additions to barn and at Wester Fowls farm, also for slater work of re-slating, etc., of part of the steading on Multhead; also for the mason, slater, and plaster works of

various repairs to the houses and steadings at Waukmill, North Knock, North Point, Wellford, and Knockoch. The plan and specifications of the works at Wester Fowls and the specifications of the other works may be seen in the hands of Mr. Charles Murray, carpenter, Barnside, Leochel-Cushnie, Alford; or with Alex. Stronach, junr. & Son, advocates, 20, Belmont-street, Aberdeen, the latter of whom will accept offers up to May 30.

May 30.—**Huntly**.—BUILDINGS.—The mason, carpenter, and slater work of the Gordon Richmond Estates, Huntly district, of:—(1) Barn and stable at Binside, Cairnie; (2) byres and sheds at Binball, Cairnie; (3) double byre and shed at Smallburn, Cairnie; (4) men's rooms, etc., at Hollows, Cairnie; (5) addition to cottage at Wester Auchairn, Cairnie; (6) offices for cottages at Coniecleuch, Cairnie; (7) barn and stable, etc., at Nether Auchmill, Kinloch; (8) double byre, etc., at Bichard, Gartly; (9) barn and stable at Kirkey, Gartly (George Forbes, tenant); (10) byre and shed at Kirkey, Gartly (Wm. Smith, tenant); (11) stable and men's room, etc., at Melkie Western, Drumblade; (12) repairs and alterations on byres, etc., at Mosshead, Drumblade (J. Kiddoch, tenant); (13) alterations, etc., and alterations on house and offices at Manzie, byres, etc., at Binside, Cairnie; (14) mason and slater work of:—(14) Re-roofing store at Meal Mill of Upper Pirriesmill; and for the plaster work of No. 13. Plans and specifications will be seen at the Estates Office, Huntly, and quantities received there up to May 30 current, at 12 o'clock noon.

May 30.—**Rye**.—HOSPITAL.—Rye Rural and Urban District Councils invite tenders for the erection of an isolation hospital. Plans and specifications may be seen at the office of Mr. E. J. Cory, F.S.I., Lighth-street, Rye, between the hours of 10 and 4 (Saturday excepted). Tenders, under cover, endorsed "Hospital Tender," must be delivered at office of Mr. Walter Daves, Clerk, Bank Chambers, Rye, not later than 12 noon on May 30.

★ May 30.—**Seaford**.—PRIVATE RESIDENCE.—Erection of private residence at Seaford, Sussex, for the Seaford West Company, Ltd. Those desiring to tender should send their names to Mr. W. Lamb, Estate Office, Clearemont-road, Seaford, from whom quantities, etc., can be obtained upon deposit of 3*l.* 3*s.* All tenders to be sent to the Estate Office by May 30.

May 30.—**Skene**.—ALTERATIONS.—The mason, carpenter, slater, and plaster work of extensive alterations to be made on the dwelling-house at Milton of Gartlogie, Skene. Mr. Samuel Copland, Ground Officer, Lyne of Skene, will issue plans and specifications, and receive offers up to May 30.

May 30.—**Stainland**.—MILL.—For masons', carpenters' and joiners' plumbers' and glaziers', painters' and stainers', and ironfounders' trades in the erection of a two-storied mill at Firth House, Stainland, for Messrs. R. & D. Norcliffe, manufacturers, Stainland. Plans and specification may be seen at offices of Mr. James Simpson, architect, etc., Southgate Chambers, Elland, and quantities obtained. Tenders must be delivered not later than 3 o'clock on May 30.

May 31.—**Bristol**.—CHURCH.—The erection of Wesley Memorial Church, Bryant's Hill, Bristol. Plans, etc., may be seen any week day, from 9.30 a.m. to 4.30 p.m., on application to Mr. G. Peters, Kingscot House, Bryant's Hill, Bristol.

Quantities obtained from Mr. W. Hugh Dinsley, architect, Chorley, Lancs., on deposit of 10*s.* 6*d.* Tenders to be delivered to Rev. W. J. Clarke, Elmira Villa, Hanham, not later than noon, May 31.

May 31.—**Ecclesfield**.—HOUSE.—The Stacey Memorial Parsonage House at Grenoside in the Parish of Ecclesfield. Plans and specifications may be seen, and quantities obtained, on application at offices of Messrs. R. and W. Dixon, architects, 5, Eastgate, Barnsley, where sealed tenders must be delivered, endorsed "Tender for Parsonage House," not later than 10 a.m. on May 31.

May 31.—**Gravesend**.—ARRANGINGS ETC., TO SANATORIUM.—The Town Council invite tenders for alterations and additions to the administration block of the sanatorium. The plan and specifications may be seen at the Borough Surveyor's Office, Town Hall, and tenders, marked "Tender for Additions to Sanatorium," must be delivered to Mr. H. H. Brown, Town Clerk, not later than May 31.

May 31.—**Llanberis**.—HOUSE.—For building a house at Llanberis. Plans and specification may be seen at Messrs. Moran & Jeffery-street, Llanberis, and at the offices of Mr. J. H. Llewellyn Lloyd Jones, architect and surveyor, Tower Buildings, Carnarvon. Tenders to be delivered to architect by May 31.

May 31.—**Mountain Ash**.—BUILDINGS.—For the erection of certain buildings, to be used in connexion with the Workmen's Institute, Mountain Ash, for the Committee. Plans, etc., may be seen at offices of Messrs. Moran & Jeffery-street, Mountain Ash, or 42, Canon-street, Aberystwyth. Tenders to be sent not later than May 31.

May 31.—**Pillaton**.—LAVATORY AND ALTERATIONS.—The erection of lavatory, etc., and various alterations at the Rectory, Pillaton. Plans and specifications may be seen at the house of Mr. Harold A. Hosking, P.A.S.I., architect and surveyor, Landrake, near St. Mary's Rectory, Pillaton. Sealed and marked tenders to be sent to Rev. R. Hosking, Rectory, Pillaton, St. Mellion, on or before May 31.

May 31.—**Waterfoot**.—ALTERATIONS TO CHURCH.—Alterations to St. James's Church, Waterfoot. Bills of quantities from Mr. A. Brocklehurst, architect, St. James's Chambers, Waterfoot, on or after May 23. Estimates to be delivered to Rev. J. T. Mann, before May 31.

June 1.—**Ballymena**.—COTTAGE HOSPITAL.—Extensions and alterations at Ballymena Hospital. Plans and specifications can be obtained from Mr. Boyd, C.E. Tenders to be sent to the Hon. Secretary, Mr. R. Porter, on or before June 1.

June 1.—**Beeston**.—MILL.—The erection of a wooden mill, adjoining Dewsbury-road, Beeston, Leeds, for Mr. William Douglas. Names to Messrs. L. & Co., 10, Victoria-square, Leeds, and at Morley. Plans and specifications may be seen, and quantities obtained, at Leeds offices on and after Friday, May 25. Sealed and endorsed tenders, "Greek Church," to be sent to Mr. W. Hillside, 10, Victoria-street, S.W., on payment of 1*s.* 6*d.* Tenders to Mr. Alleyne Brown, Clerk to the Board, 11, St. George's-place, Lord-street, Southport, before June 1, endorsed "Tender for Pumping Engine Shed."

June 1.—**Cardiff**.—GREEK CHURCH.—Tenders are invited for building the new Greek Church, on a site situated between the West Junction Canal and North Church-street, Cardiff. Plans and specifications may be seen, and bills of quantities obtained, on payment of a deposit of 1*l.* 1*s.* Sealed and endorsed tenders, "Greek Church," to be sent to Mr. W. Hillside, Raphael, Greek Consul, Duke Street, Cardiff, on or before June 1. Messrs. James & Morgan, F.R.I.B.A., architects, Charles-street, Cardiff.

June 2.—**Antrim**.—VILLA.—The Committee of Management of the County Asylum, Antrim, invite tenders for the erection of a villa on their Holywell Estate, near Antrim. The plans and specifications may be inspected in the office of the Clerk of the above institution, and at the office of Mr. S. C. Hunter, 2, Wellington-place, Belfast, from which latter copy of the bill of quantities may be obtained, on payment of a deposit of 1*l.* 1*s.* Sealed tenders to be sent to the Chairman of Asylum Committee, Holywell, Antrim, to be sent in on or before 12 noon on June 2, copies of the plans and specification may be obtained on application to Mr. Basil Wilson, M.Inst.C.E., Maryville, Malone, Belfast, on payment of the sum of 1*l.*

June 2.—**Arnside**.—RESIDENCE.—The erection of a residence at Arnside, for Mr. W. F. Bolton. Plans and Specifications may be seen, and particulars obtained, at office of Mr. Geo. L. Hogarth, architect, Kendal and Arnside, from May 24 to June 2, to which latter day tenders must be sent to architect.

June 2.—**Blunts**.—CHAPEL.—RENOVATION OF Wesleyan Chapel, Blunts. Specification may be seen at the architect's house, Landrake. Tenders to be sent to Rev. A. S. Williams, Callington, on or before June 2. Mr. Harold A. Hosking, P.A.S.I. Hon. architect.

June 2.—**Urquhart**.—STRADDLING.—Mason, carpenter, and slater works of new firm standing to be erected at Parks of Innes, Urquhart (James Estate). The plans and specifications can be seen at the Estate Office, Urquhart, and intending offerers will be met at Parks of Innes, on Thursday, May 31, between 2.20 and 4 p.m., when the works will be pointed out. Offers to be addressed to Mr. Gilbert R. McGarva, factor, Innes, Elgin, on or before June 2.

June 4.—**Antrim**.—SUM.—Great Northern Railway Company (Ireland) Directors invite tenders for the construction and erection of 4 timber sheds, 50 ft. by 12 ft., with galvanised iron roof, at their Antrim Station. Parties wishing to tender for the work must send the drawings and specification at the office of Mr. W. H. Mills, Engineer in Chief, Amiens-street terminus, Dublin, or copy of same at the District Engineer's Office, Belfast, and can be obtained at the office of the Secretary, Town Management of 18 (not returnable) each. Tenders made out on the forms supplied by the company, and endorsed "Tender for Shed at Antrim," should be delivered to Mr. Morrison, Secretary, Secretary's Office, Amiens-street terminus, Dublin, not later than 10 a.m. on June 4.

June 4.—**Croydon**.—WORKSHOP ADDITIONS.—Croydon Guardians invite tenders for erection of small first floor additions to the workshop at 4, Underwood, Queen's-road, Croydon. The plans, specification, and conditions of contract may be seen, and bills of quantities with forms of tenders obtained, at the office of Mr. Henry Berney, architect, 124, George-street, Croydon. Surveyor to the Guardians, upon depositing the sum of 3*l.* 3*s.* Tenders, sealed and endorsed "Additions to Workshops," to be addressed to Mr. Harry List, Clerk to the

Guardians, Union Offices, Mayday-road, Thornton Heath, Surrey, and to be delivered at the Union Offices, Mayday-road, Thornton Heath, Surrey, on June 4.

4.—Ludlow.—EXTENSION OF INFIRMARY.—Ludlow Guardians invite tenders for the extension of the infirmary at the Union Workhouse, and for the execution of works for drainage to the same. Plans and specifications apply to Mr. B. Weate, architect, East Hamlet, Ludlow. Separate tenders for each of the works must be sent to Mr. Arthur W. Weyman, Clerk to the Guardians, Ludlow, on or before June 4.

5.—Grimsby.—HALL.—New hall, Garibaldi-street, for the Ancient Order of Foresters. Plans, specifications, form of tender, and all particulars may be obtained at the office of the architect, Mr. Herbert Heap, Assoc. M. Inst. C.E., Osborne Chambers, between the hours of 9 a.m. and 6 p.m. Sealed tenders, which must be endorsed "Tender for proposed New Hall," and addressed to Mr. T. Street, Secretary, must be delivered at No. 164, Oxford-street, Grimsby, not later than June 5.

6.—Penryn.—COTTAGES.—Thirty or more cottages near Penryn, Cornwall, for the Fecod and Aberdrief Building Club. Plans and specifications can be seen at office of Mr. P. Vivian Jones, P.A.S.T., architect and surveyor, Henged, Penryn, and addressed to Mr. David Phillips, Hanbury Hotel, Bargoed, on or before June 5.

7.—Llanfihell.—SCHOOL.—New Council School at Llanfihell for the Anglesey Education Committee. Plans and specifications may be inspected at offices of Mr. Jos. Owen, F.R.I.B.A., County Architect, at Bangor, and Mr. David Tenders, under contract and endorsed "Llanfihell Council School," to be delivered to Mr. R. H. Williams, Secretary of Education, Education Offices, Llanfihell, not later than 10 a.m. on June 7. Forms of tenders will be supplied by the architect.

8.—Downe, Kent.—SCHOOL.—The erection of Council School for 120 children at Downe, near Bromley, Kent, for the Kent Education Committee. Plans and specifications may be inspected (by the architect to the Committee), which may be inspected at the Committee's Offices, between 10 a.m. and 4 p.m. Those desiring to tender, are to send their tenders to Mr. J. G. Campbell, 124, St. Paul, not later than May 30. Tenders, on form supplied, to be delivered to Mr. Edward Hasselhurst, Park House, Bromley, Kent, not later than noon on Friday, June 8.

9.—Dunblane.—SCHOOL.—The Building Committee invites tenders for the mason, iron, joiner, plumber, slater, plaster, painter, and glazier work for the erection and completion of the Queen Victoria School and Memorial to Scottish Sailors and Soldiers, to be erected at Dunblane, houses on needed therewith, and offices also for drainage, fencing, and laying out roads, sewers, water and gas supplies, and relative works. The relative schedules may be obtained on application to the Executive Committee, 124, St. Vincent-street, Glasgow. Printed copies of the conditions of contract, specifications, and measurements and general conditions will be supplied to intending offerors, on a deposit of 2s. The schedules shall be priced and extended, but it is intended to accept a lump sum from one offeror for the whole work. No offers for separate works will be entertained. The building contract will be allowed to sub-contract with the approval of the building committee. The schedules and tender must be sent in a sealed envelope, which shall be addressed to the Secretary to the Executive Council, Queen Victoria School, care of Mr. R. Addison Smith, Hon. Treasurer, 19, Heriot's Edinburgh, not later than June 9.

10.—Snodgrass.—MORTUARY.—Snodgrass Parish Council invite tenders for building a mortuary at the cemetery. Plans and specification can be seen at office of Mr. Tom Hilder, Clerk to the Council, Park Hill, Snodgrass, on or after May 25, before noon on June 9, endorsed "Tender for Mortuary."

11.—Burley.—ADDITIONS TO SCHOOL.—Additions to Burley Council School, for the Southampton County Council. Plans, specification, and conditions of contract may be seen, and bills of quantities obtained from the County Surveyor, The Castle, Winchester, on and after May 25, between 9 a.m. and 5 p.m. (Saturdays, 9 a.m. to 1 p.m.), on deposit of 2s. (to be made by cheque). Tenders, endorsed "Proposed Additions, Burley Council School," to be delivered on or before 10 a.m. June 11.

12.—Little Heath.—SCHOOLS, &c.—The Herefordshire C.C. Education Committee invite tenders for new elementary school and teacher's residence at Little Heath. Drawings, specification, agreement, &c., can be seen at the County Surveyor's Office, Hereford, on or after May 28, between 10 and 4 (Saturdays 10 and 12). A copy of schedule of works and prices (quantities), and form of tender, can be obtained at County Surveyor's Office on payment of 2s. Sealed tenders, endorsed "Tender for School and Teacher's Residence, Little Heath," to be delivered to Mr. Urban A. Smith, County Surveyor, Hereford, before noon on June 11.

13.—Swindon.—LAUNDRY BUILDINGS.—Swindon and Highworth Guardians invite tenders for the erection of laundry buildings and disinfecter house. Plans and specifications can be seen and particulars obtained at the office of the architect, Mr. R. J. Beswick, 10, Victoria-road, Swindon. Sealed and endorsed tenders to be delivered to Mr. John H. Clark, Clerk to the Guardians, Union Offices, Victoria-road, Swindon, on or before 5 o'clock in the afternoon of June 11.

14.—Rugby.—NEW WING TO HOSPITAL.—For erection of new wing, Hospital of St. Cross, Rugby, for the Building Committee. Bills of quantities and forms of tender to be obtained from the architect, Mr. J. D. Hooper, Albert-street, Rugby, on deposit of 1s. Sealed tenders, which must be delivered, addressed to the Chairman of Children's Wards Committee, endorsed "Tender for New Wing," before noon on Tuesday, June 12.

15.—Walworth, S.E.—UNDERGROUND CONVENIENCE.—The Northwark Borough Council invite tenders for underground convenience for women in Ariside-street, London. Plans may be seen, and specification, conditions, and terms of tender obtained, between 10 and 5, on application to Mr. A. Harrison, Borough Engineer, Town Hall, Walworth, on or after May 25, on or after May 25, on prescribed form, sealed, and endorsed "Tender for Construction of Underground Convenience," must be sent to Mr. J. A. Johnson, Town Clerk, Town Hall, Walworth-road, S.E., before 12 noon, June 13.

16.—Tooting, S.W.—TWO WARD BLOCKS, &c.—Erection of two ward blocks, Recreation Hall and Staff Quarters, at Tooting Bee Asylum, Tooting, S.W., in accordance with specifications, etc., prepared by the Engineer-in-Chief for the Metropolitan Asylums Board. Drawings, specifications, bills of quantities, conditions of contract, and form of tender can be inspected at the Board's Offices, Embankment, E.C., on and after May 24, and bills of quantities and form of tender obtained on deposit of 5s. Tenders, on prescribed form, to be delivered at the Board's Office not later than 10 a.m. on June 15.

17.—Finsbury Park, N.—BASE STAND.—The erection of a band stand in Finsbury Park, composed of brick, wood, and tiles, for the L.C.C. Drawings, specification, bill of quantities, form of tender, &c., may be obtained from the Architect, Department of Parks, East, on deposit of 10s. Tenders to be delivered at the County Hall in a sealed cover, addressed to the Clerk of the L.C.C., Spring-garden, on or before Friday, June 15.

18.—Knock.—VILLAS.—One detached and two semi-detached villas at Kensington-road, Killybeg, and specifications may be had at office of Mr. Thomas Houston, architect and civil engineer, Kingscourt, Wellington-place, Belfast. Sealed and endorsed tenders to be lodged with architect on or before June 15.

19.—Bristol.—SUEDS AND GRANARY.—The Docks Committee of the City and County of Bristol invite tenders for the construction and maintenance, or for the repair and completion, of the following works at the Royal Edward Dock, Avonmouth, now in course of construction:—Two upper-storied transit sheds, each 500 ft. long, one single-floor transit shed, 450 ft. long; a granary to contain 50,000 q. of grain. Parties desiring to tender may submit tenders for any one of the four buildings alone, the two upper-storied transit sheds together in one tender; the whole of the four buildings together in one tender; any other combination of two or more buildings in one tender. Tenders for the upper-storied sheds are invited by one or both of the following alternative methods of construction:—(1) Steel construction; (2) ferro-concrete construction. Tenders for the granary are invited by one or all of the following methods of construction:—(1) Brick construction; (2) ferro-concrete construction; (3) timber construction. Copies of the specifications, form of tender, and bills of quantities can be obtained from Mr. W. W. Squire, engineer, Engineer's Office, Cumberland-road, Bristol, on production of a receipt from the Secretary of the Docks Committee, showing that 2s. has been paid as deposit on each set of drawings applied for. Tenders must be enclosed in a sealed envelope, endorsed "Tender for Sheds and Granary, Royal Edward Dock," and addressed to the Secretary of the Docks Committee, 19, Queen-square, Bristol, and must be delivered to him before 10 a.m. on June 15.

20.—Cheltenham.—SCHOOLS.—The Cheltenham Education Committee invite tenders for new school buildings, to accommodate 1,100 children, for the Gloucester-road District of Cheltenham, in accordance with specifications and conditions, and copy of contract, to be seen at the offices of Messrs. Chatters & Smithson, architects, 17, Regent-street, Cheltenham. Early application requested for bills of quantities, which will be supplied by the architects on payment of 2s. Tenders, sealed and endorsed, to Mr. W. Preston, Secretary, Education Offices, Redcliffe, Cheltenham, before 12 o'clock on June 22.

21.—Brentwood.—ALTERATIONS.—The Visiting Committee of the Essex County Lunatic Asylum invite tenders for remodelling one of the blocks of Buildings as to form attendants' quarters. Drawings, specifications, and forms of contract may be inspected at the office of County Architect, Mr. Frank Whitmore, Duke-street, Chelmsford, between 10 and 4, except Saturdays. Names and address to County Architect before noon, June 4. Sealed tenders on the form supplied, endorsed "Tender for Female Attendants' Block," to be delivered to Mr. W. P. Zapp, Clerk, at the Visitors, Chelmsford, before 10 a.m., June 23.

22.—Alfreton.—VILLAS.—Two villas at West Houses, near Alfreton. For quantities and plans and specifications apply to Mr. Tom S. Wilcockson, architect and surveyor, Knifesmith Gate, Chesterfield.

23.—Basford.—SPRINGS.—The Cinderhill Co-operative Society, Ltd., invite tenders for the erection of new stores upon land situate in Egypt-road, Basford. Bill of quantities may be obtained from the architect, Mr. P. E. Moser, 69, Handford-road, Old Basford, on payment of two guineas.

24.—Hereford.—ADDITIONS TO LAUNDRY.—Additions to the Sanitary Laundry, Ledbury-road, Hereford. Apply in writing to Mr. W. W. Robinson, architect, 10, King-street, Hereford.

25.—Kendal.—RESTORING PREMISES.—Restoring the premises in Highgate, Kendal, destroyed by the late fire, for Mr. P. E. Moser. Plans and other information may be obtained by applying at office of Mr. John Stalker, architect, Kendal.

26.—Barnstaple.—WORKHOUSES.—The various departments of work required in (first) the erection of workmen's houses at Polmaise Colliery, near Fallin, Striling, for Messrs. Archibald Russell, Ltd.; (second) for Mr. W. E. Moser, 69, Handford-road, Old Basford; and (third) for an outfall drain. Schedules of quantities to be had after 25th, from Messrs. M. Larkie & Walker, C.E. and architects, 11, Dunbarton-road, Striling.

27.—Barnstaple.—WORKHOUSES.—The Barnstaple Board invite tenders for about 200 yds. of brick wall for burial ground. Particulars to be obtained from Rev. A. Fisher, Skilton Rectory.

ENGINEERING, IRON, AND STEEL.

28.—Southampton.—SEWAGE PLANT.—The New Forest Union Board invite tenders for the construction of a sewage disposal plant at the New Forest Union Workhouse, and other work in connection therewith. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. W. Allen, the Board's Surveyor, Totton, Southampton, on or after May 25. Tenders, endorsed "Sewage Disposal," to be delivered at office of Mr. William Coxwell, Clerk to the Guardians, Totton, Southampton, not later than May 26.

29.—Bengal.—WAGGONS, &c.—Directors and North-Western Railway Company Engineers invite tenders for the supply and delivery of:—(a) Steel and wrought-iron material for 154 covered goods waggons; (b) 402 pairs wheels and axles; (c) 804 laminated bearing springs, as per specifications, to be seen at the Company's office. Tenders, addressed to Mr. Alexander Izat, Managing Director, 257, Greenhouse, Old Broad-street, London, E.C., and marked "Tenders for Waggons," or as the case may be, are to be lodged not later than noon on May 26. For each specification a fee of 10s. will be charged, which cannot, under any circumstances, be returned.

30.—Aston.—HEATING APPARATUS, &c.—The Aston Guardians invite tenders to provide and to heating and hot-water apparatus in new buildings at the workhouse, Gravelly Hill. Plans and specifications may be seen on application to the Clerk of the Works, at the Workhouse, Gravelly Hill, Birmingham, not later than noon on May 29.

31.—India.—TYRES ENGINE AND TENDER.—The Secretary of State for India in Council invites tenders for the supply of tyres, engine and tender. Conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office by 2 o'clock p.m. on May 29.

32.—Monaghan.—WATERWORKS.—The U.D.C. of Monaghan invite tenders for the following works:—The providing, laying, etc., of 150 in. yds. of 9 in. cast-iron pipes at Tregon Reservoir; the extension of the distribution system through the enlarged urban district, which requires the providing, laying, etc., of 2,383 yds. of 3 in. cast-iron pipes with all sluice valves, hydrants, street fountains, water troughs, and fittings; the maintenance of the whole work for six calendar months after completion. Plans and specification may be seen, and forms of tender obtained, on application and payment of 1s. to Mr. J. L. Devenish Meares, C.E., Newry, or Mr. J. H. M. Wilson, C.E., Monaghan. Tenders must be in the form supplied, and the names of two responsible sureties or a guarantee society approved by the Urban Council be given for the due performance of the contract. Tenders to be sent in not later than 10 a.m. on May 29, in a sealed envelope, addressed to the Chairman of the Urban Council, and marked "Tender for Waterworks," on the outside of cover.

33.—Runcorn.—RAILING.—RUNCORN U.D.C. invite tenders for the supply of about 230 lin. yds. of cast-iron railing, similar to those now surrounding the enclosed portion of the Runcorn Cemetery. Particulars can be obtained from Mr. James Wilding, Surveyor and Engineer to the Council. Tenders, endorsed "Cemetery Railing," and addressed to the Chairman of the Runcorn Cemetery Committee, to be delivered to Mr. C. Marshall, Secretary, Town Hall, Runcorn, not later than 9 o'clock on May 29.

34.—Handsworth.—PUMPS, &c.—Manservy & Co., Ltd., of Edgburyston, invite tenders for a horse-ham, electric motor, etc., for their Gravelly-lane baths. Copies of the specification, drawings, and conditions of contract can be obtained from Mr. H. Manservy, the Surveyor to the Council, on payment of 3s. 6d. Tenders, on the prescribed form, in sealed envelopes, endorsed on the outside "Pumps and Machinery," must be delivered at Mr. H. Ward, Clerk, at the Council House, Handsworth, before noon on May 30.

35.—London.—IRONWORKERY.—The Metropolitan Asylums Board invite tenders for the supply of builders', engineers', smiths', plumbers', gas-fitters', and miscellaneous ironmongery and electrical accessories. Forms of tender (upon which alone tenders will be received), giving all particulars, can be obtained at the office of the Board, Embankment, London, E.C., where tenders, duly filled in, must be delivered not later than 10 a.m. on May 30.

36.—Poole.—BOILERS, &c.—Poole Guardians invite tenders for the supply and fixing of a Galloway boiler, laundry and steam-heating appliances, and the execution of other work at the Workhouse, Long-lee, Poole, according to specifications which can be seen on application to the Master of the Workhouse. Sealed tenders, endorsed "Workhouse Contract," to be delivered to Mr. P. E. L. Butler, Clerk, Union Offices, 139, High-street, Poole, not later than 9 a.m. on May 30.

37.—Halifax.—BOILERS.—Tenders are invited for the erection of No. 2 Cornish boilers and fittings thereto, also sundry works in connexion with same, at the Workhouse, Gifford-lane, Halifax. Plans may be seen, and specifications obtained, at office of Mr. W. Clement Williams, architect, 29, Seaford-street, Halifax. Sealed tenders to be delivered at the office of the Clerk to the Guardians, Mr. Arthur T. Longbottom, Esq., solicitor, Carlton-street, Halifax, not later than 10 o'clock a.m., May 31, endorsed "Tender for Boilers, Halifax Workhouse."

38.—Hathersage.—WORKHOUSES.—Hathersage and District Gas Company, Ltd., Directors, invite tenders for the building, erection, and equipment of a complete gasworks, at Hathersage, Derbyshire; the works to be ready for gas-making for October 1, 1906. Drawings and specification may be seen at the office of the engineer, Mr. Thomas Brown, Bakewell-road, Matlock. Tenders, sealed and endorsed, to be delivered to Mr. Robert Hall, Gas Offices, Matlock, on or before June 1.

39.—Hull.—BOILERS.—Hull Corporation invite tenders for two Lancashire boilers, 30 H.P., 6 ft. 6 in., for the tramway power station. Forms of tender and other particulars may be obtained at the office of Mr. A. E. White, M. Inst. C.E., City

Engineer, Town Hall, Hull. Tenders, endorsed "Tender for Boilers," are to be addressed to the Chairman of the Framways Committee, and delivered at the Town Clerk's office, Hull, before noon on June 1.

JUNE 1.—**Shipton**.—**PARAPET WALL**.—Worcestershire C.C. Highways and Bridges Committee invite tenders for the rebuilding of the retaining parapet wall in connexion with Shipton County Bridge at Shipton-on-Stour. Copies of drawings and specification and form of tender may be obtained on application to Mr. J. H. Garrett, County Road Surveyor, Shirehall, Worcester. Sealed tenders, endorsed "Retaining Wall, Shipton Bridge," to be sent not later than June 3.

JUNE 2.—**Glasgow**.—**PIPES**.—Gt Sewer Corporation invite tenders for supplying about 500 tons of cast-iron pipes, 15 in. and 4 in. in diameter. The drawings may be seen, and copies of the specification and forms of tender obtained, on application to Mr. J. R. Sutherland, the Engineer to the Water Department, at his office, 45, John-street. Sealed offers, marked "Water Department—Tender for Pipes," and addressed to Mr. A. W. Mylre, Town Clerk, City Chambers, Glasgow, will be received by him on or before June 2.

JUNE 5.—**Ballynasloe**.—**ENGINE AND PLANT**.—Ballynasloe U.D.C. invite tenders for the supply and erection of a gas-engine and suction-producer plant, in accordance with plans and specifications prepared by the Council's consulting Engineer, Mr. G. B. Meanan, C.E., 5, Charleville-road, Rathmines, Dublin, from whom, or Mr. R. J. Gill, Town Clerk, Town Office, Ballynasloe, copies may be obtained on receipt of 1s. Parties tendering will be required to enter into a bond for the due performance of the work, and to furnish the names of two solvent sureties. Tenders to be sent in on or before June 5.

JUNE 5.—**Horwich**.—**PLANT**.—Horwich U.D.C. invite tenders for sludge pressing and other plant required at their sewage-disposal works. Plans can be seen, and all particulars obtained, from Mr. H. L. Eimmet, M.Inst.E., Engineer, 41, Corporation-street, Manchester. Sealed tenders, endorsed "Sludge Pressing Plant," to be delivered to Mr. Peter Taberner, Clerk to the Council, Council Offices, not later than June 5.

JUNE 9.—**Paignton**.—**WATER MAIN**.—U.D.C. of Paignton invite tenders for the supply, delivery, and laying of 7 1/2 in. cast-iron water main, together with the requisite fittings, valves, air valves, washouts, and other fittings, meter-house and store, and other works, in the parishes of Marldon and Paignton, from Churcombe Cross to the Paignton and Chardon Rivers Parish boundary. Drawings may be seen, and copies of specification, bills of quantities, and forms of tender obtained, at the office of the engineer, Mr. Fred. Wm. Vandone, Palace Chambers, Paignton, on payment of 1s. Sealed tenders, upon the form provided, endorsed "Paignton Waterworks," are to be addressed to Mr. James R. Mill, Clerk to the Council, Town Hall, Paignton, on or before June 9.

JUNE 11.—**Nottingham**.—**VALVES, HYDRANTS, ETC.**—Nottingham Water Committee invite tenders for the supply of the under-mentioned goods for the ensuing year:—(1) Cast-iron double-flange sluice valves and hydrants; (2) cast-iron main pipes and special pipes; (3) lead piping, lead joints; (4) zinc-metal taps and ferrule fittings. Specifications and drawings, together with samples, weights, etc., may be seen, and other information obtained, at the office of the Water Engineer, Mr. F. W. Davies, St. Peter's Churchside; and forms of tender may be obtained at that office on payment of 1s. Sealed tenders, endorsed "Tender for Valves," "Tender for Pipes," "Tender for Lead," "Tender for Taps," to be delivered to Mr. Samuel G. Johnson, Town Clerk, Guildhall, Nottingham, on or before June 11.

JUNE 12.—**Kempston**.—**WATERWORKS**.—Kempston U.D.C. invite tenders for (a) the provision, delivery, laying, and jointing in the rural district of Bedford of about 350 tons cast-iron pipes (nominally 7 in. and 8 in.), and for the construction of certain ancillary works; and (b) the supply, delivery, laying, and jointing of about 5 miles 325 yds. of 7 in., 6 in., 4 in., and 3 in. cast-iron socket pipes, with air pendages, including all necessary sluice and air valves, hydrants, and other works, for the water supply of the Urban District of Kempston. Plans, specifications, and conditions may be seen as regards Contract a at the offices of the engineer, Mr. George F. Deacon, 16, Great George-street, Westminster, W., and as regards Contract b at the offices of the engineers, Messrs. Beesley, Son, & Nichols, 11, Victoria-street, Westminster, from whom respectively specifications, bills of quantities, and forms of tender can be obtained on payment of 5s. for each contract. Sealed tenders, endorsed "Tender for Waterworks Contract a or b," to be addressed to Mr. William Payne, Clerk of the Council, U.D.C. Offices, Bedford-road, New Town, Kempston, Beds., at or before noon on June 12.

JUNE 18.—**Middlesex**.—**STEEL FLOORING BRIDGE**.—The Kings, Seelmore and Cary Valley District Drainage Board invite tenders for supply and fixing a steel flooring bridge at Greylake's Fosse, Middlesex, Somerset, in part substitution for the existing bridge, and for other alterations of the approach thereto. Specifications and plans may be seen, and blue prints of the plans, and tender forms, may be obtained on application at office of Mr. Walter J. R. Poole, Clerk, 9, Dimple-street, Bridgewater, and sealed tenders may be sent in on or before noon on June 18, marked "Tenders for Greylake's Fosse Bridge."

JUNE 30.—**Leicester**.—**BRIDGE**.—Corporation of Leicester Water Committee invite tenders for the execution of the works required in the construction and erection of a steel bridge over the River Trent, together with the cast-iron cylinders and all dredging, excavating, bricklaying, and masonry work in the abutments and hauling path belonging thereto in connexion with section No. 2 of the main for bringing the Derwent supply to Leicester. The bridge will be in one span of the bowels (two supports) on four cast-iron cylinders, and having a clear opening of about 220 ft. between the cylinders, and a width between the centres of the main arches of 19 ft., and is estimated to weigh about 350 tons, including the cast-iron and steel work in the cylinders and hauling path. The drawings may be

inspected at the offices of the engineers, Messrs. Eyraud, Son, & Pick, 6, Millstone-lane, Leicester, and conditions of contract, specification, quantities, and form of tender obtained from them upon payment of 4s. Sealed tenders, upon the form supplied, addressed to the Chairman of the Water Committee, Town Hall, Leicester, are to be delivered not later than 6 o'clock in the forenoon of June 30, endorsed "Tender for Bridge over Trent."

MAY 30.—**Salford**.—**PIPES**.—Salford Corporation invite tenders for cast-iron pipes, etc., for roughing out the Salford Sewage Works. Drawings may be seen, and forms of tenders, with specification and quantities obtained, at the Borough Engineer's office, Town Hall, Salford. Tenders, endorsed "Pipes for Roughing Filters," addressed to the Chairman of the River Committee, may be delivered to Mr. L. C. Evans, Town Clerk, Town Hall, Salford, not later than 4 p.m. on May 30.

NO DATE.—**Bolsover**.—**SINKING A PIT**.—For sinking a pit 16 ft. diameter, finished 5-in. brickwork from the top hard to the deep soil seam, 210 yds. approximately. Work to be continued at week-ends. No water. Apply Mr. William Humble, Oxford Colliery, Bolsover, Chesterfield.

NO DATE.—**Snaithe**.—**CRANE**.—Supplying and fixing hand-power overhead crane in the limber yard, at Snaithe, Yorks. Approximate dimensions—length 30 yds., span 30 ft., height 12 ft. 6 in., and 10 yds. to lift 2 tons and 3 tons. Smiths Clog Shoe Company, Ltd., Snaithe, R.S.O., Yorks.

NO DATE.—**Pelotas**.—**DRAINAGE, ETC.**—For drainage and water supply to the town of Pelotas, Rio Grande Sul, Brazil. Full particulars to be obtained on application to Societe Generale Mercantile, 20, Rue de l'Equiper, Paris.

MISCELLANEOUS.

MAY 25.—**Glasgow**.—**ELECTRIC LIGHT**.—Glasgow Corporation invite tenders for the wiring and fitting up of an electric light installation in New St. Paul's Parish Church. The plans may be seen either at the office of the clerk of works, Mr. John A. Smith, John-street, Glasgow, or at the office of Mr. John M'Intyre, architect, 28, North Bridge-street, Edinburgh, and copies of the specification and form of tender may be obtained at the office of Mr. Colin Young, measurer, 124, St. Vincent-street, Glasgow. Tenders, marked "New St. Paul's Church—Electric Lighting," may be sent to Mr. J. Myles, Town Clerk, City-chambers, Glasgow, not later than 10 a.m. on May 28.

MAY 29.—**Portsmouth-by-the-Sea**.—**SCAVENING**.—Portsmouth U.D.C. invite tenders for the removal of house refuse and cleansing of ashpits in their district for the space of one year, viz. from July 1, 1906, to June 30, 1907. Full particulars and forms of tender, and other application to the Surveyor, St. Andrew's-road, Portsmouth-by-the-Sea. Tenders to be sent to and reach Mr. T. Austen, Clerk, Council Office, Portsmouth-by-Sea, not later than 12 o'clock noon on May 29, sealed, and endorsed "Removal of House Refuse."

MAY 30.—**Atherton**.—**GARDEN SEATS**.—The U.D.C. of Atherton invite tenders for the supply and delivery of fifty garden seats at the Central Recreation Ground, Atherton. Particulars can be obtained from Mr. E. H. Grimshaw, A.M.Inst.C.E., Surveyor to the Council. Sealed tenders, endorsed "Tender for Seats," addressed to Mr. Daniel Schofield, Clerk to the Council, may be delivered at the Town Hall, Atherton, before May 30.

MAY 31.—**Habrough**.—**REPAIR OF PLAYGROUNDS**.—Habrough Council, in connection with the Habrough Club, invite tenders for the repair of the playgrounds of the school, either (1) with tar-macadam, (2) asphalt, or (3) gravel. Tenders to be sent to the Rev. C. C. Morris, Habrough Vicarage, Lines, not later than May 31.

MAY 31.—**Iona**.—**QUARRING, ETC.**—The Iona Marble Company, Ltd., invite tenders for the quarrying and shipping of 100,000 tons of marble from the island of Iona, according to such arrangements as to size of blocks and quantities shipped as may be from time to time made. Tenders may be lodged not later than May 31 with the Secretary, Mr. Fairley Smith, 146, West Regent-street, Glasgow.

MAY 31.—**Llantrisant**.—**LIGHTING**.—Llantrisant and Llantwit Fawr U.D.C. invite quotations for the supply of seventy street lamp pillars and seventy glazed lanterns for public lighting purposes. Quotations will only be received upon the Council's forms, which, together with the specifications and conditions, may be obtained from Mr. Gomer S. Morgan, Surveyor, School-street, Pontyclun, Glam. Persons desirous of quoting must deposit the sum of 17. Quotations must be delivered to the Council's Clerk, Mr. W. Spickett, solicitor, Pontypridd, before 10 a.m. on May 31.

MAY 31.—**Manchester**.—**OIL**.—Manchester Corporation Gas Committee invite tenders for the supply to three cargoes during the nine months ending March 31, 1907, of 10,000 tons of oil, for the manufacture of carburetted water gas. Descriptions of the oil, conditions of contract, and further particulars may be obtained on application to the Engineer only to Mr. Charles Nickson, Superintendent of the Gas Department. Sealed tenders and samples, addressed to the Chairman of the Gas Committee, and endorsed "Tender for Gas Oil," may be delivered at the office of the Superintendent of the Gas Department, Town Hall, Manchester, on or before May 31.

JUNE 4.—**Carlisle**.—**RETORTS**.—Carlisle Gas Committee invite tenders for the fireclay, retorts, firebricks, etc., required at their works during one year from July 1, next. Specifications, drawings, and conditions, and addressed to the Chairman of the Gas Committee, to be delivered at the office of the Town Clerk, not later than June 4. Form of tender, giving quantities, etc., may be forwarded on application to Mr. W. Smith, B.S.E., Engineer and Manager, Gasworks, Carlisle.

JUNE 5.—**Handsworth**.—**ELECTRIC WIRING**.—U.D.C. of Handsworth invite tenders for the supply and fixing of the following:—Set 1, wiring, fitting, etc., for the electric lighting of the Birchfield-road Council schools, Perry Barr, Handsworth, viz. for the following:—Set 2, wiring, fitting, etc., for the education offices, Soho-hill, Handsworth.

Drawings, specifications, and conditions of contract may be obtained from Mr. F. N. Nield, Electrical Engineer, Generating Station, Soho-road, Handsworth, on payment of 1s. for each set. Tenders, on the prescribed form, must be sealed, and forwarded in the enclosed envelope supplied, or that purpose, and should be delivered at the Education Offices not later than June 5.

MAY 15.—**Sezill**.—**ASHES**.—Sezill U.D.C. invite tenders for the removal of ashes, etc., from the houses within the Sezill Urban District from July 1, 1906, to June 30, 1907. Particulars and conditions of contract can be obtained from Mr. Thomas Spencer, Clerk, Sezill, Northumberland, to whom sealed tenders are to be sent not later than June 13.

JUNE 14.—**Dover**.—**GAS-METER TESTING**.—For the testing of gas meters at the various stations in the Dover District. Tenders received at office of the Officer Commanding, Army Service Corps, Dover, Headquarters Office, Gifford Battery, Dover, until 12 o'clock noon, on June 14. Forms of tender, with list of stations, can be obtained on application.

PAINTING, etc.

MAY 28.—**Govan**.—**PAINTING**.—The Govan Combination Parish Council invite tenders for the painter work required for new laundry block at Gersheffs, Govan. Plans can be seen, and copies of schedules laid, on application to the architects, Messrs. Thomson & Sandilands, 4, Jan-street, Blythswood-square, on payment of 1s. 12. Schedules to be delivered to Mr. E. W. Saxton, Librarian, Free Library, Govan, by 12 o'clock noon on May 28. Offer for Painter Work, New Laundry Block, to Mr. John Thomson, Governor, Merryflatts, Govan.

MAY 29.—**Grays**.—**PAINTING**.—Grays U.D.C. Free Library Board invite tenders for painting, lining and distemping at the Free Library. Specifications may be seen at the office of the Council's Surveyor. Tenders, endorsed "Tender for Painting," to be delivered to Mr. E. W. Saxton, Librarian, Free Library, Grays, by 12 o'clock noon on May 29.

MAY 30.—**Oxford**.—**CLEANING, PAINTING, ETC.**—The Committee of Management of Ratcliffe Infirmary and the Council of Oxford invite tenders for annual cleaning, painting, etc. A specification of the work can be had on application. Sealed tenders to be sent on May 29 to the Acting Secretary, Capt. G. C. Ryan. Tenders will be opened by the Committee of Management on May 30.

MAY 30.—**Pontygarth**.—**PAINTING**.—Llandaff and District U.D.C. invite tenders for painting, distemping, and whitewashing, the walls of the Pontygarth Footbridge, which adjoins the Tall's Well Railway Station, in accordance with a specification which may be obtained on application to the Surveyor, Mr. James Giddens, M.Inst.C.E., 85, Park-place, Cardiff. Tenders, sealed and endorsed, to be sent to Mr. M. Warren, Clerk, Park House, Cardiff, not later than 12 o'clock noon on May 30.

MAY 30.—**Prescot**.—**CLEANING, PAINTING, ETC.**—Prescot Guardians invite tenders for cleaning, painting, and distemping the chapel at Whiston Workhouse. Specification and particulars may be obtained at the office of the Surveyor, Mr. J. H. Hiden, at a deposit of 10s. Sealed tenders to be sent to Mr. A. Mann, Union Clerk, Union Offices, Whiston, not later than May 30.

MAY 31.—**Winchester**.—**PAINTING**.—The Metropolitan Asylums Board invite tenders for internal and external cleaning and painting works at the Northern Convalescent Fever Hospital, Winchester Hill, N. in accordance with specification prepared by Mr. W. H. Hatch, Engineer-in-Chief. Specification, conditions of contract, bill of quantities, and form of tender may be inspected at the office of the Board, Embankment, E.C., on and after May 21, and bills of quantities and form of tender can then be obtained upon payment of 1l. Tenders, addressed as noted on the form, before 10 a.m. on May 31.

MAY 31.—**London**.—**CLEANING AND PAINTING**.—For cleaning and painting Station-buildings, etc., at the following roads:—Crouch Hill, Hackbridge-road, Walthamstow, Leyton, Leytonstone, and Wansford Park for the Midland Railway. Specifications to be seen and obtained on application to the Secretary, the engineer's office, Derby. Sealed tenders to be forwarded by post to the Secretary, Way and Works Committee, not later than 5 a.m. May 31.

MAY 31.—**London**.—**E**.—**WHITENING, ETC.**—The whitewashing and distemping walls and ceilings of Nurses' Home, Raines-street, Old Gravesend, E., for the Guardians, St. George's-in-the-East. Specifications and forms of tender may be obtained between 10 a.m. and 4 p.m. from the Clerk's office, Raines-street, Old Gravesend, E. Tenders to be delivered by 2 p.m. on Friday, June 1.

JUNE 6.—**Mold**.—**PAINTING**.—Painting C.M. Chapel Mold. Specification to be obtained from Mr. Jesse Roberts, Bryn Hilyn, Mold. Tenders to be sent to Mr. Jesse Roberts by 6 p.m. June 6. Richard Davies & Son, architects, Bangor.

JUNE 8.—**London**.—**PAINTING AND GENERAL REPAIRS**.—For general repairs and painting to the Artizan's Dwellings, Stone-lane, for the Corporation of London, in London. Specifications may be seen at the office of the Engineer to the Corporation Guildhall, where forms of tender are to be obtained. Tenders, addressed Town Clerk, Public Health Department, and endorsed "Artizan's Dwellings," to be delivered at the Hall Keeper's Office, Guildhall, between 1 and 2 p.m., June 8.

JUNE 11.—**Aberdeen**.—**PAINTING**.—The Town Council of Aberdeen invite tenders for the whitewashing of courts and closes, of which a specification and list lie at the Sanitary Inspector's office, 63, Union-street. Tenders, addressed to the Council, and endorsed "Tender for Whitewashing," to be delivered with the Sanitary Inspector on or before June 9.

JUNE 11.—**Normanton**.—**PAINTING**.—Normanton Burial Board invite tenders for painting cemetery house and railings. Specifications may be seen at any time at Cemetery House. Tenders to be sent to the Secretary, Burial Board, not later than 6 o'clock on June 11, to Mr. Edwin Backhouse, Curator, Burial Board, Normanton.

JUNE 12.—**Broad-street, W.C.**—**PAINTING, ETC.**—For painting, distemping, and whitewashing, and for repairing all gutters and drains at the Receiving House for Children and Nurses'

Home in Broad-street, W.C. for the Guardians of the Poor of St. Giles in the Fields and St. George's, Hanover, in connection with the copying of specifications at the Guardians Offices 57, Broad-street, Holborn, W.C. Tenders must be delivered at above offices not later than 10 a.m. on Tuesday, June 5.

NO DATE.—ARCHITECTURE.—PAINTING AND PAINTING.—Plumber and painter work at the Old U.P. Church, Archdeaconry, Knocking. Copies of specifications and further information to be obtained on application from Mr. Alexander Gauld, architect, High street, Falmouth.

NO DATE.—New Hartley.—RENOVATING, ETC.—For renovating and painting workmen's institute, greenhouse, railings, etc. For particulars apply to the Secretary, 7, F. Kneebone.

NO DATE.—STEAMING, ETC.—Steneby Guardians invite tenders for the carrying-out of certain distemping and painting works at their workhouse, 2, Leonard-street, Bromley-by-Bow, E. Printed form of tender and specification can be obtained upon application to Mr. T. G. Stacey, Clerk, Guardians' Offices, Barnes-street, Stepney, E.

ROADS, SANITARY, AND WATER WORKS.

MAY 28.—Evesham.—DRAINS AND PATHS.—The Burial Board for the united parishes of All Saints Church, Levenshoe, and St. Andrew's, County of Worcester, invite tenders for the laying of certain drains and construction of a road and footpaths at the ground recently purchased by the adjoining parishes of Little Hampton, in the County of Worcester. Plans and specifications, prepared by the Surveyor to the Board, may be inspected at the office of the Board, 11, Bridge-street, Evesham. Sealed tenders, marked "Evesham Burial Board Drainage," must be sent to the Clerk to the Board not later than 10 a.m. on Tuesday, June 5.

MAY 28.—Urmston.—FLAGGING AND KERBING.—The Urmston U.D.C. invite tenders for the flagging and kerbing of the footways of Station-bridge, Urmston, in Lancashire. Plans and specifications, and form of tender may be obtained from Mr. James Heath, Surveyor to the Council. Sealed tenders must be delivered to Mr. F. A. Rowland, Clerk to the Council, Council Offices, Urmston, not later than 4 o'clock on May 28.

MAY 28.—Walsend.—CEMENTING.—The Corporation of Walsend invite tenders for the cementing of footpaths or parts of footpaths in certain of the streets in the borough as may from time to time be ordered to be done up to the end of September, 1906. Specifications may be seen at the office of the Corporation, and forms of tender may be obtained on application to Mr. George Hollings, Borough Surveyor, Corporation Offices, Walsend. Tenders sealed, and endorsed "Tenders for Cementing," to be sent to Mr. W. V. Mukelster, Town Clerk, Walsend, 28, Sandhill, Newcastle-on-Tyne, on or before May 28, 1906.

MAY 28.—Ashton-under-Lyne.—WATER CARRIAGE CONVERSIONS.—The Sanitary Committee are prepared to receive tenders for work required in converting water closets into water closets and Holden-street. Plans and specifications may be seen, and bills of quantities obtained, from Mr. J. Davey, Sanitary Surveyor, Health Department, 2, Holden-street. Sealed tenders, endorsed "Conversion," to be addressed to, and delivered at the office of, Mr. John Neal, Borough Comptroller, Town Hall, Ashton-under-Lyne, not later than 12 o'clock noon, May 28.

MAY 28.—Methley.—SEWERAGE.—Methley U.D.C. invite tenders for the construction of the Methley Sewerage Extension. Plans and specifications may be seen, and quantities, with form of tender, obtained from the Engineer, Mr. John Stocks Richardson, C.E., Eastgate, Methley. Tenders, endorsed "Tender for Sewerage Works," must be delivered to Mr. Robt. S. Wiggin, Clerk, 85, Abbot-street, Leeds, not later than 12 o'clock noon, May 28.

Tydesley-with-Shakerley.—DRAINS.—Tydesley-with-Shakerley U.D.C. Gas Committee invite tenders for alterations to hydraulic drains, and for the erection of two 30 in. diameter stone-ware pipe sewers, the construction of a small bacterial filter, and other appurtenant works in connexion therewith, at Cross Inn-road, Tydesley. Plans and specifications may be seen at the office of the Engineer, Mr. H. G. Gimson, Sealed tender, endorsed "Tenders for Sewerage Works," to be delivered at the Town Clerk's office, not later than 12 o'clock noon, May 29.

MAY 29.—Barnrow.—STREETS.—Barnrow-in-Furness Corporation invite tenders for the construction of various streets. Further particulars may be obtained, together with bills of quantities and forms of tender, upon application at the office of the Borough Engineer, Town Hall. Sealed tenders, suitably endorsed, and addressed to the Chairman of the Health Committee, to be delivered at the Town Clerk's office, not later than 12 o'clock noon, May 30.

MAY 31.—Llantisant and Tonypool.—SEWERS, ETC.—Llantisant and Llantwit Fawr R.D.C. invite separate tenders for the following works:—(a) Providing and laying about 200 lin. yds. of 12 in. diameter stone-ware pipe sewer, with manholes, lampholes, etc., and laying only 340 lin. yds. of 3 in. diameter cast-iron water main, together with the necessary valves, at Gilfach-road, Tonypool; (b) the widening of the Ely River Bridge and erection of a masonry arch at Wauwhilly, Tonypool; (c) the widening of a culvert and construction of wing walls at Hill-street Tonypool. Plans and specifications may be seen, and bills of quantities obtained, from Mr. George S. Morgan, Surveyor, School-street, Tonypool, and Mr. H. in respect of each tender. Sealed tenders must be delivered to the Council's Clerk before 10 a.m. on May 31.

JUNE 1.—Hanwell.—SEWERAGE.—U.D.C. invite tenders for sewerizing, leveling, paving, metalizing, flagging, channelling, providing means of lighting and making-up of the under-mentioned

roads and footways thereof, within their district, viz.: Billmore Park-road (extending from No. 47, Elthorne-street, to the existing boundary), Elthorne-avenue (extending from No. 62 Elthorne-avenue to Seward-road); Seward-road (extending from No. 62 Elthorne-avenue to the existing boundary); Jersey-road; Thurlow-road. The plans, etc., and forms of contract may be seen, and bills of estimated quantities, and forms of tender obtained, on payment of 1s. to the Engineer, on application to the Surveyor, Mr. Sidney W. Barnes, Assoc. M.Inst.C.E., at the Council Offices, between the hours of 10 a.m. and 5 p.m. Sealed tenders to be delivered to Mr. P. J. Dennis, Clerk to the Council, U.D.C. Offices, Cherington-road, Hanwell, W., in envelopes supplied, not later than June 4.

JUNE 4.—Ludlow.—DRAINAGE.—Ludlow Guardians invite tenders for drainage works at the Union Workhouse. Plans, etc., from Mr. B. Wade, architect, East Hamlet, Ludlow. Tenders to be sent in before June 4, to Mr. A. W. Weyman, Clerk, Ludlow.

JUNE 5.—Finchley.—PAVING.—U.D.C. of Finchley invite tenders for the supply and delivery of about 5,555 super. yds. of 2 in. artificial sand paving, and for supplying and laying about 2,359 super. yds. of Portland cement paving, together with the cost of supplying and laying such paving of a similar description as may be required by them during the period ending March 31, 1907. Specification and conditions, together with form of tender, may be obtained on application to the Engineer and Surveyor at the under-mentioned office: Sealed tenders, addressed to Mr. E. H. Lister, Clerk to the Council, Council Offices, Church End, Finchley, N., and endorsed "Paving," must be delivered not later than June 5.

JUNE 5.—Woodford.—PAVING.—Woodford U.D.C. invite tenders for providing and laying concrete slabs in footway in Snakes-lane, Woodford Green. Estimated quantity, 1,100 yds. super. Plan and specifications may be seen, and bills of quantities and form of tender obtained, from Mr. William Farrington, Surveyor to the Council, Council Offices, Woodford Green, upon deposit of 1s. Sealed tenders, endorsed "Tender for Footway Paving, Snakes-lane," to be sent in, on the official forms, not later than noon on June 5.

JUNE 5.—Manningtree.—PAVING.—The Manningtree Town Council invite tenders for making-up Belsize-avenue (second portion), Leighton-road (second portion), and Corton-road (second portion). Plans and specifications may be seen, and form of tender, together with schedule of quantities and other particulars, obtained, from Mr. Charles Jones, Borough Engineer, Town Hall, Manningtree. Sealed tenders, endorsed "Tender for Making-up," to Town Clerk, Town Hall, Manningtree, before 5 p.m. on June 6.

JUNE 6.—Finchley.—SEWERAGE.—The U.D.C. of Finchley invite tenders for the construction of a 12-in. sewer of about 700 yds. in length, together with manholes and other incidental works, for the drainage of the Victoria Estate. Copies of specification, schedule, and form of tender may be obtained from the Engineer on application, accompanied by deposit of 2s. to the Council Offices, and addressed to Mr. E. H. Lister, Clerk to the Council, Council Offices, Church End, Finchley, N., to be sent in by not later than June 6.

JUNE 6.—Hove.—PAVING.—Hove Corporation invite tenders for excavating and other works in Lawrence-road (between Rutland-gardens and Regent-road) and in Langdon-road (between Portland-road and Montgomery-street). Further particulars may be obtained, and plans and specifications seen, at the office of the Borough Surveyor, Mr. H. H. Endcote, Town Clerk, Town Hall, Hove, and endorsed "Tender for Lawrence-road and Langdon-road" as the case may be, will be received, up to 6 o'clock on June 6.

JUNE 7.—Blything.—DRAINAGE WORKS.—The Guardians of the Blything Union invite tenders for works required to be done in taking up the old drains, etc., and in laying a new system, and other works in connexion therewith, at the workhouse at Bulcamp, near Halesworth, according to plan and specification prepared by Mr. Henry J. Wright, architect and Surveyor, Ipswich. Copies, plan, and specifications may be seen at the Clerk's office, Bulcamp. Tenders, sealed, and endorsed "Tenders for Drainage," to be delivered at the Clerk's offices at Bulcamp, not later than 6 p.m. on June 7.

JUNE 8.—Hebburn.—ROAD-MAKING.—The U.D.C. of Hebburn require tenders for excavating and laying out, and supplying and laying, concrete paving, concrete footpaths, etc., at Hebble-road, Whickham-road, Alm-street, Station-road, Back Station and Alm-street, Back Alwin and Alm-street, North Beck, Whickham-road, South Beck, Hebble-road, Hebburn. Plans, specifications, and quantities may be seen at the office of Mr. H. Paterson, surveyor, Council Offices, Argyle-street, Hebburn. Tenders, endorsed "Road-making," to be addressed to the Chairman of the Building and Sanitary Committee, Hebburn, and forwarded not later than 12 o'clock noon, June 8.

JUNE 9.—Glasgow.—SEWER.—Glasgow Corporation invite tenders for the work necessary in the construction of sewer No. 1 (Contract No. 13), extending from Moss-road, north of Cardonald Station, to a point near Paisley-road, south of Drox Station. Plans, specifications, and working drawings may be seen at the office of the Engineer, Mr. J. G. Mackenzie, at the office of the City Engineer at his office, City Chambers, 64, Cochrane-street, Glasgow, on payment of a fee of 5s. Sealed offers, to be delivered at the office of the Surveyor, Mr. A. W. Myles, Town Clerk, City Chambers, Glasgow, not later than 12 o'clock noon, June 9.

JUNE 11.—Alnwick.—SEWERAGE WORKS.—R.D.C. of Alnwick invite tenders for replacing the stone-built conduits in connexion with sanitary pipes. The plan and specification may be seen upon application to the Clerk, Mr. H. W. Walton, Alnwick, to whom sealed tenders, duly endorsed, are to be delivered before 1.30 p.m. on June 11.

*** JUNE 11.—Beckenham.—TAR MACADAM.**—The Beckenham U.D.C. invite tenders for the tar-macadaming of Bromley-road, Beckenham, and Manor-road. Plans may be seen, and bills of quantities, specifications, and forms of tender obtained, on application to Mr. John R. Birtwell, Surveyor, on and after May 25, on payment of 1s. Tenders, sealed, and endorsed "Tender for Tar Macadam," to be delivered to Mr. F. Stevens, Clerk to the Council, Beckenham, not later than 4 p.m. June 11.

JUNE 11.—Ilford.—PRIVATE STREET WORKS.—Ilford U.D.C. invite tenders for leveling, metalizing, channelling, kerbing, paving, and making good Durban, Coleridge, Wellwood, Lockwood, and Durden roads, Kimberley-avenue, and right-of-way leading from Lockwood-road to Simmside-road. Plans and specifications may be seen, and form of tender obtained, on application to Mr. H. Shaw, A.M.Inst.C.E., Surveyor to the Council, at the Town Hall, Ilford, during the usual office hours, on payment of a deposit of 2s. Sealed tenders, endorsed "Tender for Private Street Works," are to be delivered to Mr. John W. Beaton, Clerk to the Council, Town Hall, Ilford, on or before June 11.

JUNE 15.—Hoveley.—SEWAGE DISPOSAL.—The Hoveley and South Cleveland Joint Sewerage Board invite tenders for the construction of sewage disposal works at Berry Brow. The works comprise bacterial continuous filter beds, circular tanks, and lead-laying out storm water main, and land disposal, with carrier, etc., small pumping station, the construction of new road, etc. The plans may be seen, and quantities and form of tender obtained, at the office of the Engineer, Mr. W. H. Radford, C.E., Albion Chambers, King-street, Nottingham, on deposit of 3s. Sealed and endorsed tenders must be sent in to Mr. Alfred J. Sissons, Clerk to the Joint Board, Huddersfield, on or before June 15.

NO DATE.—Garden.—WIDENING.—Tarniv R.D.C. invite tenders for widening Haud-lane, Garden. Particulars can be obtained on application to Mr. H. Grant, Bailey, Clerk to the Council, Crypt Chambers, Chester.

NO DATE.—Moortown and Headingley.—EXCAVATING, ETC.—Excavating, concreting, etc., at Moor-town Reservoir. Also for renewing brick walling, rebuilding, etc., at the Headingley Pumping Station. Apply Fritz Blakeley Company, engineers, Thornhill, Dewsbury.

STONE, MATERIALS, AND STORES.

MAY 28.—Barry.—PIPE, LEAD, CASTINGS, ETC.—Barry U.D.C. invite tenders for the supply and delivery during the year ending May 31, 1907, of:—(1) Lead and copper pipe, pig and sheet lead, tin, and galvanized iron; (2) leather, rubber, and asbestos goods. Tender may be obtained at the Clerk's office, 158, Holton-road, Barry. Sealed tenders, endorsed "Tender for Lead," to be delivered to Mr. F. B. Tordoff, Clerk, not later than 10 a.m. on May 28.

MAY 28.—Feltham.—ROAD MATERIAL.—Feltham U.D.C. invite tenders for the supply of about 500 tons of granite—(a) 1 in. to 1 1/2 in., (b) 1 1/2 in. to 2 in., (c) 2 in. to 2 1/2 in., to be delivered free at Feltham not later than June 30, 1907, in such quantities and at such times as shall be directed by the Surveyor of the Council; also from 150 to 200 tons of best Kentish flints, to be delivered free at Feltham in quantities of (a) 50 tons, (b) 100 tons. Sealed tenders, endorsed "Tender for Road Material," must reach Mr. H. Merton Taylor, Clerk of the Council, Town Hall Chambers, Feltham, not later than May 28. Forms of tender may be obtained from the Council's Surveyor, Mr. E. T. Newark, Town Hall Chambers, Feltham, to whom samples of granite should be sent.

MAY 28.—St. Marylebone.—WOOD BLOCKS.—For the supply and delivery of about 250,000 ft. cub. of 5 in. by 9 in. best Swedish yellow deal crotched paving blocks for the St. Marylebone Metropolitan Borough Council. Forms of tender to be obtained on application from Town Hall, and other particulars from the Borough Surveyor. Tenders to be addressed to Mr. James Wilson, Town Hall, Marylebone, etc. Sealed and endorsed "Tenders for Wood Blocks," accompanied by four unretouched samples, to be delivered at above address on or before 12 noon on May 28.

MAY 29.—Stratford-upon-Avon.—ROAD METAL.—The Stratford-upon-Avon Town Council invite tenders for the supply of broken and unbroken road metal required for the maintenance of the borough roads during the ensuing year, according to specification to be obtained, together with form of tender, on application to Mr. Reden Dixon, A.M.Inst.C.E., Borough Surveyor, Municipal Offices, Stratford-upon-Avon. Tenders to be lodged with the Borough Surveyor, sealed and endorsed "Tender for Stone," not later than May 28.

MAY 29.—Great Yarmouth.—GRANITE SETTS.—Great Yarmouth Town Council invite tenders for the supply of 2,000 tons of granite paving sets, 5 in. deep. The sets to be delivered either in trucks at railway station or over ships' side at the Fish Wharf Quay, Great Yarmouth, in lots not exceeding 600 tons; in the latter case the Town Council will pay the landing dues of 2s. per ton and provide for stacking on the quay. Tenders, properly endorsed in sealed envelopes, stating the price per set, are to be delivered at the office of the Borough Surveyor, Town Hall, Great Yarmouth, not later than 10 a.m. on May 29. A sample set is to be delivered to the office of Mr. J. W. Croker, M.Inst.C.E., Borough Surveyor, Town Hall, Great Yarmouth, prior to or at the time of delivering the tenders.

MAY 30.—Kingsington-upon-Thames.—GRANITE.—Kingsington-upon-Thames Corporation invite tenders for the supply of 1,500 tons of granite paving sets, or other granite, suitable for road making, 1,000 tons to be broken so as to pass through a ring having a 12 in. internal diameter, and the remainder through a 14-in. ring. Tenders to be on forms to be obtained of the Borough Surveyor at the Municipal Offices, Kingsington, and sealed and endorsed "Tender for Granite," to be delivered at office of Mr. Harold A. Winsor, Town Clerk, Municipal Offices, Kingsington-upon-Thames, on or before May 30.

May 30.—**Workshop.**—**GRANITE.**—Workshop U.D.C. invite tenders for the supply of 120 tons of granite, broken to 24 in. gauge, and 80 tons of granite, broken to 12 in. gauge, delivered at Workshop Station. Tenders must be sent in to Mr. Geo. J. Featherston, Clerk, Town Hall, before 10 o'clock on May 30.

May 31.—**Highbridge.**—**STONES, ETC.**—The Highbridge U.D.C. invite tenders for supplying and delivering to the Highbridge Railway Station 1,600 tons (more or less) of fine or other stone macadam, broken to 24 in. gauge, and also for the supply of coarse and dust chippings, in such quantities as may be directed, the respective materials not to be delivered in quantities exceeding 40 tons per day. The contractor will be subjected to a penalty of 20s. per day if the quantities required are not delivered in accordance with contract. Quotations to be at per ton. Tenders are also invited for the hire of a 10-ton steam road roller, with water cart, for the year 1906-7. Quotations at per hour for actual work done. This tender must include a quotation for road scarifying at per yard super, particulars as to working hours, etc., to be stated. Tenders for macadam to be accompanied with samples, endorsed "Stones," steam road rolling endorsed "Roller," to be sent to Mr. W. C. Shier, Town Surveyor, Highbridge, on or before May 31.

May 31.—**South Stoneham.**—**FLINTS.**—South Stoneham R.D.C. invite tenders for the supply of flints to the several stations in the district. Persons tendering should state whether the flints will be surface picked or dug and samples should accompany the tender. Any further particulars may be obtained of Mr. W. J. Potter, District Surveyor, Clenny Portland, Tenders and samples must be delivered to Mr. E. T. Westlake, Clerk, 20 Portland-street, Southampton, not later than 1 o'clock on May 31 marked "Tender for Flints."

May 31.—**Stockbridge.**—**ROAD MATERIAL.**—Stockbridge U.D.C. invite tenders for the supply of road

material, as below, viz:—Granite or whinstone, about 300 tons; dress (or ender), about 600 tons; screenings, about 200 tons. Particulars, with forms of tender, to be had from Mr. J. Marsden, Clerk to the Council, Council Offices, Stockbridge, to whom samples, tenders, endorsed "Material," must be sent before May 31.

JUNE 1.—**Brighton.**—**PORTLAND CEMENT.**—The Brighton Corporation invite tenders for the supply of Portland cement for the year ending June 30, 1907, the same to be delivered at any of the Brighton railway stations as ordered in quantities of from 6 to 20 tons at one time. The specification and form of tender may be obtained on application to the Borough Surveyor at the Town Hall, Brighton. Sealed tenders, addressed to Mr. Hugo Talbot, Town Clerk, Town Hall, Brighton, and endorsed "Tender for Portland Cement," must be at the Town Hall before 10 o'clock in the forenoon on June 1.

JUNE 2.—**North Berwick.**—**LIAM.**—North Berwick Town Council invite tenders for the supply of 50 tons of yarding lime. Offers to be lodged with Mr. A. D. Wallace, Town Clerk, on or before June 2.

JUNE 5.—**Fallsworth.**—**MATERIALS.**—Fallsworth U.D.C. invite tenders for the supply of the under-mentioned materials and stores during the period of twelve months ending June 11, 1907, namely:—Paving sets, curbs, flags, Portland cement, earthenware pipes, bends, junctions and gullies, Buxton lime, green crystal concrete, disinfectants, and galvanized sanitary pans. Forms of tender and further particulars may be obtained at the office of Mr. G. F. Gray, Surveyor, Council Offices, Fallsworth. Sealed tenders, on forms supplied, and endorsed "Tender for..." must be delivered to Mr. H. C. Broome, Clerk to the Council, Fallsworth, not later than 12 o'clock noon on June 5.

JUNE 5.—**Romney Marsh.**—**GRAVEL.**—Romney Marsh R.D.C. invite tenders for the supply and delivery of 300 yds. of quartzite of 2 in. gauge

to the parishes and roads hereunder stated, viz.—100 yds. Gullford-road, Brookland; 100 yds. Straight-road, Brookland; 100 yds. Snake-road, Brenzett. The above material to be delivered before September 15, 1906, and yarded at the expense of the contractor in such a manner and in such quantities as the surveyor may direct, and subject to his measurement. Tenders, endorsed "Quartzite," to be delivered to Mr. William B. Smith, District Surveyor, New Romney, not later than June 6.

JUNE 11.—**Cleethorpes.**—**GRANITE.**—Cleethorpes U.D.C. invite tenders for 1,500 to 2,000 tons of Quebec Belgian granite, machine broken, as to pass in any direction through a 2 in. ring, delivered in quantities of not less than 100 tons, carriage paid, to Cleethorpes Station, or at some convenient depot in Grimsby, for the year ending March 31, 1907. A sample of granite is to accompany each tender and to state rate per ton of the material. Sealed tenders, addressed to the Surveyor to the Council, and endorsed "Tenders for Granite," to be delivered at the offices of the Council not later than 12 o'clock noon on June 11.

JUNE 15.—**Radcliffe.**—**TRAMWAY MATERIALS.**—Radcliffe U.D.C. invite tenders for the supply of the following materials, viz.:—(1) Granite sets; (2) steel girder tram rails, fishplates, bolts, nuts, points and crossings, and other special track work. Specifications and forms of tender may be obtained on application to Mr. W. L. Rothwell, Engineer to the Council, on payment of a fee of 2s. Tenders, endorsed "Tramway Materials," to be sent to Mr. S. Mills, Clerk, Council Offices, Radcliffe, on or before June 15.

NO DATE.—**Thurstone.**—**ROAD MATERIAL.**—Thurstone U.D.C. invite tenders for supply of dress, granite, and screenings for road repairs. For further particulars and form of tender apply to Mr. R. Longden, surveyor, Thurstone, near Penistone.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*SECOND MASTER	Leicester Man. Scho 1 of Art	250l.	May 30
*ASSISTANT TEACHERS (TWO)	150l. and 100l.		June 5
*ARCHITECTURAL ASSISTANT	Newport Corporation	104l. per annum	

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*BKMG., etc. PLANT, CARRAGH—Gt. Council War Dept. Bt.wks., Newbridge, Co. Kildare	Robert J. Goff & Co.	June 6
*RESIDENCE AND BUILDING ESTATE, BEULAH SPA, S.E.—At the Mart	Chesterton & Sons	June 11
*FREEHOLD PROPERTY, EAST PUTNEY—At the Mart	Farrbrother, Ellis, Ererton, Branch, Galsworthy, & Co.	June 12
*FREEHOLD ESTATE, STREATHAM HILL—At the Mart	Edwin Fox & Bousfield	June 13
*FREEHOLD BUILDING ESTATE, PLYMOUTH—Law Office, Plymouth	Glebe & Bishop	June 14
*BUILDING SITE, QUEEN-STREET, CHEAPSIDE—At the Mart	G. A. Wilkinson & Son	June 18
*TOOLS AND IRONMONGERY—At Plough-court, 50a, Barbican, E.C.	A. S. Cohen	June 19-20
*FREEHOLD BUILDING LAND, NEW SOUTHGATE—At the Mart	Hartman Bros.	June 20
*FREEHOLD ESTATE, HOVE, SUSSEX—At the Mart	Farrbrother, Ellis, Ererton, Branch, Galsworthy, & Co.	June 21
*BUILDING PLOTS, BUISLIP PARK ESTATE—On the Estate	Venton, Bull, & Cooper	July 7

PATENTS.—Continued from page 597.

with plaster or cement, and supported on the ground, on the walls of the staircase and on the landing, by a strip of metal reinforcing the brickwork, which strip is fixed to the arch by fastenings and connected to the walls by a suitable number of tie bars embedded in the brickwork, and holds the bars of the flight by bolts, this belt, which helps to give the stairs great solidity, being, if required, concealed by a covering of plaster or the like.

9,248 of 1905.—J. F. STEPHENSON: Device for Cleaning Flues or Pipes.

This relates to a device for cleaning flues or pipes comprising a series of spring-pressed scrapers mounted on a central shaft, and consists in pivotally mounting the scrapers in a slotted collar fixed on the shaft in such manner that the scrapers bear against the collar and act as the device is drawn through the tube, and providing a flexible connexion to the operating handle.

18,131 of 1905.—J. S. BURN: Lavatory Apparatus.

This relates to a lavatory apparatus comprising a tray with fluted or channelled sides, and a hollow channelled cone or upright tapered body placed on the centre of the tray to form a holder for brush stems, and also to form a sloping back and inclined base with channelled surfaces for the reception of soap, etc.

20,338 of 1905.—C. H. ADAMS: Road Gullies and the like.

This relates to a road gully and the like in which the grating is formed with a corrugated surface preferably in its length, so that a series of grooves results in which depressions the gully grate openings are formed, usually as a gully slot. Water will flow naturally into these grooves or

corrugations, and thus find its way into the gully, and by not making the slots of great width, leaves and obstructions will not enter so readily. The gully body is formed with a trapped outlet provided with screw or other inspection device. A tipping bucket or siphonic discharge is placed in the gully so that it may serve to flush the sewer, and a wire or other screen or guard is placed within the gully so that the leaves which are collected therein may be readily removed.

4,630 of 1906.—E. A. GREEN: Inlets or Junction Pipes Used for Drainage, Sewerage, and the like purposes.

This relates to inlets or junction pipes used for drainage and the like, and consists in forming a portion of the roof over the drop opening at an inclination of 45° or thereabouts to the horizontal instead of as a curve or rounded bend, and in providing each side of the horizontal or approximately horizontal portion at the top, the roof with a gradually increasing width from the entering towards the drop end.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 11.—By SPELMANS' (at Norwich).
Norwich.—Tombland, corner freehold residence and offices, p. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

By NICHOLAS, DENVER, & Co.
Lancing, Sussex—"Lancing Hall," and 2 a. 0 r.
15 p. 4 p. £2,250

By PROTHORP & MORRIS.
Leyton.—645, 650, 652, and 654, High-rd., l. v. r. 1484, 2,260

Hockley, Essex.—Main-rd., enclosure of land, 9 a. 2 r. 10 p. f. 290

Main-rd., a parcel of land, 22 a. 0 r. 3 p. f. ... 530

By TYSER, GREENWOOD, & Co.
Hammersmith.—15 and 29, St. Peter's sq., l. v. r. 851, 1,415

Acton.—2 to 10 (even), Roslin-rd., u.t. 96 yrs., g.r. 92, 10s., v.r. 77, 11s. 6d. 710

By W. MAURICE-JONES (at New Southgate).
New Southgate.—Friar Barnet-rd., four freehold building sites 482

Whetstone.—6, Doncaster-ter. (s.), u.t. 73 yrs., g.r. 82, v.r. 34, 240

Fitchley.—1, Rose-cottage, l. v. r. 321, 10s. ... 280

By HAMPTON & SONS (at Aberystwith).
Eglwys-Fach, Cardigan.—"The Glandry Castle Estate," 827 acres, l. in various lots (s.), 10,700

May 15.—By J. BARTON & Co.
City.—9, 10, 11, and 12, Bartholomew-close (s.), area 2,574 ft., l. v. r. 4551, 6,725

By COCKETT & HENDERSON.
Wanstead.—Grove-rd., "Brookvale" and 1 of an acre, l. p. 1,300

By DUNCAN & KEMPSON.
Blackfriars.—5 and 7, Marlbot-st. (s.), u.t. 831 yrs., g.r. 104, v. r. 82, 600

Acton.—Acton-vale, "Vale Lodge," u.t. 80 yrs., g.r. 104, 10s., v. r. 561, 450

By FOSTER & CRANFIELD, with G. RAVENSHAFER.
Ealing.—17, The Broadway (bank premises), l. v. r. 394, 6,000

1, The Broadway (s.), l. v. r. 2801, 4,500

By JENKINS, SONS, & Co.
New Cross.—82, Shaddeles rd., u.t. 631 yrs., g.r. 51, v. r. 3, 335

By ARTHUR RICHARDS.
Totterham.—778, High-rd., (site of the old Vicarage), area 1 a. 3 r. 15 p., l. p. 2,650

638, High-rd. (s.), l. p. 1,500

By FLEURET, SONS, & ADAMS (at Mason's Hall Tavern).

Hammersmith—Kings-st. The "Lord Raglan" ... 212,000
May 16.—By FOSTER & CRANFIELD.
Caledonian Road.—42, Teyford-st., with yard and stables, n.t. 841 yrs., gr. 51, yr. 600.

By HOBSON, RICHARDS, & CO.
Fulham.—60, 65, 69, and 91, Chaybrook-rd., u.t. 74 yrs., gr. 211, yr. 1852, 48.
By HUMBERT & FLETCHER.
Watford, Hert. —Hampd. Hempstead-rd., "Nascott House Estate," 16 s. 0. 15 p. l. p. 1, r. 1907.

By MIDDLETON & CRACKNELL.
Hempstead.—52, Crediton-rd., u.t. 92 yrs., gr. 214, yr. 1907.
By NORROY, TAYLOR, & GIBSON.
Horsely.—Ratholeave-av., sta. f.g. rents 2011, 10s. reversion in 80 yrs.

By D. W. RICHARDSON.
Bogen's Park.—21, Clonoster-crea, u.t. 27 1/2 yrs., gr. 101, yr. 551.
Harlesden.—6, Harlesden-gdns., u.t. 881 yrs., gr. 81, yr. 451.
Wandsworth.—Hamd. Hempstead-rd., u.t. 1451.

By THURGOOD & MARTIN.
Kingsland.—21, Mortimer-rd., u.t. 271 yrs., gr. 101, yr. 601.
Holloway.—Verbena-rd., u.t. 321 yrs., gr. 61, yr. 41.
Wood Green.—Cobham-rd., l.g. rents 1501, reversion in 90 yrs.

By TOMLIN & CO.
Brookley.—20, Brookley-gt., u.t. 851 yrs., gr. 41, yr. 301.
Forest Hill.—161, Forest Hill, l. yr. 301.
WHEELER BROS.
Chelsea.—45, Amerston-st., u.t. 44 yrs., gr. 71, yr. 401.

By KENSLEY (at R.R.C.).
Romford, Essex.—Prince's-rd., "Bleak House," u.t. 101, yr. 201.
Heston Grange.—The Common, a freehold holding, 10 a. 1 r. 20 p. 3/4.
May 17.—C. C. 171.

By PRICE, ARBOW, & TAYLOR.
Broadstairs, Kent.—14, The Broadway, l. r. 1201.
By P. O. SQUIRE & CO.
Beckenham.—186, Kingshall-rd., u.t. 751 yrs., gr. 71, yr. 551.

By JOSEPH STOWER.
Forest Row, Sussex.—The Beeches Farm, 43 a. 3 r. 20 p. 1, yr. 601.
A freehold cottage and enclosure, 7 a. 0 r. 26 p. 1.
By SIMMONS & SONS.
South Kensington.—10, St. Sidwell-pl., l. yr. 551.

By W. H. HOLMES & SONS.
Batterssea.—10, 22 (even), Candahar-road (e.), l. yr. 1501.
By J. W. NEIGHBOR.
Hoxton.—26, 28, and 30, Whitmore-rd., u.t. 121 yrs., gr. 241, 181, yr. 581, 121.

By EDWARD WOOD.

Wood.—48, Howard-rd., u.t. 95 yrs., gr. 41, 10s., s. r. 241, 11s.
Totterham.—9, Kenble-rd., u.t. 75 yrs., gr. 41, 4s., w. r. 281, 12s.
Homerton.—58, Churchill-rd., l. yr. 461, 10s.

CONTRACTIONS used in these lists.—E.S.R. for freehold ground-rent; l.g.r. for leasehold ground-rent; g.r. for ground-rent; r. for rent; n.t. for unexpired term; p.a. for per annum; yrs. for years; l.a. for lease; s. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; at. for avenue; gdn. for garden; yd. for yard; gr. for grove; h. for house; p.h. for public-house; o. for office; s. for shops; ct. for court.

MEETINGS

FRIDAY, MAY 25.
Royal Institution.—Mr. Leonard Hill on "Compressed Air and its Physiological Effects." 9 p.m.
SATURDAY, MAY 26.
Royal Institution.—Professor Sir James Dewar on "The Old and the New Chemistry"—11 a.m.

MONDAY, MAY 28.
Society of Arts (Cantor Lectures).—Mr. O. W. Eve on "Heralry in Relation to the Applied Arts"—11.11. 8 p.m.
TUESDAY, MAY 29.
Society of Arts (Applied Art Section).—Mr. Harry Fowell on "Cut Glass." 8 p.m.

FRIDAY, JUNE 1.
Royal Institution.—Professor W. H. Moissan on "L'Ébullition des Métaux." 9 p.m.
FRIDAY AND SATURDAY, JUNE 1 AND 2.
Incorporated Association of Municipal and County Engineers.—Yorkshire District Meeting to be held at Scarborough; paper on "Municipal Work in Scarborough," by Mr. Harry W. Smith, A.M.Inst.C.E., Borough Engineer.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 10s. per annum (26 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, &c. To all other parts, 12s. per annum.
Remittances payable to J. MORGAN, should be addressed to The Publisher of "THE BUILDER," Catherine-street, W.C.

PRICES CURRENT OF MATERIALS.

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

Table with columns for material types (Hard Stocks, Rough Stocks, Grizzlies, etc.), prices (£ s. d.), and quantities (per 1000, per ton, etc.).

BRICKS, &c. (continued).

Solays, Cham. 4 s. d.
Inferred, Sains. 14 0 0 per 1000, at railway depôt.
Second Quality White and Dipped Salt Glazed 2 0 0 less than best.

STONE.
BATH STONE—delivered on road w.g. s. d.
Gons, Paddington Depôt. 1 6 1/2 per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt. 1 8 1/2 " "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Fimlico Wharf. 2 1 " "

YORK STONE—Robin Hood Quality.
Scrapped random blocks. 2 10 " "
6 in. sawn two sides landings to sizes (random sizes) 2 6 " "
40 ft. super. 2 3 per ft. super. " "

HARD YORE—
Scrapped random blocks. 3 0 per ft. cube, " "
in. sawn two sides landings to sizes (random sizes) 2 8 per ft. super. " "
6 in. rubbed two sides ditto 3 0 " "
3 in. sawn two sides slabs (random sizes) 1 2 " "
in. self-faced random flags 0 5 " "

Hopton Wood (Hard Bed) in blocks 2 0 per ft. cube, del. rly. depôt.
" " " 6 in. sawn both sides landings 2 7 per ft. super. del. rly. depôt.
" " " 3 in. sawn both sides random slabs 1 0 " "
" " " 2 in. do. 0 8 1/2 " "

Table with columns for material types (In. In., 20x10 best blue Bangor, etc.), prices (£ s. d.), and quantities (per 1000, per 1000 at r. d., etc.).

TILES.

Table with columns for tile types (Best plain red roofing tiles, Hip and Valley tiles, etc.), prices (£ s. d.), and quantities (per 1000, per doz., etc.).

BUILDING WOOD.

Table with columns for wood types (Deals, Battens, etc.), prices (£ s. d.), and quantities (per standard, per 1000, etc.).

WOOD (continued). BUILDING WOOD (continued). Foreign Saw Boards— 1 in. and 1 1/4 in. by 7 in. 1 0 0 At per load of 50 ft.

JOINERS' WOOD. White Sea: first yellow deals, 3 in. by 11 in. 24 0 0 At per standard.

Pitch-pine deals, 3 in. by 11 in. 13 0 0 At per standard. Second yellow deals, 3 in. by 11 in. 16 0 0

White Sea and Petersburg. First white deals, 3 in. by 11 in. 14 10 0 At per standard.

Pitch-pine deals, 3 in. by 11 in. 13 0 0 At per standard. Under 2 in. thick extra. 0 10 0

JOISTS, GIRDES, &c. COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROPRIETORS OF PUBLIC SALES &c.

IRON— Common Bars Per ton, in London. £ s. d. 8 0 0

Sheet Iron, Galvanised, flat, ordinary quality. Ordinary sizes, 6 ft. by 2 ft. to 3 ft. by 20 ft. 14 0 0

LEAD, &c. Per ton, in London. £ s. d. LEAD—Sheet, English, 3 lb. and up. 19 10 0

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES. 15 oz. thirds 34d. per ft. delivered.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES. Hartley's 2d. per ft. delivered.

OILS, &c. Raw Linseed Oil in pipes per gallon £ s. d. 2 0 0

VARNISHES, &c. Fine Pale Oak Varnish per gallon £ s. d. 8 0 0

PUBLISHER'S NOTICES. Nat. Tel., 612, Gerrard. Telegrams, "The Builder, London."

CHARGES FOR ADVERTISEMENTS. COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROPRIETORS OF PUBLIC SALES &c.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS. Terms for series of Trade advertisements, and for front page and other special positions, on application to the Publisher.

ALTERATIONS IN STANDING ADVERTISEMENTS OR ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

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

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. All communications must be authenticated by the name and address of the sender whether for publication or not.

TENDERS. Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursday.

ABERDEEN.—For alterations and additions to the north-east portion of the main buildings of Aberdeen Royal Asylum. Messrs. Kelly & Nicol, architects, 367, Union-street, Aberdeen.

BARNSTAPLE.—For lavatory buildings and general alterations, etc., at North Devon Infirmary. Mr. J. C. Southcombe, architect, Barnstaple. Quantities by architect:—

BIRMINGHAM.—For the erection of shops, bake-houses, etc., Dale-end and Moor-street, for Mr. Alfred Hughes. Messrs. Nowell Parr & Kates, architects, Brentford. Quantities by Mr. Geo. Kenwick, Coleman-row, Birmingham:—

BEVERLEY.—For wrought iron fencing at Queensgate Cemetery, for the Corporation. Mr. J. G. G. Smith, A. H. Inst. C.E., Guildhall, Beverley:—

ADVERTISERS IN "THE BUILDER" may have Replies addressed to the Office, Catherine Street, Covent Garden, W.C., free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION PRINTED ON THIN PAPER, FOR FOREIGN AND COLONIAL CIRCULATION, is issued every week.

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

BEVERLEY.—For private street works, Princess-gardens, for the Corporation, Mr. J. Gould Smith, A.M.Inst.C.E., Guildhall, Beverley:—
 G. Curtiss, £270 4 3
 L. B. Knox, £80 7 8
 J. Brunton, £7 4
 & Co., £69 11 9
 Parker & Sharp, £8 7 8
 C. Stephenson, £54 9 6
 J. Constable, £2 19 0

BEVERLEY.—For constructing a concrete retaining wall on the river Hull at Greenhill, for the Corporation, Mr. J. Gould Smith, A.M.Inst.C.E., Guildhall, Beverley:—
 J. Brunton, £585 0 0
 L. B. Knox, £488 10 7
 Brunton & Co., £31 11 0
 Boyce, Bradley, & Co., £27 4 4
 I. Robinson, £20 0 0
 & Co., £70 1 9
 J. Scarr, £518 8 0
 G. K. Waghorn, £443 3 1
 Parker & Sharp, £490 7 9
 T. C. Starkey, £45 10 3
 Leggett & Spigutt, £498 0 0
 Hull, £443 10 3
 Accepted subject to entering into proper contract.

BYFLEET (Surrey).—For erecting house and premises, Church-road, for Mr. A. Sharp, Mr. D. G. Andrew, architect, East Molesey:—
 W. G. Traynor, £2,490 0 0
 Higgs & Out-
 waite, £2,347 0 0
 W. A. Smyth, £2,114 0 0
 W. Brunton, £1,990 0 0
 S. R. Spiner, £1,970 0 0
 Lane, Son, & Co., £1,928 0 0
 G. Willis, £1,919 0 0

CAERLEON.—For extensions and alterations of Williams' Endowed Schools, Messrs. Lansdowne & Grigs, architects, Metropolitan Bank-chambers, Newport, Monmouthshire:—
 J. B. Jenkin, £5,910 0 0
 R. W. Moon, £4,250 0 0
 J. Browncombe, £4,130 0 0
 & Son, £4,740 0 0
 J. Jenkins Ltd., £4,450 0 0
 C. H. B. C. C. C., £4,400 0 0
 J. H. Leadbetter, £4,300 0 0
 Jerritt & Fisher, £4,192 0 0
 * Recommended for acceptance.

CHARLESTOWN.—For erecting a pair of houses at Charlestown, near Weymouth, for Messrs. Courage, Mr. S. Jackson, architect and surveyor, Bridge-chambers, Weymouth:—
 E. Selby, £450 0 0
 T. J. Stevens, Love-
 lane, Weymouth, £376 15 6
 G. B. Holmes & Co., £300 0 0

CHESTER-LE-STREET.—For the supplying and laying of about 2,000 yds. of 6-in. water pipes, together with the necessary valves, hydrants, and other accessories, for the taking up, cleaning, and depositing within 200 yds. of the job, of about 1,450 yds. of 2-in. and 3-in. existing water pipes, for the Rural District Council, Mr. J. H. Mole, Surveyor, Chester-le-Street:—
 J. G. Buttersons, Washington, Co., Durham, £574 16 8

CLIFFE.—For erecting a new County school to accommodate 128 children at Cliffe, Coaling-street, near Rochester, for Kent Education Committee, Mr. Wilfrid H. Robinson, Architect to the Committee:—
 P. G. & Co., £1,852 0 0
 G. E. Skinner, £1,558 0 0
 A. E. Tong, £1,897 0 0
 G. E. Gato, £1,530 0 0
 Beale & Hubbard, £1,798 0 0
 W. Reeves, £1,700 0 0
 Gann & Co. Ltd., £1,649 0 0
 L. Seager, £1,641 10 0
 Woolston Bros., £1,640 0 0

COFADILL.—For erecting a Welsh Calvinistic Methodist school, 4 miles from Tregaron station, for the Calvinistic Methodist Connection, Mr. G. Dickens Lewis, architect, 12, Terrace-road, Aberystwyth:—
 W. Edwards, £534 10 0
 L. D. Davies, £534 5 0
 D. P. Jones, £523 5 0
 T. T. Wynnydd, £492 0 0
 Llanystyd, £492 0 0
 D. Evans, £490 0 0

DEVANHA.—For construction of pipe-sewers, man-holes, &c., for Aberdeen, for Mr. C. H. Dyack, Borough Surveyor, 414, Union-street, Aberdeen:—
 J. McAdam & Sons, Charlotte-street, Aberdeen, £157 1 11

ENNSKILLEN.—For erecting two semi-detached cottages, Mr. W. Scott, architect, Victoria-terrace, Ennskillen:—
 J. Donnelly, £400 10 0
 J. Flanagan, £367 0 0
 J. Hynes & Sons, £443 13 0
 N. Nixon, Monach, £430 8 0
 Ennskillen, £289 16 0

EPFNO.—For constructing nurses' and infants' schools, at Coladad, for the Guardians, Mr. H. Tooley, architect, Buckhurst-hill, Epfno:—
 J. Wheel, £1,650 0 0
 E. E. Whitch, £1,343 8 7
 I. Keen, £1,485 5 7
 S. Page & Sons, £1,236 0 0
 Newell & Lusty, £1,390 0 0
 J. Barker & Son, £1,209 0 0
 E. Knorworth, £1,310 10 0
 R. Wannier, £1,168 9 0
 Foster & Son, £1,300 0 0
 Myall & Treason, £1,166 0 0
 Martin, Wells, £1,209 0 0
 W. H. Whyte, £1,140 0 0
 Wells & Sons, £1,247 0 0
 J. Whitin & Sons, £1,124 0 0
 Park & Sons, £1,281 0 0
 C. W. Phipps, £1,134 8 0
 Cowlin & Sons, £1,275 0 0
 Lawrence & Sons, £1,274 0 0
 T. W. Heard, £1,257 0 0
 Sons, £1,124 0 0
 H. Wood & Sons, £1,256 0 0
 Woolston & Co., £1,219 12 0
 Sons, £1,100 0 0
 Fitch & Cox, £1,219 12 0
 Sons, £1,100 0 0
 [Architect's estimate, £1,300.]

EYNSFORD.—For the erection of a new County school to accommodate 230 children at Eynsford, Crockenhill, Kent, for the Kent Education Committee, Mr. H. Robinson, Architect to the Committee:—
 W. H. Smith, £3,697 16 6
 J. Barker & Co., £2,500 0 0
 E. P. Bull & Co. Ltd., £2,863 0 0
 Woolston Bros., £2,450 0 0
 Nelson & Co., £2,430 0 0
 W. E. Brox, £2,430 0 0
 T. Knight, £3,039 0 0
 J. Lansdale, £2,724 0 0
 Martin, Wells & Co., £3,029 0 0
 C. Skinner, £2,724 0 0
 Strang & Sons, £3,029 0 0
 J. A. Davidson, £2,612 0 0
 Ltd., £2,991 0 0
 O. E. Wallis & Sons, £2,980 0 0
 Sons, Ltd., £2,580 0 0
 J. Ellingham, £2,980 0 0
 Sons, Ltd., £2,580 0 0
 W. F. Blay, £2,985 0 0
 Sons, Ltd., £2,585 0 0
 White & Able, Kent, £2,525 0 0

GOSPORT.—For about eight miles of main-laying (15 and 16 inch pipes), for the Waterworks Co. Mr. E. T. Hildred, A.M.Inst.C.E., 1, High-street, Gosport. Quantities by engineer:—

W. Griffiths & Co. Ltd.	£9,172 6 21	R. C. Brebner & Co., £4,277 0 0	
A. Woolbridge	7,057 18 8	G. F. Bughird	4,136 18 0
W. Whiting	6,864 13 1	W. L. Wallis & Co., £4,048 19 0	
Bateman, F. Mitchell & Son, £6,107 18 0		J. Hodgson & Son, Ltd., £4,017 19 8	
H. J. Ryan & Co., £5,238 0 0		W. H. Dean, £4,004 5 4	
W. L. Meredith	4,456 4 4	F. Osman, £4,000 0 0	
J. Creed	4,825 3 1	D. Davis, Ball, & Co., £3,987 7 7	
H. Ashley	4,618 13 6	J. H. M. & Co., £3,987 7 7	
J. Hunt	4,302 4 4	J. H. M. & Co., £3,987 7 7	
H. E. Buckley	4,568 4 1	Donald, Oxford, £3,776 0 0	
A. K. Mum	4,567 15 9		

HARBERTON.—For sewage tank and filter bed, and for laying stoneware pipe drain. Mr. W. F. Tollit, Surveyor, 10, High-street, Totnes:—
 G. Parrell, Cott, Dartington, Totnes, £249

HULL.—For the erection of a greenhouse, East Park, Huddersfield, for the Parks and Burials Committee of the Corporation, Mr. J. H. Hirst, City Architect, Town Hall, Hull:—
 Hull General Builders, Ltd., £13 11 10
 D. Lowe & Co., £305 0 0
 W. Sanderson, Temple-street, Hull, £289 15 0

LEICESTER.—For the builders' work in the construction of engine beds, cooling room, etc., connected with duplicate refrigerating plant at the wholesale market, for the markets committee, Mr. E. G. Mawley, Borough Engineer, Town Hall, Leicester:—
 G. Southern, £435 11 7
 W. G. Harrison & Son, £235 8 0
 J. Hutchison & Co., £408 0 0
 J. Herbert & Son, £339 9 0
 Clark & Cross, £408 0 0
 J. E. Johnson & Son, £334 0 0
 Haskard, Rukkin, & Beck, £397 0 0
 [All of Leicester.]

LIDDIARDAN.—For additions and alterations to Council school, Mr. R. Lloyd Jones, County Architect, 7, New-street, Pwllheli:—
 D. & R. Jones, Rhydydd, Pwllheli, £851 10 0

LONDON.—For condensing water works for the Hackney Borough Council, Mr. N. Scorgie, Borough Engineer, Town Hall, Hackney, N.E.:—
 T. Dovers & Son, £4,784 0 0
 Thomas & Thomas, £4,528 0 0
 J. Mowlem & Co., £4,520 0 0
 Hughes & Stirling, £4,412 19 1
 Kirk & Randall, £4,404 10 0
 J. Aird & Sons, £3,980 18 0
 G. Hay & Co., £3,983 6 0
 J. M. Croxall & Son, £3,528 12 11
 T. W. Peirce & Co., £3,255 1 7

LONDON.—For constructing a footbridge for Deptford Borough Council. Quantities by Messrs. W. T. Farthing & Son:—
 E. & E. Isles, £4,823 0 0
 Tilbury Contracting and Dredging Company, Ltd., £3,372 8 7
 Routon & Paul, Ltd., £3,125 10 0
 G. Sands & Son, £2,969 15 0
 M. T. Shaw & Co., Ltd., £2,968 10 8
 Barry Transporters Engineering Co., £2,955 0 0
 A. Woodham & Sons, £2,951 10 0
 C. Wall, Ltd., £2,870 0 0
 A. Findlay & Co., Ltd., £2,852 12 11
 Kirk & Randall, £2,781 0 0
 Somervell & Co., £2,773 10 0
 A. Hantsdale & Co., Ltd., £2,714 17 1
 W. H. Hyde, £2,580 0 0
 J. Westwood & Co., Ltd., £2,580 0 0
 Cross & Cross, 39, Victoria-st., S.W., £2,410 0 0

LONDON.—For erecting, on the site fronting to Allardyce-crescent, Brixton, (1) a new parochial hall, (2) gymnasium and classrooms, (3) caretaker's house, for the Vicar and Committee of St. Paul's, West Brixton, Mr. C. E. Hewitt, architect, 21, Old Queen-street, Westminster. Quantities by Mr. S. Hunt, 129, Queen's-road, Brighton:—

Contract No. 1.	Contract No. 2.	Contract No. 3.	Total estimate.
Stius & Woods	£ 4,461 0 0	£ 1,213 0 0	£ 5,674 0 0
Rose & Co., Ltd.	4,499 0 0	1,199 0 0	5,698 0 0
W. Willett	4,531 16 0	1,247 11 0	5,779 7 0
W. Johnsons & Co. Ltd.	4,441 0 0	1,115 0 0	5,556 0 0
F. & G. Foster	4,340 0 0	1,115 0 0	5,455 0 0
Palman & Fotheringham, Ltd.	4,250 0 0	1,120 0 0	5,370 0 0
Saxe & Son, Ltd.	4,281 0 0	986 0 0	5,267 0 0
C. Ansell	4,150 0 0	1,118 0 0	5,268 0 0
W. Holt & Sons	4,077 0 0	1,104 0 0	5,181 0 0
T. H. Hawkins & Co.	4,112 0 0	1,198 0 0	5,310 0 0
S. Page & Sons	4,063 0 0	1,079 0 0	5,142 0 0
Holliday & Greenwood, Ltd.	4,047 0 0	1,057 0 0	5,104 0 0
Rice & Son	4,144 0 0	1,033 0 0	5,177 0 0
Thomas & Edger	3,979 0 0	1,057 0 0	5,036 0 0
F. & H. F. Higgs	4,093 0 0	1,069 0 0	5,162 0 0
K. & E. Evans	4,059 0 0	1,020 0 0	5,079 0 0
J. & M. Patrick	3,987 0 0	1,054 0 0	5,041 0 0
W. Smith & Sons	3,927 0 0	1,079 0 0	5,006 0 0
H. L. Holloway	3,940 0 0	1,084 0 0	5,024 0 0
J. W. Green	3,950 0 0	1,087 0 0	5,037 0 0
L. Whitehead & Co., Ltd.	3,949 0 0	1,027 0 0	4,976 0 0
A. White & Co.	3,876 0 0	1,079 0 0	4,955 0 0
J. & C. Bowyer	3,957 0 0	994 0 0	4,951 0 0
W. S. Shepherd & Co.	3,893 0 0	968 0 0	4,861 0 0
G. Castle & Son	3,876 0 0	1,030 0 0	4,906 0 0
G. E. Wallis & Sons, Ltd.	3,888 0 0	1,061 0 0	4,949 0 0
H. T. Bishop	3,920 0 0	1,098 0 0	5,018 0 0
J. Barker & Co., Ltd.	3,793 0 0	1,049 0 0	4,842 0 0
L. Garrett & Son	3,710 0 0	1,070 0 0	4,780 0 0
Battley, Sigs & Holness	3,730 0 0	987 0 0	4,717 0 0
B. E. Nightingale	3,691 0 0	983 0 0	4,674 0 0
J. Cassé	3,888 0 0	965 0 0	4,853 0 0
W. Taylor & Co., Hanmer-street, W. 1	3,693 14 6	1,049 11 0	4,743 5 6

LONDON.—For new street works for the Hackney Borough Council:—
 Grounds & Newton, £532 15 9
 E. T. Bloomfield, £28 17 10
 Porter, £13 3 1
 T. Adams, £107 11 10
 W. Griffiths & Co., Ltd., 35-39, Hamilton-house, Bishopsgate-st. Without, E.C. 1, 494 13 5

LONDON.—For demolition of houses, Hesketh-place, and Thomas-place, Notting Dale, and erecting workmen's flats, for the Royal Borough of Kensington:—
 E. J. Clayton, £3,300 0 0
 B. Colley & Sons, £2,540 0 0
 F. Eatwell, £3,261 0 0
 F. & G. Foster, £2,491 0 0
 J. Garrett & Son, £3,170 0 0
 H. Lovatt, Ltd., £2,440 0 0
 Rowe & Co., Ltd., £2,804 0 0
 Parry Bros., £2,429 0 0
 T. Almond & Son, £2,420 0 0
 Ltd., £2,475 0 0
 J. Barker & Co., £2,377 0 0
 W. J. Dickens, £2,070 0 0
 J. H. Bywaters, £2,345 15 0
 Martie, Wells, & Co., Ltd., £2,635 0 0
 of the Broad-way, Westminster, £2,175 0 0
 Patman & Fotheringham, £2,600 0 0
 Cowley & Drake, £2,597 0 0

LONDON EDUCATION COMMITTEE TENDERS.

DEPTFORD.—For improvements proposed to be effected at the Alverton Street School:—
 T. D. Long, £19,966
 E. Triggs, £19,765
 Sibley & Son, Ltd., £8,909
 E. Wallis & Sons, £9,647
 W. Lawrence & Son, £8,840
 J. & C. Bowyer, £5,566
 Martin, Wells, & Co., £8,111
 W. Johnson & Sons, £8,100
 Treasure & Sons, £8,100
 Ltd., Wandsworth, £8,100
 J. & M. Patrick, £7,999
 Common, £5,938
 [The architect's (Education) estimate comparable with these tenders, is £8,441.]

Islington, N., Pole's-park (Heating Apparatus).
 Russell & Co., £800
 B. Harlow & Son, £717
 J. Jeffreys & Co., £798
 O. & E. Bradley, £717
 Stevens & Sons, £784
 T. S. Knight & Sons, £695
 Stoods & Co., £781
 Purcell & Nobbs, ST & Ashwell & Nesbit, Ltd., £785
 B. R. Cleveland, £658
 C. Kite & Co., £735
 Fitzroy-square, £658
 [The estimate of the architect (Education), comparable with these tenders, is £7,925.]

Fulham, Hagon-road (Division of Rooms).
 J. Stones, £448 8 0
 W. Martin, £350 0 0
 Lattney Bros., £409 0 0
 H. Bouman, £14 and £10 & Co., £370 0 0
 E. Royal Victor, £369 0 0
 place, Old Ford
 G. Godson & Sons, £354 0 0
 road, £329 0 0
 [The architect's (Education) estimate, comparable with these tenders, is £300.]

St. George-in-the-East, Berner-street (Heating Apparatus).
 J. Grundy, £147 0 0
 J. Fraser & Son, Ltd., £146 0 0
 J. Debris & Sons, Ltd., £103 0 0
 G. & E. Bradley, £101 0 0
 Comyn, Ching, & Co., Ltd., £94 10 0
 Stevens & Sons, £92 17 0
 J. Veston & Co., £77 0 0
 Bolton, Fane, & Co., £77 0 0
 Palowkar & Sons, 90 and 91, Queen-street, Chancery-lane, £77 0 0
 [The estimate of the architect (Education), comparable with these tenders, is £87.]

Hackney, N. E.C. 6, Kingsland Secondary School (Kingsland).
 Stevens & Sons, £9,726 0 0
 W. H. Hyde, £9,668 0 0
 J. & M. Patrick, £9,978 0 0
 G. E. Wallis & Sons, Ltd., £8,583 0 0
 J. & C. Bowyer, £8,568 0 0
 Treasure & Sons, £8,570 0 0
 Martin, Wells, & Co., Ltd., £8,473 0 0
 B. E. Nightingale, £8,453 0 0
 A. E. Symes, Carpenter's-road, Stratford, £8,335 0 0
 W. Lawrence & Sons, £8,305 0 0
 [The architect's (Education) estimate, comparable with these tenders, is £8,973.]

For contract No. 1 conditionally.

MANCHESTER.—For the superstructure of Section A of the Manchester Royal Infirmary, Mr. E. T. Hall (London) and Mr. J. Brooke (Manchester), architects.—
 Holiday & Green... Morrison & Co.... £251,300
 wood £258,277 Mill & Sons 245,000
 T. Rowbottom .. 256,752 Brown & Son... 244,480
 Foster & Dicksee 253,950 Arnold & Son* .. 259,546

NEW BOLSOVER.—For erecting a new Infants' school for Derbyshire County Education Committee, Mr. H. Tatham Sudbury, architect, Estate Offices, Hkeston.—
 Haskard, Rud-kin, & Beck, £4,395 0 0 J. Cooper & Son £3,625 0 0
 G. Peach 4,182 0 0 T. Outburt .. 3,598 0 0
 D. Roberts 4,053 15 0 Lind & Swan 3,550 0 0
 G. Haynes 4,010 17 3 Lee & Kirk .. 3,540 0 0
 W. Maule & Co. 3,995 10 0 Harris & Hunt,
 H. Oakley 3,900 0 0 Ripley* 3,499 18 6
 A. Earnshaw .. 3,823 0 0 H. Vickers & Son 3,415 0 0
 F. H. & J. W. Moore 3,800 0 0

NEWTON ABBOT.—For waterworks, Ippelen water supply, for the Rural District Council, Mr. F. W. Vanstone, engineer, Palace-chambers, Paignton.—
 J. Shaddock £3,875 8 5 G. Pollard & W. Grixon Co. £2,746 9 7
 thwaite .. 3,518 11 11 S t e e r t 2,708 18 0
 F. J. Collins-Pearce 2,988 0 0 Woodman & F. A. A. Stacey 2,894 0 0 R. E. Narra-
 H. Drew 2,894 0 0 T. Shaddock 2,886 11 11
 T. Shaddock .. 2,886 11 11 cott 2,854 0 0
 Hawking & Best 2,836 6 8 Smith & Co. 2,812 16 9
 E. Harris 2,752 15 0 E. Pike, Tor-quay* 2,343 7 11

NORTHWOLD (Norfolk).—For erecting a Sunday-school, for the Primitive Methodists, Mr. E. Snare, architect, 82, Alderbrook-road, Balham, S.W. Quantities by architect:—
 K. G. Dye, North-wold £255 0 J. Contes £246 16

SHEFFIELD.—For the adaptation of the Old Medical school buildings for the purpose of the school of cookery and domestic science, for the Education Committee, Messrs. J. D. Webster & Son, architects:—
 H. Freckingham .. £2,025 T. Roper & Sons, J. Esheby & Son .. 1,075 Ltd. £995
 Dawson, Jones, & Co. 1,064 J. Vasey & Son 990
 W. & A. Forsdike .. 1,030 H. Boot & Son 970
 D. O'Neill & Son .. 1,022 G. Allison & Son, G. Longlen & Son, Ltd. 1,005
 A. Bradbury & Son 1,033 Nottingham* 952
 [All of Sheffield.]

SOUTHALL.—For sewer and surface water drain, Rectory-road, for the Southall-Norwood Urban District Council, Mr. Reginald Brown, Engineer and Surveyor, Public Offices, Southall.—
 H. Hyde £1,290 0 0 Napier £826 8 1
 H. Date 863 7 6 H. Morcroft .. 817 0 0
 Rayner 854 5 3 T. Watson jun., A. & B. Ham-son, 838 14 6 Marsh 734 6 0
 Etheridge 835 6 1 Reade 710 7 6
 Wheeler 827 12 8 L. Johnson .. 697 7 6
 [Engineer's estimate, £755.]

SOUTHEND-ON-SEA.—For new school, Bourne-mouth Park-road, for the Education Committee, Messrs. Greenhalch & Beekbank, architects, Bank-chambers, Southend. Quantities by Mr. G. T. G. Wright, "Book-wood," 54, York-road, Southend-on-Sea.—
 J. S. Hammond & Son, Romford* £11,175

TYWARDREATH (Cornwall).—For the renovation and alteration of the Wesleyan Church, Tywardreath, Par Station, Mr. F. C. Jury, architect, 1, Alma villas, Tregonissey-road, St. Austell.—

Masonry.

R. Richards	£335 0
N. Pearce	210 12

Carpentry.

T. Smith	626 0
J. T. Dunn	607 0
W. H. Hewett	536 0

Masonry and Carpentry.

J. P. Isbell	940 0
W. H. Hewett	865 0
F. A. Truscott, Plymouth*	716 0

TYDWELLLOG.—For erecting a new Council school, Mr. R. Lloyd Jones, County Architect, 7, New-street, Pwllhell.—
 W. & R. Jones, Pwllhell* £2,250 10

WALTON.—For drainage works, Walton, for Wakefield Rural District Council, Mr. F. Massie, Engineer.—
 Wilson Bros., Park-lane, Wakefield* .. £1,607 12 7

WARRENPOINT.—For constructing sea baths, for the Urban District Council, Messrs. Kaye, Parry, & Rose, engineers and architects, 63, Dawson-street, Dublin. Quantities by Messrs. Beckett & Medcalf.—
 P. McAlinson £7,500 D. Neany 55,280
 K. Kees & McMalley 6,361 D. Mohood 5,096
 A. Hall & Co. 5,800 R. Carry & Co. 4,950
 H. Lavery & Co. 5,728 M. C. L. aughlin & R. Colhouse 5,680 Harvey 4,900
 J. & W. Stewart .. 5,620 R. J. Martin, Ltd. 4,843
 Gollen Bros., Ltd., 5,488 A. Fraser 4,749
 Courtney & Co. 5,374 O'Connor & Martin, Lowry & Percy .. 5,295 Drogheda 4,654
 W. J. Campbell & Sons 5,240 Brabner & Co. 3,403
 [Recommended for acceptance.]

WERRINGTON.—For erecting a house at Werrington Industrial School, Mr. J. Beardmore, architect, Bucknall.—
 Tom p k i n s o n & J. Moss 566
 Betty 4737 Fielding & Son 651
 P. Bennion 729 J. Cummings 596
 W. Alcock 682 T. Godwin 581

WHITEBURN.—For laying sewer and the construction of manholes, for South Shields Rural District Council, Mr. J. H. Morton, architect, King-street, South Shields.—
 W. Whitburn Seer. Greetham Bros. 566 4 6 J. Arundel 250 17 6
 J. W. White 63 5 8 R. M. Storey 58 11 8
 G. E. Simpson .. 63 5 0 W. D. Allison .. 85 0 0
 J. M. Wright .. 61 7 0 J. H. Hall, Harton, J. T. Charlton .. 60 9 0 South Shields* 53 17 6

Ventilating Shafts, Bolton Colliery.

J. H. Hall £105 5 0	J. Arundel £145 12 6
G. E. Simpson .. 195 0 0	J. Wells, Lumley
R. M. Storey .. 170 17 6	Villa, Cleadon
Greetham Bros. 160 15 0	Sunderland* .. 134 0 0
J. Young 147 10 0	J. M. Wright .. 140 10 0

WRENTHAM.—For erecting two houses, warehouse, offices, stables, and cart shed, Pentrice, for Mr. G. Vignar, Mr. M. J. Gunnor, architect, Egerton-street, Wrexham.—
 W. E. Samuels ... £1,725 Davies Bros., Hill- W. Hughes 1,635 J. Street £1,550
 W. B. Woolley .. 1,613 Lewis Bros. 1,543
 T. Jones 1,603
 [Architect's estimate, £1,600.]

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The Care of Ancient Monuments.



HE perception that ancient monuments are of value to the modern world is almost entirely a growth of comparatively recent years. There is no evidence of

the existence of any such feeling in the Roman world; on the contrary, the Romans cut and carved, and swept away ancient buildings, wherever they went, to erect their own structures on the sites. Both with Greeks and Romans there were certain temples or altars which were sacred for religious reasons, but not on historic grounds. There was no trace in the Middle Ages of any feeling as to the vestiges of a historic past, for practically there was no history; and the architect of the XVth century would pull down the much finer work of the XIIth or XIIIth, to make way for his own, without the slightest compunction. The Italian Renaissance seemed the dawn of an interest in ancient monuments, but it was an interest for the sake of their art, not for the sake of their historic significance. It is only well within the century just past that the perception has grown up that the relics of the past condition of a country, embodied in ancient monuments, were very important historic evidences, to be preserved with religious care, as things which, once destroyed, can in no possible sense be replaced. And in this

country we are still very backward in this respect. The average Englishman is almost entirely concerned with the present; it has been exceedingly difficult to get our Parliament to pass even inadequate and half-hearted legislation for the preservation of ancient monuments; anything like compulsory interference is regarded as an invasion of the sacred rights of individual property; and a perception of the historical value of ancient relics has to be thrust upon our community, as it were, at the point of the sword.

The important subject of the preservation of ancient monuments by State care and legislation has been treated systematically in a small book recently brought out by Professor Baldwin Brown,* in which the subject is considered under two heads—the first division dealing with the Principles and Practice of Monument Administration, and the second with the actual facts as to such administration in the various European Countries. In this country the question which will be most debated is the right of Government to interfere in regard to monuments which are legally private property. Our public and our legislators are abnormally sensitive as to private rights, and very indifferent, for the most part, in regard to the historic and national value of monuments which are unique, and which, once destroyed

or seriously impaired, can never be replaced. Railway companies may easily get permission to take private property, or to injure its amenities, for the carrying out of a new line, provided that they can show that there is, or is likely to be, a travelling clientele for the line. But those who wish to preserve historic monuments from possible injury or destruction at the hands of private possessors are at once met by the cry of interference with the hereditary rights of private ownership, which, it is argued, are to be sacrificed merely to gratify the fancies of archæological faddists. The "mild and unpretentious Monument Act of 1882," as Professor Brown characterises it, originally contained a clause under which a private owner who possessed an ancient monument and wished to destroy it, was bound to offer it first for purchase at a valuation by the Treasury.

"This limitation on the freedom of an owner to destroy what might be a unique work of genius and a priceless national possession the British Parliament refused to accept, and the Act carried contains no compulsory provisions at all. Yet this innocuous measure, with all its teeth drawn, was protested against to the last in the House of Commons as 'an invasion of the rights of property' in order to gratify the antiquarian tastes of the few at the public expense!"

We should be disposed to go further than even the original Bill proposed, and to rule that the owner of such a monument should be obliged to maintain it with care and either to report periodically to the Government as to its condition, or to accept the periodical visit of a Government Inspector of historic monuments to see to their condition. But how different is the view of the

* "The Care of Ancient Monuments": an account of the legislative and other measures adopted in European countries for protecting ancient monuments and objects and scenes of natural beauty, and for preserving the aspect of historical cities. By G. Baldwin Brown, M.A., Watson Gordon Professor of Fine Art in the University of Edinburgh. Cambridge University Press; 1905.

subject taken in some other countries will be evident from the following summary by the author of the effect of the Italian Act of 1902:—

"No proprietor may demolish or alter monumental remains existing on his estate unless he can convince the authorities that they are not worth preservation (Act, 11), nor without express leave do any work upon any part of them that is exposed to public view (Act, 10). If the officials responsible for the care of monuments become aware that works of repair or protection are necessary on a monument in private hands, they can call on the proprietor to carry these out within a certain time, and if he fail to do this they can step in and execute the work required, charging the proprietor with the economic value of the improvement (Act, 12; Reg., 127-8). If the private proprietor desire to sell a monument or object of art of special value, or have entered into a contract for such a sale with another party, he must give timely notice to the proper authorities, and must also make the proposed purchaser aware that the object is one on which the authorities have a lien."

In his chapter on France Professor Brown gives the history of the formation of the "Commission des Monuments Historiques," the status of which received legal sanction as late as 1887, though the work of the Commission had been going on for fifty years previously. The duties of the Commission were more especially defined in a decree of January 3, 1889. It was to establish a list of monuments possessing historical and artistic interest, to point out those which ought to be restored, to examine schemes presented for their restoration, and to lay before the Minister of Fine Arts proposals for the application of the funds voted for the preservation of the classified monuments. Up to 1887 the Commission had no legal power of safeguarding the monuments they had "classed"; they could advise and exhort, but could not enforce their views on owners, private or public, of monuments. And it appears that at this time a monument in the hands of a private owner might be "classé" without the owner being informed of the fact, which naturally led to much discontent when the owner was going to make some alteration on what he regarded as his own property, and found himself confronted by an Inspector of the Commission. The law of 1887 was to empower the Minister of Fine Art, after consultation with the Commission, to act in regard to monuments of any national interest, not only architectural monuments, but dolmens, menhirs, and even movable objects, such, we presume, as ancient church plate and other objects of artistic value. Professor Brown rightly criticises the wording of the phrase in the Act, "historical and artistic interest," which should evidently have been "historical or artistic," since the two conditions are not always found combined, and an object may be worth classifying and preserving for its historical value though it has no artistic interest; and we gather that practically this is the principle acted upon. The State may carry out compulsory purchase of an object when the owner is unable to maintain it: and in the case of a recalcitrant proprietor who refuses to allow a monument of national interest to be placed under the operation of the law, the Act authorises the Minister to set in motion the machinery for securing a compulsory purchase of the property in question; but it is admitted that the machinery moves slowly, and it appears that a mischievous or indifferent prop-

rietor may be able to injure a monument irreparably during the interim in which the "machinery" is being set in motion. He would in that case be liable to an action for damages on the part of the State, but there are no penal provisions; so that it would seem that some further legislation is needed for the entire protection of national monuments.

This careful and elaborate organisation for the preservation of national monuments in France has had also its serious drawback, to English feeling at all events, in the too great thoroughness with which the reparation of architectural monuments has been carried out. The French are nothing if not systematic; and, once an architectural monument being reported to be in a dangerous condition, nothing seems to have satisfied the Commission but a thorough restoration—in many cases so thorough that the architectural and historical value of a great building has been nearly scoured out, and the Commission might have been regarded in some instances as a worse enemy to the architectural preservation of a building, in the true sense of the words, than Time or an indifferent and ignorant proprietor. The French restoring architects, in fact, who are the agents and to a certain extent the advisers of the Commission, know too much, and are too anxious to leave all the traces of their knowledge on an ancient building. If they could have been content with repair instead of restoration the case would have been better. This view of the matter, it is almost needless to say, is fully recognised by the author of the book under notice.

We will turn now for a moment to the first division of the book, dealing with principles and practice—with what might or should be done. The chapter on the meaning and scope of the term "monument" proposes as wide an extension as possible, including all objects which have historic interest, whether erections or movable objects; and also great scenes and sites in nature—Niagara Falls for example, which indeed seem very much in need of some Commission of protection to prevent their being by little and little destroyed, or disfigured so as to lose all their impressiveness. In regard to erections, it is pleaded that, in addition to great architectural monuments whose value all would admit, there are the humbler domestic relics of older days—country cottages, street fountains, signboards, etc., which would not, as things are at present, find a place in any State inventory, but nevertheless have their value as relics of the past; and the author quotes the convenient German expression "das Stadtbild," meaning the general characteristic aspect of a city, as a possession not to be lightly broken into and destroyed. There are cases, in the growth of towns, in which the "Stadtbild" must almost inevitably give way to the practical demands of the present; there are others in which it is so unique and completely a part of the character of a city, that it ought to be preserved even at the cost of a little inconvenience to the modern generation. As a typical instance Venice is cited: "Venice is still Venice though the most conspicuous of its monuments has been overthrown; but it would cease to be Venice were all

the smaller canals, the network of which gives the place its *cachet*, filled in and macadamised!" Yet this is what the Venetian authorities, at one time at all events, were recommending; whether this bad dream has been definitely renoué we know not. But (as we have before suggested) it would seem almost worth while for the kingdoms of the world to combine to purchase Venice as a possession for ever, just to keep it being so absolutely unique a city in its ancient form.

In considering the question "Why should monuments be preserved?" Professor Brown gives what is, we think, a necessary warning against the too "perfidious zeal" of some archaeologists who will turn their back upon all practical considerations, and by this want of discrimination assist in raising a barrier of prejudice against the conservation of monuments. The tendency of the average English mind is to regard archaeological considerations as merely fanciful and to be necessarily and rightly postponed to practical requirements; and it is a point of wisdom not to strain matters too hard in opposition to this national tendency. Archaeologists who are moderate in their demands and show themselves willing to consider both sides of the subject, will be likely to do more with the practical Englishman than those who profess to regard him as a mere Philistine to be pushed on one side with contempt. As an example of what patience and goodwill may achieve in preserving public monuments, the author cites the case of the two churches in the Strand, for the demolition of which there was a popular clamour some years ago, on the ground that they were in the way of the traffic. They were, as he says, resolutely and successfully defended by the lovers of amenity, and "the result has been that in the extensive scheme now being carried out by the London County Council they are not only preserved but become foci of a large architectural composition. They have now not only ceased to be obstructions but have become ornaments, and the same time serve to point a warning against hasty demolition of the older features of our cities." In the chapter on "Restoration and anti-Restoration" Professor Brown also steers that middle course which so few people who deal with this subject know how to keep, and we are glad to see that he defends the restoration of Dunblane Cathedral, which was unreasonably opposed by the Society for the Protection of Ancient Buildings, and he expresses generally the view that there should be a distinction drawn between ancient buildings which are still in use for the purpose for which they were intended, and those which are ruins and out of use—between, as we may say, living and dead structures of the past.

Altogether, this is both a wise and a useful book, giving a summary of the existing state of the provisions for the preservation of monuments, and a reasonable theory as to what may be or ought to be done. There are two points to which we would put notes of interrogation. On page 8 the author quotes, in a footnote, from the *Journal* of the Institute of Architects, a passage commencing with the statement that though foreign countries are often supposed to rejoice

Ministers of the Fine Arts, "as a fact no Minister of Fine Arts pure and simple exists anywhere." This statement seems another example of what we have often noticed, that the Institute of Architects does not seem sufficiently awake to what goes on in France. If France has no Minister of Fine Arts, what, we may ask, is M. Dujardin-Beaumetz, who was appointed some two or three years ago Under-Secretary of State for Art, and who has been a very active and energetic official? And on page 95 there is the remark that the prohibition of some alterations to houses in the Place Vendôme was not, "as was supposed in Britain," due to the outraged taste of the artistic Parisians, or to the intervention of a despotic Minister of Fine Arts, but turned on the question of the building servitudes which the proposed alterations contravened. This seems an odd remark, for what were those building servitudes enacted for at all, except for the express purpose of providing against the disfiguration of architecturally designed squares and streets? And that there was public interest in and discussion of the subject in Paris at the time, we have the best reason to know.

THE OPENING OF THE GREENWICH ELECTRICITY GENERATING STATION.

THE new generating station for the power required by the London County Council tramways was opened on Saturday by Mr. Evan Spicer, the Chairman of the Council. It was naturally made the opportunity for a good deal of self-congratulation on the part of the Council. All those who saw for the first time a station for generating electric power "in bulk" must have been considerably impressed with the magnitude of the machinery. They must also have been impressed with the familiar way the councillors talked of tens of thousands of horse-power. What struck us most after hearing the speeches and seeing the station was the enormous importance of the "antiquation factor" in electrical work. We understand that the generators for the half of the station which is not yet completed will be low-speed turbo-generator sets, and not low-speed reciprocating engine generator sets like those which have been installed in the first half. This would meet with the almost universal approval of power engineers at the present day.

When the station is completed, therefore, the people of London will have on one side of their Greenwich Power House enormous low-speed reciprocating engines and generators, and on the other high-speed turbo-generator sets of the same power, occupying very much less floor space, and probably requiring a very much smaller amount of attention.

The question naturally arises whether the engineers responsible for the work were rash in fixing on the low-speed type of generating plant at a time when steam turbines and turbo-generators had passed out of the experimental stage, and had been running for two or three years at several stations in this country and abroad. For instance, two Parsons turbo-alternators of 1,500 horse-power each had been supplied to the city

of Elberfeld in Germany in 1900, and were tested most carefully by a committee of German experts with most satisfactory results. It has to be remembered, however, that even intelligent anticipation of future practice is always more or less in the nature of an experiment, and involves risk. The unfortunate experiences of the London Electric Supply Corporation with their power station at Deptford in 1889 is a case in point. Those who are responsible for the spending of the ratepayers' money are rightly chary of doing anything in the nature of pioneer work. It is possible also that in the immediate future the question of gas turbines will have to be considered, and if they prove successful the present practice of using steam turbines will have to be abandoned. There is no reason why the gases produced by continuous explosions should not be passed through suitable turbines, and in this way, judging from the theoretical standpoint, great economy would follow. Luckily the saving effected by steam turbines and high-speed machinery over a thoroughly well-designed low-speed system is not very great, and so the machinery installed will probably run for many years.

The site of the station is on the bank of the river close to Greenwich Hospital, and it has been well chosen so far as facilities for obtaining coal economically and for obtaining water for condenser purposes are concerned. At present about 25,000 horse-power is available for working the tramways, half the station being practically finished. The four large engines, which form the most important links in the chain connecting the heat developed in the furnaces with the mechanical power generated in the tramway motors, are of the "vertical-horizontal" type. They work at a steam pressure of 180 lb., and run at the low speed of ninety-four revolutions per minute. Only a high-pressure and a low-pressure cylinder are used, but in passing from one to the other the steam passes through a receiver, where it is heated by live steam direct from the boiler. Each engine consists of two complete "half-engines," one on each side of the generator, so as to secure a proper balance of the shaft and an even turning movement. The exhaust steam passes from the low-pressure cylinder to a condenser in the basement. The normal output of the engines is about 5,000 horse-power.

The electric generators are coupled directly to the engines, and generate current at 6,600 volts. Being slow speed their size is enormous compared with generators of equal power in other power stations. We noticed that in accordance with modern practice the field magnet coils were wound with bare copper strip tape placed edgewise. As these coils are whirled through the air at a high speed the copper is effectively kept cool. The magnets are built up of laminated steel stampings, and hence the eddy currents which often cause serious loss in large alternators are avoided.

The armatures are star-wound with the centre connected to earth. This limits the maximum possible pressure between any point of the machines,

or the networks linked with them, and earth. We suppose that the corresponding windings of the motor-generators at the sub-stations are also connected with earth in the same way as in other power distribution systems. Any want of balance in the windings, therefore, or in the load, will send a current of triple frequency through the earth *via* the water and gas pipes. It would be interesting to know if power engineers take any records of this current.

The main switch gear is simple and is admirably adapted for its purpose: The high-tension switches are operated by means of low-tension motors. The operator can see the instruments on the switchboard, and faces the engine-room when at work. The main cables leave the station by two groups; one group, passing through the Blackwall Tunnel, will supply the tramways on the North of London, and the other the tramways on the South. The factor of safety of the cables has been made extremely high, so that no special precautions need be taken when switching them on or off. This is a step in the right direction.

NOTES.

The Building Trade. The labour returns published for April showed for the first time some improvement in the building trade. It has hitherto not benefited with the activity apparent in other classes of employment. In reply to a question asked in the House on May 23 the President of the Local Government Board asserted that the condition of the building trade was improving rapidly, and that everything pointed to the building trade joining in the increased prosperity of other trades. Let us hope that the next labour returns will confirm the optimism of the right honourable gentleman.

The Channel Tunnel Again. WITH the advent of a new administration, the hopes of those who would construct a tunnel between England and France have so far revived that an early opportunity will be taken of submitting a resolution to the House of Commons in favour of the project, which has been dormant for nearly a quarter of a century. With the object of preparing the public for discussion of the subject a pamphlet has been issued in which are presented some favourable evidence given before the Joint Parliamentary Committee in 1883, and other information bearing upon the advantages expected to follow the execution of the work. Considering the wonderful improvement that has been effected in the speed and comfort of vessels engaged in the cross Channel service—so that the journey between Dover and Calais is now accomplished in about one hour—and the popularity of other and longer routes between England and the Continent, we are doubtful whether the increase of passenger traffic would be sufficient to justify the cost of constructing a tunnel, and still more dubious as to the utility of a sub-aqueous route for goods traffic, except perhaps to those engaged in one or two special branches of import trade. If nervous people dread the much-advertised terrors

of *mal de mer*, we believe they would fear still more the serious risks inseparable from the journey through a thirty-mile railway tunnel. Moreover, it is by no means certain that the execution of such a work would be possible. The opinion of independent engineers is that serious faults may exist in the bed of chalk upon whose assumed continuity the practicability of the scheme absolutely depends. If in this layer there is a single fault such as would permit the penetration of water to the workings, then tunnelling would clearly be impossible, because the necessary depth below sea level is so great as to forbid the conduct of operations under the heavy air-pressure by which alone water could be excluded.

San Francisco. THE American technical journals last to hand contain full particulars and numerous photographic views of buildings in San Francisco taken after the earthquake and fire. These accounts confirm the somewhat scanty technical details that had previously reached this country, and justify the conclusions we have already expressed. They make still more clear the facts that for lofty buildings the steel frame is an admirable safeguard against shock, and that for buildings of moderate height good solid stone and brick masonry and substantial timber framework are little liable to damage by earthquake. But the additional point is now demonstrated that buildings standing upon foundations carried down to solid rock, or upon piles driven into well compacted strata, suffer far less than those founded upon made ground and alluvial soil. The most recent evidence from San Francisco shows conclusively that the temporary shaking of rock well below the surface, while not causing serious effects upon the best types of construction, was sufficient to throw the less stable surface ground into wavelike undulations of most destructive character. A little reflection suggests that it is far less trying for any building to be shaken by tremors transmitted from a distance than to be violently tossed up and down on the surface of land reproducing in some measure the characteristics of a storm at sea.

Powers of Local Authorities. THE case of Attorney-General *v.* Pontypridd Urban District Council (reported in the *Builder*, May 26, 1906), noted in these columns August 26, 1905, has been carried to the Court of Appeal, but the decision of the Court below has been affirmed. It will be remembered that the defendant Council had purchased certain land from the relators under powers conferred upon them by the Electric Lighting Acts for carrying out a system of electric lighting. The Council then wished to erect a dust destructor on the land, intending to generate the electric light by the heat so produced. The relators objected to this use of the land, and Mr. Justice Farwell held it was outside the powers conferred upon them. The Court of Appeal have upheld this judgment upon the ground that the erection and use of the dust destructor was not within the meaning of the Acts "necessary and incidental to" the supply of electric light. The

Local Government Board had advised the Council that they could not sanction the use of the land for this purpose, but had suggested that the relators might purchase back the land and then resell it to the Council for the special purpose under the Public Health Acts. The relators, the original vendors, however, would not do this, and then the Council had endeavoured to get over the difficulty by a friendly sale and repurchase to and from a third person. This legal fiction seems to have been of no effect, and serious injustice would be done were land to be sold for a specific purpose, and then its use converted to some other purpose by any such fictitious sale without the concurrence of the vendor. The Council acted *bona fide*, and in the interest of the ratepayers, and Lord Justice Romer expressed some regret that he had had to come to the conclusion involved in the judgment. All the same, local authorities who are seeking to extend their operations in so many directions may well be reminded of the limits of their powers as conferred by statute.

Drainage Authorities. THE complications involved by the system of Local Government in London is illustrated by the case of Mayor, etc., of Westminster *v.* London County Council. In about the year 1849 the Commissioners of Sewers consented to the drainage of three houses, now known as 102 to 104, Grosvenor-road, into the Thames. This drain, the special case stated, was at the passing of the Metropolis Management Act, 1855, a combined drain under sect. 74. In 1870 the Church of All Saints, with or without the consent of the vestry, was also drained into this drain, thereby we presume the drain was converted into a "sewer." The vestry ensured the proper working of a tidal flap controlling the flow of sewage, and in 1899 their successors, the Westminster City Council, undertook the same duty. The Thames Conservancy Act of 1894 prohibited drainage into the Thames, and then the only practical method of draining these houses was to carry the sewage to the metropolitan main sewer in Lupus-street, but it was decided that the London County Council had no power to order the Westminster Council to connect the houses with the low level sewer of the London County Council in Lupus-street. The Westminster Corporation have connected the houses with the Rutland-street sewer, and now were claiming the cost from the London County Council, the question being whether the London County Council were bound to provide means to prevent the sewage passing into the Thames. The result of the judgment appears to be that sect. 135 of the Metropolis Management Act, 1855, gave the Metropolitan Board of Works, the predecessors of the London County Council, a discretion as to what main sewers should be necessary to prevent the flow of sewage into the Thames, that in their opinion the low level sewer in Lupus-street sufficed, and that under sect. 69 it was for the vestries to drain their own districts, which would include the sewer in Rutland-street, and that the amending Act of 1858 carried the matter no further. With the changes in jurisdiction effected

in recent years, and the creation of new authorities, it seems absurd that reference should still have to be made to the old Metropolitan Acts of 1855 and onwards, and a codification of this branch of the statute law is certainly urgently needed.

Houses "Unit for Habitation." IN the case of Slight *v.* Portsmouth Corporation, at present very shortly reported, a curious point seems to have been taken. Some old houses in Portsmouth, having fallen into disrepair, were ordered to be closed as unfit for habitation on April 12, 1904, under a by-law then in force, but since repealed and replaced by another. From the date of this order the houses had remained uninhabited and had not been let or used. Proceedings having been taken under the Housing of the Working Classes Acts, 1890 and 1903, for a closing order, it was contended that by virtue of the previous order these houses had ceased to be "dwelling houses" within the meaning of those Acts, and that no power existed to make a further order under the above Acts in respect of them. This contention was, however, negatived by the Divisional Court.

Colour Photometry. THE paper on "Colour Phenomena in Photometry," by Mr. J. S. Dow, which was read to the Physical Society last week, is one of considerable importance at the present time. We have always considered that the "candle-power" of a source of illumination depends very considerably on the colour of the light it emits, and Mr. Dow quoted results and showed experiments which proved this conclusively. He showed, for example, the Purkinje phenomenon. A sheet of blue and a sheet of red paper were placed on the screen. In a bright light both appeared equally distinct. In a dim light, however, the blue appeared to be much the more distinct. The author's explanation of this phenomenon and of several others which occur when comparing lights of different colours was physiological, depending on the distribution of the rods and cones in the retina of the eye. Whatever theory we adopt as to the difference between the functions of these rods and cones, the effect produced must vary with their relative numbers on the part of the retina covered with the image of the illuminated disc of the photometer. The cones are more numerous than the rods near the centre of the retina, but are less numerous near its circumference. This irregular distribution explains how the relative brightness of different colours varies as the eye looks at them from different distances. In the discussion, Mr. A. P. Trotter pointed out the commercial importance of being able to rate lamps emitting differently coloured rays in candle-power, and stated that there was little difficulty in comparing the intensity of colours which came near to one another on the spectrum. Mr. A. Russell mentioned that there were only cones on the yellow spot on the retina, and so if care were taken that the image of the photometer disc always fell on this spot consistent results would be obtained. He also pointed out that the old-fashioned

grease-spot photometer was the best for heterochromic photometry, as the light transmitted through the spot made the colours on both sides more nearly the same and so made the obtaining of a "balance" an easy matter.

MR. NIGEL BOND, secretary to the National Trust, makes an appeal for a sum of 500*l.* to enable the trust to complete the purchase of this fine old Tudor mansion, with 220 acres of land, towards which an anonymous donor contributes 10,000*l.* upon certain conditions. A further amount of 1,000*l.* should be forthcoming in order that the fabric may be rendered weather-tight, and that the façade may be repaired. Barrington Court, about four miles distant from Iminster, was built of Hamhill stone in the middle of the XVIIth century, by, it is believed, Henry Daubeney, second Baron and first Earl of Bridgewater, who died in 1548; the manor had vested during a long period previously in his family. In 1605 Sir Thomas Philips, Bart., bought the property, which has of late years been occupied as a farmhouse. Some eighty years ago a fire greatly damaged half of the interior; some wainscoting has been wantonly stripped away, and the great hall is converted for the storage of eider. The house is E-shaped on plan, having two end-wings and a central porch. The general design presents but little of the classic influence so prevalent in similar houses of the period we indicate; there is not much ornamental detail, but the twisted finials of the gables and the twisted chimneys are notable elements of the composition. The Duke of Monmouth sojourned at Barrington Court when making his progress in the West Country.

A Remarkable House. In the fine avenue of Addison-road a dwelling-house is in progress, and is now finished externally, which has excited a great deal of notice from passers-by, and is worth the attention of architects as an experiment in structural polychromy of a kind quite new, as far as we are aware, in this country. A coloured elevation of this house, of which Mr. Ricardo is the architect, was exhibited at the Royal Academy a year or two ago; we did not feel very much drawn to it at the time, but in execution it is much more effective than it appeared in the drawing. The whole exterior of the house is in glazed material; Messrs. Doulton's white "Carrara" material for the pilasters and capitals and cornices, and other features which in a brick and stone house would be described as "stone dressings"; the wall-faces between are in Burmantofts bricks, giving large masses of light blue, interspersed with bands of other colours; nothing very strong; the whole effect is harmonious when you consider it in itself and apart from the rather startling contrast which it makes with the sober every-day tones of the other houses along the road. There is a very bold modillion cornice carried round great part of the exterior, with another and a subordinate modillion cornice above; the roof is covered with a special glazed roofing tile, semi-circular in section, obtained

from Spain, which keeps up the glazed surface effect, while its ridged appearance gives texture and scale to the whole. The treatment of part of the wall in a series of three large arches springing from pilasters, with the windows grouped beneath them, is to our thinking not quite domestic enough in appearance, and gives a kind of suggestion of its being a small public building rather than a private residence; but opinions may differ on that point. The house is at all events a most interesting architectural experiment, and we may congratulate Mr. Ricardo on having had an opportunity of carrying out his predilection for coloured architecture in so complete a manner.

Paddington Technical Institute.

THE Exhibition of students' work at the Paddington Technical Institute was opened on Friday, the 25th ult. The Institute was first opened in 1904 by the London County Council as a technical school, and the number of pupils entered this session is 970, a large and increasing proportion of whom are engaged in technical industries. The school is particularly suitable for engineering students, and contains a fine engineering laboratory in the basement, well-fitted with machine latnes, planing and shaping machines, etc. There is also a motor-car class, with an M.C.C. car for experimental purposes. A large amount of student work done in the various classes was on view. In the stone-carving room some good clean-cut alphabets of beautiful design were to be seen. Another large class-room was filled with drawings of building construction, chiefly elementary, also a few interesting measured drawings of St. Saviour's, Southwark, and one or two designs for houses, the latter, however, apparently executed by the class teachers, and not by the students themselves. We notice that there is a small land-surveying class. It seems a pity that more students do not take advantage of this useful and profitable branch. In the adjoining room some really good specimens of embroidery work were shown. The other art classes, however, would appear to be in a somewhat languishing condition if one is to judge by the number and quality of the exhibits.

The German Exhibition at Knightsbridge.

WE hope we may conclude that the "Exhibition of Modern German Art" in the Prince's Hall at Knightsbridge does not really afford a fair representation of that art; if so, the less said about German art the better; but we have rather a suspicion that it gives Londoners the same kind of impression of German art which might be afforded of English art by an exhibition of the New English Art Club in Berlin. A few good things are lent by the Berlin National Gallery, such as Herr Liehermann's "Flax-Cleaning in Holland" and Herr Olde's "Winter Sun," a very powerful piece of winter landscape effect; but even the Berlin National Gallery contributes one terrible picture in the shape of Herr Böcklin's "Elysian Fields," a fantasy in hard texture and horrible colour which we imagine would be crossed at the back at once by a Royal Academy hanging

Committee. Herr Exter's "A Barber" is a fine and powerful nude study, good in colour and effect; and among other works which relieve the general medley of the ugly and the vulgar in painting are Herr Dettmann's landscape "In the Park"; Herr von Keller's "Lady in Black," a small portrait study very interesting in character and expression; Herr Kraus's "Hopless Attempt"; and Herr Lepsins's "Portrait of Professor Dilthey." But of a great proportion of the pictures it is only a question whether they excite anger at their ugliness and vulgarity or laughter at their absurdity; As already observed, however, we cannot believe that this is in any true sense a representative collection of modern German art.

Mr. D. Farquharson's Exhibition.

IN the upper room at Messrs. Tooth & Son's new gallery in Boud-street is a collection of nearly thirty small landscapes by Mr. D. Farquharson, who, since his comparatively recent appearance in the Royal Academy exhibitions, has taken almost immediately and by common consent a very high place, if not the highest, among contemporary English landscape-painters. This exhibition is of interest as showing that Mr. Farquharson, who has been known at the Academy chiefly by paintings on a large scale, loses none of his power when working on a small scale; we go from one picture to another, and all are fine in composition and colour. If we were to select some for mention as especially good, we should name "A Valley by the Sea" (53); "Hedgerows in May" (57); "Golden Autumn" (58); "In Athol Woods" (64); and "Up Among the Grouse" (71); the last a quite perfect little landscape.

The Handel Festival.

WE may draw the attention of our (probably) numerous readers who are interested in music to the fact that this is again the Handel Festival year, the three performances of which are to be held on the 26th, 28th, and 30th of June. On the 26th the *Messiah* will be given; the second day, the 28th, will be devoted as usual to a selection, to include some things which are seldom heard, and to include also a selection from *Israel in Egypt*, instead of making this, as usual, the subject of the third day's performance. This alteration may be regretted by some, but we presume that the intention is to give those portions of *Israel* which are undoubtedly Handel's, and omit the considerable number of borrowed movements from older composers. *Israel* has got to be regarded as a complete work, but (as is well known to musicians) it is really a patchwork, in which a good many pieces are adapted or adopted from one or two older Italian composers of church music, in order to fill up an entertainment for which Handel apparently had not time to compose the whole music.* The third day, June 30, is to be devoted to *Judas Maccabeus*.

* At the time of the last Festival but one the *Pall Mall Gazette* published, the day before the *Israel* performance, a complete analysis of these borrowings, by the Editor of this Journal (who has made a special study of the subject), showing exactly what portions of the oratorio are really Handel's and what are not. The genuine portions, it should be added, are immeasurably superior to the rest.

one of Handel's finest and most effective oratorios, which has not hitherto been given as a whole at any of the Festivals. We call our readers' attention to the subject more especially because the fashionable musical opinion of London (if it can be dignified by the name of opinion) has recently taken the turn of a resolute depreciation of Handel, and the shallow musical criticism of the daily press is occupied in sneering at the Handel Festivals as a kind of entertainment only suitable for country cousins. This is a mere piece of foolish cant; the Handel Festival is one of the finest things we do in England, and ought to be supported by all those who take their intellectual pleasures seriously.

ARCHITECTURE AT THE ROYAL ACADEMY.—II.

THE model of a monument to the late Lord Dufferin, to be erected at Belfast (1615), is a conspicuous object in the Architectural Room; the sculpture by Mr. Pomeroy, the architectural portion by Mr. A. B. Thomas. This is an architectural canopy, oblong on plan, supported at the angles on Ionic columns carrying slices of entablature on them in the rather awkward manner which long architectural custom has sanctioned. It is arched over the long way, by a semi-circular arch which carries a pedestal on which is a figure; on the short sides the opening is bridged by low-pitched segmental arches which abut rather awkwardly against the pulvinate frieze; but as a whole it is a good and effective architectural design of the kind, and the plan of the pedestal and steps, with their curved lines, is well contrived. Beneath the canopy is a portrait statue, and on either side of the pedestal are seated figures representing respectively India and Canada. Gilded festoons of bronze are drooped as decorations across the front and back of the arch. The only remaining model in the room, Mr. Creswick's "Proposed House at Buenos Ayres" (1614), may be noticed here, though it comes under the head of domestic architecture, which we are not specially considering in this article. It looks, perhaps, with its central dome, a little too much like a public building, but it is designed to have a character suitable to a sunny climate, with loggias with coupled columns running round a considerable portion of the house, carrying lean-to tiled roofs. The dome is not very well connected with the four square flat-topped piers from which it springs, and the flat-topped blocks on the lower level seem rather to want something on them, though this may be more evident in the model than it would be in the building itself seen from the ground level. As a whole, though it seems to want "pulling together" rather in detail, it is a good architectural conception, shown in a well-executed model.

Among designs for public buildings some for the Wesleyan Hall are conspicuous. Mr. J. A. Swan exhibits what we take to be his perspective sketch in the first competition (1401), which is not so satisfactory as the completed design published in our issue of July 22 last year; as shown in this sketch, the flat finish of the centre portion between the towers looks awkward and has no connexion in its cornice line with anything else in the design; in the second competition this was rectified and the line of cornice carried round the towers; but in any case there is an awkward gap between the towers, which seems to want filling up. The author is to be commended for showing plans in connexion with the view, though on a very small scale. Messrs. Runtz & Ford exhibit their sketch design (1406; no plan), in a very pretty washed drawing. They treat the building with a solid rusticated base of two stories, with an Ionic order above; the general effect is decidedly pleasing, though the design of the dome is rather weak. Messrs. Lanchester & Rickards exhibit the fine perspective view of their design (1393; no plan), which we published on June 24 of last year; and Mr. E. Vincent Harris exhibits both his preliminary and final designs (1407, 1408; no plan), the latter of which

was published in our issue of August 5 of last year. These we need only refer to; they were noticed fully at the time of the competition. Messrs. Malloys & Cross exhibit their sketch design (1409), a small perspective drawing showing some originality of treatment in the principal block. We notice in this and in one or two other designs with domes a practice of placing a lantern on a dome with its line tucked-in, so to speak, at the base, leaving a crevice between the base of the lantern and the dome, which to our eyes has a very bad effect; the lantern should grow out of the dome, not look as if perched upon it with a spreading base of its own quite independent of the surface of the dome.

Two drawings by Mr. Norman Shaw remained unnoticed in our first article; and though they belong strictly perhaps to street architecture rather than to public buildings, they are two of the most important designs in the room. One of these, the new offices of the Alliance Assurance Company in St. James's-street, has been published, since the Academy opened, in our issue of May 19, and was previously the subject of a very appreciative notice in our columns under the head of "Notes on New Buildings in London" (February 3, pages 111-112), so that we need not return to it further at present. The other is Mr. Shaw's design for the front of the Piccadilly Hotel, "now building from designs prepared for H.M. Office of Woods" (1439); the fact that there is no plan to this may be excused on the ground that this is confessedly only a design, prepared at the request of the Office of Woods, for the street face of the building, and that the plan was not Mr. Shaw's concern. This front has a certain relation, *via* Air-street, to the new front of the Quadrant, and accordingly the character of the strongly-rusticated lower story of the Quadrant, with its arches and mezzanine windows, is continued here; above that the character of the design is entirely different from that of the Quadrant. A nearly unbroken row of small windows, running across above the arcade, binds the whole composition together; above this the centre portion is recessed, with an open colonnade across it, which will have an admirable effect; the ends are treated as gabled pavilions, with a picturesque arrangement of windows. The corbelled-out turrets perched on the centre of each semi-circular gable-head may be open to criticism, not as to their appearance, for they form very pretty features, but as being too much of the nature of constructed ornament; for in spite of the little windows in them, it is difficult to understand of what possible utility they can be, and yet they are rather too large to be justified for show only. But as a whole, this will be a very fine addition to the architecture of Piccadilly, superior to anything at present to be seen in this eastern portion of the thoroughfare, in spite of Burlington House and the Ritz Hotel, both of which are very commonplace pieces of architecture in comparison.

Messrs. Newman & Newman's "Design for Municipal Buildings, Burnley" (1417; no plan) is a suitable and municipal-looking building, composed of architectural materials which are pretty well worn. There is more originality in Messrs. Blomfield & Spiller's "Competitive Design for Library at Wakefield" (1416; no plan), a one-storied building with large windows divided into small panes, running right up to a widely-projecting cornice; over the central portion, over a slight break in the wall line, a wide curved pediment is carried, including some sculptured ornament beneath it; there is a low glazed dome behind. It would look like a library were there not a suspicion that, with the large windows, there is not enough wall-space for books; a plan would have shown how it was managed in this respect. The absence of plans is a crying evil in the architectural room, and there seems to be no improvement in this respect. This is still more felt in the case of Mr. A. Blomfield's "Council Offices, Woodford" (1440), a building on a triangular site which must have presented rather a difficulty in planning, and which may be very well planned, but we are left entirely to conjecture on this point; and the exterior, irrespective of the planning, is not of very much architectural interest.

Mr. J. J. Stevenson exhibits a drawing with some descriptive notes, of his restoration of the Mausoleum at Halicarnassus, "in accordance with the contemporary descriptions and measurements and the remains in the British Museum" (1436). It is rather to be bad that the drawing is hung so high that the descriptive notes cannot be read; a serious attempt at a reconstruction of the Mausoleum is an important exhibit, and ought to have been hung where the author's intentions and reasoning could have been understood. Mr. Stevenson's theory as to the Mausoleum has been noticed and (if we remember right) illustrated in our columns a good many years ago. The outline of the stepped *pteros* spreading out in a curve at the foot and rising afterwards in a steeper line, does not commend itself to us as very probable—it certainly looks very bad; but we admit that it has some support from the fragments of steps in the British Museum, some of them with wide and some with very narrow treads. The argument *per contra* is that no Greek architect would have been likely to build anything so awkward-looking to the eye. However, in the absence of the possibility of reading the notes on the drawing we cannot go into the subject from Mr. Stevenson's point of view; and if the Academy hangers could not see that a design of this kind was hung so that it could be intelligible to those who wished to study it, it might as well not have been hung at all.

Messrs. Warwick & Hall's design for the Hackney Central Library (1433; no plan) is a rather good Renaissance design, with canted angles emphasised by stone bands in the brickwork; the front features are coupled columns in three groups at regular intervals, one of them in centre of the front, above which a clock-beam stands out over the road; but in a design so generally symmetrical the position of the door between the centre and left-hand groups of columns, with nothing to balance it, looks rather awkward. Mr. Vincent Harris's "Proposed Town Hall, Dartmouth" (1474; no plan), is just the thing for a town hall for a small town; a quiet long low building with a row of circular-headed windows in a rusticated ground story, rectangular windows above, and a pediment and turret in the middle; a design recalling the style and feeling of some of our county-town municipal buildings. Mr. Brierley's "Interior of Council Chambers, County Hall, Northallerton" (1477), is a clean pen-line drawing of a Greek cross room with a dome and a large coffered arch over each face of the plan; adequate, but like many other council rooms. Mr. F. E. D. Edwards's "Bradford Town Hall—Proposed Extension" (1478), shows an important piece of work of considerable interest. The new portion of the plan, shown in black, is on a site coming down to a narrow end, where the dining-hall is placed, with a polygonal recess at each outer angle, the windows of which make a feature in the external architecture. The Council Room is placed as an internal room in the centre of the new building, with circular vestibules formed in the diverging corridors in order to get over the angle made by the Council Room entrance and the corridors. The architect has not carried on Lockwood & Mawson's Gothic exactly in the exterior treatment, except to reproduce their corbelled-out turret with gargoyles; otherwise he has made a more modern Gothic of his own, which serves to mark the added portion as new work. Altogether this is a very good addition scheme, both in plan and in exterior treatment.

Mr. Bradshaw's "Central Tower, Leysian Mission Buildings" (1436) is a remarkably effective and well-executed brush drawing in monochrome, showing a picturesque but very rambling and uncertain piece of design. Mr. Littler's "County Sessions House, Preston" (1487; no plan) is respectable municipal architecture, but not more, as Mr. Skipper's interior of the "Norwich Union Life Assurance Society's New Head Office" (1516) is respectable office architecture, owing its position chiefly, perhaps, to a very well-executed coloured perspective drawing in which marble columns play an important part. Messrs. Ernest George & Yeates's "Royal Exchange Buildings" (1522) were published in our issue of May 19, and need not be further described here; a plan was provided for our publication, but there is none in connexion

with the Academy drawing. Messrs. Eden & Mount's "Eton War Memorial—Second Preliminary Design" (1521: no plan) is a rather heavy Classic block with stone pavilions at the angles with an order of pilasters, and a stone columnar order on the brick face of the intervening wall; heavy obelisk finials appear above the pilasters of the angle pavilions, and statues above the columns; the whole is dignified but, as observed, rather heavy. Mr. Stokes has a pretty little water-colour drawing of "St. Mary's Training College, Newcastle—Showing Refectory" (1531: no plan); we presume the refectory is the low building joining the wings, with plain circular-headed stone-dressed windows, and intermediate little pilaster-like strips of stone starting from the string on the springing-line of the window-heads to finish under the eaves, a feature which seems to have no particular meaning or function except to make a little variety. Mr. Warren's exterior of the "New Dining-hall, Wellington College" (1535) is furnished with a plain, an outer columned loggia (which is a feature in this; there is a kind of general picturesque quality about it, but the architectural treatment is rather rambling and seems to lack a controlling motive. Mr. E. W. Twining exhibits in a very good perspective drawing his picturesque but perfectly unpractical design for "Proposed County Hall and Bridge over the Thames" (1541: no plan); this is a municipal hall in Gothic style built on a bridge, after the manner of one or two well-known French châteaux; a perfectly possible scheme in an architectural sense, but totally unpractical, for the reason that it necessarily presupposes a long and narrow building in which concentration of departments and offices would be impossible; there must be long communication corridors which would mean waste of time and energy in internal traffic, as any plan would be certain to have shown, so that in this case the author may be said to have acted wisely in not disclosing the inherent weakness of the scheme by a plan, but leaving it to produce its effect solely as a picturesque architectural combination, in which sense it is effective and deserving of praise.

Mr. Corlette's competition design for the University of Capetown (1552), to which plans are added, but hung too high to be seen, is architecturally an interesting attempt to give to this class of building an architectural character suited to a tropical climate, though the design seems a little too scattered and irregular. Mr. R. G. Kirkby's "Design for New Law Courts, Capetown" (1557: no plan), is well treated architecturally, the columned and pedimented pavilions at ends and centre contrasting effectively with the very simple treatment of the intervening portions. Mr. Caröe exhibits a large perspective drawing of his block of buildings in connexion with the Westminster improvement scheme (1563: small block plan only). Messrs. Scott & Hudson's "New Town Hall and Municipal Offices, Durban" (1593: no plan), is a dignified building with a good treatment of the angle pavilions; the cupola with its two stages is too high and too telescopic-looking in its design, and the rather heavy lantern shows again that awkward feature of the spreading base unconnected with the surface of the dome, to which we have alluded in another instance. No attempt has been made at any special treatment of the architecture suggested by the climate; it is a Northern classical building transported to Southern soil. Mr. Paul Waterhouse's "Refuge Assurance Company, Manchester: tower and additional wing" (1594) is a striking drawing showing the front in sharp perspective with a high sight-line—almost a bird's eye view; the tower stands nearly separate in a break in the frontage line, running up with a plain stalk carrying a lantern stage of unusual and effective design, with concave faces and free columns at the angles; the finishing stage seems rather too heavy in outline for its position; there is a plan, but too high to be studied. Mr. Mountford's "Lancaster Town Hall" (1601: no plan) is a Town Hall which, whether intentionally or not, represents what one may call Lancashire municipal style; a solid and dignified but rather heavy brown stone building (according to the colouring), with a columned portico on the entrance side, and a small wall portico with engaged

columns in the centre of the long side, the further portion of which shows a plain mass of wall with an immense blocking stage above the cornice line. This is a building with character in it, though of a somewhat ponderous type. Messrs. Pearson & Millburn's "Municipal Offices, Cheltenham" (1599: no plan), shown in a small and very well-executed water colour drawing, is one of the most original and pleasing public building designs in the room; there is a slight curve on plan in the front wall, flanked by a stone pavilion at each end, the intermediate portion being of brick walling with a small order of engaged stone columns in the upper story; a canted angle, with a small tower rising in the centre, is flanked by another stone pavilion which serves to connect it with the return face of the building; the effect of the whole is very pleasing. Messrs. Warwick & Hall's selected design for the Lambeth Municipal Buildings (1610: no plan) is inadequately shown in a rather rough pen sketch which does not do it justice; another design, by Mr. W. J. Hardcastle, for the same building (1612: no plan) is much more attractive as a drawing and is a pleasing design, but rather wanting concentration of motive, and the device of spreading out the angle rustication of the tower in a curve each way at the base is a very unhappy idea, involving almost a contradiction of conditions of structure.

LETTER FROM PARIS.

ACCORDING to the terms of the street regulation of Paris, the proprietors of the houses over the arcades of the Rue de Rivoli, from the Place de la Concorde to the Rue du Louvre, cannot modify the architectural lines of the composition nor alter the height of the buildings. Some of the proprietors, however, have shown themselves very refractory in respect of this rule, and the Administration has, to the surprise of most people, treated certain of them with a quite unexpected laxity. Thus the Automobile Club have been permitted to establish a terrace garden on the top of their building, and the proprietors of the Hôtel Menrice to add another story, to the great indignation of the "Vieux Paris" Committee. But in the present case the Municipality can do nothing, since the building concerned is on ground belonging to the State, and, as it appears, the Department of Fine Art will take no steps in the matter; apparently for the same motives that led them some years ago, on the commencement of the Rue Etienne Marcel, to accept the building of two lofty houses which destroy the harmony of the Place des Victoires.

The "Vieux Paris" Committee, whose efforts unfortunately are seldom successful, is also much moved by the scheme, presented by MM. Némot and Buquet, for the enlargement of the Chamber of Deputies. This scheme will involve the substitution for the existing façade, which makes a kind of pendant to the façade of the Madeleine at the other end of the same axis, of a completely new façade on an advanced frontage line and with an increased extension to right and left.

It is probable that the protest of the Committee will have no effect, for the Government is concerned with the question of finding space rather than with that of architectural effect, and the scheme in question will at all events secure a much larger and better ventilated Salle des Séances; and as an architectural scheme it does not merit the severe criticisms passed on it. It comprises a central peristyle, to which access is gained, as at present, by a great flight of steps occupying the whole width of the portico. In the latter, eight columns of the Corinthian order will support an entablature, the frieze of which is to be decorated with eight statues; above the main cornice is to be a balustraded attic ornamented in the centre by a large cartouche with seated supporting figures, and groups of emblematic decoration at the angles. Two wings, with pilasters of the same order as the columns, connect the portico with the two angle pavilions, which are to carry groups of sculpture. The general aspect is imposing, but it involves the suppression of the large pediment over the central portico built by Poyet at the beginning of the last century,

and which actually leads to nothing; whereas the large *perizon* of M. Némot's design will lead directly to the new Hall and will serve as the entrance for the Deputies. This is a manifest improvement, and therefore the criticisms of the "Vieux Paris" Committee will not count for anything. It is possible that the Committee may be more fortunate in another effort they are making, in regard to the Pont Notre Dame. This has to be rebuilt, and the Committee demand that this reconstruction should not involve the substitution of steel for masonry, and that the architectural character of the bridge should be preserved in the new structure. Unhappily the vestiges of old Paris are disappearing successively in consequence of the demands of modern life. Traffic circulation becomes more and more intense, and the requirements of hygiene are too often the enemies of the picturesque. Thus we shall soon see the disappearance of the Hôpital Andral, a picturesque but insanitary old building in the Rue des Tournelles, no longer of any utility. It is a former convent, dating from 1625, once belonging to the Hospitalières de la Charité, and which will now be delivered over to the "démolisseurs."

On the other hand, commemorative monuments and statues of celebrities more or less consecrated by time continue to encumber the public streets. We may make an exception, however, in regard to the fine monument to Cornélie inaugurated last Sunday, a rather tardy homage to a great Frenchman. As already noticed, the monument, erected on the Place du Panthéon, is the work of M. Allouard (sculptor) and M. Latour (architect). M. St. Marcoux will shortly have completed the monument to Dumás *filz* which he is carrying out for a site on the Place Malesherbes. We may mention also a monument to M. Gustave Larroumet, the former Secretary of the Académie des Beaux-Arts, which M. Roussel is executing on the lateral façade of the Théâtre Français, at the entry from the Palais Royal. At Neuilly will shortly be erected M. Pierre Gramet's statue of Alfred de Musset, to stand on a red marble pedestal in the round-point of the Porte Maillot, not far from Bartholdi's extravagant monument to the aeronauts of the Siege. M. Fremiet has just completed a monument to Rude, the great sculptor, which will find place in the Jardin de l'Infante of the Louvre, near the monuments to Boucher, Raffet, and Meissonier.

The exhibition of the works of Fantin-Latour at the Ecole des Beaux-Arts has attracted much interest, also that of the works of Gustave Moreau at the Georges Petit Gallery; among them especially "The Young Man and Death," "Jacob and the Angel," "Jason and Medea," "Helen on the Walls of Troy," etc., as well as some water-colour illustrations to La Fontaine's fables which are almost unknown to the public. There is talk of setting apart a special room at the Petit Palais for the works of Courbet, whose sister has just presented to the Municipality a remarkable picture by him, "Les Demeiselles de la Seine," and others of whose pictures can be collected by her aid. The scheme is regarded with some interest in view of the fact that Courbet might be considered to have been really the first Impressionist, and the precursor of Manet.

We have to record the death, at the age of 76, of M. Charles Lecœur, architect, of Paris, a pupil of Labrousse and of the Ecole des Beaux-Arts. He had been appointed, in 1860, architect to the Municipality of Compiègne, where he built the Hôtel of the Sous-Préfecture, as well as schools and other buildings; he built also the Mairie of Pierrefont. He had made a special study of school buildings, and was architect for a number of Lycées. He built also the thermal establishment of Bourbon l'Archambault, and the new establishment of the same kind at Vichy, with its theatre and casino. In spite of his large practice, M. Lecœur also carried out most efficiently the duties of architecte-expert to the Civil Tribunal at Paris, and his advice was very much valued in regard to many important technical questions, especially in regard to schools and colleges, which had to be considered and decided in the Department of Public Instruction. M. Lecœur was Chevalier of the Legion of Honour.

THE SEVENTH INTERNATIONAL CONGRESS OF ARCHITECTS.

The arrangements for this Congress, to be held in London from July 16 to 23, are rapidly approaching completion. The following are some extracts, published in the *Journal* of the Royal Institute of British Architects, from the provisional programme which will shortly be sent to members of the Congress:—

The headquarters of the Congress will be the Grafton Galleries, Grafton-street, W.

The inaugural meeting will take place at the Guildhall, E.C.

Meetings will be held both at the Grafton Galleries and the premises of the Royal Institute of British Architects, 9, Conduit-street, W., for the discussion of the subjects of the programme.

The Grafton Galleries will be open at ten o'clock on the morning of Monday, July 16, when the President will hold an informal reception.

Badges, tickets for visits, etc., cards of invitation, will be obtainable at the Congress Bureau, Grafton Galleries.

At 11.30 there will be a meeting of the Permanent International Committee.

At three o'clock the inaugural meeting of the Congress will take place at the Guildhall, E.C., kindly placed at the disposal of the Congress by the Corporation of the City of London.

The Royal Academy of Fine Arts will entertain the Congress at a soirée at Burlington House.

The Right Hon. the Lord Mayor of London will entertain the Congress at a conversation at the Mansion House on the evening of Tuesday, July 17 (limited to 1,000 invitations).

The Royal Institute of British Architects will entertain the Congress at a garden fête at the Royal Botanic Society's Gardens on the evening of Thursday, July 19.

The Art Workers' Guild will entertain a small party of members on the evening of Friday, July 20.

The Chairman and Directors of the London Exhibitions, Ltd., have put 500 invitations to visit the Imperial Royal Austrian Exhibition at Earl's Court at the disposal of the Executive Committee. Application for tickets must be made at the Congress Bureau, Grafton Galleries.

The Zoological Society of London have kindly offered admission, to foreign members, to their gardens on Sundays, July 15 and 22—days when they are closed to the general public—on presentation of their cards of identity.

The Royal Botanic Society have kindly offered members free admission to their gardens during the Congress week on presentation of their cards of identity.

The Lyceum Club (for ladies) will constitute lady members of the Congress visiting London hon. members of the Club.

The Lyceum Club also kindly offers a reception to the Congress on the afternoon of Wednesday, July 18.

The Ladies' Committee are arranging for the comfort and convenience of ladies. They will be recognisable by the committee badge.

The following are some of the visits arranged for:—

A. *Hatfield*.—The seat of the Marquis of Salisbury. Tuesday, 2.30.

B. *Hampton Court Palace*.—Tuesday, 2.30. A and B are alternative visits, and will take place simultaneously.

C. *Buckingham Palace Gardens*.—By the gracious consent of His Majesty King Edward VII.; and *Westminster Abbey*. Wednesday, 2.30. Later

D. The works of Messrs. Holloway Brothers, and

E. The potteries of Messrs. Doulton & Co. These visits D and E will take place simultaneously.

F. *Windsor Castle*.—By the gracious consent of His Majesty King Edward VII. Thursday, 2.30.

G. St. Paul's; The Temple; The Institute of Chartered Accountants; St. Bartholomew's Church, Smithfield. Thursday, 2.30. This London visit is arranged for those who do not go to Windsor; as also alternative visits:

H. Kensington Palace; Dorchester House, by the kind consent of His Excellency the American Ambassador.

J. *Oxford*.—All-day visit on Friday.

Lunch in the halls of Exeter College and Balliol College.

K. *Cambridge*.—All-day visit on Friday, alternative with Oxford. The Congress party will be received in the Senate House by the Master of Trinity as Deputy Vice-Chancellor. Lunch in the halls of King's College and Clare College.

L. *Tower of London*.—Friday morning, for those who do not join the Oxford and Cambridge visit.

M. Victoria and Albert Museum and Royal College of Science: Sir Aston Webb's new buildings. Friday afternoon, for those who do not join the Oxford and Cambridge visit.

N. Bridgewater House, by the kind consent of the Right Hon. the Earl of Ellesmere. Saturday morning.

O. Greenwich Hospital. Saturday afternoon.

P. Houses of Parliament; The new Westminster Cathedral. Saturday afternoon, for those who do not join the Greenwich visit.

The farewell banquet will take place on the evening of Saturday, July 21, at the Hotel Cecil, at 7.30. Price of ticket (wines included), 21s. It is hoped that many distinguished persons in London will be present.

Sir Lawrence Alma-Tadema, R.A., has kindly consented to design the menu card.

There will be the following exhibitions in the Congress premises, Grafton Galleries:—
An exhibition of photographs of buildings executed by living British architects.

A chronological exhibition of British architecture from the Norman Conquest (1066) to the death of Sir Charles Barry (1860).

Oil paintings and water-colour drawings of English architecture.

A few choice specimens of British furniture and silver work.

At the premises of the Architectural Association, 18, Tufton-street, Westminster, S.W., will be exhibited a selection of Viennese students' drawings arranged by Professor Otto Wagner (Vienna).

The Executive Committee have received the following communications on the questions of the programme:—

1. *The Execution of Important Government and Municipal Architectural Work by Salaried Officials.*

M. F. Blondel (France).
Society of Austrian Architects.
Gaston Trélat (France).

Oscar Simon (Société Centrale d'Architecture de Belgique).

2. *Architectural Copyright and the Ownership of Drawings.*

George Harmand (France).
H. H. Statham.
Gaston Trélat (France).

3. *Steel and Reinforced-Concrete Construction.*

(a) The general aspect of the subject.
(b) With special reference to aesthetic and hygienic considerations in the case of very high buildings.

The Joint Committee on Reinforced Concrete (England).

Herr Wilemanns (Austria).
Professor Henry Adams (England).
E. P. Goodrich (America).
Louis Cloquet (Société Centrale d'Architecture de Belgique).
Joaquim Bassegada (Spain).
Gaston Trélat (France).

4. *The Education of the Public in Architecture.*

John Belcher, A.R.A.
T. G. Jackson, R.A.
Arthur Hill.
Othmar von Leixner (Vienna).
Herr Mthusius (Berlin).
Banister F. Fletcher.
Francisco del Villar y Carmona, Manuel Vega y March, Eduardo Mercader y Saccanella (Spain).
Society of Austrian Architects.
Gaston Trélat (France).
Gaston Ancaux (Société Centrale d'Architecture de Belgique).

5. *A Statutory Qualification for Architects.*

Robert Walker.
John S. Archibald (Canada).
L. Bonnier (France).
Society of Austrian Architects.
Gaston Trélat (France).

6. *The Architect Craftsman: How Far Should the Architect Receive the Theoretical and Practical Training of a Craftsman?*

Reginald Blomfield, A.R.A.
Professor W. R. Lethaby.
J. M. Poupinel (France).
Fr. van Gobbelschroy (Société Centrale d'Architecture de Belgique).
Society of Austrian Architects.
Gaston Trélat (France).

7. *The Planning and Laying-out of Streets and Open Spaces in Cities.*

Raymond Unwin.
Herr Stübben (Germany).
E. Hénard (France).
B. Polles y Pivo, J. Majo y Ribos, M. Bertran de Quintana (Spain).
C. H. Buls (Société Centrale d'Architecture de Belgique).
Gaston Trélat (France).

8. *To What Extent and in What Sense Should the Architect Have Control over Other Artists or Craftsmen in the Completion of a National or Public Building?*

Sir W. B. Richardson, K.C.B., R.A.
H. P. Nénot (France).
C. B. Müller (Germany).
Association of the Architects of Catalonia (Spain).
Society of Austrian Architects.
Gaston Trélat (France).

9. *The Responsibilities of a Government in the Conservation of National Monuments.*

Professor G. Baldwin Brown.
A. Bessard (France).
Gaston Trélat (France).
Joseph Artegas y Ramoneda (Spain).

10. *The Organisation of Public International Architectural Competitions.*

J. Guadet.
Society "Architectura et Amicitia" (Holland).
Gaston Trélat (France).

The Executive Committee have also arranged for Professor Meydenhauer, of Berlin, to read a paper on "Messbildverfahren" or "Photometry." A communication on this subject has also been received from M. Marcel le Tourneau, of Paris.

M. Honoré Daumet (Paris) will read a communication on the Château de Saint-Germain.

Mr. Cecil Smith (Keeper of Greek and Roman Antiquities, British Museum) will read a paper on "The Tomb of Agamemnon."

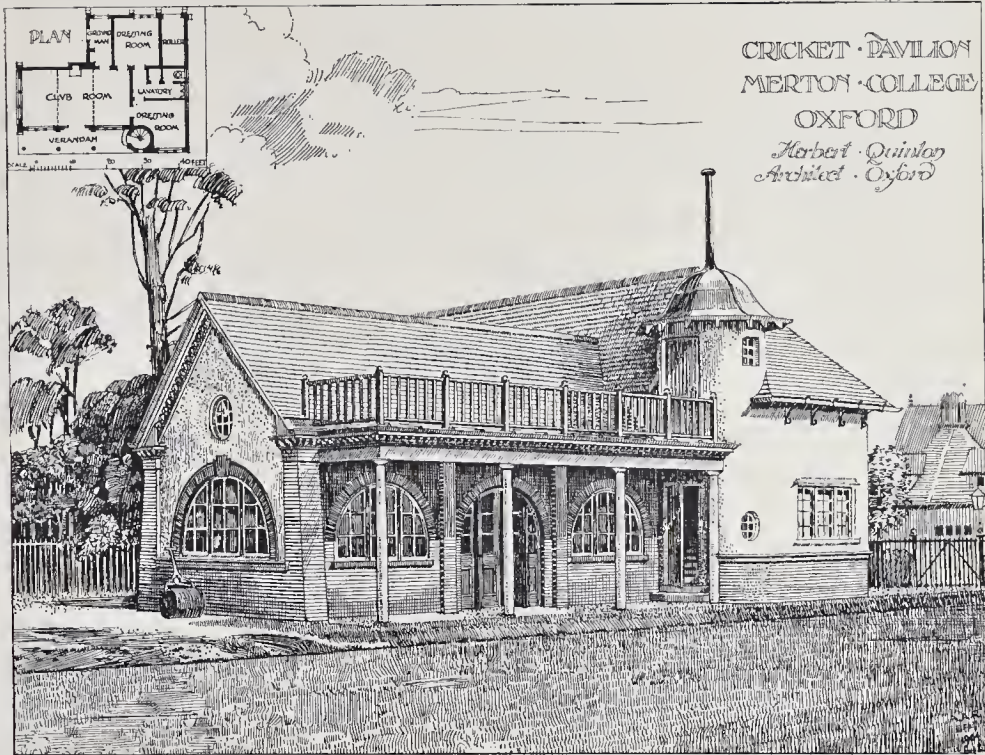
Abstracts of the papers and communications will, if possible, be sent to members of the Congress some time before the opening day.

THE SOCIETY OF ARTS.

On Monday evening Mr. George W. Eve gave his final lecture on "Heraldry in Relation to the Applied Arts." He began by describing the development of the helm. At first these were light, and rested on the head without touching the shoulders, but with the introduction of plate armour came the later type, firmly supported at its base and capable of carrying a heavy crest. The great helm was always shown in profile until the middle of the XVIIIth century, when it fell out of use with the cessation of the tournament, and its place was taken by the helmet, which indicated rank by its pose and detail.

The helm usually faces left, but this is not absolutely necessary, and if a number are placed together in a frieze they should all face to a central point, such as a fireplace. The mantling, at first quite short and used as a protection against the sun, soon became long and elaborate; it is valuable as a means of filling up and binding together decorative compositions. It may take the form of any kind of flowing ornament, and so is very useful for connecting up the heraldic group with its surroundings; its colour, however, is fixed by rule. In England it must be of the first colour and the first metal mentioned in the blazon, but exceptions are found in the Royal arms and in Scottish practice.

A general guide to the proportion of a heraldic group is that the shield may be about two-fifths of the height, and the helm and crest the remainder. The shield should, however, be larger if it carries much detail.



CRICKET PAVILION
MERTON COLLEGE
OXFORD
Herbert Quinton
Architect Oxford

Supporters first appeared as badges used to fill up the corners below the shield, and were always relatively small in medieval work. Later they attracted the attention of carvers, and became very large and out of all proportion to their importance. A good deal of freedom is allowable as regards their position and pose, but they should always emphasise the shield, which is the principal object of the group.

The British Imperial crown was then described in detail, and hints were given as to the treatment of the Insignia of Orders.

On banners and horse-clothing all animals, etc., should face to the staff or front. The development of the Union Jack from the banners of St. George, St. Andrew, and St. Patrick was shown with the aid of diagrams, and the lecturer concluded with a warning against the narrowness of view, which results in mannerism, and the repetition always of certain quaint forms.

A vote of thanks to Mr. Eve was proposed by Sir H. Traeman Wood, who emphasised the importance of accuracy in work of this kind.

CRICKET PAVILION, MERTON COLLEGE, OXFORD.

The cricket pavilion here illustrated was built for Merton College, at a cost of 900*l.*, in 1904. The walls externally are red brick and rough-cast, woodwork finished green, and the roof covered with Broseley tiles. The hot water for shower-bath and lavatory-basins was obtained by means of Fletcher's stoves.

Mr. Herbert Quinton, of Oxford, was the architect, and Messrs. Symm & Co. the contractors.

WATERFALLS IN NORWAY.—Pending further and probably more stringent legislation upon the matter, an Act has just been passed which prohibits the sale of waterfalls to other than Norwegian subjects, whilst foreigners are inhibited from having more than a leasehold interest in the properties concerned.

THE SURVEYORS' INSTITUTION: CONFERENCE IN BIRMINGHAM.

A PARTY of the members of the Surveyors' Institution visited Birmingham last week, as mentioned in our issue for the 26th ult. The Corporation placed the Council House at the disposal of the visitors, and before the formal proceedings of the conference were entered upon the members were cordially welcomed to the city by the Lord Mayor (Councillor A. J. Reynolds). The chair was occupied by the President (Mr. Charles Bidwell).

The Lord Mayor, in welcoming the Institution to Birmingham, said he recognised the fact that they were a large and important body of gentlemen, whose profession was one requiring expert knowledge of a high order, combined with those other qualifications which went to make the man and the gentleman. He was glad to see that their ideals were high, and that they were endeavouring to attain them. Like the guilds established in London and elsewhere in the Middle Ages they sought in the first place to attain a high technical efficiency with which they endeavoured to incorporate those wider interests which could only be properly obtained by a liberal education in other respects. With this object in view, and to connect their members with the highest educational institutions, they offered facilities for scholarships at the Universities of Cambridge and North Wales, and at Armstrong's College, Newcastle, so as to give their coming members that university and higher education which was rightly considered so valuable an adjunct to the learned professions. While their membership was large, he was glad to see that they did not put their trust in numbers only, but in the qualifications possessed by those who wished to belong to their body, for he found that out of 530 who entered for membership in March the percentage of passes was 64, showing that the examination was framed with the view to maintaining the status of the profession. An important part of the work of the Institution was the

study and discussion of contemplated or actual legislation. He felt it was for the public benefit that an Institution like theirs was able and willing to take up difficult subjects and to discuss them apart from political prejudice.

The President, in acknowledging the welcome, expressed the pleasure it gave the members to visit the metropolis of the Midlands.

History and Development of Birmingham.

Regret was expressed that indisposition prevented Sir Oliver Lodge addressing the Institution on "Afforestation," as had been announced. The first paper read was by Mr. H. A. Pritchard (Deputy Town Clerk) on "The History and Development of Birmingham," in which he gave an interesting account of the growth of Birmingham from a humble hamlet to a world-famed industrial centre. From the hamlet to the village community, concluded Mr. Pritchard, from the village community to the country town, and from the country town to the populous city, they found Birmingham in the early years of the twentieth century the metropolis of the Midlands, and one of four of England's greatest provincial towns. The centre of a large and populous district, she embraced within her own boundaries a population of 545,000 inhabitants, the results of whose industry found a market throughout the world. A glance at her local history, however, illustrated that the records of her principal citizens formed the chief factor in her success and development. A Birmingham man had been described as "of strong individuality, independence of character, facility of resource, and with an enduring love for the old town." The city had not attained her present wealth, dignity, and importance except by the efforts of her leading men. Each in his different sphere had influenced her progress—from Boulton, the resourceful manufacturer, Watt, the inventor, Baskerville, Priestley, Scholefield, Attwood, the reformer, and many others, to the present senior member for the city, whose early

public life and administrative genius were devoted to her welfare with such marked success and fruitful results.

Mr. Pritchard was heartily thanked for his paper.

Professor C. Lapworth followed with a paper, from which it appeared that had it not been for certain geological movements the Birmingham of to-day would have been a very different place from that described by Mr. Pritchard. In the course of his address on "The Economic Geology of the Birmingham Country," Professor Lapworth said the solid floor of the district, like that of every other extended area in Britain, was formed by the edges of the massive rock-sheets that constituted the so-called geological formations. Omitting the complicated little area of the Lickey Hills, there were seven of these formations. If these seven rock-sheets had remained horizontal, as they were originally deposited, the strata of the highest formation, those of the Keuper marl, would to-day have formed a gently undulating lowland like that of Central Warwickshire. The mineral riches of the coal and iron beds of the South Staffordshire coalfield would have remained undiscovered, buried half a mile deep below the surface of the ground. The Birmingham country, instead of being what it was at present, a land remarkably varied in its scenery and productions, inhabited by a teeming manufacturing and mining population, collected in great towns and in the van of industry and progress, might have been a monotonous agricultural region, with a scanty population gathered here and there into quiet little villages—a country peaceful and picturesque it might be, but without progress and almost without a history. But, providentially, the great rock-sheets had not remained horizontal. They had been bent up in the western parts of the district into the dome-like form which was termed the Staffordshire arch, and warped down in the eastern parts into the basin-like form called the Warwickshire trough. They had been broken across and dislocated by the two great crust fractures, which they knew as the western and eastern boundary faults of the South Staffordshire coalfield, and also by a third great fracture, the Birmingham fault, which ran through the city itself. Professor Lapworth described in detail the various geological formations.

Mr. Vernon, in proposing a vote of thanks to Professor Lapworth, referred to the geological advice to surveyors contained in his paper. He said the whole world had had a terrible lesson in geology, and they wanted to know more of the interior of the earth if they were to avoid the dangers of Naples and San Francisco.

Mr. Gilpin Brown (Chairman of the Warwick and Worcester Provincial Committee) seconded the resolution, and it was carried.

Professor Lapworth, acknowledging the resolution, said geology was regarded as a mysterious science, but the riches of Birmingham and the Black Country were questions of geology; in fact, they might say in a general way that geology was at the base of everything.

Overcrowding in Towns.

Mr. John Willmot read a paper on "Proposed Legislation Affecting Real Estate," in which he gave a short epitome of the following Bills:—The Land Valuation (Scotland) Bill, the Public Health Acts Amendment Bill, the Housing of the Working Classes Act Amendment Bill, and the Land Tenure Bill. Dealing with the second named Bill, Mr. Willmot said that in considering the revision of by-laws they would agree with him that due provision should be made to ensure that only such houses were erected as would provide sanitary and wholesome dwellings. This would still be possible even if by-laws were relaxed so as to permit of the use of various kinds of materials in the erection of buildings. He believed that the by-laws should prescribe a minimum size and height for rooms, and the proportion which the area of the window should bear to the floor space. The revision of by-laws on the above lines would admit of the erection of cheaper houses, which would naturally tend to an increase in the building of cottages, and in some rural districts would be of great assistance in keeping the agricultural population upon the land. The remedy for overcrowding in urban districts was, he believed,

to a great extent within the power of the local authorities themselves, and the difficulty could be met by relaxing the by-laws as to the construction of new streets. In agreeing to the construction of less expensive roads, the local authorities might reasonably stipulate for a certain area of land to be allotted to each house. If this were done he felt sure a great step would be taken towards the provision of healthy and wholesome houses for working men at a reasonable cost on the outskirts of the great centres of population where they were often at the present time to urgently required. But so long as the existing cast-iron rules were applied to the construction of all roads, so long would the difficulty of providing cheap and healthy houses for working-men continue. The whole question of building by-laws and by-laws relating to the construction of new streets was a matter which might with advantage be dealt with in a Bill, to be introduced by the Government, the provisions to apply to both urban and rural districts. Dealing with the third mentioned Bill, to enable rural district councils to adopt Part I. of the Act without first obtaining the leave of the county council, the speaker said he was strongly of opinion that local authorities should not be permitted to speculate with the ratepayers' money in carrying out building schemes which would probably result in a loss and a consequent taxation of the ratepayers, some of whom might be erecting cottages to compete with them. There was at the present time plenty of private capital available to erect all the houses required, providing a reasonable return on the capital could be assured. There was no demand or necessity for the Land Tenure Bill, which was likely to interfere with the present pleasant relations between landlord and tenant.

A vote of thanks was accorded Mr. Willmot for his paper. In the short discussion that followed the paper the Land Tenure Bill was strongly condemned, while one speaker described the legislation as "most mischievous and socialistic."

After luncheon, which was served at the Grand Hotel, parties of members visited the Birmingham Sewage Farm, Messrs. Cadburys' model village at Bournville, the Wolseley Motor-car Company's Works at Saltley, Messrs. Elkington's electro-plate works, Messrs. Osler's glass works, the Generating Station of the City Electric Supply Department in Summer-lane, and the new University buildings at Bournbrook.

The Dinner.

In the evening the members dined at the Grand Hotel, under the presidency of Mr. Bidwell. In proposing "The City of Birmingham," Mr. Howard Martin (Vice-President) expressed appreciation of the kind welcome and the generous hospitality they had received in Birmingham.

Mr. H. A. Pritchard (Deputy Town Clerk) responded. He said reference had been made to the efficiency of Birmingham's municipal government, and the proposer of the toast was perfectly right when he said that the men of Birmingham came forward to do their duty to the community to which they belonged.

Mr. William Fraser proposed "Kindred Societies," coupled with the name of Mr. Thomas Cooper (President of the Architects' Society), remarking that Birmingham, so far as architecture was concerned, abounded in good works.

"The Surveyors' Institution" was proposed by Mr. E. Anthony Lees, who said it helped to promote efficiency in the discharge of the duties which were cast upon the members, and anything which tended to efficiency in any branch of human activity must be a source of satisfaction to all who wished for the well-being of their kind.

The President, in replying to the toast, referred to the founding of scholarships by the Institution, and said their object was to educate intending members of the profession and maintain its status.

Other toasts were "The Warwick and Worcester Provincial Committee," proposed by Mr. G. Langridge (Vice-President), and replied to by Mr. W. D. Gilpin Browne, and "The Visitors," proposed by Mr. Arthur Vernon, and acknowledged by the Mayor of Worcester (Mr. H. A. Leicester).

[The preceding Report has been taken from the *Birmingham Post*.]

The annual general meeting of the Institution was held on Monday at No. 12, Great George-street, S.W., Mr. C. Bidwell, President in the chair, when the thirty-eighth annual report of the Council was read by Mr. Alexander Goddard, the Secretary.

The Report stated that the twelve months showed an activity and growth which indicated the continued prosperity of the Institution. The total membership is now 3,876, as compared with 3,719 last year, and 3,560 in 1904. The Council noticed with regret some falling-off in the number of students during the past two years. Having regard to the importance of young men, at the beginning of their business career, being imbued with that spirit which should arise from connexion with an important professional body, they have made the following alterations in the regulations to students, in order that the advantages of enrolment in this class may be made more obvious:—

1. Students to be allowed to make use of the loan library.

2. Students to be allowed to enter for the Preliminary Examination, provided that they have attained the age of 16 years, and make a written statement that it is their intention to follow the profession of a surveyor.

3. Students to be allowed to take the Intermediate Examination between the ages of 21 and 25 (subject to the disabilities mentioned in rule 11 as to competing for students' prizes if over 21½ years), retaining their advantages as to proportion of pass-marks and fees, but ceasing, in accordance with the by-laws, to be students after the age of 2½ years.

4. In case of failure to pass the examination, students' examination fees for subsequent entries, up to the age of 25 years, to be reduced from three to two guineas.

An opportunity having occurred of acquiring the head lease of No. 11, Great George-street, it was thought advisable to take advantage of it, in view of the possibility of the building being needed at some future date for the extension of the Institution premises.

The necessary funds for the purchase were therefore provided from the accumulated account, and the transaction was thus arranged without loss of income.

As to the Preliminary and Professional Examinations, in the Preliminary Examination 106 of the 190 candidates passed, and the percentage was 55.78, against an average of 71.45, and in the Professional Examinations the candidates numbered 535, of whom 349 passed, the percentage being 65.23, against the average of 69.19.

Included among the 535 candidates who sat for the Professional Examinations were thirty-eight who were re-examined in their respective typical subjects. Of these, six were Land Agency candidates, who were all successful; twenty-two Valuation candidates, of whom fifteen were successful; and ten Building and Quantity Surveyor candidates, of whom five passed. Of the 497 new candidates, 323 were successful, while twenty-four Valuation and twenty-nine Building and Quantity candidates failed only in their respective typical subjects, and were referred back for re-examination in those subjects on a future occasion. Included among the 497 new candidates were seven Scottish candidates, examined in Glasgow, of whom six passed, and four Irish candidates, examined in Dublin, all of whom satisfied the examiners.

The prizes in connexion with the examinations of 1906 were awarded as follows:—

The Institution Prize, value 15 guineas, to William Henry Baines, a student candidate in the Building subdivision, who passed at the head of the list with 797 marks, and who also gained

The Penfold Silver Medal, awarded annually for the best marks in the two sections (Student and Non-Student) of the Intermediate Examination, calculated on the basis of their respective pass marks.

The Special Prize, value 10 guineas, to Frederick William Lord, the student candidate next on the list, who obtained 763 marks in the Valuation subdivision of the Intermediate Examination.

The Penfold Gold Medal, to Sidney James Murrell, for the highest total of marks in the Final Examination. This candidate in the Valuation subdivision gained 820 marks out of a possible 1,000.

The Driver Prize, value 15*l.*, to Harry John Venning, who passed at the head of the list of non-student candidates with 808 marks out of 1,000 in the Building subdivision of the Intermediate Examination.

The Beadel Prize, to Gilbert George Symons, a non-student candidate, for the best work (77 per cent. of the maximum marks) in the subject "Agriculture" in the Intermediate Examination.

The Craxter Prize, to Henry Norman Savill, for the highest marks (86 per cent. of maximum) in the subject "Principles and Practice of Valuation" in connexion with the Final Examination.

The Galsworthy Prize, to Herbert Ivie Wykes, a Valuation candidate in the Final Examination. This prize is given annually to the candidate whose marks in the Final Examination, and those gained in the Intermediate Examination for which he entered as a student candidate, combine to form the highest total. The prize-winner's marks were 784 in the Final, and 783 in the previous Intermediate Examination, a total of 1,567 out of a possible 2,000, or 78 per cent.

The Scottish Committee Prize of 10 guineas, to William Rose Young for the best work in connexion with Professional Examinations in Scotland (76 per cent. of full marks).

The Preliminary Prize, to John Batstone, who passed this year at the head of the list of candidates in the Preliminary Examination.

The Council record their sense of deep obligation to those gentlemen who had undertaken the task of setting the work and awarding the marks in the various subjects in connexion with the examinations of 1906. They specially mention the work done, in a purely honorary capacity, by Mr. J. W. Willis Bond, Mr. E. J. Castle, K.C., Mr. R. E. Colann, Mr. J. E. Drower, Mr. H. A. Rigg, and His Honour Judge F. A. Philbrick, K.C., in setting the legal papers; and by Mr. W. Eve, Mr. E. J. Harper, Mr. F. Lee, Mr. F. J. C. May, Mr. C. John Mann, Mr. J. Douglas Mathews, Mr. J. H. Oakley, Mr. J. W. Tyler, and Mr. J. D. Wallis, in the more essentially professional subjects. Among the members of the Council, the following again acted as honorary examiners:—Mr. Daniel Watney, Mr. T. M. Rickman, Mr. A. Vernon, and Mr. H. T. Steward, Past Presidents; Mr. G. Langridge and Mr. J. W. Penfold, Vice-Presidents; and Mr. H. Chatefield Clarke, Mr. E. P. L'Anson, Mr. H. W. D. Theobald, and Mr. J. Henry Sabin. Mr. Percivall Currey again undertook an important professional subject. The cordial thanks of the Council were also due for the valuable co-operation of those provincial members who have rendered such efficient services as examiners and moderators in connexion with the Branch Preliminary and Professional Examinations in Glasgow, Dublin, and Manchester.

The Council reminded members that the first examinations in connexion with the Institution scholarships, tenable at the Universities of Cambridge and North Wales, Bangor, and at the Armstrong College, Newcastle-on-Tyne, will be held about July next at those centres.

The gold medal for the best paper read during the session 1904-5 was awarded to Mr. E. Morten, Barrister-at-Law, for his address on "Surveyors' Reports and Certificates." The winner of the medal the previous year was Mr. J. Smith Hill, Associate, who read a paper on "Agriculture in Cumberland, 1850-1900," at the country meeting held at Newcastle-on-Tyne.

The library had been enriched by the addition of a number of useful works, and an attempt had been made to bring the editions of the many works of reference which it contains up to date. The Council refer to the obligation imposed upon members by by-law 32 to make some contribution to the library within short time of their election to the membership. They would remind those who had not fulfilled this obligation that, on election, they signed a declaration pledging themselves to comply with the by-laws and specifically promising to make some contribution or donation to the library.

The provincial committees have again proved their value to the Institution in advising as to the eligibility of candidates for examination and transfer, and the Council wish to lay special stress upon the importance of their assistance in this respect. It was obvious that in many cases the eligibility of a

candidate could best be judged by members on the spot, who had the means of investigating his professional antecedents and ascertaining his qualifications. It being of the greatest importance to the Institution that only qualified men should be admitted, the Council wished to impress upon all concerned the necessity for special care being taken in examining these applications, to insure that no candidate shall be accepted who does not come fairly within the definition of surveyors laid down in sect. 1 of the by-laws. It was now eighteen years since the provincial committees were first organised, and their existence had been abundantly justified, not only by the assistance they had so willingly rendered in the direction above indicated, but by the opportunity they had afforded of bringing country members and country opinions into closer touch with the central body. As a further means of enabling the Council to come into more direct relations with country members, who, owing to distance from town or other causes, might be unable to attend the meetings or take a direct part in the business of the Institution, they had nominated the provincial chairmen to act with them on one or other of the standing committees.

Another considerable change had been made. Up to the present Professional Associates had no *locus standi* on the provincial committees. With the object, however, of interesting them in the business of their local branches, and thus indirectly in that of the Institution itself, and helping them to realise the responsibilities as well as the advantages of membership, they had been made members of the provincial committees, with full rights of attending meetings and taking part in the discussions. It was hoped that this new departure might have the double effect of increasing the interest in the discussions and business of the committees, and in making the Institution a more intimate factor in the professional life of the younger members.

The Council's scheme of providing, at the expense of the Institution, lecturers of established repute to open discussions at meetings of provincial committees, on subjects of professional interest, had now been in operation for upwards of twelve months, and had been taken advantage of with satisfactory results on four occasions. From inquiries on the subject, which had been received from provincial chairmen, it was evident that a more general response to the Council's offer would have resulted, had it not been for the introduction of the Land Tenure Bill in the House of Commons, which had provided an ample topic for discussion at the local meetings held during the present year. The four lectures which had been given had been valuable in themselves, and had had the effect of stimulating both attendance and discussion at the meetings. The experiment had, during the comparatively short period it had been under trial, proved sufficiently successful to justify its continuance, and the Council would be glad to consider further applications for lecturers on special subjects.

As mentioned in the last annual Report, the London Building Act (Amendment) Bill of 1905, as introduced, aroused such opposition that its promoters decided to abandon all but the clauses dealing with the prevention of fire. The provisions contained in this portion of the Bill were very carefully considered by the Council, and with a view to putting the experience of practical surveyors at the disposal of the Legislature, a number of amendments were drawn up, and the Institution was represented by counsel and witnesses before Committee in both Houses of Parliament. The result of this action was that when the measure received the Royal Assent, it had lost many of the more objectionable provisions which it at first contained, and might, in its present form, be reasonably expected to fulfil the purpose for which it was passed.

The opposition which led to the abandonment of the remainder of the Bill caused its promoters to recognise that, if further amendment of the London Building Acts were to be attempted, it would be necessary to give the matter fresh consideration. To assist them in deciding how practical improvement might best be effected, the Building Committee of the London County Council requested the Surveyors' Institution and kindred professional bodies to give them the advantage of their experience. A special committee was accord-

ingly appointed by the Council, which gave a considerable amount of time and labour to the subject, with the result that a memorandum, pointing out not only the reason for objection to the various proposals in the 1905 Bill, but the manner in which the existing Acts might with advantage be amended, was drawn up and submitted to the County Council.

Although a private member's Bill, the fortune of the ballot enabled the Land Tenure Bill to come up for second reading early in the session, when it was passed by a large majority and, receiving the approval of the Government, was referred to the Grand Committee on Trade. The Council recognised at once that the adoption of the provisions of the Bill would mean a long step in the direction of dual ownership, with its attendant dangers to the agricultural interest, and immediate action was therefore decided upon. The provincial committees were asked to discuss the measure, and to place their views before the Council, while a committee of the Council was set up to consider the Bill clause by clause, and to determine how best it could be amended. A comprehensive memorandum was drawn up by this committee, and the dangers to be anticipated from the measure, together with a number of suggested amendments, were laid before the President of the Board of Agriculture and Fisheries by a strong deputation. Steps were also taken to make Members of Parliament for agricultural constituencies conversant with the opinions held by members of the Institution on the subject. The Bill has been considered by the Grand Committee, and has now been reported to the House, with amendments, for third reading. The Council are pleased to note that many of the objectionable proposals, which at first characterised the Bill, have been eliminated, and in its present form it embodies, with one important exception, the suggestions for improvement which were submitted to the Government in the memorandum drawn up by the Council. The exception referred to is the compensation for disturbance allowed under clause 5, which it is still hoped may be modified before the Bill becomes law.

Another measure which, although confined to Scotland, embraces a principle which, if adopted, would inevitably be extended to the rest of Great Britain, was the Land Values Taxation (Scotland) Bill. After being read a second time in the House of Commons, it had been referred to a Select Committee, and steps were being taken to insure that the Institution should be represented among the witnesses called to give evidence before the Committee. The subject was one of interest to every member of the profession, and the Council felt that the Majority Report of the Royal Commission on Local Taxation, adverse to the proposals for the separate rating of land values, should not be lightly set aside without the Legislature being made thoroughly conversant with the views of those who would, to a great extent, be responsible for carrying out such proposals in practice.

The services of the Institution have also been called upon in connexion with the Royal Commission on Motor-cars, and the Departmental Committee on Small Holdings.

In the case of the former, two members were nominated to give evidence before the Commission. In the latter, the President of the Institution was chosen by the late Minister for Agriculture to form one of the Committee, while other members have given evidence before it. Valuable information was also provided through the provincial committees, replies to a number of questions relative to small holdings being obtained through them from members having experience on this subject.

In response to the appeal for subscriptions towards the presentation of his portrait to Mr. Julian C. Rogers, as some acknowledgment of his many years of arduous work for the Institution as Secretary, the sum of 317*l.* was contributed. Mr. Stanhope A. Forbes, A.R.A., was commissioned to carry out the work, and the portrait, at present on exhibition at the Royal Academy, would be presented to Mr. Rogers at the opening meeting of next session.

The Council are glad to be able to report that the value of the employment register, as to means of securing qualified assistants, has been more fully recognised by senior members during the past year. At the same time, they feel that full advantage is not yet taken of

the facilities offered under this head, and they would strongly urge all members having vacancies for assistants or improvers to apply, in the first place, to the Secretary for particulars of any suitable men whose names appear in the register, and thus to lend a helping hand to fellow-members at the outset of their career.

On the motion of Mr. E. W. Hudson, seconded by Mr. King, the Report was adopted.

A vote of thanks having been accorded to the auditors,

Mr. Mann moved, and Mr. Fowler seconded, a vote of thanks to the President, Vice-President, and other members and Associates of the Council for the able manner in which they had administered the affairs of the Institution during the past year.

The motion was heartily agreed to, and Mr. Bidwell replied on behalf of the Council.

On the motion of the Chairman, seconded by Mr. Martin, the Hon. Secretary, Mr. Percivall Currey, and the Secretary, Mr. Goddard (including the other officers of the Institution), were thanked for their services, and these gentlemen having replied, a vote of thanks was accorded to the scrutineers.

The President then distributed the prizes to the successful candidates in the recent examinations, and on the motion of Mr. Woolley, seconded by Mr. H. Chatfield Clarke, a hearty vote of thanks was accorded to the President.

Mr. Bidwell thanked the members, and then vacated the chair, which was taken by his successor, Mr. Langridge, who thanked the members for electing him.

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS.

II.—MARSH COURT, STOCKBRIDGE.

On Saturday, the 26th ult., a large party of members of the Architectural Association journeyed to Stockbridge, in Hampshire, to look over an important modern house, Marsh Court, recently completed from designs by Mr. E. L. Lutyens. In the absence of the author, the visitors were directed by Mr. Donovan, representing the contractors, to the different parts of the buildings, and were informed by him upon matters of general concern.

The site is a beautiful one, situated upon the verge of an escarpment of the chalk Downs which characterise the locality. Fine views of a pleasantly-wooded and watered valley are obtained on the south and west borders, and the immediate ground built on falls slightly in the same direction. Full use has been made of the occasion by grasping the natural features of the country and blending them with the design of the house.

Local material is almost entirely used with the exception of certain varieties of stone in external pavings and balustrades. The main part of the house has a plan suggesting an **U** type, with the wings and central entrance facing a large courtyard on the north. This courtyard is paved with stone sets of varying sizes, laid on edge, to an interesting design radiating from a geometric grass parterre. Stone balustrades and steps enclosing small sunk gardens are introduced upon the margins of this courtyard, while on the west side access is provided to a long, wide terrace by large flights of steps possessing considerable architectural character.

A sunk Italian garden is sited on the south front of the house, having high retaining walls of brick, steps, terraces, and pavings in stone and brick, small water basins, fountains, and lead cisterns. The design is skilful, but suggests a garden upon a larger scale, and is in reality the only feature in which a sense of confusion and restlessness obtains. Other garden-work in lawns, pergola, and terraces are charming in effect, and gain much from a broader treatment. Oak seats of a most pleasing design are scattered about the gardens in effective positions.

The walls of the house, although built "hollow," are faced in solid chalk quarried in the locality. The blocks are somewhat small in size, and, as the joints do not readily reveal themselves, there is a strong white glare in the sunny places of the fronts.

Small inlays of roofing tiles and black snapped flints are inserted at distant intervals, and lead up to the brickwork of a chimney, the tiling of a roof, or other feature. Chalk is used in piers, arches, mullions, and transoms; the facing is devoid of texture, but appears to harden well, although on the rainy fronts considerable discoloration has set in, which, it is anticipated, will disappear with age. Local tiles are used upon the roofs, the lines of which are kept very broad and simple. Various devices in the nature of lead flats are resorted to in order to keep down the height and yet maintain the long, low character of the buildings. Great attention is given to the detail of the chimneys, which are varied in form, and built in red brick. Chimneys rising from a chalk-faced projection have elaborate stepping and recessing in small features of brick and roofing-tiles, which produce an idea of gradation from the material of the base to that of the stack.

A simpler manner is seen in the office or east wing; the small inner court in particular is a delightful piece of brick design.

The accommodation provides for a comparatively small number of rooms, especially bedrooms, but the apartments are large, and are arranged at varying levels to suit their respective heights and to conform to the levels of the site. A long gallery on the north side affords access to the principal rooms on the two floors, at the west end of which is the principal staircase. Some rooms are placed in the basement and overlook the Italian garden. The billiard-room is in the west wing, and its chief feature, apart from all the fittings and apparatuses designed by Mr. Lutyens, is the base of the table built up solid in chalk.

The hall, drawing-room, and dining-room face south, and are all admirably fitted up with oak panelling, interspersed with features moulded and carved in chalk. Entrances from the gardens are placed at convenient intervals, and loggias, with brick tile vaulting, provide shelter from the elements.

Almost every structural and decorative detail in the house and offices has been designed by the architect. The greater part of the furniture and fittings are also his work, and the splendid result of his efforts is seen in the fine character and strong personality which pervades the entire work, from a floor-ventilator to a bell-indicator.

Space prevents reference to matters of detail or to the charming detached buildings, such as the electric generating station, stables, farm buildings, and cottages, in all of which the strong sense of a great artistic individuality is always present. Messrs. Cubitt & Co., the builders, are to be congratulated upon the excellence of their work.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Alderman Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Brompton Borough Council 15,427*l.* for electric lighting purposes; Hammersmith Borough Council 15,000*l.* for street improvement; Islington Borough Council 22,503*l.* for electric lighting purposes; Lambeth Borough Council 10,000*l.* for erection of town hall; and Poplar Borough Council 2,650*l.* for electric lighting purposes. Sanction was also given to Lambeth Borough Council to borrowing 4,088*l.* for paving works.

Bills of Quantities and the Erection of Cottages.—The General Purposes Committee recommended:—

"That paragraph No. A 3 of the order of reference to the Housing of the Working Classes Committee be amended by the addition of the following words:—'And provided that no contract be entered into without the sanction of the Council, the Committee shall, notwithstanding the provisions of standing orders Nos. A 22 and A 23, be authorised, as regards any cottages that the Council may determine to have erected, to obtain from builders tenders for the erection of such cottages without bills of quantities being supplied, and further, to arrange that the contract for such cottages shall provide that payments shall be made fortnightly upon the architect's certificate to the extent of 80 per cent. of the value of the work done; that 15 per cent. shall be paid on the completion of each cottage, and that the remaining 5 per cent. shall be paid within three months after

the completion thereof, subject to the obligation resting upon the contractor in respect of the maintenance of the cottages."

The recommendation was carried after discussion.

By-laws for the Good Rule and Government of the County of London.—The Local Government, Records, and Museums Committee recommended:—

(a) That the following by-laws for the good rule and government of the County of London be made by the Council in pursuance of the provisions of sect. 23 of the Municipal Corporations Act, 1882, and sect. 16 of the Local Government Act, 1883; that the seal of the Council be affixed to three copies of the by-laws; and that, in accordance with the statute, a sealed copy be sent to the Secretary of State for the Home Department:—

"No person shall (1) sweep or otherwise remove from any shop, house, or vehicle into any street any waste-paper, shavings, or other refuse, or being a costermonger, news-vendor, or other street trader, throw down and leave in any street any waste-paper, shavings, or other refuse; (2) throw down and leave in any street, for the purpose of advertising, any bill, placard, or other substance; (3) throw down and leave in any street any bill, placard, or other paper which shall have been torn off or removed from any bill-posting station.

No person shall deposit in any street or public place any refuse, glass, or any other sharp or dangerous article, or any fruit or the leaves or refuse of any vegetable.

No person shall throw, place, or leave any bottle or any broken glass, nail, or other sharp substance (not being road material), on or in any street or public place in such a position as to be likely to cause injury to passengers or animals or damage to property.

In these by-laws the expression 'street' includes any highway, and any road, bridge, lane, path, footway, meadow, square, court, alley, or passage to which the public have a right of way.

Any person who shall offend against any of these by-laws shall be liable for each offence to a fine not exceeding 40*s.*

(b) That the by-laws made by the Council on May 12, 1905, relative to the throwing down in streets of waste-paper, refuse, advertising bills, broken glass, etc., be repealed as from the date on which the above by-laws come into force.

The recommendations were agreed to.
Main Drainage Extension.—The following recommendations of the Main Drainage Committee were agreed to:—

"That the estimate of expenditure on capital account of 146,000*l.*, submitted by the Finance Committee for the construction of the portion of the middle level sewer No. 2 from Old Ford to Queens-road, Shoreditch, and a branch sewer across London-fields connecting this sewer with the existing high-level sewer, such estimate including the cost of supervision, general incidentals, etc., be approved.

That expenditure on capital account not exceeding 140,100*l.* be sanctioned for the construction of the portion of the middle level sewer No. 2 from Old Ford to Queens-road, Shoreditch, and of a branch sewer therefrom to the high-level sewer; that the work be done without the intervention of a contractor, and that the drawings, specifications, quantities, and estimate of 140,100*l.* be referred to the Works Committee for that purpose."

Schools.—The Education Committee recommended:—

"(a) That, whilst placing on record its opinion, that on educational grounds, the average number of children per adult teacher should, on no account be raised, the Council in view of the urgent necessity of increasing school accommodation in various parts of London, do accept the effective accommodation calculated on the basis set forth in the foregoing report as the accommodation for school provision purposes.

(b) That the necessary steps prescribed by sect. 8 (1) and (2) of the Education Act, 1902, be taken with a view to giving public notice, and informing the Board of Education, of the Council's intention:—

(i) To provide a new public elementary school for 800 children for subdivisions Q and X of the Hackney (School Board) division (Bethnal Green, N.E., and Haggerston).

(ii) To provide 500 additional public elementary school places for subdivisions P, Q, R, and S of the East Lambeth (School Board) division by the enlargement of the "Oliver Goldsmith" London County Council school (Camberwell, N.).

(iii) To provide a new public elementary school for 600 children, with power to enlarge for 800, upon the Hortensia-road site (Chelsea).

(iv) To provide a public elementary school for 1,600 children on the Barnsbury Park site (Islington, S.), or, alternatively, a school for 600 children on that site, and a school for 800 children in the north-eastern corner of subdivision AH of the Finsbury (School Board) division (Islington, S.).

(v) To provide 1,200 additional public elementary school places in subdivision A of the Marylebone (School Board) division (St. Pancras, S.).

(vi) To provide additional accommodation for 500 children by the enlargement of the Addison-gardens London County Council school (Finsbury).

(vii) To provide a public elementary school for 600 children, with power to enlarge to 800 on the Sherington-road site (Greenwich).

(viii) To provide a public elementary school for 1,200 children in subdivision Z of the Hackney (School Board) division (Hoxton).

(ix) To erect a public elementary school for 600 children in subdivision T of the Marylebone (School Board) division (St. Pancras, S.).

(x) To erect a public elementary school for 1,000 children in subdivision U of the Marylebone (School Board) division (St. Pancras, S.).

(xi) To enlarge Rhyll-street, London County Council

school (St. Pancras, N.) by the addition of 300 public elementary school places.

(xiii) To provide 600 public elementary school places in the neighbourhood of King's Cross (Holborn).

(xiv) To provide 500 additional public elementary school places in subdivision B43 of the Finsbury (School Board) division (Islington, N.).

(xv) To enlarge the Hungerford-road London County Council school (Islington, W.) by 414 places.

(xvi) To erect a public elementary school with accommodation for 800 children in the neighbourhood of Hopes-road, Lambeth (Kensington).

(xvii) To provide 1,000 additional public elementary school places for subdivision Z of the Chelsea (School Board) division (Kensington, N.).

(xviii) To erect a public elementary school, with accommodation for 600 children, for subdivisions E, F, I, J, K, of the West Lambeth (School Board) division.

(xix) To provide 500 additional public elementary school places in subdivision X of the Marylebone (School Board) division (Marylebone, W.).

(xx) To erect a public elementary school for 900 children in the north-eastern part of subdivision O of the Marylebone (School Board) division (Marylebone, W.).

(xxi) To provide a public elementary school for 1,100 children in subdivision F of the Marylebone (School Board) division (Marylebone, W.).

(xxii) To provide a public elementary school with accommodation for 600 children, for subdivisions E, F, I, J, K, of the West Lambeth (School Board) division (Kensington, N.).

(xxiii) To provide 500 additional public elementary school places by the enlargement of the Fancestrade London County Council school (Newington, W.).

(xxiv) To provide a public elementary school for 500 children in subdivision G of the Marylebone (School Board) division (Paddington, N. and S.).

(xxv) To provide 600 additional public elementary school places for subdivisions A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, B11, B12, B13, B14, B15, B16, B17, B18, B19, B20, B21, B22, B23, B24, B25, B26, B27, B28, B29, B30, B31, B32, B33, B34, B35, B36, B37, B38, B39, B40, B41, B42, B43, B44, B45, B46, B47, B48, B49, B50, B51, B52, B53, B54, B55, B56, B57, B58, B59, B60, B61, B62, B63, B64, B65, B66, B67, B68, B69, B70, B71, B72, B73, B74, B75, B76, B77, B78, B79, B80, B81, B82, B83, B84, B85, B86, B87, B88, B89, B90, B91, B92, B93, B94, B95, B96, B97, B98, B99, B100, B101, B102, B103, B104, B105, B106, B107, B108, B109, B110, B111, B112, B113, B114, B115, B116, B117, B118, B119, B120, B121, B122, B123, B124, B125, B126, B127, B128, B129, B130, B131, B132, B133, B134, B135, B136, B137, B138, B139, B140, B141, B142, B143, B144, B145, B146, B147, B148, B149, B150, B151, B152, B153, B154, B155, B156, B157, B158, B159, B160, B161, B162, B163, B164, B165, B166, B167, B168, B169, B170, B171, B172, B173, B174, B175, B176, B177, B178, B179, B180, B181, B182, B183, B184, B185, B186, B187, B188, B189, B190, B191, B192, B193, B194, B195, B196, B197, B198, B199, B200, B201, B202, B203, B204, B205, B206, B207, B208, B209, B210, B211, B212, B213, B214, B215, B216, B217, B218, B219, B220, B221, B222, B223, B224, B225, B226, B227, B228, B229, B230, B231, B232, B233, B234, B235, B236, B237, B238, B239, B240, B241, B242, B243, B244, B245, B246, B247, B248, B249, B250, B251, B252, B253, B254, B255, B256, B257, B258, B259, B260, B261, B262, B263, B264, B265, B266, B267, B268, B269, B270, B271, B272, B273, B274, B275, B276, B277, B278, B279, B280, B281, B282, B283, B284, B285, B286, B287, B288, B289, B290, B291, B292, B293, B294, B295, B296, B297, B298, B299, B300, B301, B302, B303, B304, B305, B306, B307, B308, B309, B310, B311, B312, B313, B314, B315, B316, B317, B318, B319, B320, B321, B322, B323, B324, B325, B326, B327, B328, B329, B330, B331, 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(xxviii) To provide a public elementary school, with accommodation for 600 children, for subdivisions E, F, I, J, K, of the West Lambeth (School Board) division.

(xxix) To provide a public elementary school, with accommodation for 600 children, for subdivisions E, F, I, J, K, of the West Lambeth (School Board) division.

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(xlvix) To provide a public elementary school, with accommodation for 600 children, for subdivisions E, F, I, J, K, of the West Lambeth (School Board) division.

(cl) That the Board of Education be informed of the views contained in the foregoing report relating to the erection of a school for subdivision C of the Tower Hamlets (School Board) division, and T1, T2, and U of the Hackney (School Board) division (Whitechapel), and that they be requested to sanction the erection of a permanent public elementary school for about 600 children on the Buxton-street site (Whitechapel).

The consideration of the recommendations was adjourned.

Tramways.—The Highways Committee recommended as follows:—

"That, subject to a settlement being arrived at with the Islington Metropolitan Borough Council as to the division of the cost for the tramway tracks and margins, and to the approval of the Board of Trade under the London County Tramways (Electrical Power) Act, 1900, being obtained to the system of erection and of reconstruction proposed to be adopted on the tramways, the tender of Robert W. Blackwell & Co., Ltd. amounting to £258,185, 15s. 11d., for the execution of the roadway and the underground conduit system of electric traction, of the tramways from the Angel, Islington, to a point near Highbury (N.L.R.) Station, *via* High Street and Upper-street, be accepted.

That Robert W. Blackwell & Co., Ltd. be allowed to sublet to the undermentioned firms (or to such other persons or firms as may be approved by the chief engineer under the contract) the following portions of the work in connexion with the reconstruction of the tramways between the Angel, Islington, and Highbury (N.L.R.) Station:—(i) to the Anderson Foundry Company, Ltd., of Middlesbrough, the manufacture of the rakes and castings; (ii) to Messrs. Bayliss, Jones, & Baylis, Ltd., of Wolverhampton, the manufacture of the tie-bars, etc.; and (iii) to the Associated Portland Cement Manufacturers, Ltd., the supply of cement; that the said tender be preferred in preference to any other tender standing order No. A 247 relative to sub-letting.

That the manufacture and the fitting of car-paintwork referred to in the contract entered into with the British Westinghouse Electric and Manufacturing Company, Ltd., in pursuance of the resolution of March 6, 1905, for the supply of 150 electrically equipped cars, be executed by staff of the tramways department under the direction of the chief officer of tramways, for a sum not exceeding £500.

That the seven electrical equipments referred to in the contract entered into with Jessop & Appleby Bros. (Leicester and London), Ltd., in pursuance of the resolution of April 10, 1905, for the supply of seven electrical equipments, be obtained from the British Westinghouse Electric and Manufacturing Company, Ltd., as an extension of the contracts entered into with that firm in pursuance of the resolutions of July 25, 1905, and March 6, 1906, at a cost not exceeding £379½."

The recommendations were agreed to.

List of Rates of Wages and Hours of

Labour.—The Works Committee reported as follows, the recommendation being agreed to:—"A working rule agreement has been arrived at between the London Master Builders' Association and the National Association of Operative Plasterers (London District), and it is necessary that the hours of labour of plasterers inserted in the Council's list of rates of wages and hours of labour should be amended in accordance with the agreement. We recommend that the Council's list of rates of wages and hours of labour be amended so as to provide that the hours of labour of plasterers, during thirteen weeks after the second Monday in November, shall be forty-four a week."

The Council adjourned at nine o'clock for the Whitsun recess.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

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

Lines of Frontage and Projections.

St. George, Hanover-square.—A projecting porch and four projecting balconies in front of No. 17, Hill-street, Berkeley-square (Messrs. Hindley & Wilkinson for Mr. C. Rube).—Consent.

Westminster.—A building at the corner of Horseferry-road and Elverton-street, Westminster (Mr. D. B. Helderwick for the Board of Officers of the Westminster Dragoons).—Consent.

Marylebone, West.—An open portico in front of No. 76, Upper Berkeley-street, St. Marylebone (Mr. T. Henwood, jun., for Mrs. B. Cohen).—Consent.

Clapham.—That the application of Mr. H. G. Hills for the Wandsworth Metropolitan Borough Council, for an extension of the periods within which the erection of buildings on a site abutting upon the south side of Clapham Park-road, and the east side of Park-hill, Clapham, was required to be commenced and completed, be granted.—Consent.

Norwood.—Porches to Nos. 57 to 75 (odd numbers only) inclusive, Frankfort-road, Herne-hill (Mr. F. L. Goldard).—Consent.

St. George, Hanover-square.—Three houses on the site of Nos. 11, 12, 13, and 14, Hubart-place, St. George, Hanover-square (Messrs. Bochmer & Gibbs for Messrs. G. Trollope & Sons and Colls & Sons, Ltd.).—Consent.

Peckham.—A osteo-therapy shop in front of No. 134, Queen's-road, Peckham (Mr. J. E. Murch).—Refused.

Chelsea.—Buildings on the south-eastern side of Fulham-road, Chelsea, to abut also upon College-street and Kimbolton-row (Messrs. Elms & Jupp for Mr. E. Bingham and Messrs. T. Crapper & Co., Ltd.).—Refused.

Width of Way.

Camberwell, North.—Two houses on a site on the east side of Elmington-road, Camberwell, with the forecourt fences at less than the prescribed distance from the centre of the roadway of the street (Mr. W. M. Proudfoot for Mr. S. F. Cope).—Consent.

Kensington, North.—A working-class dwelling on the southern side of Thomas-place, Kensington (Mr. W. C. Leste for the Kensington Royal Borough Council).—Consent.

Kensington, South.—The retention of an iron forecourt railing in front of No. 22, Aubrey-walk, Kensington, at less than the prescribed distance from the centre of the roadway of the street (Mr. F. Selby for Mr. A. Withers).—Consent.

Width of Way and Lines of Frontage.

Dulwich.—Four houses with porches on the southern side of Love-walk, Camberwell, westward of No. 1 (Mr. A. E. Mallins for Mr. J. Ham).—Consent.

Woolwich.—Buildings on the eastern side of Blendon-road, Plumstead, northward of Wernbrook-street (Mr. J. Wernham).—Consent.

Width of Way and Space at Rear.

Whitechapel.—The re-erection of Nos. 21, 22, and 23, Great Pearl-street, Spitalfields, at less than the prescribed distance from the centre of the roadway of Great Pearl-street, and with an irregular open space at the rear of No. 23 (Mr. W. Gilbert for Mr. A. Wearing).—Consent.

Width of Way, Frontage, and Construction.

Kensington, North.—The retention of a building at the rear of No. 124, Holland Park-avenue, Kensington, abutting upon Princess-road (Mr. S. J. B. Stanton for the Holland Park Motor Company).—Refused.

Formation of Streets.

Woolwich.—(a) A deviation from the plans approved on November 7, 1899, for the formation of new streets on the Suffolk-place farm and Bostal farm, Abbey-wood, Plumstead, so far as relates to an alteration in the position of Conference-road (Mr. W. B. Sheppard for the Royal Arsenal Co-operative Society, Ltd.).—(b) That the Council do consent to the application of Mr. T. G. Arnold for the Royal Arsenal Co-operative Society, Ltd., for an extension of the time within which the formation or laying out of new streets on the Suffolk-place farm and Bostal farm, Abbey-wood, Plumstead, was to have been completed.—Consent.

Hampstead.—That an order be issued to Messrs. Farbrother, Pills & Co., sanctioning the formation or laying out of a new street for carriage traffic to lead from Frogland-lane to Barby-avenue, Hampstead (for Sir Spencer P. M. Maryon-Wilson, Bnt.).—Consent.

Fulham.—That an order be issued to Messrs. Dalgrave & Co., sanctioning the formation or laying out of a street, to be used for the formation of foot traffic only, on the site of Nos. 619 to 631, Fulham-road, Fulham, and in connexion therewith the erection of buildings).—Consent.

Buildings for the Supply of Electricity.

St. Pancras, East.—The construction of an ash hopper, dust screen to ash hopper, exhaust steam pipe from turbines and dust screen to the coal conveyors at the Peat-street generating station, Camden Town (Mr. S. W. Baynes for St. Pancras Metropolitan Borough Council).—Consent.

Paddington, North.—A sub-station on the southern side of Rendolph-mews, Portofolow-road, Paddington (the Metropolitan Electric Supply Company, Ltd.).—Consent.

The applications marked † are contrary to the views of the local authorities.

THE LONDON SANITARY INSTITUTE: MEETING AT BOURNEMOUTH.

A PROVINCIAL sessional meeting of the Royal Sanitary Institute was held at Bournemouth on Saturday last week. The Chairman of the Council of the Institute (Colonel J. Lane Nutter) presided over a fair attendance of members. The Mayor of Bournemouth (Alderman J. A. Parsons) extended a hearty welcome to the members.

Dr. Philip W. G. Nunn (Medical Officer of Health for Bournemouth) read a paper on "Sanitary Administration in a Health Resort," which dealt mainly with the sanitary conditions prevailing under the municipality at Bournemouth. In the course of a discussion which followed, Dr. Groves (Isle of Wight) insisted that every man residing in a district governed by a local authority had the right to demand the sanitary conditions which the law afforded him, but in a health resort they had to do more than that, they had to recognise the sentiment of hospitality, that visitors were their guests, and if Christianity did not prompt them at least their sense of honour ought to make them see that people were not put to any disadvantage in the places which they visited. Dr. W. B. Barclay (Weymouth) argued that the social and moral welfare of the people was as important as the sanitary administration of a town. He consequently favoured Sunday being made a day of rational amusement. Hygiene and sanitary administration should, he said, be taught in a practical as well as a theoretical manner in all their schools. Dealing with the dust problem, he attributed the spread of diseases largely to the insanitary evils created by motor-cars on the roads. He had been struck by the absolute overcrowding which occurred in health resorts. He advocated compulsory inspection of every lodging-house by the sanitary authorities. The Chairman said that every municipality should have an abattoir, and argued that the same remarks with reference to milk supply applied to the sale of meat. At the conclusion of the discussion the members adjourned to the Royal Bath Hotel for luncheon, and during the afternoon, at the invitation of the Mayor and Corporation, they proceeded for a drive to the principal parts of the town, visiting the Sanitary Hospital and Royal Boscombe and West Hants Hospital.

MOUNT ZION BAPTIST CHAPEL, RAMSGATE.—This chapel has just been reopened after having been renovated. Mr. Stanley H. Page has been the architect, and the contractors have been Messrs. Jannin Brothers.

Spac at Rear.

Paddington, South.—Buildings on the eastern side of Richmond-road, Paddington, on the space at the rear of No. 112, Westbourne-grove (Mr. J. A. L. Gimblette).—Refused.

Archaeological Societies.

SUSSEX ARCHÆOLOGICAL SOCIETY.—A special meeting of the Sussex Archaeological Society was held at Lewes Town Hall on the 25th ult. It was convened to "discuss the plans and estimated cost of building the proposed new library and museum in the 'Gun Garden' adjoining Lewes Castle." The Chairman was the Rev. Canon J. H. Cooper, who prefaced the discussion with a few details, which were supplemented by Mr. Reginald Blaker, in regard to the history of the problem to date. Briefly it may be stated that in 1903 the Society learned that the house at Lewes Castle, occupied for nearly twenty years, had been sold without any intimation being given to them, and the fact necessitated the provision of suitable premises elsewhere. In December of that year a committee was formed, and, to secure for the Society access to the castle, what is now known as the "Gun Garden" was acquired. It was upon this site that a proposal to erect a museum and library gained favour in some quarters. Plans were prepared for a "simple two-storied building," containing a museum and a strong room for valuable MSS., etc., on the ground floor, and a well-lighted library and study above, with a convenient residence for a caretaker. The cost of this building, with necessary furniture, it was estimated would probably reach, if not exceed, 3,000*l.* It was apparent to all who attended a general meeting of the Society last March that there was no unanimity of opinion on the subject, several of the members being averse to the erection of a building on the "Garden" site. On the question of expense, the Chairman mentioned that the Society now had a membership of several hundreds, and the subscriptions towards the estimated cost of the new project, given for two years, would not average more than 3*l.* or 4*l.* He emphasised the essentiality of securing access to the castle, supporting his contention, from a monetary point of view, by mentioning that something like 150*l.* per annum was derived from fees for admission paid by visitors, though last year, he added, he believed there were 200 less visitors than the year before, in consequence of the museum's removal, and they only took 115*l.* The Society, he added, had a valuable museum, but it was housed very badly.—Pro forma, as he explained, the Rev. W. Hudson then moved, "That the plans and estimates now submitted be approved, and that the Council be requested to proceed with the work." This was seconded by Mr. Salzmann, and a lengthy discussion ensued. Mr. C. E. Clayton described the proposal to erect a building on the "Gun Garden" site as "an act of vandalism of a monstrous and extraordinary nature." He asked the members to record in the most unmistakable manner their opinion that to erect any building whatever, even if it were to be only the height of a chair, in the "Gun Garden" was a distinct error, not only of judgment, but one of those things that no Archaeological Society should countenance. He did not think as many as fifty members would offer a subscription to defray the cost if that scheme were carried into effect.—After a good deal of discussion, the Chairman asked for a show of hands on the motion. No one supported the proposal, and it was rejected by what appeared to be an almost unanimous vote. Subsequently Mr. Griffith proposed the following resolution:—"That the Council be requested to make inquiries into the best method of making the library and collection of prints and collections belonging to the Society conveniently available for the members, without undue expense to the Society, and report to the first general meeting to be held next year. Mr. Somers Clarke seconded, whereupon Mr. Aubrey Hillman moved, as an amendment, the insertion of the words "at a site in Lewes" in the resolution to follow the phrase "conveniently available." He maintained that they should keep the library at Lewes and prevent it going to Brighton. Alderman Wightman, who seconded the amendment, impressed upon the meeting that Lewes was more suitable than Brighton for the library of the Society. The amendment was carried, and the resolution, as altered, adopted.—Abstracted from a report in the *Sussex Daily News*.

Fifty Years Ago.

FROM THE *Builder* OF MAY 31, 1856.

If London were built throughout in the so-so character of the larger portion of its vast extent; if there were no fine squares, no gardens and lawns, no commanding buildings and places (or piazzas), then we should not have so much to deplore the original laying-out of the streets, ranging, as they do, in all directions but the rectangular. The central quarters even are nearly all obnoxious to the same objection; the nearer the Temple or the Royal Court, the worse the lanes, the greater the "bizarreness" of both buildings and arrangements, and the more contemptible the public! Near Gray's-inn, Leather-lane, Baldwin's gardens, with other familiar places, are too well-known; near the Temple, Essex-street is the most respectable avenue; near St. Paul's, Paternoster-row, Ave Maria-lane, Amen-corner, etc., etc., keep up at a respectful distance the invariable characteristic of the ancient cathedral, viz., a plea "ad misericordiam," for mundane externals; near St. Mary's-le-Strand, and close upon St. Clement's Dunes, *Holywell-street* marks again the sanctuary—the place formerly resorted to for its living waters, is no longer the fountain of health or of piety; but near Lincoln's-inn-fields—how shall we describe the sinuosities, the complexity, and the filth which block up and degrade the very heart of the metropolis? Here is the largest and best situated of our squares (offering a causeway leading direct between the two great arteries of Oxford-street and the Strand) comparatively useless and deserted; it runs nearly half-way between both, and yet there is no advantage taken of the easement it offers for a grand traverse street.

A line drawn southward from it, on the west side, would cut the dens of Clare market and street, Vere-street, Duke-street, and other *deles*, and issue out not far from the front of Somerset House, by Newcastle-street eastward of St. Mary's-le-Strand.

A little violence might be done to the end of the venerable stack of Holywell-street, one house at the end of which block should come down, to make an appropriate opening; and in continuation large clearances should be made through Clare-market and the vicinal heaps of dingy houses, which seem to have been accidentally ranged as a sort of maze to amuse the special pleaders who formerly occupied New-inn, Lyon's-inn, and all the other ins as well as outs of the region.

LONDON BUILDING ACT TRIBUNAL OF APPEAL.

MARWOOD v. LONDON COUNTY COUNCIL.

ON Monday the Tribunal of Appeal continued the hearing of the appeal by Mr. Francis P. Marwood against the certificate of the Superintending Architect of Metropolitan Buildings defining the general line of buildings on the east side of Gliddon-road, Fulham, between Edith-road and the Metropolitan District Railway, and further defining the general line of buildings on the south side of Talgarth-road, Fulham, between the building known as No. 83 in that road, and Gliddon-road. Mr. Schiller appeared for the appellant, and Mr. A. Moresby White for the respondents. The facts of the case, briefly stated, are as follows. Over twenty years ago a building estate was developed which was bounded on one side by the Metropolitan District Railway, and the Talgarth-road, which runs parallel with the railway, was constructed. Gliddon-road was subsequently constructed, and ran at right angles with the Talgarth-road. For a time Gliddon-road was a *cul de sac*, as a wall along one side of Talgarth-road blocked it. Subsequently it was decided to develop the land on the other side of the Metropolitan District Railway, and to do this a bridge was built over the railway, just opposite the Gliddon-road, and the wall which blocked the mouth of Gliddon-road was removed, so that apparently the bridge became a continuation of Gliddon-road. The appellant has erected a block of flats on the approach to the bridge, so that the buildings front the bridge approach on one side and Talgarth-road on the other, and he contended that the bridge and approach formed no part of Gliddon-road, and was never intended to be a continuation of it, and that in fact it was called St. Paul's Bridge until it was renamed Gliddon-road Bridge by the London County Council. The Superintending Architect, however, in fixing the building line took the line of the existing houses in Gliddon-road, and continued it across Talgarth-road, and

applied it to the bridge approach (on which the flats are built) as being part of Gliddon-road, with the result that if the line was adhered to the appellant would have to set back his buildings several feet.

After hearing a considerable amount of evidence, the Tribunal decided to vary the certificate of the Superintending Architect, and found that there was no general line of buildings on the east side of the road between Talgarth-road and the Metropolitan Railway, and that the building marked A on the plan attached to the certificate was situated in Talgarth-road.

The effect of this decision is that the bridge is found not to be a continuation of Gliddon-road, and consequently the appellant will not have to pull down his building. Fronting Talgarth-road, however, there are several bay windows going up three stories, which project over the building line, and these will have to be removed unless the consent of the London County Council is obtained for their retention.

Illustrations.

DESIGN FOR THE PROPOSED PEACE PALACE.

WE devote our illustration plates this week to the fine design for the proposed Peace Palace at The Hague which was sent in by Mr. H. T. Hare, which we venture to think will not be found to be surpassed, in combined architectural and practical character, by any of the designs which have been submitted.

The plan unites the two portions of the programme, the Palace and the Library, in one architectural composition. The interior services are, however, entirely independent and distinct, and can be used separately.

The plans given on one of the sheets, though to a small scale, sufficiently explain the general arrangement of the building. The book-storage department has been arranged on a curved line, which suits well with its requirements, and at the same time makes an effective feature in the rear elevation of the building.

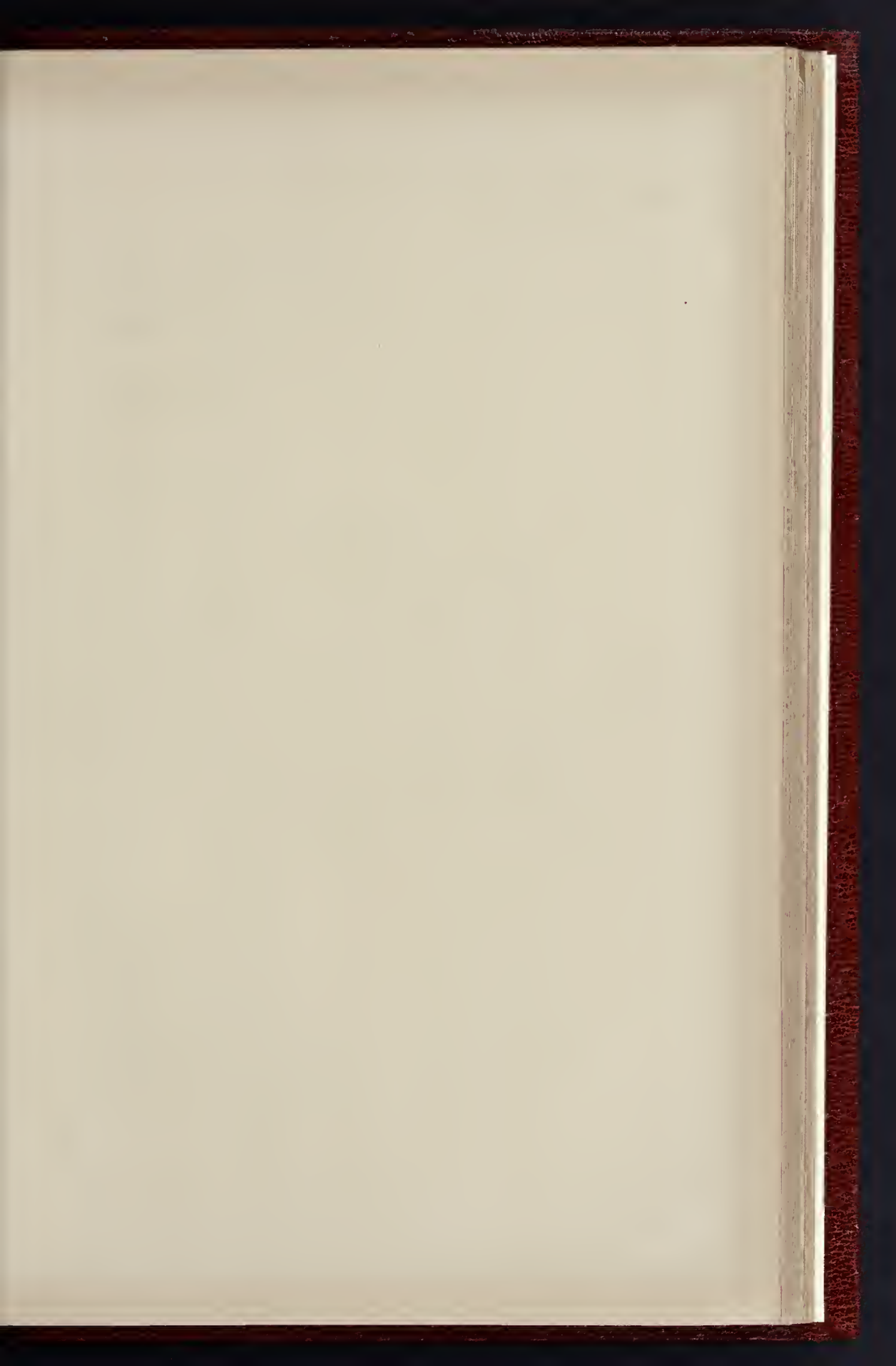
In regard to materials, it was intended to build the whole of the exterior façades in stone to be afterwards selected; the floors to be all of fireproof construction, and the roofs and cornices covered with asphalt, except the dome, which would be roofed with lead. The interior of the grand vestibule was to be finished in marble on the walls and floors; the floors of other apartments, as well as all other woodwork in them, to be of oak; the ceilings of the large rooms in decorative plaster-work, with spaces prepared for ceiling paintings.

The heating was intended to be by hot-water radiators in the principal apartments, to which fresh and partially-warmed air would be introduced by electrically-driven fans, the same method being used for extraction.

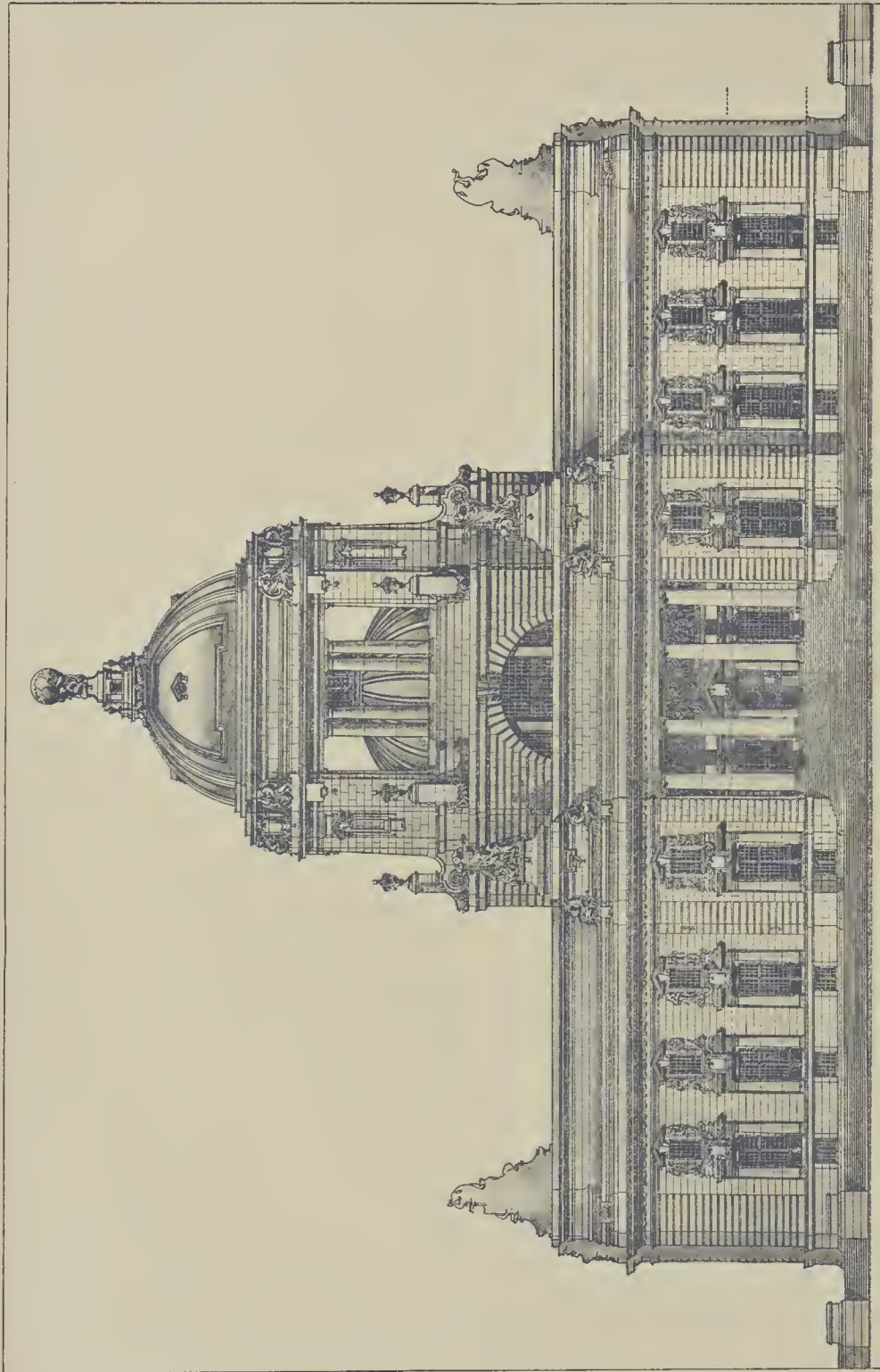
The author's estimate for the cost of the building, independently of the laying-out of the land and of some of the more important sculptural decorations, is 1,520,000 forins (about 150,000*l.* in English currency).

The drawings were got up and finished by Mr. Fulton, whose valuable assistance in this respect Mr. Hare is glad to acknowledge.

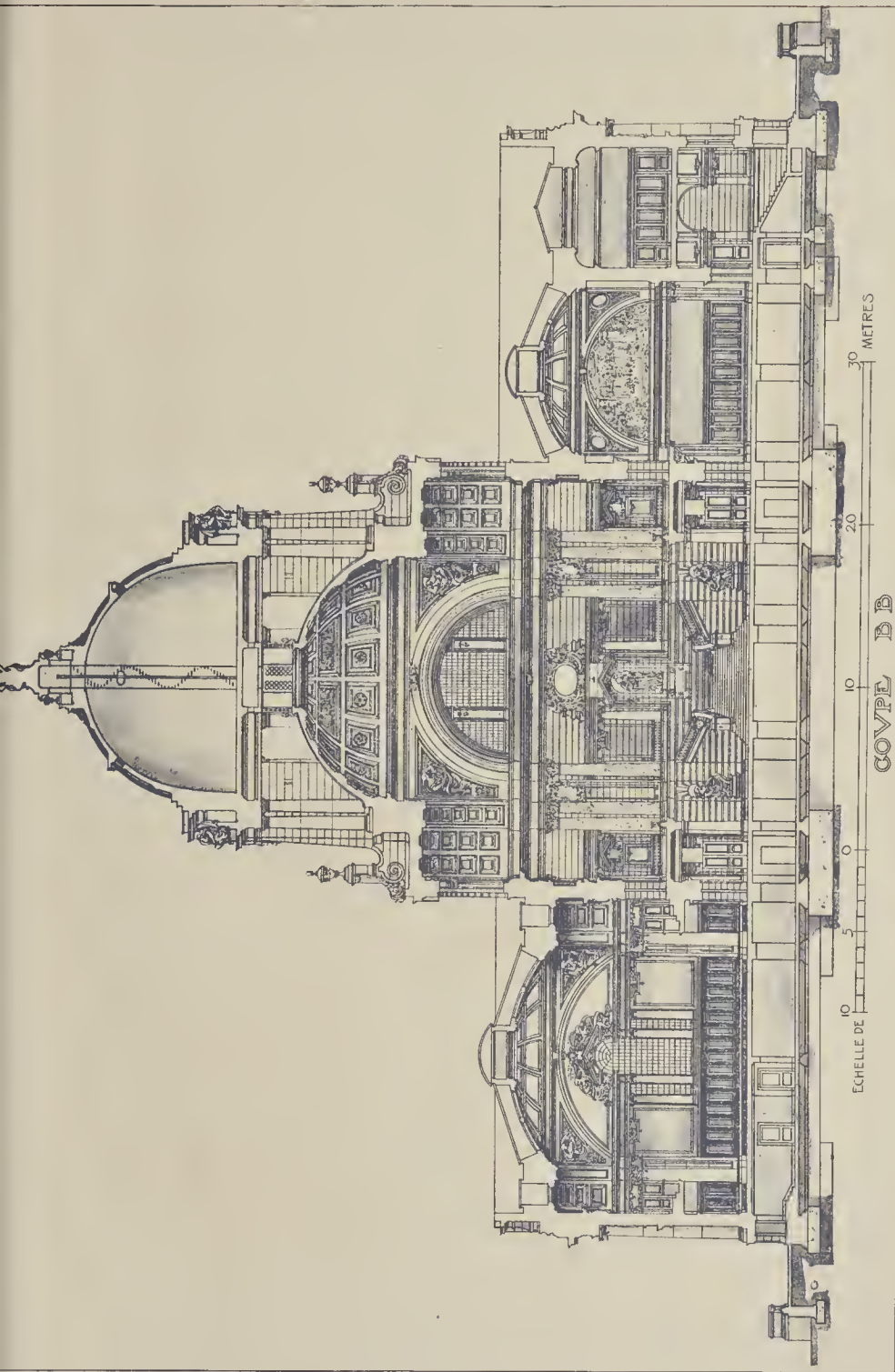
MISSION CHURCH, GATESHEAD.—The foundation-stone of St. Cuthbert's Mission Church and Parochial Hall, which is to be erected in Rawlins-road, Bensham, in connexion with the St. Cuthbert's Parish Church, Gateshead, was laid on the 18th ult. The buildings, which comprise a mission church, 40 ft. 9 in. by 31 ft. 3 in., and a parish hall, 48 ft. 6 in. by 40 ft. 9 in., are situated at Rawlins-road, Bensham. Adjoining the hall at the back are two class-rooms and a kitchen. The main hall of the church is separated by a movable partition, so that the two can be readily thrown together to form one large hall 79 ft. 7 in. long and 40 ft. 9 in. wide. The vestry is placed at the west end of the church, and adjoins the main entrance porch, which is so arranged as to be the principal approach to both church and hall. The walls are of brick, with red pressed facings and red terra-cotta dressings, and the roofs, which are open inside, will be covered with slates. Extra lighting and ventilation in the roof of the hall is obtained by large dormer windows. The contractor for the whole of the work is Mr. Wm. Hall, of Gateshead; and the architects are Messrs. J. W. Frazer & Corking, of Newcastle and Gateshead.



THE BUILDER, JUNE 2, 1906.

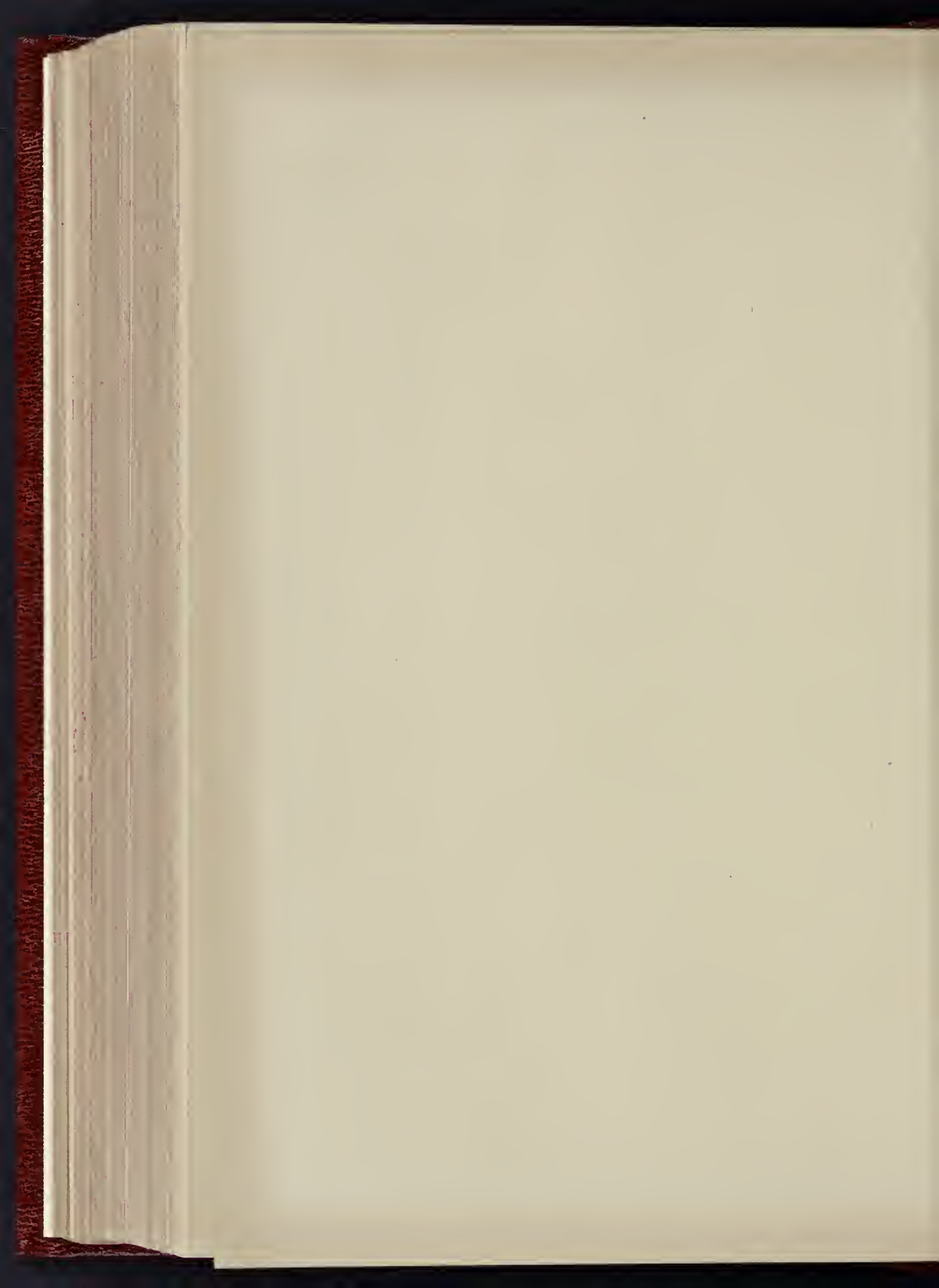


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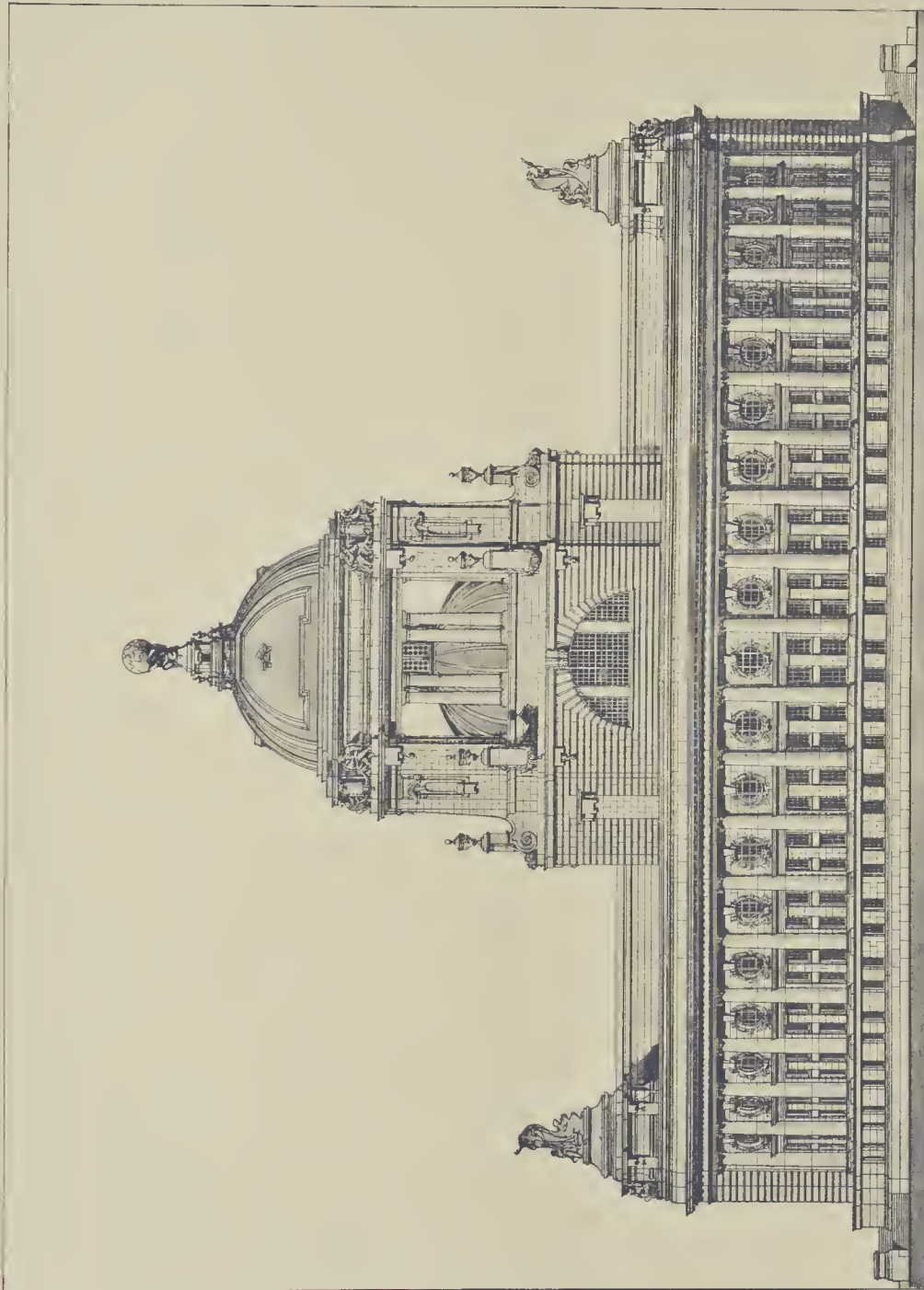
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COMPETITION DESIGN FOR PEACE PALACE AT THE HAGUE.—By Mr. H. T. HARE, F.R.I.B.A.

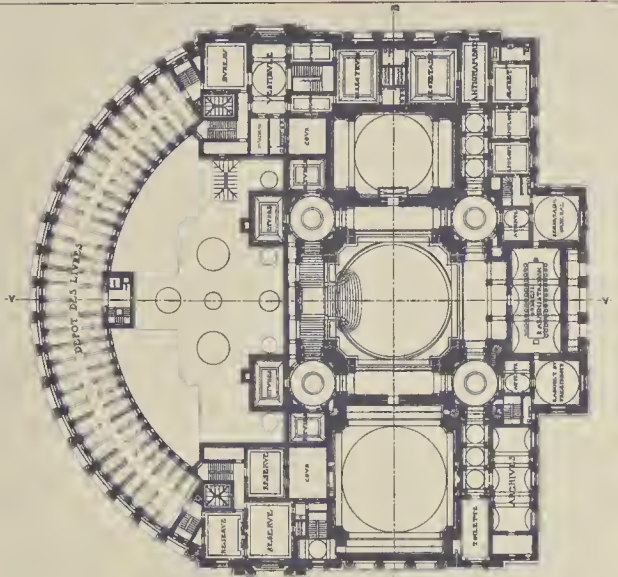




THE BUILDER, JUNE 2, 1906.

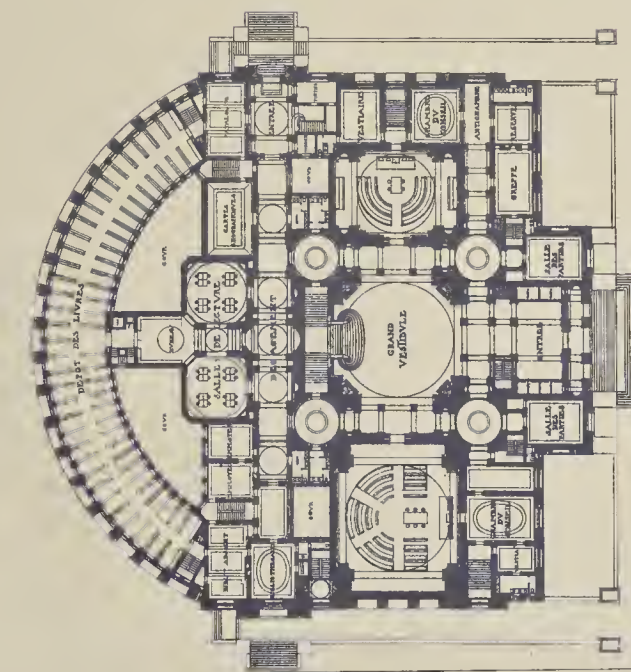


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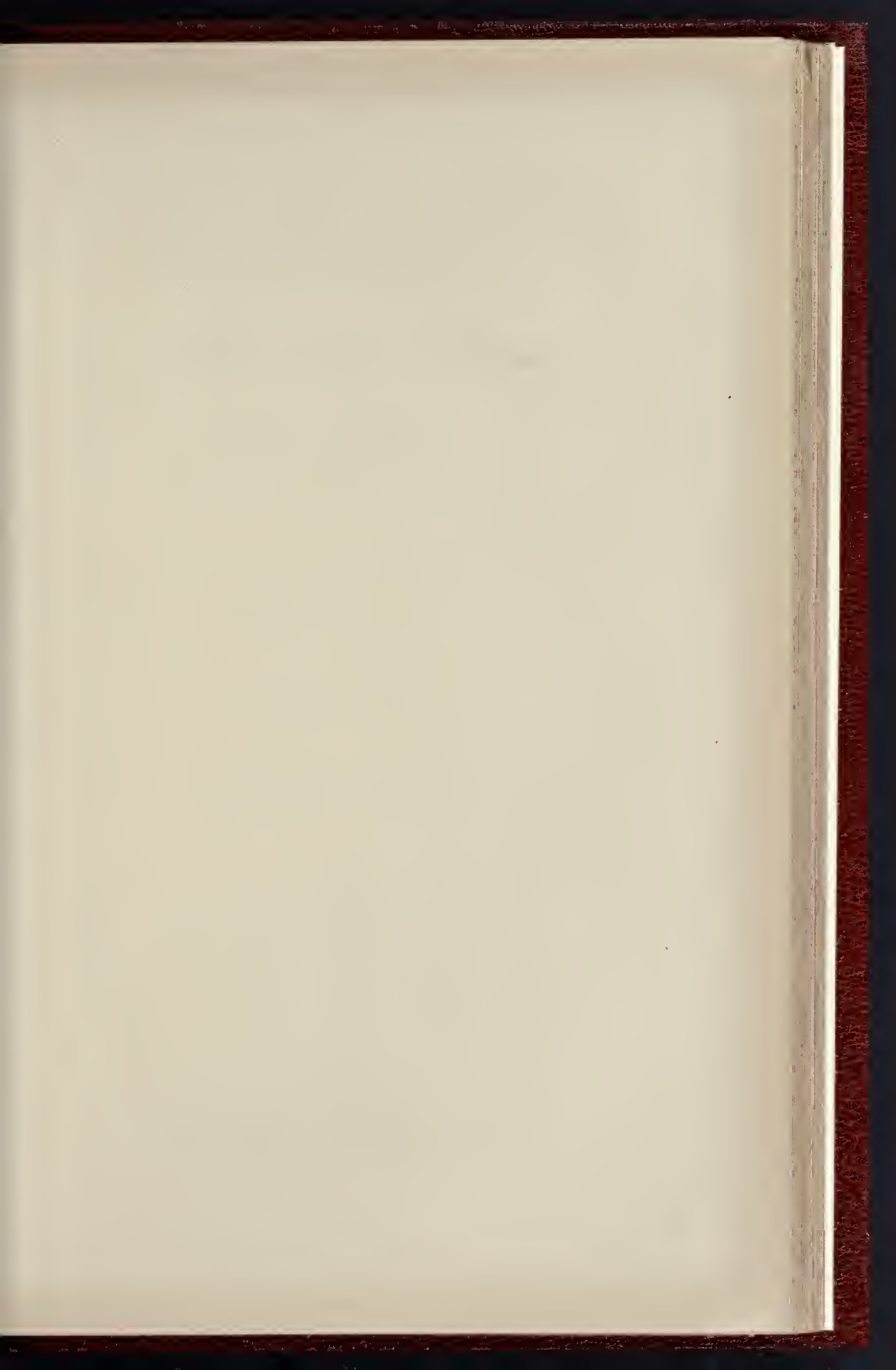
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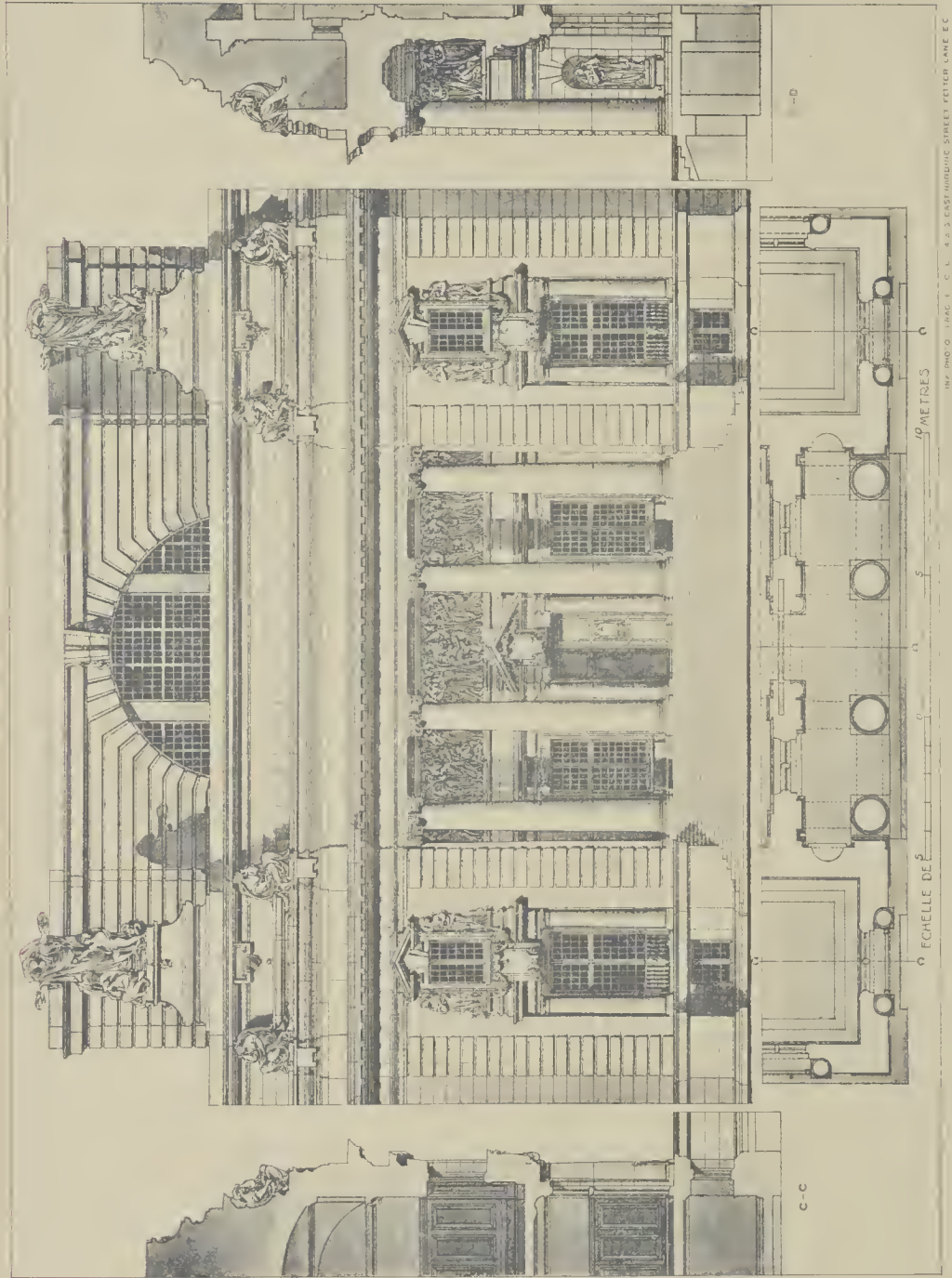
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THE PHOTO SURVEILLANCE CO. 433 EAST WINDING STREET FETTER LANE E.C.

COMPETITION DESIGN FOR PEACE PALACE AT THE HAGUE.—By MR. H. T. HARE, F.R.I.B.A.

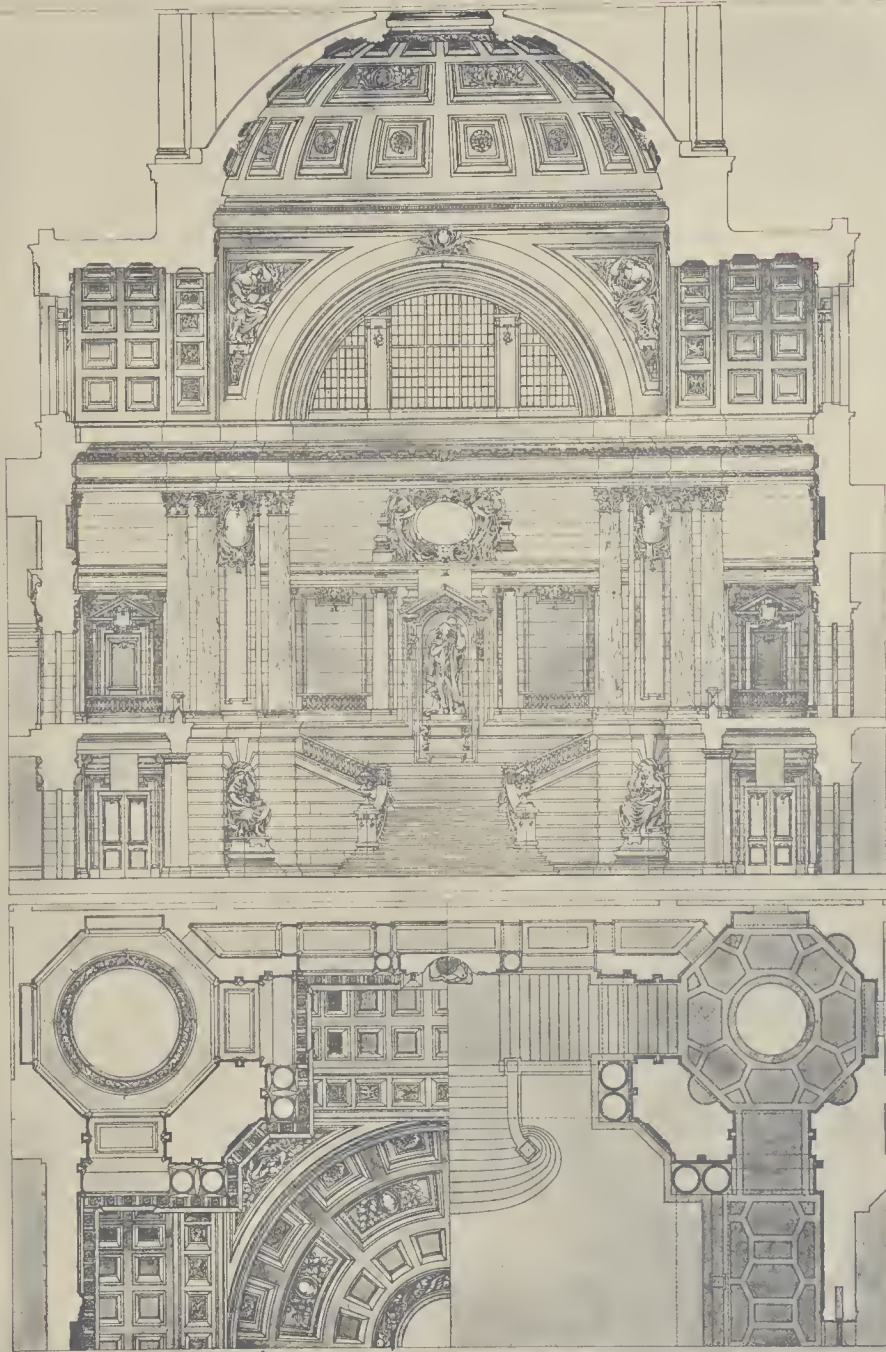


THE BUILDER, JUNE 2, 1906



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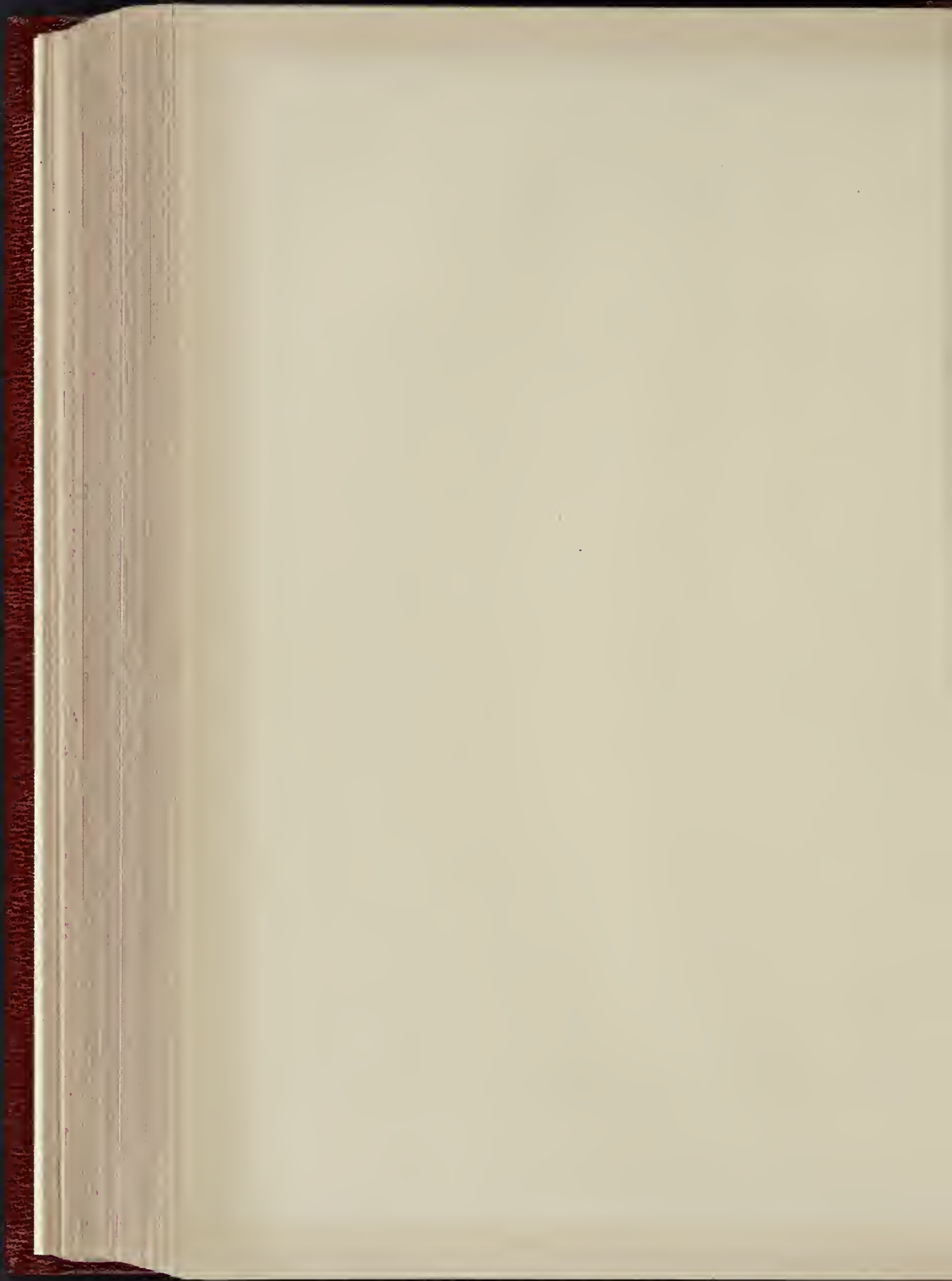


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COMPETITION DESIGN FOR PEACE PALACE AT THE HAGUE.—By Mr. H. T. HARE, F.R.I.B.A.





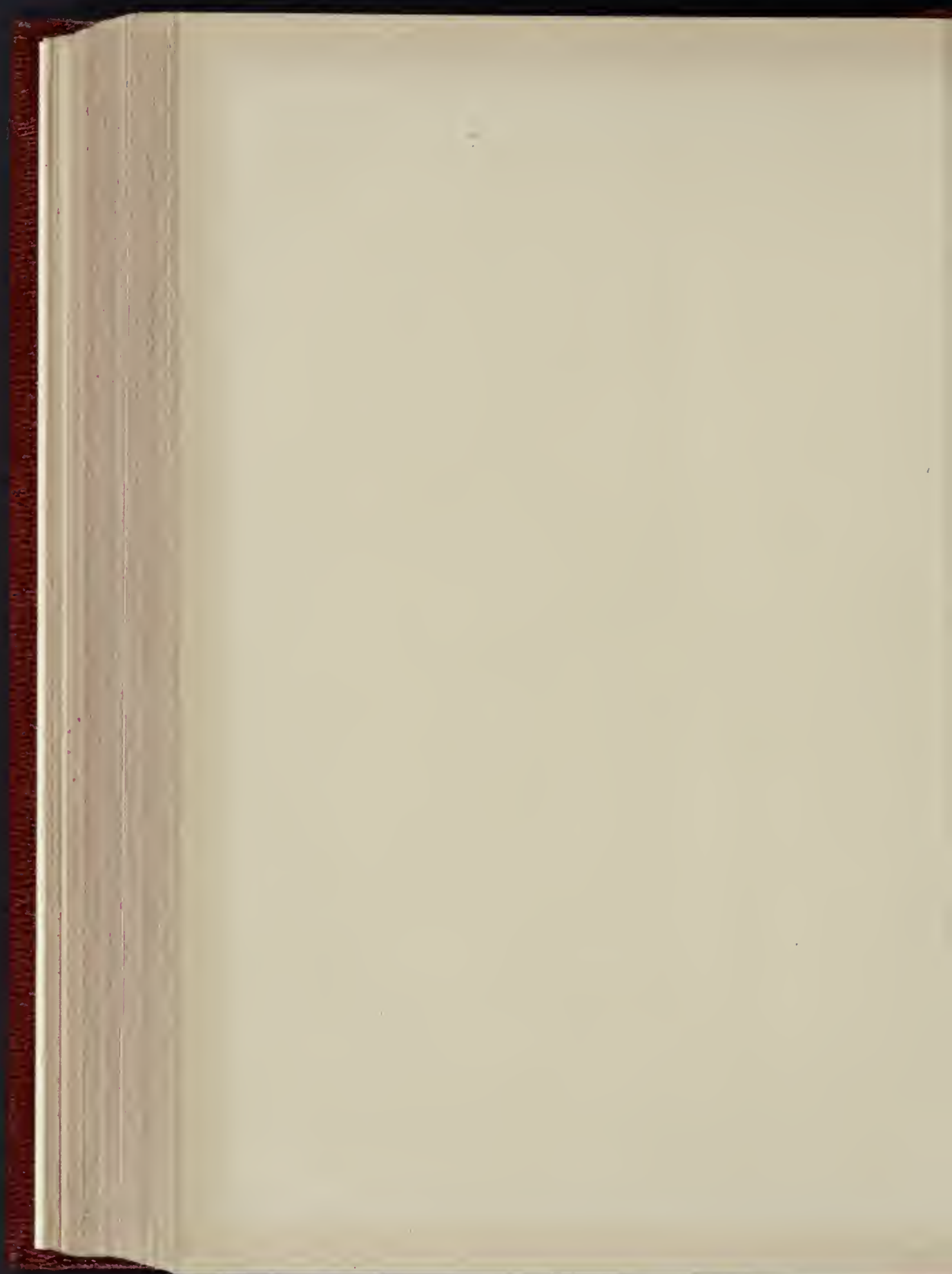


COMPETITION DESIGN FOR PEACE PALACE



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THE HAGUE.—By Mr. H. T. HARE, F.R.I.B.A.



BOOKS RECEIVED.

THE AMERICAN VIGNOLA. Part II. By William R. Ware. (B. T. Balford, 12s. 6d.)
SOME DEVONSHIRE SCREENS. By Don Bede Camd; O.S.B. (Ampleforth Abbey, 1s.)
JOINERS' MACHINES, AND HOW TO WORK THEM. By T. R. Groom. (W. Rider & Son, 1s.)

SOCIETY OF ENGINEERS: TRANSACTIONS FOR 1905: with General Index, 1857 to 1905. Edited by Perry F. Nursey, Secretary. (E. & F. N. Spon.)

EXPERIMENTS ON HOT-WATER SYSTEMS. By A. Snyers. (The Sanitary Publishing Company.)

Correspondence.

"ARCHITECTS AND DECORATION."

Sir,—The interesting extract from the *Builder* of May 24, 1896, which you publish in your last week's issue under the above heading, shows that even so far back as, and in such a generally artless and tasteless age as, the "fifties," the "decorator" had fastened with his octopus-like tentacles upon the legitimate preserves and province of the architect, but certainly not to the extent which obtains to-day.

History repeats itself, and practically the whole of the article could with truth be applied to present-time conditions, with the exception that there are scores of architects who are capable of devising schemes for decoration, while there were comparatively very few able to do so in an equally satisfactory manner fifty years ago.

Competition is not confined nowadays to one's own profession, but the architect's province is invaded on all sides by provision, drapery, furnishing, building, and other firms who undertake every branch of an architect's duties, and being able to keep up large and attractive establishments, and having the great advantage of advertising, attract a large amount of architectural business. These firms frequently do their best to oust any architect who may have been previously called in, and the client is tempted by the plausible title of the "universal supply" decorator that he has an architectural and decorative staff who can undertake all the work required, and thus there is really no need to employ an architect, whose fees can thus be saved!

The estate agent with an "architectural" branch is another source of unfair competition, as he can and does advertise extensively. Surveyors, also, to municipal and educational authorities deprive (not, of course, willfully) their professional brethren of work which should legitimately be allocated to the latter.

All these sources of competition are undoubtedly having a disastrous effect upon our profession, as is evidenced by your advertisement columns of "situations vacant and wanted." They are a very good index of the state of the architectural labour market.

I should be glad if somebody could suggest even a partial remedy.

ARTHUR R. MAYSTON.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XXI.

THE SLIDE-RULE IN TECHNICAL CALCULATIONS.

IN preceding articles we explained the manner in which the slide-rule is applied to the operations of multiplication and division, and we also pointed out in general terms the manner in which the instrument is applied to the processes of involution and evolution.

We now illustrate the various methods of using the slide-rule, and indicate some devices by whose aid results can be obtained with a minimum expenditure of time and to the maximum possible degree of accuracy. As in previous chapters, attention is confined to the ordinary 10-in. rule, of which Fig. 16 may be taken as a typical illustration.

Proportion.

Rule (1).—Set the first term on B or C opposite to the second term on A or D, and opposite the third term on B or C read the fourth term on A or D.

Example (1): Find the value of x in the proportion $20 : 17 :: 8.825 : x$.

Using scales C and D, move C to the left so that 2 comes over 17, and below 8825 on C read 75 on D. Inserting the decimal point at the proper place, we have $x = 7.5$.

Using scales A and B and regarding them as indicating numbers from 1 to 100, the same result is obtained by moving B to the left and reading the result on the right-hand portion of A, or regarding each of them as containing two scales from 1 to 10 by moving B to the left or the right, and reading the result on the left-hand or right-hand portion of A, as the case may be.

By simple modifications of Rule (1) any unknown term can be obtained from the three other terms of a proportion.

Rule (1a).—To find the first term of a proportion, set the third term on B or C opposite the fourth term on A or D, and opposite the second term on A or D read the first term on B or C.

Rule (1b).—To find the second term of a proportion, proceed as in Rule (1a), and opposite the first term on B or C read the second term on A or D.

Rule (1c).—To find the third term of a proportion, set the first term on B or C opposite the second term on A or D, and opposite the fourth term on A or D read the third term on B or C.

As a result of the constant relations obtaining between the values on each pair of scales, the value of the ratio $20 : 17$ in Example (1) is shown, when the slide is moved to the left, at the right-hand index of the slide as 0.85, the reciprocal being given at the left-hand index of the body as 1.176+. If the slide is moved to the right, the value of the ratio and of its reciprocal will be found at the converse indices.

This property of the slide-rule can be utilised in obtaining equivalents for any ratios required in practice, and for converting vulgar to decimal fractions, or *vice versa*.

Example (2): Arrange the rule so as to constitute a table giving all decimal equivalents of a foot.

Set 12 on C over the L.H. index of D. We can now read directly on D the decimal equivalent of any part of a foot expressed on C in inches, or in inches and parts of an inch which can be easily converted to decimals, such as $1\frac{1}{2}$ in., $1\frac{1}{4}$ in., $1\frac{3}{8}$ in., and so on.

The slide-rule finds one of its most valuable applications in the conversion of various measurements from one system to another, and it is really astonishing that so many architects and engineers still deny themselves the advantages of the wonderful facilities it offers in this way.

To enable the operator to utilise to the fullest extent the valuable property of the rule as a conversion scale, tables of constants are necessary, such as those contained in Tables IV. to VII. and in all pocket-books of data for architects and engineers.

Some frequently-employed constants are indicated on the scales of the rule, but the positions of all others have to be found. As most conversion factors comprise three, and some four, significant figures, it is not always easy to determine the correct place on the scale chosen.

For example, no one could determine correctly the value of a radian = 57.2957796° , or even the approximate value 57.3° . Therefore the ratio $1 : 57.3$ is difficult to set exactly on the scale. But if we take $\frac{1 \times 3}{57.3 \times 3} = \frac{3}{171.9}$ there is no trouble in setting the slide with a very close approach to exactitude, for setting 3 on C over 171.9 on D is equivalent to setting 1 on C over 57.3 on D.

Similar treatment can be applied to all other factors where it seems to be desirable, not only to conversion factors, but to those used in ordinary calculations. In the particular case cited above, however, the constant ρ , marked on scales C and D affords ready means of obtaining what is practically the exact value, for $0.63662 \times 90 = 57.2958$.

Hence the latter can be obtained by setting the R.H. index of C opposite ρ , and placing the cursor on 57.2958 opposite 9 on D. It does not matter in the least that the value cannot be correctly read, because the time for reading only comes when the final result of any calculation has been found.

If scales A and B are used for conversions, all required results from any given constant can be read without further adjustment. The only drawback to the employment of

these scales is the impossibility of obtaining exact readings to more than two or three significant figures, according to position on the scale where the results occur.

In using scales C and D for conversions, it always happens that part of scale C projects beyond one end or the other of scale D. To obtain readings from such portions of C, the cursor must be placed so that the hair-line is over that index which is within the length of Scale D; the slide must next be moved until its other index comes below the hair-line, and the required values can then be read.

Multiplication.

Scales C and D.—In Article XIX. the method of performing multiplication by means of scales C and D was explained sufficiently to make further reference unnecessary with regard to this particular application of the slide-rule.

Scales A and B.—When scales A and B are employed for which is within the length of the product is as follows:—

Rule (2).—Moving the slide towards the right, if the product is read on the left-hand portion of scale A, the number of digits is one fewer than the number of digits in the two factors. If the product is read on the right-hand portion of scale A, the number of digits in the product is equal to the number of digits in the two factors.

This rule is applicable to decimal fractions as well as to whole numbers by bearing in mind that in any factor which is a decimal fraction the number of digits must be taken as 0 or a minus quantity, according to the number of ciphers immediately following the decimal point.

Thus: the number of digits in $1 = 0$, in $.01 = -1$, in $.001 = -2$, and so on.

In other respects the process of multiplication is performed exactly as if scales C and D were employed. The use of scales A and B carries the advantage that all results can be read on scale A without the necessity for any adjustment of the slide after it has once been set in the proper position, for if one end projects so as to throw some of the figures on scale D beyond one end of scale A the result can be read on the other half of the same scale.

The only disadvantage of the upper scales is that the smaller intervals of graduation do not give results so accurately as the more extended graduation of scale C and D. Consequently, when saving of time is a more important factor than minute accuracy, scales A and B should be employed. Under converse conditions scales C and D are certainly preferable.

Inverted Slide.—In Article XIX. we explained briefly the effect of inverting one of the two scales then under consideration.

When the slide of a slide-rule is inverted, as shown in Fig. 19, the scale C adjoins scale A, and scale B adjoins scale D. In this inverted position the two scales of the slide can be conveniently designated as B' and C' to facilitate reference.

At first it is somewhat confusing to read figures upside down, but a little practice soon gives facility, and the cursor enables the operator to make exact reference of the figures on one scale to those on the other.

Examination of Fig. 19 shows that the product of every number on D by the number opposite to it on C' has the constant value 10, and the same condition is found when scales A and B' are examined.

Therefore if the values of all the figures on scales B' and C' are considered to be divided by 10, they are the reciprocals of the figures opposite to them on scales A and D, and *vice versa*.

For instance, on each pair of scales, reading in order A to B' and D to C', 2 is opposite 0.5, 3 to 0.33, 4 to 0.25, 5 to 0.2, and so on.

As pointed out in Article XIX., the inverted slide can be used for multiplication, but in that case unless the process is conducted like division the results will be equivalent to quotients, because the reciprocals of all numbers are necessarily employed as factors.

To obtain the product of any two numbers, we must proceed, as in division, by setting the multiplier opposite the multiplicand, and the product will be read opposite one index of the slide.

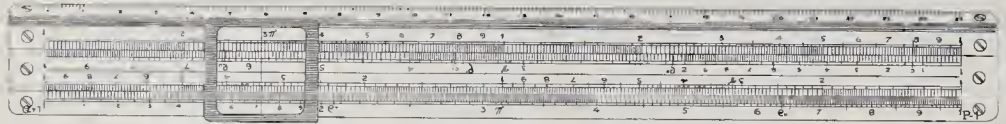


FIG. 19

Illustration to Student's Column.

The rule for the number of digits in the product is as follows:—

Rule (3).—If the product is read on the left-hand portion of scale A, the number of digits is equal to the number of digits in the two factors. If the product is read on the right-hand portion of scale A, the number of digits is one fewer than the number of digits in the two factors.

Example (3).—Multiply 48 by 3.

Set 3 on B' opposite 48 on A, and read 144 on A over L.H. index of B'. The number of digits in the product by Rule (3) is $(1+2) = 3$. Therefore the product = 144.

Before disturbing the rule as adjusted for Example (3) the relations of all coincident figures on scales A and B' should be examined. It will be found that every value on A multiplied by the value opposite to it on B' gives the constant product 144.

The property of the slide-rule thus revealed can be most usefully applied to the determination of different factors for any number. Example (4) illustrates one out of many directions in which this property can be employed to save time in practical work.

Example (4).—Find alternative dimensions of width and length for a tank to hold 900 gals. of water, $900 \div 6.23 = 144$ cubic ft., the depth of the tank to be 3 ft.

Set L.H. index of B' to 144 on A; opposite 3 on B' read 48 on A; set L.H. index of B' opposite 48 on A; then opposite various widths on B' read corresponding lengths on A.

This:

Width 3 ft. 3.5 ft. 4 ft. 5 ft. 6 ft. 6.23 ft. Length 16 ft. 13.7 ft. 12 ft. 9.6 ft. 8 ft. 6.93 ft.

Successive Multiplication.—When processes of multiplication have to be performed one after another no intermediate readings are necessary, as each product can be marked by the hair-line of the cursor as a basis for the next following multiplication.

The only matter requiring special attention is to settle the number of digits, or to adjust the position of the decimal point in the product at the end of the calculation.

Scales C and D are generally used for successive multiplications, because the rule for settling the number of figures in the product is more simple than that necessary for a similar purpose if scales A and B are employed.

To obtain the correct number of digits in the final product we have merely to take the sum of the digits in the factors and to deduct one digit for every time the slide is used projecting to the right hand.

Example (5).—Find the value of $3.6 \times 43 \times 0.075 \times 55 \times 190$.

(1) Set the R.H. index of C to 56 on D, and bring the cursor to 45 on C; (2) set the R.H. index of C to the cursor, and bring the cursor to 75 on C; (3) set the L.H. index of C to the cursor, and bring the cursor to 55 on C; (4) set the R.H. index of C to the cursor, and below 19 on C read 1215.

There are $(1+2-1+2+3) = 7$ digits in the factors, and as the slide only projected to the right in setting (3), the number of digits in the product is $7-1 = 6$. Therefore the required value is 121,500, which is very near to the exact product 121,524.5 obtained by arithmetic.

BANK PREMISES, BUSHEY.—New premises have been erected in High-street, Bushey, by Messrs. Brighton, Watford, for the London and South Western Bank, Ltd., to the plans by Mr. C. L. Morgan, London. The building is three stories high, and the front elevation is faced with a dark polished granite.

Obituary.

ALDERMAN JAMES TUNSTALL.—Alderman James Tunstall died on the 24th ult. at his residence, Wilton Lodge, Palatine-road, Withington, Manchester. The deceased erected a large number of working-class dwellings, including more than fifteen hundred houses in Beswick alone, and groups of others in Longsight, Plymouth-grove, Greenheys, and other localities.

General Building News.

CHURCH, SOUTH TWERTON.—The foundation-stone has just been laid of a new church which is being erected at South Twerton. The work is being carried out from the plans of Mr. H. O. Buckle, the Diocesan Architect.

CONGREGATIONAL CHURCH, IPSWICH.—The foundation-stone of a new Congregational Church in St. John's, Ipswich, was laid recently by Mr. D. Ford Goddard, M.P. The architect is Mr. Edward H. Collier, of Ipswich, and his design is for a structure in the Gothic style, to be erected in red brick with stone dressings.

CONGREGATIONAL CHURCH, HOYLAKE.—The new Congregational Church at Hoylake was opened a short time ago. The building will accommodate a congregation of about 450. The architects were Messrs. Douglas & Minshull, and the contractor was Mr. James Merritt, of Birkenhead.

PRIMITIVE METHODIST SUNDAY-SCHOOL, WALKER.—A new Sunday-school is being erected in Welbeck-road, Walker, in connexion with the Walker Primitive Methodist Church. The new building will be built of brick, with stone facings, and will have an assembly hall 53 ft. long by 31 ft. wide, with four class-rooms running down the side. In this hall there will be a platform and organ. Behind this will be a lecture-room, class-room, kitchen, lavatory, etc., with heating chamber below the garden. The building has been designed by Messrs. Davidson & Phillipson, Newcastle, and the contractor for the work is Mr. John Hutchinson, Newcastle. The probable cost of the building, including the furniture, will be 1,800.

FREE METHODIST CHURCH, WALLSEND.—The new United Methodist Free Church in Buddle-street, Wallsend, has just been opened. The principal entrances are on the south front in Biddle-street, giving access also to the vestibules with cloak-rooms. East and west of the vestibules are the staircases to the galleries. The western staircase being carried up as a tower. The organ chamber and choir gallery are placed at the north end of the church immediately behind the pulpit. On the ground floor there are vestries for minister and stewards, parlour and class-room, and on the first floor at the rear of the church are rooms for the special work of a social centre. The design of the church is in Early English Gothic, and it has been built of red brick with stone dressings. All the interior work is of pitch pine, and the windows are glazed with cathedral glass with tinted margins and lead frames. The heating is by low-pressure hot water system, and there is an installation of electric light. The church has been erected by Mr. James MacHarg, contractor, Wallsend, from plans prepared by Messrs. Badenoch & Bruce, architects, Newcastle.

CHURCH ENLARGEMENT, SOUTHCHURCH, ESSEX.—Holy Trinity Church, Southchurch, is now being enlarged at a cost of 3,000. The work, which is from plans prepared by Mr. J. A. Couper, is being carried out by Councillor W. C. Leaney. It provides for a nave and aisle, and, when finished, the old church will form the south aisle. The accommodation will be increased from 170 to 370.

RESTORATION OF TERRINGTON CHURCH, NORFOLK.—The work of restoring this church has just been completed. The greater part of the rebuilding has been done by Mr. W. H. L. Brown, of Lynn, but the earlier portions of the work were by Mr. J. Thompson, of Peterborough; and Mr. E. J. Case, of Lynn, is responsible for the work in the porch. The operations have been superintended at various times by Messrs. Hicks & Charlgrove, of Newcastle, and Mr. Lacey, Diocesan

Architect. The total cost of the work has been about 7,000.

CHURCH INSTITUTE, PENARTH.—On the 26th ult. the foundation-stone was laid of the new institute which is being built in Albert-road, Penarth, in connexion with St. Augustine's Church. The part in course of erection is at the rear, consisting of the parish hall, a billiard-room, and general reading-room. The estimated cost is 2,000, whilst another 2,000 will be required for the front part, in which part will be various rooms for the use of young people. The builder is Mr. John Jones, Penarth, Mr. H. Snell is the architect.

FIRE STATION, CROYDON.—The foundation-stone of the new central fire station in Park-lane, Croydon, was laid a short time ago. The building stands at the corner of Park-lane and Park-street, the site being 62 ft. by 168 ft. in depth. On the ground floor is the engine-room, with stabling for four horses in the rear, and from Park-lane this is approached by three doors, the fourth, of similar design, giving access to the duty room. The superintendent's-room, workshop, stores, etc., are on the same level. In the first floor is a recreation-room, reading-room, and the superintendent's quarters. On the second and third floor and over the workshop in the rear there will be accommodation for seven married and six single firemen. Externally the building will be faced with Wrotham red fancy brick (from Messrs. Pascall's, South Norwood), with buff-coloured sandstone dressings for the windows and doorways, while the plinth will be of Irish limestone. The firemen's quarters will be approached through a tower having the entrance in Park-street, the space in the centre of the tower being utilised for drying the hose. The total cost of the building when complete will have been about 10,000. The building contract is for 8,750. This is in the hands of Messrs. Hudson & Co., of Westminster. The electric lighting is being installed by Messrs. Casperd & Co., of Croydon, and the heating by Messrs. Wenham & Waters, also of Croydon. The plans of the building have been prepared in the Borough Engineer's office with the assistance of Mr. Helder.

PUBLIC LIBRARY, MALVERN.—A new public library has just been opened at Malvern. The new building was designed by Mr. Henry A. Crouch, of London, the architect, and Mr. James Herbert, of Wolverhampton, was the contractor. The building is faced with Hereford red bricks, with Monk's Park stone dressings, the roof being of Coalbrookdale tiles. It is fronted by a stone loggia, which gives approach to the vestibule. The floor here is of concrete, the floors of the rooms are of wood blocks. The whole of the screens, doors, fittings, etc., are of English walnut. There is a lecture hall, which will seat 200 people, and also on the ground floor a reading library, centrally situated and well appointed, with the news and reference rooms on its right and left respectively. Double doors shut off the lecture-hall from the library. Upon the same floor is a students'-room. Among the rooms on the first floor is one which will be devoted to ladies. In the basement a room will be devoted to the children.

URBAN COUNCIL OFFICES, HAYES.—The new Council offices, which have been erected at Hayes by Lord Hillingdon, were opened recently. The offices are situated in Grange-road, and are of local stocks with picked stocks for the front, and red brick dressings to doorway. The window heads and aprons are of red rubbers, and the heavy door pediment being of hard stone. The heating is by gas fires throughout. The furnishing has been done by Messrs. Maw, Till, Kirke, & Co., of Hull. The Surveyor to the Council, Mr. C. Curtis Gray, prepared the plans; and Mr. E. Plaistow, of South-road, Southall, was the contractor for the work.

PARKS HALL, TREDEGAR.—The foundation-stone of a new hall and Sunday-school for the Parish of St. James, Tredegar, was laid recently. The hall, which is to cost 1,200, provides accommodation for 520, and is being erected by Mr. J. Newcombe, contractor, Tredegar, from plans prepared by Messrs. James & Morgan, architects, Cardiff. The walls are the local stone, the front faced with dressed shoddes, having red pressed brick and Forest stone dressings.

INFIRMARY EXTENSION, KEYNSHAM.—The new wing of Keynsham Workhouse Infirmary was opened on the 19th ult. by Mr. W. H. Bateman Hope, M.P. The building consists chiefly of two

wards, one above the other, each containing three beds, and also an isolation ward and a lying-in ward. The cost of the work was £1,422, apart from furniture, and Mr. H. M. Bennett was the architect.

PROPOSED EXCHANGE, CARDIFF.—Plans are being prepared by Mr. W. M. Corbett for a new exchange, which it is proposed to erect on a site adjoining the Custom House, Cardiff. The building is to cost from 30,000l. to 40,000l.

PROPOSED IMPROVEMENTS TO THE TOWN HALL, ABERGAVENNY.—The subject of how best to improve the present hall or to build a new Assembly Hall has been under continuous discussions at meetings of the Town Council. The Council advertised for plans to alter the present buildings and received plans from M. Baldwin, 1,750l.; Mr. S. A. Johnson, 2,200l.; Mr. E. Foster, 800l.; and Mr. Francis, 2,500l. for a new hall. It was then decided that a circular should be prepared embodying all the four schemes with a guarantee of the cost signed by each architect, that the plans should be on view one month, and that a poll of the town should be taken as to the best course to adopt. In the meantime a public meeting was called so that the various schemes could be laid before the town and the town could be taken into consideration. A lengthy discussion ensued, and it was eventually decided that the whole question should be referred back to the Council.

BUSINESS PREMISES, CRIEFF, N.B.—At last week's meeting of the Dean of Guild Court plans were passed for a new block of buildings to be erected at the corner of King-street and Com-missioner-street, Crieff. The buildings will extend along King-street 72 ft., and along Commissioner-street 20 ft., where they abut on a building belonging to the same proprietor. The ground floor is occupied by shops and a small dwelling-house, while the first floor contains large function and tea rooms. The top floor is arranged as a dwelling-house. The architect is Mr. Gordon L. Wright, of Edinburgh.

Stained Glass & Decoration.

REVERENDS, HERFORD.—A reredos has been erected behind the altar in All Saints' Church, Herford. It is of carved oak, and consists of three panels—a central panel and two side panels with canopies above. The subject of the panels is the Ascension, which is painted on tiles, and the background is of old mosaic. At some future date it is intended to add two more panels at the top of the existing reredos panels. The tiles were painted by Messrs. Simpson & Sons, London, and the remainder of the work was carried out by Mr. Robert Clarke, of Herford, who designed the reredos somewhat upon the lines previously suggested by Mr. Oldrid Scott.

REVERENDS, HERFORD.—The new reredos to the altar at Corpus Christi Church, Gladys-avenue, North End, which has been in progress for some months past, has been completed. The work is in the late Gothic style. It was executed by Mr. A. B. Wall, sculptor, of Cheltenham, from the design of the architect, Mr. C. W. Bevis, of Southsea.

Foreign.

SAN FRANCISCO.—The first all-steel building to be erected in the world is slowly rearing its unhandsome bulk from the ash-heaps of one of San Francisco's main arteries of traffic. It is the "George Whittell Building," and the architect, Mr. Frank Shea, had planned that it should be the most up-to-date "fire-resister" that iron and stone could produce. After the earthquake had passed and the fire had devoured the business section, Mr. Shea found that the gaunt begrimed girders and framework of the partly-built Whittell building had defied shock and flame. The thought struck him, "Why not sheath it in metal like a battleship?" He suggested to the owner that such a structure would answer every requirement as to comfort and convenience; would be more commodious and at the same time both fire and earthquake proof. Mr. Whittell assented, and the framework is being rapidly walled in with steel plates riveted on steel-ribs. It is to be ready for completion within six months, and will cost, when finished, 150,000l. There are to be fifteen stories, a mezzanine floor, and a deep basement. The different floors are not to be partitioned, and the tenants have already selected the areas requisite to their needs. American architects are watching the progress of the building with interest, as it is predicted that this type of structure will create a revolution in methods now being employed in the building world. Mr. Shea is confident that the projectors of hundreds of buildings of this class will follow his idea. After a careful inspection by experts, the "Call," "Crocker," "St. Francis

Hotel," "Shreve," "Flood," "Mutual Savings Bank," and "Merchants' Exchange" buildings have been passed as sound, and will be ready for occupancy within a few days. The above-named are all of structural steel construction, and comprise most of the highest buildings in the West. Up to the 15th inst. it had not transpired that any large orders for steel had been placed in the hands of American steel mills. The Steel Trust has given absolute instructions to the mills under their control, that orders from the devastated city are to be given precedence over all others. This will militate seriously against the chances of English mills securing an appreciable fraction of the business. The San Francisco Reconstruction Committee, including among its membership representative men of financial, engineering, and business reputation, has subdivided into twenty-four committees, one of these being the "Committee on Securing Structural Materials for the use of the City and its People."

GERMANY.—In the competition for designs for a tower in memory of Prince Bismarck to be erected in Diiren, the first premium was awarded to Herr Berns, and the second premium to Herr Hans Schell.

SWITZERLAND.—The plans for the new Casino to be erected at Berne have been completed by MM. Lindt and Hoffmann, and the work of building will shortly be commenced. A new asylum is to be built at Herisau from plans by MM. Rittmeyer and Furrer, at a cost of about 1,722,000 francs, not including the purchase of the site. A new theatre is to be built at Basle in place of the old one which was burned down in October, 1904.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. William Atkinson has retired from the firm of Welch & Atkinson, Surveyors, of 10, Lancaster-place, Strand; and the practice will be carried on at the same address and under the same title by Mr. George Stephenson, who has for several years been a member of the firm.—Mr. H. T. Neil, Quantity Surveyor, has removed his offices from Chancery-lane, Darlington, to Queen-square, Leeds.

THE BOROUGH POLYTECHNIC.—This institution announces a course of six lectures on "Elementary Principles of Electric Lighting, in Relation to Buildings," to be given by Mr. John Henderson, D.Sc., on Thursday evenings, 8 to 9 p.m., commencing May 31. This course is intended specially for students employed in the building trades, architects' offices, and insurance companies.

NEW HIGH-LEVEL BRIDGE AND QUAY EXTENSION, NEWCASTLE.—It is anticipated that the new high-level bridge will be finished in about two months' time. It carries four railway lines laid for a total length of rather more than a half-mile, from the Newcastle Central Station to meet the main line on the other side of the river, to London, and stands about 300 yds. below Redhough-road bridge. The total length, 1,150 ft., of the bridge is divided into four spans of steel construction supported by piers of granite. The middle two spans are 300 ft. each, the other two are 191 ft. (south), and 231 ft. (north). The girders are 82 ft. in the clear above high-water, their ends rise from centre to centre of the girders being 48 ft. 6 in., with a 50 ft. breadth over all, of steel work weighing in the aggregate nearly 5,800 tons. The masonry for the piers is carried down to 69 ft. below high water, the foundations are built upon caissons, and the three river piers have an extreme width of 103 ft. 6 in. at the cut-waters; for the middle pier 195,000 cubic ft. of granite have been used. The designs were prepared for the North-Eastern Railway Company by Mr. Charles A. Harrison, M.Inst.C.E., their chief-engineer, northern division, whom Mr. A. Cameron represented upon the works. The Cleveland Bridge and Engineering Company, of Darlington, are the contractors, and one of their directors, Mr. F. W. Davis, directed the foundation and other constructive work, with the aid of Mr. J. H. Walker, A.M.Inst.C.E., and of Mr. C. S. R. Kirkpatrick, under his appointment as City Engineer. Mr. Kirkpatrick, we may mention, has recently framed an initial scheme for the construction, at an estimated cost of some 50,000l., of additional quay accommodation, having a frontage of 350 ft. to the river Tyne, and a frontage of 115 ft. to the Ouseburn, and with depths of 20 ft. and 10 ft. respectively at low tides.

WAR OFFICE, WHITEHALL.—The new building will be heated by apparatus patented and supplied by the Brightside Foundry and Engineering Company, of Sheffield, arranged upon the duplicated system, and so that the whole, or any part, may be used at any time. Water for the rooms, lavatories, etc., will be heated by exhaust steam from the engine-plant, a feature of the invention is the use of vacuum-pumps for drawing steam, at a low pressure, into the radiators.

VICTORIA TO CRICKLEWOOD TUBE RAILWAY.—The House of Commons Committee, of which Mr. Rickett is Chairman, have found proved the preamble of a Bill for the construction of a tube railway line from Victoria to Marble Arch, and an extension of time for the similar line thence to Cricklewood already authorised by an Act of 1899. The Committee, however, required the insertion of clauses in the Bill for the compulsory provision of exchange-stations with existing railways at Victoria, Hyde Park-corner, and Marble Arch, before the line is opened for public traffic, instead of giving powers to the Board of Trade to suspend that obligation. The Committee also imposed a time limit of four years from the passing of the Act for the completion of the line, and of two years for the acquisition of the necessary lands.

SLATES AND TILING.—We have received from Mr. C. B. Atkinson (325, Wightman-road, Hornsey), a folding card giving tables of sizes, gauge, weight, etc., of various slates, the number of each required to cover a certain space, and rules for measurement of each. The card folds and is slipped into a small case, and is convenient for reference.

SLAVERY PROPERTY AND DRAINAGE.—A conference of Metropolitan Borough Councils to consider the question of the exemption of Crown property from the provisions of the Public Health (London) Act, 1891, and the by-laws made thereunder is to be held in the Islington Town Hall on June 21.

DRAINAGE WORKS JURISDICTION.—The General Purposes Committee of Paddington Borough Council reported on Monday that twelve months ago the following rules relating to the procedure in regard to the jurisdiction as to repairing drains in existing buildings were experimentally adopted up to March 31, 1906:—(1) That all notices and plans relating to drainage work in existing buildings be sent to the surveyor by the builders (or other persons). (2) That, upon the receipt of any such notices and (or) plans, the surveyor shall forthwith forward the same to the Medical Officer of Health, together with a memorandum of the amendments which he considers necessary to bring the plans and specifications into conformity with the by-laws. (3) That the Medical Officer of Health do carry out all negotiations with the builders (or other persons), serve such notices as are required to bring the said plans and specifications into conformity with the by-laws, and return one copy of the completed plans to the surveyor. (4) That, where any material deviation from the plans and specifications is first submitted to the surveyor (or as corrected by him to conform with the by-laws) be proposed, such deviation shall be submitted to the surveyor for his approval before being carried out. (5) That the Medical Officer of Health do supervise the execution of the work. (6) That all notices and plans be returned to the surveyor on the completion of the work set out therein." The Borough Surveyor and Medical Officer of Health reported that the division of jurisdiction had worked well, and the Committee had, therefore, decided that the rules should continue in operation until the Council would otherwise order.

LECTURES ON DOMED BUILDINGS.—At the London County Council School of Building (Ferdale-road, Brixton) a course of lectures on "Domed Buildings," illustrated by lantern photographs, is being given by Professor Beresford Pitt. The next lecture, on "The dome of St. Peter's, Rome," having been treated on the previous Thursday. The lecture on June 14 will deal with Les Invalides and the Pantheon, Paris.

COMBINED DRAINAGE.—At a conference of delegates from Metropolitan Borough Councils, convened by the Fulham Borough Council, and held in the Fulham Town Hall last week to consider the subject of combined drainage, the following resolutions were adopted:—(a) That this conference of London Borough Councils do respectfully urge the Right Honourable the President of the Local Government Board to give the subject of the unsatisfactory state of the law relating to combined drainage in London his serious consideration, with the view of a Bill to amend the law being introduced into Parliament at an early date. (b) That a deputation be formed to wait upon the President of the Local Government Board in order to present the foregoing resolution to him in person, and to urge the view of the conference on the subject-matter. (c) That the whole of the delegates appointed to this conference form the proposed deputation, and that the Councils of the City of Westminster and Metropolitan Boroughs of Battersea, Chelsea, Greenwich, Stepney, and Wandsworth be invited to appoint representatives thereon. (d) That the resolution passed by this conference be embodied in the form of a joint memorial to the Local Government Board setting out the facts of the case, and that the several Metropolitan Borough Councils represented by the deputation be asked to affix their seals thereto when ready. (e) That the terms of the proposed memorial be referred to the Mayor and Town Clerk of Fulham to settle.

Legal.

ALLEGED OBSTRUCTION OF LIGHT OF ST. GEORGE'S CHURCH, HANOVER-SQUARE.

In the Chancery Division, on the 25th ult., Mr. Justice Swinfen Eady had before him the case of Anderson and others v. Francis & Adams, on a motion by the plaintiffs, the Rector and Churchwardens of St. George's, Hanover-square, for an interim injunction restraining, until the trial or further order, the defendants, a firm of builders, from building in Maddox-street so as to obstruct the light coming to the windows on the north side of the church.

It was arranged that the motion should stand over till the first motion day next sittings, the defendants undertaking in the meantime not to further proceed with the work.

Mr. Evg. K.C., and Mr. Cann appeared for the plaintiffs; and Mr. P. Stokes for the defendants.

ACTION AGAINST THE LONDON COUNTY COUNCIL.

On the 25th ult., Mr. Justice Bray, in the King's Bench Division, delivered a considered judgment in the case of the Mayor, etc., of the City of Westminster v. the London County Council.

The case came before his lordship in the form of a special case, which had been stated in the action, the question for decision being whether the London County Council was under a legal liability to provide means of preventing the sewage of certain houses in Grosvenor-road and All Saints' Church from passing into the River Thames. The action was brought by the plaintiffs for a declaration that the defendants were liable to commence and complete the necessary sewers and works to prevent the sewage from passing into the river, and also to recover 6277. odd as money paid by the plaintiffs for and at the request of the defendants.

It appeared from the special case that Grosvenor-road, with the embankment on one side thereof abutting on the river, was constructed by the Commissioners of Woods and Forests, and in May, 1849, the Commissioners of Sewers, on the application of a builder on behalf of the then owner of Nos. 102, 103, and 104, Grosvenor-road, consented to the construction of a drain from the houses into the river, and this being done the sewage from the houses was discharged into the Thames. All Saints' Church was built about 1870, and some time afterwards a drain from the church was connected with the drain from the houses by means of which the sewage from the church was also discharged into the river. It could not be stated whether the drain from the church and its connexion with the pipe leading from the manhole into the river was constructed with or without the knowledge or consent of the Vestry of St. George, Hanover-square. The houses in question and the church are in the parish of St. George, Hanover-square, and under the London Government Act, 1839, the powers and duties of the elective vestry of that parish became vested in the Westminster City Council. The sewage from the houses and church passed into the river through a flap which opened at low tide, but at high tide was closed by the pressure of the water. Before 1899 the Vestry of St. George, and after 1899 the Westminster City Council, took steps to insure the proper working of the flap, but with that exception the Westminster Council exercised no acts of interference with or control over the drainage of the houses. Having regard to the Thames Conservancy Act, 1894, the only efficient mode of disposing of the sewage from the houses and the church was to bring it into the Metropolitan main drainage system at the Lupus-street sewer. In July, 1895, it was decided that the London County Council had no power to order the Vestry of St. George, Hanover-square, to construct a sewer to commence opposite No. 102, Grosvenor-road, and terminate in Lupus-street at the low-level sewer belonging to the County Council. In October, 1903, the Conservators of the Thames called upon the Westminster City Council to discontinue within three months the passage of sewage into the Thames from the sewer taking the drainage of the Grosvenor-road houses, and in consequence the City Council ceased to see to the effectual working of the flap opening into the Thames. In June, 1904, during proceedings by the owners of the houses against the City Council for ceasing to maintain the proper working of the flap, both parties agreed that a sewer must be constructed for carrying off the drainage, and it was also agreed that the proceedings should stand over to give the Westminster City Council an opportunity of arranging with the London County Council for the immediate construction of such a sewer, leaving the question of the cost of such sewer to be determined between these bodies. In furtherance of the suggestion the Westminster City Council had a sewer constructed carrying the sewage from the houses and church into the Rutland-street sewer, for which works they paid

6277. 4s., the sum claimed in the action. The case for the London County Council was that they were under no obligation to provide means for carrying the drainage of the houses or of the church into one of the City of Westminster sewers communicating with the Metropolitan main drainage system, and that in any case they had a discretion in the matter.

Mr. Justice Bray, in his judgment, said the plaintiffs alleged that the liability of the London County Council to provide means of preventing the sewage in question from passing into the river was created by sect. 135 of the Metropolitan Management Act, 1855, or by sect. 1 of the Amendment Act of 1858. Previous to the passing of the Act of 1855 the Commissioners of Sewers of the City of London and the Metropolitan Commissioners of Sewers had constructed certain main sewers, the sewage from many of which passed directly into the Thames. The Metropolitan Board of Works was created by sect. 135 of the Act of 1855, and by that section the main sewers became vested in them. At the time of the passing of the Act the sewage from the houses in question was passing directly into the Thames by a drain made with the consent of the Commissioners of Sewers, and the contention was that the Metropolitan Board of Works should have constructed a main or intercepting sewer to take this sewage, and as they did not do so, but carried their intercepting sewer along Lupus-street instead of the Grosvenor-road, that they or their successors, the London County Council, could be compelled to construct a main sewer to prevent this sewage from passing into the Thames. In his opinion sect. 135 did not compel the Board to lay a main sewer to intercept this sewage. They did in 1869 lay in Lupus-street a sewer sufficiently low to take the sewage through a sewer along Rutland-street, and, they might, in their discretion, have thought that such a sewer as the low-level Lupus-street sewer was all that was necessary. It was for the vestries and district boards under sect. 69 to make the necessary sewers for effectually draining their parishes or districts, and in his opinion the Metropolitan Board of Works was not bound to lay a main sewer so as to intercept the drain of every house that drained into the Thames. Sect. 1 of the Act of 1858 did not, in his opinion, take away from the Board the discretion they formerly had. He accordingly entered judgment for the defendants with costs.

Mr. Macmorran, K.C., and Mr. Colam appeared for the plaintiffs; and Mr. English Harrison, K.C., and Mr. Daldy for the defendants.

SEQUEL TO THE CHARING-CROSS STATION ACCIDENT.

In the Court of Appeal, composed of Lords Justices Vaughan Williams, Scolding, and Moulton, on the 29th ult., judgment was delivered in the cases of Lennox v. Curzon and Scott v. Lennox, on two separate appeals by the respective defendants from decisions of Mr. Justice Lawrence in the King's Bench Division.

The actions, which were brought for rent, arose out of the accident which occurred at the Charing-cross Station on December 5 last year, when the Avenue Theatre was practically destroyed.

It appeared that Mrs. Scott was the lessee of the freehold of the theatre, and Mr. Lennox the assignee of the lease, which had been granted to the Theatrical Syndicate, Ltd., Mr. Curzon being a sub-lessee, who had granted a further sub-lease to Mr. Cyril Maude. The question in the cases was whether the respective defendants were excused in the events which had happened from paying the rent of the theatre, the point for determination turning on the construction of a covenant in the superior lease. This ran as follows:—"If and whenever during the said term the said theatre and premises shall be closed by order of any superior authority or be destroyed by fire or so damaged by fire that the same cannot be continued to be used as a theatre, the rent shall as from the date of such closure, or from the day following such fire, if any, be suspended." By the lease the cost of structural alterations ordered by the County Council were to be borne by the lessors. In Mr. Curzon's sub-lease the words of the covenant were slightly different, as the words "by fire" were omitted. Mr. Justice Lawrence held that the rent was payable in both cases, and gave judgment for Mrs. Scott as against Mr. Lennox for 750. and costs, and for Mr. Lennox as against Mr. Curzon for 2,100. and costs. Hence the present appeals.

Their lordships held that in the circumstances the theatre had been closed by the order of a superior authority, and that, therefore, the payment of rent by the defendants was suspended. The appeals were therefore allowed.

POINT UNDER THE PUBLIC HEALTH ACT, 1875.

The case of the Mayor of Ludlow v. Prosser came before a Divisional Court of the King's Bench Division, composed of Justices Ridley and Darling, on the 25th ult., on a motion by the defendant to set aside an award.

It appeared from the statement of Mr. Randolph, who appeared for the defendant in support of the application, that by reason of the plaintiffs exercising their powers under the Public Health Act, 1875, damage had been caused to the defendant, and the matter went to arbitration under the provisions of the Act. The arbitrators, before proceeding with the arbitration, appointed an umpire. The arbitrators failing to agree on the amount of compensation to be given to the defendant, the matter was referred to the umpire, who subsequently published his award, but the award had not annexed to it the declaration required by sect. 180, sub-sect. 10, of the Act of 1875. As soon as the defendant became aware of the omission he took proceedings to set the award aside.

The local authority were not represented by counsel, and, in the result, their lordships set the award aside.

Patents of the Week.

APPLICATIONS PUBLISHED.*

9,902 of 1905.—A. P. McALISTER: *Grates for Open Fireplaces.*

This relates to fireplaces, and consists in providing a combined fret, ash-pan, and draught regulator in one piece, so as to enable the draught to be controlled when moving the fret. The fireplace is formed of fire-brick to stand on the floor level on to separate holes or cheeks supporting a loose firegrate, which thus stands entirely clear of the hearth. The said combined fret and ash-pan is movable, and is provided with a bit-and-nut regulating grating or the like, and is placed in front to fit closely to the bottom firegrate and separate hobs or cheeks aforesaid. A space or hot chamber is formed next the fire-brick, through which air from an adjoining apartment may be drawn, and, after being warmed, returned to the said apartment.

9,549 of 1905.—P. KESTNER: *A Process for Laying Smoke Issuing from Smoke Funnel, Chimneys, and the like.*

This relates to a process for laying smoke carried by combustion gases, consisting in introducing or injecting into said gases water or steam according to the temperature of said gases, so that after the steam or water and gases have been thoroughly mixed by being passed through a fan a sufficient quantity of steam remains in admixture with said gases to cause the steam on being condensed by the cooling of the atmosphere to be deposited on the soot particles, and render these so heavy that they will be laid almost immediately after their escape from the funnel.

11,133 of 1905.—P. F. WILLIAMS: *Cooking-Stoves Heated by Gas or Oil.*

This relates to a domestic cooking-stove, the oven of which is heated by means of a chamber underneath, but outside the said oven, the heat being distributed by a shield and flues equally to either side of the oven, and to the back of the oven, from all of which flues the heat arises to the top flue of the said oven and escapes therefrom to the outer air.

12,617 of 1905.—S. NAYLOR: *Radiators for Hot Water Heating.*

This relates to radiators for hot water heating, and has for its object to introduce a hollow plug in the lower end section of the radiator or where the flow pipe is usually connected; the hollow plug has a hole in the upper part to cause the water to ascend the first loop or section, the plug prevents the water circulating into the other loops or sections until it has passed up the first; the water then passes along the upper part of the other sections, and circulates by downward currents and out at the opposite end of the radiator. By this process of circulation a more thorough and positive heating of the radiator is ensured, which yields an increased temperature and consequently adds to the efficiency of the radiator.

13,494 of 1905.—W. J. THOMAS: *Fasteners for Window-Sashes and the like.*

This relates to fasteners for window-sashes and the like, and consists in the use of a bolt, connected by a radius arm to a fulcrum or spindle, and controlled by a strong elastic spring retained or withheld in an "unsash" position when the window is open, by a "gravit" catch suspended and held at its inner end to the bolt, or near its end, by a pin passing through the catch with a projection in the side of the catch, which engages with a fixed erection or stop on the bottom plate. The outer end of the catch extends to the edge of the meeting rail and over a slot in the lower sash, to which the bolt is attached. On the meeting rail of the upper sash is a fixed projection or "tripper," fixed in such manner that in closing the window it rises through the slot and lifts the catch, thus releasing the bolt and fastening the

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

PATENTS.—Continued on page 629.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this list, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —, Contracts, iv, vi, viii, x.; Public Appointments, xviii.; Auction Sales, xxx. Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

Contracts.

BUILDING.

JUNE 4.—Abergavenny.—ALTERATIONS, ETC.—Making certain alterations and additions to Pant-y-noon, near Abergavenny, situated about 2 miles on the road to Crickhowell, for Mr. J. G. Jones. Names to Mr. B. J. Francis, architect, Abergavenny, not later than June 4.

JUNE 4.—Crawcrook.—CLUB PREMISES.—The West Ryton, Crawcrook and District Social Club, Ltd., invite tenders for extension of club premises at Poplar House, Crawcrook. Plans and specifications may be seen on application to the steward, between the hours of 10 a.m. and 6 p.m. Separate tenders to be sent for each trade as specified, and endorsed "Tenders for alterations," which should be delivered to Mr. Fred W. Lishman, Secretary, before noon on June 4.

JUNE 4.—Dundalk.—WALL, ETC.—For building an enclosing wall round St. Nicholas' Church, Dundalk; erecting a wrought-iron railing and gates to same; for painting walls, and for sealing new transept and south aisle. The plans and specifications may be seen at office of Mr. W. H. Byrne & Son, architects, Dublin; or at St. Patrick's Presbytery, Dundalk. The estimates are to be sent separately for walls, railing, seats, and painting. The estimates to be sent in a sealed envelope to the Rev. M. J. Quinn, Adm., St. Patrick's, Dundalk, endorsed "Estimate for St. Nicholas' Church, Dundalk," not later than June 4.

JUNE 5.—East Ardsley.—HOSPITAL.—For the erection of the proposed small-pox isolation hospital in Stone-Lane, East Ardsley. Names to Mr. Frank M. East, J.P., Tisbury House, Wakefield, on or before June 5, stating for which contracts contractor wishes to tender, after which date the necessary particulars will be supplied. The work will be divided into the following contracts:—(a) Fencing, rivet oak, corrugated iron, or crosscot wood; (b) access road formation, and main outfall sewer construction, and the laying of gas and water mains; (c) foundations for buildings and certain portions of the super-structures, internal drainage, and formation of necessary roads on site; (d) provision of cast-iron water mains; (e) provision of cast-iron tank, including fixing; (f) provision of cast-iron gas mains and wrought-iron service mains; (g) provision of steeling of structures. Plans and specifications may be seen at office of Mr. H. H. Beaumont, Clerk to Wakefield and District Small-pox Isolation Hospital, Chancery-lane, Wakefield.

JUNE 5.—Nantyglo.—ALTERATIONS TO CHAPEL.—Alterations to Heron Chapel, Nantyglo. Plans and specification may be seen at office of Mr. William Thomas, architect and surveyor, 7, Queen's-street, Nantyglo. Bills of quantities supplied on payment of 2s. 2s. Sealed and endorsed tenders to be sent in not later than June 5.

JUNE 5.—Rhydying.—SCHOOLROOM.—The erection of a new schoolroom in connection with Zion Congregational Church, Neath. Plans and specifications may be seen at the schoolroom. Endorsed tenders to be sent to Mr. David Morgan, architect, 25, Alfred-street, Neath, on or before June 5.

JUNE 5.—Thrapston.—STREBY WORKS.—Thrapston Corporation invite tenders for the following works at the Thrapston Union, in accordance with drawings and specifications prepared by the architect, Mr. J. T. Blackwell, of 53, High-street, Kettering:—(a) sundry small works, chiefly bricklayers' trade; (b) excavations, filling, and puddling; (c) drainage; (d) construction rain-water cistern; (e) plumbing. Applications for bills of quantities (stating section of work) must be made to the architect on or before June 5. Tenders to be addressed to Mr. J. T. Blackwell, and endorsed "Tender for Thrapston Union," section "A," "B," "C," "D," or "E," as the case may be.

JUNE 6.—Carlisle.—EXTENSION OF BUILDINGS.—Carlisle Corporation invite tenders for the extension of buildings at the central electric lighting station, situated in James-street. Persons desirous of tendering may inspect the drawings, specification, stipulations, and conditions of contract, and obtain a copy of the bill of quantities and Form of tender, at the office of Mr. Henry C. Marks, M.Inst.C.E., City Engineer and Surveyor, 35, Fisher-street, Carlisle. Endorsed tenders for "Tender for Electric Lighting station," to be delivered at office of Engineer not later than 10 a.m. on June 6.

JUNE 6.—Lambourn.—SCHOOLROOM.—Erection of a Primitive Methodist schoolroom at Lambourn. Plans and specifications may be seen at Mr. W. H. Dowling's, High-street, Lambourn. Tenders may be sent to Mr. H. M. Dull, The Manse, Hungerford, before June 6.

JUNE 6.—Walsend.—COOKERY BUILDING.—The Corporation of Walsend invite tenders for the erection of a building in connexion with the cookery centre of the Education Department of the Borough of Walsend, and the Richardson Dees School. Amended plans and specifications may be seen on application to the Borough Surveyor, Mr. George Hollings, Corporation Offices, High-street, Walsend. Tenders to be delivered to Mr. W. V. Cartwright, Town Clerk of Walsend, 23, Sandhill, Newcastle-on-Tyne, marked "Tenders for Cookery Centre," on or before June 6.

JUNE 6.—Watford.—UNINAL.—Watford U.D.C. invite tenders for the erection of a three-stall uninal at the "Queen's Arms," Gallow Land. Plans and specification and general conditions can be seen on application to Mr. D. Waterhouse, Surveyor to the Council, 14, High-street, Watford. Sealed tenders, endorsed "Tender for Uninal," to be delivered to Mr. H. Morten Turner, Clerk to the Council, 14, High-street, Watford, by 12 o'clock noon on June 6.

JUNE 6.—York.—COTTAGES.—York City Council invite tenders for the erection of two cottages and office at Naburn Locks. Specification and bill of quantities may be obtained at office of Mr. A. Cross, architect, Guildhall, York, on deposit of 1l. 1s. Tenders, endorsed "Cottages, Naburn," to be delivered not later than June 6.

JUNE 7.—Stockport.—HOSPITAL.—Stockport Corporation invite tenders for the erection of the first portion of an observation block at Dialstone-lane Hospital. The plans, drawings, and general conditions of contract may be inspected at the office of the architect, Mr. G. H. Brady, Borough-chambers, St. Petergate, Stockport, and specifications and quantities will be supplied by him on payment of a deposit of 1l. 1s. which will be returned on receipt of a bona-fide tender. Sealed tenders, endorsed "Hospital Building Contract," addressed to the Chairman of the Corporation, Municipal Buildings, Stockport, or to Mr. Robert Hyde, Town Clerk, Town Clerk's Office, Stockport, not later than 12 o'clock noon on June 7.

JUNE 8.—Carlisle.—The Corporation of Carlisle invite tenders for the erection of a caretaker's cottage at the Meeting of the Old and New Waters, Gelsdale. Drawings, specification, stipulations, and conditions of contract may be inspected, and a copy of the bill of quantities and form of tender obtained, at the office of Mr. Henry C. Marks, M.Inst.C.E., City Engineer and Surveyor, 35, Fisher-street, Carlisle on deposit of 10s. 6d. Sealed tenders, endorsed "Tender for Cottage," to be delivered at his office not later than 10 a.m. on June 8.

JUNE 8.—Cefn Hirgoed.—HOSPITAL.—Ogmore Small-pox Hospital Committee invite tenders for the erection of a small-pox hospital at Cefn Hirgoed, near Brynecethin, Bridgend. Plans and specifications may be seen, and quantities obtained, from the architect to the Committee, at his offices at Blackmill, on payment of a deposit of 1l. 1s. Tenders to be sealed, and endorsed "Small-pox Hospital," and addressed to Mr. R. C. Griffiths, 10, Wyndham-street, Bridgend, not later than 4 p.m. on June 8.

JUNE 8.—Haslingden.—WALLS, ETC.—Haslingden Town Council invite tenders for the erection of the boundary walls, supplying and fixing wrought-iron unclimbable fencing, and the asphaltting of the playground in connection with the extensions of the secondary school, Bury-road. Plans, specifications, and general conditions may be seen, and bills of quantities obtained, on application at the office of Mr. J. Singleton, architect and surveyor, Municipal offices. Tenders, endorsed "Playground," must be sent in to Mr. W. Musgrove, Town Clerk, Municipal Offices, Haslingden, not later than June 8.

JUNE 8.—Salcombe.—HORSES AND SHOPS.—Erecting two houses and three shops at Salcombe. Drawings and specifications can be seen on application to the Times office, Salcombe, and tenders to be delivered before 12 noon on June 8 to Mr. John W. Ellis, Bar Lodge, Salcombe.

JUNE 9.—Blaengwynn, etc.—POLICE-STATIONS, ETC.—Chamaron Quarter Sessions and C.C. Standing Joint Committee invite tenders for the following works:—(1) New police-station at Blaengwynn; (2) new police-station at Llanbradach; (3) building a wall round the land at the rear of Ton Pentre Police-station and Court. Plans and specifications of the respective works may be seen, and copies of the bills of quantities obtained, at the following places:—Work No. 1, Port Talbot Police-station; work No. 2, Cerpilly Police-station; work No. 3, Ton Pentre Police-station; and for all the works at offices of Mr. W. E. T. Allen, Deputy-clerk of the C.C. Chamaron, C.C. Offices, Westgate-street, Cardiff. Sealed tenders are to be delivered to Clerk, together with the full names and addresses of two substantial sureties, not later than June 9.

JUNE 9.—Cardiff.—COOKHOUSE.—Cardiff Guardians invite tenders for the erection of a cookhouse at their Cardiff Workhouses, according to plans and specification prepared by their Architect, Mr. Edwin Seward, F.R.B.A., Queen's-chambers, Cardiff, from whom bills of quantities may be obtained on payment of 2s. 2s. Forms of tender may be obtained from the architect, and must be returned to Mr. Arthur J. Harris, Clerk, Union Offices, Queen's-chambers, Cardiff, not later than 10 o'clock a.m. on June 9, endorsed "Tender for Cookhouse."

JUNE 9.—Gresford.—HORSES.—The erection of three houses in Houll's-lane, Gresford. Plans and specifications may be seen, and bills of quantities obtained, at the office of Mr. Fred F. Beaman, architect and surveyor, Southgate-chambers, Halifax, from June 1 to June 9.

JUNE 9.—Maldenwell.—CORRIERS.—The erection of two new police-stations in the County of Lincoln, for the Corporation of Basinstoke. Plans and bills of quantities on application at office of Mr. R. H. Fowler, architect, Louth,

from June 1 to June 9, inclusive, on which latter date tenders are to be delivered at 12 o'clock noon.

JUNE 9.—Morriston.—SCHOOLROOM.—For "Libanus" new schoolroom, Morriston. Plans and specifications can be seen, and particulars obtained, at the offices of Mr. Charles S. Thomas, architect and Surveyor, Wind-street, Swansea. Tenders to be sent to Mr. George Rowe, Llanlleonaw, Morriston, on or before June 9, endorsed "Tender for Libanus Schoolroom."

JUNE 9.—Worcester.—SCHOOL ALTERATIONS.—The Education Committee of the Worcester City Council invite tenders for certain alterations in connexion with the infants' schoolroom at Hounds-lane, Worcester. The plans and specification may be seen at my offices, Worcester-chambers, Pierpoint-street, Worcester. Tenders on special forms, to be delivered at the offices of Mr. E. P. Spackman, Hounds-lane, Worcester, not later than June 9. Mr. Henry Rowe, City Architect, Worcester.

JUNE 11.—Biantyre and Larkhall.—LANARK DISTRICT of the Middle Ward Committee invite tenders for the brick, mason, joiner, slater and plaster, plumber, iron, and painter works of public slaughter-house to be erected at Biantyre and Larkhall. Schedules may be obtained from Mr. Gavin Paterson, architect, Hamilton, on payment of 10s. 6d. Tenders must be lodged with Mr. W. E. Whyte, District Clerk, Hamilton, on or before June 11.

JUNE 12.—Baldon.—HOUSE.—Works required in the erection of a house in Effe-lane, Baldon. For quantities apply, from June 6 to June 12, Messrs. Walker & Collinson, architects, Cheap-side-chambers, Bradford.

JUNE 12.—Bristol.—CLUBHOUSE.—Additions and alterations to the Clubhouse, Failand, for the Bristol and Clifton Golf Club. Plans and specifications, and bills of quantities, at the offices of Messrs. Bernard & Son, 4, St. Stephen's-chambers, Baldwin-street, Bristol. Tenders to be delivered by June 12.

JUNE 12.—Cheltenham.—ENGINE-SHED.—The Great Western Railway Company invite tenders for an engine-shed at Cheltenham. Plans and specifications may be seen, and forms of tenders and bills of quantities obtained, at the office of the engineer, at Gloucester Station, between 10 a.m. and 4 p.m. Tenders, addressed to Mr. G. K. Mills, Secretary, Paddington Station, W. endorsed "Tender for Engine-shed, Cheltenham," before June 12.

JUNE 12.—Halifax.—HORSES.—Erecting three blocks of cottage homes in Upper Wash-lane, Halifax, for Mr. R. D. Ward, J.P. Plans and specifications may be seen, and bills of quantities obtained, from June 7 to June 12, inclusive, on which last day tenders are to be delivered at the offices of Messrs. Longbottom & Culpin, architects and surveyors, George-street, Halifax, endorsed "Cottage Homes."

JUNE 12.—Rhywynny.—ALTERATIONS TO CHAPEL.—Alterations and additions to Zion Congregational Chapel, Rhywynny, in accordance with plans and specifications prepared by Messrs. James and Morgan, F.R.I.B.A., architects, Cardiff. Plans and specification may be seen, and further particulars obtained, either at the architects' office, or on applying to Mr. Elias Jones, Cyclops, Rhywynny. Tenders, sealed, and endorsed "Tenders for Zion Chapel," to be in the hands of Mr. Elias Jones not later than June 12.

JUNE 13.—Bargoed and New Tredegar.—HORSES.—A dwelling-house at Bargoed, also dwelling-house at New Tredegar, for the Powell Duffryn Steam Coal Company, Ltd. Plans and specification may be seen, and full particulars obtained, at the office of Mr. Geo. Kenshole, architect and surveyor, Salford-road, Bargoed. Tenders to be sent to Mr. N. Phillips, Elliott Offices, New Tredegar, on or before June 13.

JUNE 13.—Halifax.—HORSES.—The erection of two dwelling-houses in Middle Dean-street and Green-lane, West Vale, and alteration to adjoining premises. Plans may be seen, and bills of quantities obtained, upon application at offices of Mr. Thos. Kershaw, F.R.I.B.A., architect, L. and Y. Bank-chambers, Halifax, on and after June 6, sealed tenders to be delivered not later than June 13.

JUNE 13.—Nelson.—ALTERATIONS.—Alterations at Commercial-street, Nelson, Clam., for the Treharris Co-operative Society, Cardiff-road, Treharris. Plans and specifications may be seen at the office of Mr. W. Dowleswell, architect, Treharris. Sealed, endorsed tenders to be sent to the secretary on or before June 13.

JUNE 13.—Portland.—WESLEYAN CHURCH.—Tenders are invited for the erection of Wesleyan Methodist Church, Eaton-square, Portland. Bills of quantities may be obtained from the architect, Messrs. A. Trobe & Weston, F.R.I.B.A., 44, Corn-street, Bristol, or from Mr. E. Pearce, 3, Easton-square, Portland, on payment of a deposit of 2l. 2s. Tenders to be sent in before June 13.

JUNE 13.—Tooting, S.W.—TWO WARD BLOCKS, ETC.—Erection of two ward blocks, Recreation Hall and Staff Quarters, at Tooting. By Aspin, Tooting, S.W. in accordance with specifications prepared by the Engineer-in-Chief for the Metropolitan Asylums Board. Drawings, specifications, bills of quantities, conditions of contract, and form of tender can be inspected at the Board's Office, Embankment, E.C., on and after May 24, and bills of quantities and form of tender obtained on deposit of

51. Tenders, addressed as directed on form, to be delivered at the Board's Office not later than 10 a.m. on June 13.

JUNE 15.—Gorseion.—STORES.—The erection of a new co-operative stores at High-street, Gorseion. Plans and specifications may be seen with Mr. William Williams, architect, Fronder, Pontardulais. Sealed and endorsed tenders to be sent to the Secretary, Pontardulais and Gorseion Industrial Co-operative Society, Ltd., Pontardulais, on or before June 15.

JUNE 15.—Falmouth.—SCHOOL.—Falmouth Education Committee invite tenders for the erection of proposed girls' school at Clare-terrace according to plans and specifications, which may be seen by appointment with the Municipal Offices, Falmouth, or at the office of the architect, Mr. Sampson Hill, Green-lane, Redruth, from whom all particulars relating to the work may be obtained. Forms, upon which all tenders must be made, may be obtained from the secretary or the architect. Sealed tenders, endorsed "Tenders for Clare-terrace School," are to be sent to Mr. E. E. Armitage, Secretary, Municipal Offices, Falmouth, on or before June 16.

JUNE 16.—Manchester.—LABORATORY.—Manchester Rivers Committee invite tenders for the extension of the existing laboratory at the Daythulme Sewage Works, near Urmoston. Drawings may be inspected, and bills of quantities and tender forms may be obtained on application to the Secretary of the Rivers Department, Town Hall, Manchester. Tenders must be enclosed in the official envelope provided expressly for the purpose (otherwise the tender will not be considered) and delivered at the above office not later than 10 a.m. on June 16.

JUNE 18.—Talgarth.—REPAIR OF CHURCH.—The repair of Llandellalle Church, Talgarth. Plans and specifications may be seen at Llandellalle Rectory. Tenders to be sent to Mr. Ernest V. Collier, architect, 4, Quay-street, Carmarthen, not later than June 18.

JUNE 18.—Wimbledon.—COTTAGES.—The Corporation of Wimbledon invite tenders for seven cottages for Corporation's workmen, to be erected in Durnford-road. Plans and specifications may be inspected, and bills of quantities obtained, at Borough Surveyor's Office, Town Hall, Wimbledon, upon payment of 2s. Sealed tenders, addressed to the Chairman of the Electric Lighting Company, and endorsed "Tender for Workmen's Dwellings, Durnford-road, Wimbledon," before noon, June 18.

JUNE 19.—Paddington.—W.—ALTERATIONS AND ADDITIONS TO POST OFFICE.—Tenders are invited for the alterations and additions to the Paddington District Post Office, W., for the Commissioners, H.M. Office of Works, specifications, copy drawings, conditions, and form of tender may be seen on application to Mr. J. Wager, H.M. Office of Works, Westminster, S.W. Bills of quantities may be obtained from the office of the Secretary, H.M. Office of Works, 11, St. James's Place, London, W. Tenders, addressed to the Secretary, H.M. Office of Works, Storey's Gate, S.W., and endorsed "Tender for Paddington District Post Office," to be delivered before 12 o'clock on June 19.

JUNE 19.—Rottingdean.—COTTAGES.—Brighton Guardians invite tenders for the erection of two pairs of farm labourers' cottages on land adjoining the Warren Farm Schools, in the Parish of Rottingdean. Copy of specification and form of tender, together with any further information, can be obtained on application to Mr. E. Wright, Architect, for the Guardians, at the Parochial Offices, where the plans may also be inspected. Sealed tenders, endorsed "Tender for Cottages," are to be addressed to Mr. B. Harford, Clerk to the Guardians, Parochial Offices, Prince's-street, Brighton, and delivered on or before June 19 by 10 o'clock a.m.

JUNE 20.—Watford.—OFFICE EXTENSIONS.—The Watford U.D.C. invite tenders for the erection of addition to and alterations of Council Offices. The plans and specifications can be seen, and bills of quantities obtained, on application to Mr. D. Witherhouse, Council Surveyor, 14, Church-street, Watford, on and after May 28, on payment of 1l. 1s. Sealed tenders, endorsed "Tender for Office Extensions," to be delivered to Mr. H. Moran Turner, 14, High-street, Watford, before 12 noon, June 20.

JUNE 21.—Hornsea.—GRAND STAND.—Tenders wanted for erection of grand stand, Hornsea Show Ground, June 21, five tiers high, 100 ft. long. Andy Mr. Chas. T. Niven, Secretary, Hornsea, near Hull.

JUNE 22.—Lower Sandhurst.—SCHOOL.—The Berkshire Education Committee invite tenders for a new school for 250 scholars at Lower Sandhurst, Berks. Names to the Secretary of the Education Committee, The Forebury, Reading, before June 12, with deposit of 3l. 7s. for bills of quantities. Plans, specifications, and form of contract will be open for inspection at the Education Secretary's office on and after June 5 between 10 a.m. and 5 p.m. Tenders to Education Secretary on the form and in envelope provided, by first post June 22.

JUNE 23.—Brentwood.—ALTERATIONS.—The Visiting Committee of the Essex County Lunatic Asylum invite tenders for remodeling one of the blocks of buildings so as to form attendants' quarters. Drawings, specifications, and forms of contract may be inspected at the office of County Architect, Mr. Frank Whitmore, Duke-street, Chelmsford, between 10 and 4, except Saturdays. Names and address to County Architect before noon, June 4. Sealed tenders on the form supplied, endorsed "Tender for Female Attendants' Block," to be delivered to Mr. W. P. Gepp, Clerk to the Visitors, Chelmsford, before 10 a.m., June 23.

JUNE 25.—Edgeworth.—SCHOOL.—The Lancashire Education Committee invite tenders for the erection of a new public elementary school at Hob-lane, Edgeworth, near Bolton. The plans may be seen, and bills of quantities obtained, at the office of the County Architect, Mr. Henry Little, 16, Ribblesdale-place, Preston, by payment of a deposit of 2l. Tenders must be delivered before 12 o'clock noon on June 26, sealed and endorsed, to Mr. J. B. Gough, Burton U.D.C. Offices, Bromley Cross, near Bolton.

JUNE 27.—Wallis's yard, S.W.—FACED OFF NEW ROAD-ROOM, ETC.—Tenders are invited for the erection of new board-room and offices, etc., and extension of the workhouse in Wallis's yard, Bucking-

ham Palace road, S.W., for the St. George's Guardians. Plans and specifications may be inspected, and bills of quantities obtained, on application to the architect, Mr. Francis J. Smith, Parliament-mansions, Victoria-street, S.W., on or after May 28, and before June 6 to June 11. Tenders to be addressed and delivered to the Clerk to the Guardians, St. George's (Hanover-square) Hall, Mount-street, W., before 10 a.m. June 22.

NO DATE.—Beccles.—HOTEL.—New hotel, with stabling, coach-house, and carshed, at Inuzate-street, Beccles, for the Colchester Brewing Company. Names and address of architect, Mr. F. H. F.S.I., architect, Beccles. Bills of quantities and form of tender will then be forwarded in due course.

NO DATE.—Foyers.—NURSING HOME.—The mason, carpenter, plumber, slater, plasterer, and painter and glazier works, etc. of nursing home, proposed to be erected at Foyers, for Messrs. The British Aluminium Company, Ltd. Names with Messrs. Cameron & Burnett, architects and ordained surveyors, Academy-buildings, Inverness, from whom schedules of quantities and all other information are to be obtained.

NO DATE.—Haslingden.—SILICO.—New weavil shed at Haslingden for the Granite Manufacturing Company. Names and address of architect, Mr. P. Pickup, mill architect, Mercantile-chambers, St. James-street, Barnley, from whom full particulars can be obtained.

NO DATE.—Hull.—ALTERATIONS.—Certain alterations and additions to the Old School Chapel of St. Peter's, South Hull. Names to Messrs. Brodric, Lovell & Walker, architects, 17, Lower-street, Hull, and Central-chambers, Bridlington, together with a deposit of 10s. 6d., when bills of quantities and fourth sheets of drawings will be forwarded.

NO DATE.—London.—CHURCH.—Completion of St. Barnabas Church, Dulwich, London. Names to Messrs. Oliver, Lawson, & Wood, architects, Milburn House, 15, Grosvenor-street, London, W. The list a limited number will be invited to compete.

NO DATE.—Maldstone.—THEATRE.—Tenders are invited for the construction of Maldstone Empire Theatre, Maldstone, Kent. Details of programme, plan, and specifications, etc., may be seen at the United States Commercial Agency, 199, Piccadilly, W.

NO DATE.—Omagh.—GAMMERS.—Tenders are invited by the Building Committee of the Tyrone County Club for building a new clubhouse in Omagh. To be erected to the plans prepared by Mr. Godfrey W. Ferguson, architect, of Avenue-chambers, Belfast, at the expense of the Club. Bills of quantities may be had from Mr. S. C. Hunter, quantity surveyor, Scottish Provident-buildings, Belfast. Further particulars can be obtained from Col. H. Irvine, Estate Office, Omagh.

NO DATE.—Wortley.—ADDITIONS TO INSTITUTE.—The various works required in the additions to Wortley Working Men's Institute. Names to Mr. Frank W. Rhodes, architect and surveyor, Upper Wortley, Leeds, and bills of quantities will be forwarded when ready.

ENGINEERING, IRON, AND STEEL.

JUNE 5.—Darwen.—LIBRARY.—Iron and steel work in the construction of the free library for Darwen Corporation. Quantities and particulars can be obtained from the architects, Messrs. Haywood & Harrison, Post Office-chambers, Accrington, at whose office plans of the proposed work can be seen. Sealed tenders, endorsed "New Library Iron and Steel Work," must be forwarded to Mr. Wylburn P. Millwell, Town Clerk's Office, Darwen, on or before June 5.

JUNE 6.—Clydach.—BRIDGE.—Glamorgan C.C. invite tenders for the following works:—(1) Widening Guelph-street, Bryn, on the Swansea and Pontardawe main road, near Clydach; (2) Widening Nantlow Bridge over the Swansea Gwent, and the Swansea and Pontardawe main road, near Lynch. Plans and specifications of the respective works may be seen, and copies of the bills of quantities obtained, at the following places: At Clydach, District Office, and at Mr. W. E. R. Allen, Deputy-Clerk of the County Council, Glamorgan C.C. Offices, Westgate-street, Cardiff, where plans and specifications may be seen and copies of the bills of quantities obtained. Sealed tenders, made out on the bills of quantities supplied, are to be delivered to Deputy-Clerk, together with the full names and addresses of two substantial sureties, not later than June 6, marked outside as the case may be.

JUNE 6.—India.—CHAIRS.—The East Indian Railway Company is prepared to receive tenders for the supply and delivery of cast-iron chairs, as per specifications to be seen at the Company's offices. Tenders are to be sent to Mr. C. W. Young, Secretary, Nicholas-lane, London, E.C., not later than 12 o'clock noon, marked "Tender for Cast-iron Chairs," June 6. For specification a fee of 1l. 1s. is charge, which cannot under any circumstances be returned.

JUNE 8.—Buckholm.—REPAIR OF BRIDGES.—The Melrose District Committee of Roxburghshire C.C. invite tenders for repair of two bridges on the main road near Buckholm, the work consisting of stripping arches and haunches, covering them with coat of concrete 24 in. thick, building tie walls, etc. Plans and specifications may be seen, and schedules obtained at the office of Mr. C. Montagu, C.E., Newtown St. Boswells. Sealed tenders, marked "Tender for Buckholm Bridges Repairs," to be lodged with Mr. A. Morrison Small, W.S., District Clerk, Melrose, not later than June 8.

JUNE 9.—Dean.—BRIDGE.—Great Harwood U.D.C. invite tenders for the labour (only) required in taking down and rebuilding the small bridge at Dean, within the district. Drawings and specifications may be seen between the hours of 9 and 10 a.m. on application to Mr. A. H. Dunkin, Surveyor to the Council, to whom tenders, sealed, and endorsed "Dean Bridge," are to be delivered not later than June 9.

JUNE 9.—Guildford.—FENCING.—For supplying and erecting about 700 lin. ft. of barbed-wire fencing with iron standards, in the Parish of St. Andrew, Guildford. All particulars can be obtained at the office of Mr. William G. Lower, Surveyor to the Estate

Trustees, 124, High-street, Guildford. Tenders are to be sent on or before June 9.

JUNE 9.—Keldgate.—RESERVOIR.—Inull Corporation invite tenders for the construction of a covered concrete service reservoir at Keldgate, to hold about 10 million gallons. Drawings may be seen and copy of specification and form of tender may be obtained, on and after May 28, at the office of Mr. J. B. Rector, City Water and Gas Engineer, 12, Alder Gelder-street, Hull, on payment of 2l. Cheques and postal orders to be made payable to Mr. T. G. Milner, City Treasurer, to Hull. Tenders, endorsed "Keldgate Reservoir," are to be addressed to the Chairman of the Water and Gas Committee, and delivered at the Town Clerk's office not later than June 9.

JUNE 11.—Dundee.—PIPS.—The Dundee Water Commissioners invite tenders for over 4,000 tons of cast-iron pipes, 27 in. diameter. Tenders are also requested for the excavator work, etc., in removing over 3,000 tons of existing pipes, and for carting, laying and jointing new main. Drawings, specifications, and schedules may be obtained at the office of Mr. George Baxter, Engineer and Manager, Dundee Water Commissioners, Engineer's Office, Dundee, on receipt of the sum of 5l. 5s. Sealed tenders, endorsed "Dundee Pipes," must be received at the office of Mr. W. H. Blyth Martin, Town Clerk of the City of Dundee, and Clerk of the Commissioners, before June 11.

JUNE 11.—East Ham.—East Ham Corporation invite tenders for the supply and delivery at the sewage outfall works, East Ham, of the necessary steam, exhaust, and other piping required for the outfall, in connection with the works, and being laid down there. Particulars, form of tender, and specification may be obtained upon application to Mr. C. H. Campbell, M.Inst.C.E., the Borough Engineer, Town Hall, East Ham. Tenders to be delivered, addressed to "The Chairman of the Public Health Committee, Town Hall, East Ham, E.," and to be received at the office of the Town Clerk, before 12 o'clock noon of June 11.

JUNE 11.—Finchley.—PLANT.—Finchley U.D.C. invite tenders for the supply and erection of one capacity of 200 gallons per hour continuous working. Plans may be seen, and conditions, specification, and form of tender obtained at the office of the Electrical Engineer, 20, The Broadway, Finchley, N. A Winchester quart sample of the water will be sent to firms desiring to tender on receipt of 5s. (not returnable) to cover expenses of sending same. Sealers' names to be marked on the outside "Electricity Works, Sect. XXVII," to reach Mr. E. H. Lister, Clerk to the Council, Council Offices, Finchley, before 5 p.m. on June 11.

JUNE 14.—Wellington.—STEEL BUILDING.—For the supply and erection of a steel building with corrugated sheeting, 60 ft. by 22 ft. by 22 ft. 6 in. high. Drawings and specification may be had by application to the Northamptonshire Direct Castings Company, Ltd., Wellingtonborough. Tenders will not be considered after June 14.

JUNE 14.—Banbridge.—ROOF.—Great Northern Railway Company (Ireland) Directors invite tenders for the construction and erection of a steel tank, 25 ft. by 22 ft. 6 in., at Banbridge. Parties wishing to tender may see the drawing and specification at the office of Mr. W. H. Mills, Engineer-in-Chief, Amiens-street, Dublin, or copies of the same at the offices of the District Engineer, Belfast; and can obtain at the said offices lithographed copies of the drawing, specification, and form of tender, on payment of 10s. (not returnable) per set. Tenders, made out on the form provided by the Company, and endorsed "Tender for Umbrella Roof," should be delivered to Mr. T. Morrison, Secretary, Banbridge Office, Amiens-street, Belfast, on or before June 14.

JUNE 23.—Guildford.—RESERVOIR.—Guildford Town Council invite tenders for the construction of a reservoir in ferro-concrete on the Hennebane system, near the junction of the windmill race, for pumping purposes, and the erection of certain brick and tile buildings on the site of the high-level reservoir situated at the same Ordnance datum. Plans and specifications may be seen, and copies of the specification, bill of quantities, and form of tender obtained, on application to Mr. C. G. Mason, M.Inst.C.E. the Borough Engineer and Surveyor, upon payment of the sum of 3l. 5s. Sealed tenders, endorsed "Tender for Works of Water Supply Higher Levels," are to be sent to Mr. F. S. Miller, Town Clerk, Guildford, before 12 noon, June 23, by 12 p.m.

JUNE 30.—Clintstone.—WELL.—Mansfield Corporation invite tenders for sinking a well near Waterfield Farm, in the Parish of Clintstone, five and a half miles distant from Mansfield. The well is to be 150 ft. deep and 12 ft. in diameter in the new red sandstone, and is to be lined in part with cast-iron, and in part with brick, and to include driving certain pumping plant capable of raising 70,000 gallons of water per hour 150 ft. high, or 1,680,000 gallons in twenty-four hours. In addition to the well sinking, the contract will also include driving certain headings and putting down bore holes. The drawings and specification may be seen at the office of the engineers, Messrs. Grover & W. Hodson, 10, Bevil-street, Nottingham, and copies of the schedule of quantities and form of tender obtained on deposit of a cheque for 5l. 5s. Sealed tenders, endorsed "Tenders for Clintstone Well," are to be sent to Mr. Hartrop White, Town Clerk, not later than June 30.

JULY 17.—Saltash.—BRIDGE.—The Saltash Corporation invite tenders for the construction of a bridge to carry traffic from an embankment across the River Tamar at Saltash Passens. Plans and specification of the bridge may be obtained from Mr. Fred. E. Cleveland, Town Clerk, Saltash, and tenders to be delivered on or before July 17, within twelve months of the acceptance of a tender. Sealed and marked tenders to be sent to the Clerk not later than July 17.

MISCELLANEOUS.

JUNE 4.—Kennay.—CEMETERY.—The erection of boundary walls, and laying-out of a new cemetery

at Kenney. Plans, specifications, and general conditions may be seen with Mr. A. Whyte, Clerk to the Parish Council, Kenney, who will receive offers for work, on or before June 4.

JUNE 4. — Pontypridd. — CABLES.—Pontypridd U.D.C. invite tenders for the supply, delivery, and erection of 2,000 ft. of 3 triple core cable, paper insulation. Specification, general conditions, and form of tender may be obtained on application to Mr. J. A. Gendall, Electrical and Tramways Engineer, upon payment to Mr. J. Cosens Jones, Clerk to the Council, District Council Offices, Pontypridd, of a deposit of 2l. 2s. Tenders, on the prescribed form, sealed, and endorsed "Tender for Cables," must be received by the Clerk on or before June 4.

JUNE 5. — Armagh. — STEAM ROLLER, ETC.—Armagh C.C. invite tenders for the supply of a 6-ton compound steam roller, a sleeping van, and a water cart. Tender, forms, and conditions may be obtained on application to Mr. Joseph Atkinson, Secretary, Courthouse, Armagh. Sealed tenders, addressed to the Secretary, Armagh C.C., to be delivered not later than June 5.

JUNE 5. — Blackrock. — BOARDING, ETC.—The U.D.C. of Blackrock invite tenders for the supplying of 60 yds. of morabio boarding and gates as described in the specification, and a surveyor copy of which can be seen at office of Mr. R. Finlay Heron, Town Clerk, Town Hall, Blackrock, Co. Dublin, between the hours of 9 a.m. and 5 p.m. Tenders, on forms supplied, and endorsed "Tender for Boarding," must be received at this office before 4 p.m. on June 5.

JUNE 5. — Blackrock. — WHEELS.—The U.D.C. of Blackrock invite tenders for the supplying and fitting on of one pair of wheels for steam road roller. Specification and particulars can be obtained from the Town Clerk, Mr. R. Finlay Heron, Town Hall, Blackrock, Co. Dublin, must be lodged with the Town Clerk on or before June 5.

JUNE 5. — Huncote. — SCAVENGING.—Bibby R.D.C. Parochial Sanitary Committee invite tenders for supplying and fitting of all dustbins, pits, receptacles, cesspits, pans, and the removal of house refuse in such parish. The contract will be for twelve months from July 1 next. Alternative tenders are required: (1) Contractor providing scavenging cart; (2) the Council providing cart. Tenders, sealed, and endorsed "Tenders for Removal of House Refuse," must be delivered to the Town Clerk, Mr. B. S. Stiles, Clerk, Alliance-chambers, Leicester, on or before June 5.

JUNE 5. — Portsmouth. — CABLES.—Portsmouth Corporation invite tenders for the supply of tramway cable cables. The specification, with general conditions, and form of tender, can be obtained on application to the Town Clerk, Town Hall, Portsmouth, but a deposit of 5l. 5s. must accompany the application. Drawings may be seen at the office of Mr. V. G. Lironi, M.I.M.E., A.M.I.N.E.E., 10, Abchurch-lane, London, E.C. 4. Tenders must be delivered to the Town Clerk, Town Hall, Portsmouth, not later than 10 a.m. on June 5.

JUNE 5. — Portsmouth. — TRAMWAYS.—Portsmouth Corporation invite tenders for the supply of sixteen double-decked tramway electric motor-cars. The specification, with general conditions, and form of tender, can be obtained on application to the Town Clerk, Town Hall, Portsmouth, but a deposit of 5l. 5s. must accompany the application. Drawings may be seen at the office of Mr. G. W. Lamb, Jnr., Tramways Engineer, Vivash-road, Emsay, Portsmouth. Tenders must be delivered to the Town Clerk, Town Hall, Portsmouth, not later than 10 a.m. on June 5.

JUNE 6. — Gosforth. — CARTING WORK.—Gosforth U.D.C. invite tenders for carting work from June 29, 1906, to June 26, 1907. Particulars may be obtained on application to the Town Clerk, Gosforth. Tenders, endorsed "Team Labour," must be sent so as to reach Mr. R. Sheriton Holmes, solicitor, Clerk to the Council, Council Chambers, Gosforth, on or before June 6.

JUNE 6. — Hove. — SEATS.—Hove Corporation invite tenders for providing sixteen seats with glazed tops, to be placed on the Hove sea wall. Drawing and specification may be seen, and further particulars obtained, at the office of the Borough Surveyor, Mr. H. H. Scott, Town Hall, Hove. Tenders, on forms supplied, addressed to Mr. H. Hindcock, Town Clerk, Town Hall, Hove, and endorsed, "Tender for Seats," will be received up to six o'clock on June 6.

JUNE 6. — Portadown. — ENCLOSING GROUNDS.—For enclosing Portadown Agricultural Society, Ltd., grounds according to plans and specifications, which can be seen at Mr. Robert Chapman's office, Edward-street, Portadown. Tenders to be delivered to Mr. George I. Browne, Carleton-street, not later than 6 p.m., June 6.

JUNE 6. — Scavenging.—Blaydon U.D.C. invite tenders for the removal and disposal of scullie ashes, contents of ashpits, house refuse, etc., at Blackhall, Newcastle. Specification, conditions, and form of tender, and full particulars may be obtained from Mr. Robert Biggins, Sanitary Inspector, at the Offices of the Council, Blaydon-on-Tyne. The contract will be for 12 months. Sealed tenders, endorsed "Tenders for Scavenging Contract," are to be delivered to Mr. Henry Dalton, Clerk, Blaydon-on-Tyne, before noon on June 7, at which time the contract will be opened at the Council.

JUNE 7. — Cork. — CLEANING RESERVOIR.—Cork R.D.C. invite tenders for cleaning of the reservoir at Pembroke. Bassetts, Cork. Particulars may be seen in office of Mr. John Cotter, Clerk of Council. Tenders may be lodged in the tender-box, Board-room, Cork Workhouse, not later than 12 o'clock on June 7.

JUNE 7. — Huddersfield. — SKYLIGHTS.—The Corporation of Huddersfield invite tenders for the supplying and fixing of skylights. The specification, conditions, and form of tender, will be required to execute a contract, the draft of which may be inspected at the Town Clerk's office, Town Hall, Huddersfield, on or before June 5. Plans, specifications, and general conditions may be seen, and bills of quantities and forms of tender obtained, on application at the offices of the Borough Engineer, 1, Peel-street. Sealed tenders, endorsed "Tender for Skylights," signed in the handwriting of the tenderer or his agent and addressed "To the Clerk, Town Hall, Huddersfield," must reach him not later than 2 p.m. on June 7.

tion at the offices of the Borough Engineer, 1, Peel-street. Sealed tenders, endorsed "Tender for Skylights," signed in the handwriting of the tenderer or his agent and addressed "To the Clerk, Town Hall, Huddersfield," must reach him not later than 2 p.m. on June 7.

JUNE 9. — Bilston. — SCAVENGING.—Bilston Education Committee invite tenders for the provision of furniture for Stonefield Council School. Forms of tender, specification, and schedule may be obtained from Mr. F. F. Fenel, Education Officer, Stonefield, Bridge-street, Walsall, on payment of a deposit of 1l. All tenders must be forwarded to Mr. F. M. Cooper, Secretary, Education Office, Town Hall, Bilston, endorsed "Tender for Stonefield Council School Furniture," not later than 12 o'clock noon on June 9.

JUNE 9. — Bradford. — ELECTRIC LIGHTING, ETC.—Bradford Education Committee invite tenders for electric lighting at the Hanson new junior school, and for electrical fittings for the physical laboratories at the Belle Vue boys' secondary school, and Hanson new schools. Drawings may be seen, and specifications, etc., obtained, at the Education Offices (Architect's Department). Sealed tenders, endorsed (a) Electric Lighting—Hanson Junior School, or (b) Laboratory Fittings—Belle Vue and Hanson Schools, must be delivered at office of Mr. F. M. Cooper, Secretary, Education Office, Moor-crow, Bradford, addressed to the Secretary, before noon on June 9.

JUNE 11. — London. — CHASSIS.—Metropolitan Asylums Board invite tenders for the supply of two chassis for ambulance carriages. Forms of tender and statement of general requirements can be obtained at the Office of the Board, Embankment, London, E.C. where sealed tenders, endorsed "Tender for Motor Ambulances," must be delivered by 10 a.m. on Monday, June 11.

JUNE 12. — Lewisham. — CARS, ETC.—Lewisham Borough Council invite tenders for the supply and delivery of five slop carts, one ordinary van, two steam-roller trucks, five water vans, four orderly cabs, twelve motor vans, and four delivery vans. Rows, to be built within a radius of ten miles from the Town Hall, Catford. Specifications may be seen, and forms of tender obtained, at the Town Hall, Surveyor's Department. The tenders must be on forms issued by the Council, enclosed in an envelope, sealed, and endorsed "Tender for Cabs, etc.," and must be delivered to the Town Clerk on June 12 at the Town Hall, Catford, and placed in the box there provided for the purpose.

JUNE 12. — Southampton. — ROAD ROLLER.—Southampton Corporation invite tenders for supplying a steam road roller, in accordance with specification and particulars which may be obtained upon application to Mr. J. A. Crowther, Borough Engineer. Tenders, endorsed "Tender for Road Roller," must be delivered at the Town Clerk's office before 2 p.m. on June 12.

JUNE 12. — Ardeer. — SINKING SHAFTS.—The Glamorgan Iron and Steel Company, Ltd., invite tenders for the sinking of two circular shafts at Ardeer. For specification, etc., apply Drawing Office, Ardeer Iron Works, Stevenson, Ayrshire.

PAINTING, ETC.

JUNE 6. — Cranbrook. — PAINTING.—Cranbrook Guardians invite tenders for repainting and painting the outside work of the cottages and the workhouse at Cranbrook. Specification of the work may be seen on application to Mr. H. Fincham, the Master. Tenders must be sent in by noon on June 6.

JUNE 6. — Hunslet. — PAINTING.—Hunslet Guardians invite tenders for the painting and colour-washing required at their Children's Homes at Bothwell Lodge, Forth-street, Leeds. Particulars and specifications of the work may be obtained on application at the office of Mr. Fred. W. Mee, Clerk to the Guardians, Union Offices, Hunslet, Leeds, where sealed tenders, addressed to the Secretary, Hunslet, must be received by 10 o'clock a.m. on June 6.

JUNE 6. — Gt. Ham. — PAINTING, ETC.—The Park and Cemetery Committee invite tenders for repainting and painting the gates, required at their Greenlands and Hollywood Cemeteries. Specifications of the work may be seen at the Registrars' Offices. Sealed tenders, addressed to Mr. Robert Parker and Mr. Thomas Eastwood, endorsed "Painting," on or before June 6.

JUNE 9. — Nottingham. — PAINTING.—Outside painting to be done to the gates and the lodges at the Waverly-street and Sherwood-street entrances to the Arboretum. Specifications, forms of tender, and bills of quantities on application at the City Architect's Office, on payment of a deposit of 10s. Tenders, endorsed "Tender for Painting Lodges, etc., Arboretum," to be addressed to Mr. Samuel G. Johnson, Town Clerk, and delivered at the Guild-hall, before 12 o'clock noon on June 9.

JUNE 9. — Tredegar. — PAINTING.—Painting and re-pointing Castle-street Church, and schoolroom, Tredegar. Specification to be seen at the office of Mr. Tom Jones, Secretary, P.O., Commercial-road, Tredegar, to whom sealed tenders are to be delivered not later than 12 o'clock on June 9.

JUNE 12. — Isleworth. — PAINTING, ETC.—Brentford Guardians invite tenders for cleaning, painting, and disinfecting, etc., the interior of the infirmary buildings at Isleworth, in accordance with specifications which can be seen at offices of Mr. William Stephens, Clerk to the Guardians, Union Offices, Isleworth. W. Tenders, endorsed "Painting Infirmary," must be delivered to Clerk not later than 2 p.m. on June 12.

JUNE 12. — Lewisham. — PAINTING, ETC.—Lewisham Borough Council invite tenders for repainting and painting the footbridge over the London, Brighton, and South Coast Railway at Sydenham Park. Specifications may be seen, and forms of tender obtained, at the Town Hall, Surveyor's Department. The tenders must be on forms issued by the Council, enclosed in an envelope, sealed, and endorsed "Tender for Painting and Repairing Footbridge," and must be delivered to the Town Clerk on June 12 at the Town Hall, and placed in the box there provided for the purpose.

JUNE 13. — Dartford. — CLEANING AND PAINTING.—The Metropolitan Asylums Board invite tenders for cleaning and painting works at Darenth Asylum, Dartford, Kent, in accordance with specification

prepared by Mr. W. T. Hatch, Engineer-in-Chief. Specifications, conditions of contract, and form of tenders may be inspected at the Office of the Board, Embankment, E.C. 4, on and after June 4, and then be obtained on payment of 1l. Tenders, addressed as noted on the form, must be delivered at the Office of the Board before 10 a.m., June 13.

JUNE 13. — Rither Green. — CLEANING AND PAINTING, ETC.—The Metropolitan Asylums Board invite tenders for repairs and cleaning and painting works at Park Farm, Hospital Hill, Rither Green, S.E., in accordance with specification prepared by Mr. W. T. Hatch, Engineer-in-Chief. Specifications, conditions of contract, and form of tender may be inspected at the Office of the Board, Embankment, E.C., on and after June 1, and can then be obtained on deposit of 1l. Tenders, addressed as noted on form, must be delivered at the Office of the Board before 10 a.m., June 13.

JUNE 16. — Southwark. — PAINTING.—For painting and decorating the interior of Southwark Wesleyan Chapel, and for revarnishing all the pews and other woodwork. Particulars may be had from Mr. J. Wadsworth, South View, Southwark. Sealed tenders to be sent to the Rev. E. Wright Aldwick, 11, Saville-row, Hatfield, on or before June 16.

JUNE 19. — East Ham. — CLEANING LATRINES.—East Ham Education Committee invite tenders for cleaning and whitewashing latrines and privies, and urinals at the various schools, as described in the form of tender. Specification and form of tender to be obtained at the Education Office, East Ham. Each contractor must deposit a Bank of England note, or crossed cheque of equal value, with his tender. Tenders, on the printed form, must be delivered to Mr. J. Pender, Secretary, Education Office, East Ham, E., not later than 4 o'clock p.m., June 19, and should be endorsed "Tender for Cleaning and Whitewashing."

JUNE 25. — Dunham. — PAINTING.—In three sections, are required for painting Dunham Bridge, above and below the roadway, together with the Gutters and outlinings, pines, fences, etc. The specification may be seen, and form of tender obtained, upon application to Messrs. Storer & Gamble, Bank-street-chambers, Lincoln. The tenders are to be delivered not later than 10 o'clock a.m. on June 25.

ROADS, SANITARY, AND WATER WORKS.

JUNE 3. — Yeovil. — SEWERS.—Yeovil Town Council invite tenders for the construction of about 500 lin. yds. of 12-in., and 557 lin. yds. of 9-in. stoneware pipe sewers, Summerlands and District drainage scheme. Specification and forms of tender may be seen, and forms of tender obtained, at the office of Mr. A. Odly, Borough Surveyor, Municipal Offices, Yeovil, to whom sealed tenders must be delivered by 12 noon on June 5, endorsed "Sewers," and addressed to the Chairman of the Sanitary Committee.

JUNE 4. — Newport. — FOOTWAYS.—The Newport (Fife) Town Council invite tenders for the construction of granolithic footways. Specifications, schedules of quantities and forms of tender may be obtained from Mr. D. A. Donald, C.E., Borough Surveyor, Borough-chambers, Blyth Hall-buildings, Newport, Fife, on depositing the sum of 1l. 1s. Tenders, on forms supplied, and endorsed "Granolithic Footways," are to be lodged with surveyor not later than 10 a.m. on June 4.

JUNE 4. — Newport. — SEWER.—The Newport (Fife) Town Council invite tenders for the construction of a 9-in. fireclay and iron pipe outfall sewer at Scrozieside, Wormit, with manways and fittings, etc. Plans may be seen, and specifications, schedules of quantities, and forms of tender obtained, from Mr. D. A. Donald, C.E., Borough Surveyor, Borough-chambers, Blyth Hall-buildings, Newport, Fife, on depositing the sum of 1l. 1s. Tenders, on forms supplied, and endorsed "Sewer," must be received by the Surveyor not later than 10 a.m. on June 4.

JUNE 5. — Cullercoats. — ROADWORKS.—For excavating, laying a rubble foundation, and paving with whinstone chips in Huddleston-street, Simpson-street, and Back-lane, Cullercoats, for Tynemouth Corporation. Plans and specification may be seen at the office of Mr. John F. Smille, Borough Surveyor, to whom sealed and endorsed tenders are to be sent not later than 12 noon on June 5.

JUNE 5. — Tynemouth. — ROADWORK.—Tynemouth Borough Council invite tenders for excavating, laying a rubble foundation, and paving with whinstone chips in Huddleston-street, Simpson-street, and Back-lane, Cullercoats. Plans and specification may be seen at the office of Mr. John F. Smille, Borough Surveyor, to whom sealed and endorsed tenders are to be sent not later than 12 noon on June 5.

JUNE 6. — Aberkenny. — SWANSEAS, ETC.—FRAGMENTS AND BOANS. The Glamorgan C.C. invite tenders for the following works:—(1) Improvement of footpath at Evanston, Aberkenny; (2) widening main road at Forestfach, Swansea; (3) widening and improving the Cardiff and Pontypridd main road between Mill House, Upper Boat, and the junction of the Heolhon with the Cardiff and Pontypridd main road at Whitechurch; (4) widening Caedwylwyn Bridge over the Swansea Canal on the Swansea and Pontardawe main road, near the junction of the Swansea Canal; (5) widening Nantllogwr Bridge over the Swansea Canal on the Swansea and Pontardawe main road, near Clydach. Plans and specifications of the respective works may be seen, and copies of bills of quantities obtained, at the following places:—Work No. 1, Aberkenny, Police-station; Work No. 2, Caedwylwyn, Police-station; Work No. 3, Pontardawe, Police-station; Work Nos. 4 and 5, Cardiff, Police-station; Work No. 4, at the office of Mr. W. E. B. Allen, Deputy Clerk, at the C.C. Glamorgan C.C. Offices, Westgate-street, Cardiff, where also the plans and specifications of all the other works may be seen, and copies of the bills of quantities obtained. Sealed tenders, made up to the bills of quantities supplied, are to be sent to the Deputy Clerk, together with the full names and addresses of two substantial sureties, not less than June 5, marked outside "Tender for Evanston Footpath," "Tender for Forestfach Road Widening," etc., etc., as the case may be.

JUNE 6.—Ealing.—SEWER.—Ealing Town Council invite tenders for the construction of new relief effluent water sewer from Southern works to River Thames, and manholes, etc., in connection therewith, as under:—About 3,000 ft. of 24-in. pipe. The drawings and specifications may be seen, and forms of tender, together with schedule of quantities and other particulars, obtained from Messrs. Jones, M.Inst.C.E., Borough Engineer, Town Hall, Ealing, W., any day during office hours, upon payment of a deposit of 3s. Sealed tenders, in the envelope supplied, endorsed "Tender for New Relief Effluent Water Sewer," must be delivered at office of Mr. Geo. E. Brydges, Town Clerk, Town Clerk's Offices, Town Hall, Ealing, W., not later than 9.30 a.m., on June 6.

JUNE 6.—Huddersfield.—ROADWORKS.—For sewerage, kerbing, and forming 206 yds. of main street; also sewerage and forming of 220 yds. of back street (Wellfield and Croft House Marsh). Bills of quantities may be obtained, plans and specifications seen, at offices of Messrs. Brook, Dransfield, & Dyson, Surveyors, Estate-buildings, Huddersfield. Tenders must be delivered on or before June 6.

JUNE 6.—Watford.—STONEWARE PIPE SEWER.—Watford U.D.C. invite tenders for the construction of 400 lin. yds. of 9-in. stoneware pipe sewers and storm water drain, with the necessary manholes, etc. (King-street and Smith-street sewerage). Persons desirous of contracting for the work may see the drawings, form of contract, specifications, etc., at the offices of the Council, 14, High-street, Watford, between the hours of 9.30 a.m. and 1 p.m. A copy of the schedule of works (quantities), and a form of tender can be obtained at the office of the Council. Sealed tenders, addressed to the undersigned Clerk to the Council, and endorsed "Tender for Sewerage," must be delivered under cover to Mr. H. Morien Turner, Clerk to the Council, at Watford, not later than June 6.

JUNE 7.—Edinburgh.—ROADS.—Edinburgh Corporation invite tenders for work on the carriageways of—(1) Colinton-street, at Colinton (paving with concrete); (2) Torphichen-street (paving with hard whin sells). Schedules of quantities may be obtained on application to the City Road Surveyor, City Chambers, Edinburgh, within the official envelope supplied, must be lodged with Mr. Thomas Hunter, W.S., Town Clerk, City Chambers, by 10 a.m. on June 7.

JUNE 9.—Forres.—CONCRETE PAVEMENTS, ETC.—Forres Town Council invite offers for laying concrete pavements and kerbs and granite crossings in High-street and Cammin-street. Specifications and schedule of quantities may be obtained from Mr. John Rankine, Borough Surveyor, and offers lodged with Mr. Rob. Urquhart, Jun., Town Clerk, Forres, on or before June 9 at noon.

JUNE 9.—Leeds.—Paving, etc.—Leeds Corporation invite tenders for the paving and flagging of the following streets—Arre-road, Barnborough-street, Raincliffe-street, Eastfield-street, Crivich-street, Temple View-terrace, Everleigh-place, Everleigh-grove, Chantrell-grove, and Chantrell-place. Plans and specifications may be seen at the City Engineer's Office, Municipal buildings. Tenders, on printed forms, to be obtained at the Highways Office, must be sent to the Town Clerk's Office on or before June 12, addressed to the Highways Committee, and endorsed "Tender for Private Street Works."

JUNE 9.—Morrison.—ROAD WIDENING.—Swansea R.D.C. invite tenders for the widening of Llanllanwen-road, near Ynionfryn, Morrison. Plans and specifications may be inspected on application to Mr. G. Powell Thomas, Highway Surveyor, Forest-fich. All tenders to be in the hands of Mr. Edward Harris, Clerk, District Council Offices, Alexandra-road, Swansea, by June 9.

JUNE 11.—Halifax.—REPAIRS TO PLAYGROUNDS.—Halifax Education Committee invite tenders for repairs to asphalted playgrounds, cement pointing to walls, and inside painting and colouring of schools. Specifications may be seen, and forms of tender obtained, on application to Mr. Edward C.E., Borough Engineer, Town Hall, Halifax. Tenders, endorsed "Playgrounds, Pointing, or Colouring of Schools," must be sent to Mr. W. H. Ocker, Secretary, on or before June 11.

JUNE 11.—Northampton.—PAVING.—The Corporation of Northampton invite tenders for the execution of about 1,300 sq. yds. of granolithic concrete paving in the cattle pens at the cattle market. Plans and specifications may be seen, and bills of quantities and forms of tender obtained, on application to Mr. Alfred Fidler, M.Inst.C.E., Borough Engineer, Guildhall, Northampton, on deposit of a cheque for 2l. 2s. Sealed tenders, endorsed "Paving of Cattle Market," and addressed to Mr. Herbert Hankinson, Town Clerk, Guildhall, Northampton, must be delivered at the Town Clerk's Office, Guildhall, Northampton, on or before 12 noon on June 11.

JUNE 12.—Birmingham.—SEWERS.—The Public Works Committee invite tenders for the reconstruction of the Washwood Heath and Salfley outfall sewers across the Birmingham Tame and Rea District Drainage Board's lands at Salfley, including alterations to the culverts under the Midland Railway, and a crossing over the River Lea. The plans and specifications may be seen, and quantities and forms of tender obtained, on deposit of a sum of 2l. Tenders, sealed, and endorsed "Salfley Outfall Sewers," and addressed to the Chairman of the Public Works Committee, must be delivered at the office of Mr. T. Arnall, Acting City Surveyor, The Council House, Birmingham, on or before June 12.

JUNE 12.—Islington.—PAVING.—Islington Borough Council invite tenders for paving with wood-blocks portions of the carriageways of High-street and Upper-street, and for removing the granite sets from portions of High-street and Upper-street, and paving other roads at present macadamised, with such sets. Conditions and specification may be seen, and forms of tender and bills of quantities obtained, upon application to the Borough Engineer, Mr. J. Batten Barber, at the Town Hall, Upper-street, N., and payment of 2l. 2s. Sealed tenders, endorsed "Tender for Wood and Granite Paving," must be received by Mr. Wm. F. Dewey, Town Clerk, Town Hall, Upper-street, Islington, N., not later than 4 p.m., June 12.

JUNE 12.—Tottenham.—TAR AND ASPHALT PAVING.—The Tottenham U.D.C. invite tenders for repair of the tar and asphalt paving throughout their district. Specifications and forms of tender can be obtained on application to Mr. W. H. Prescott, Council Engineer, Building Department, The Green, Tottenham. Persons tendering will be required to deposit 5l. when handing in their tenders. Sealed tenders, in the form supplied, endorsed "Tender for Tar and Asphalt Paving," must be delivered to Mr. Edward Crowne, Clerk to the Council, Tottenham, by 12 noon, June 12.

JUNE 13.—Croydon.—KERBING AND PAVING.—Croydon T.D.C. invite tenders for works of kerbing and paving in the parishes of Addington, Beddington, Coulsdon, Merton, and Mitcham, and the hamlet of Wallington, comprising about 9,500 lin. ft. of granite kerbing, 16,533 super. yds. of concrete paving, and 21,500 super. yds. of tar paving. Plans may be inspected, and forms of tender, and a copy of the specification may be obtained, from Mr. J. S. Killick, the Council's Highway Surveyor, at his office, Town Hall, Croydon, on payment of a deposit of 5l. Tenders, on forms provided, to be delivered to Mr. E. J. Gowen, Clerk of the Council, Town Hall, Croydon, on or before June 13.

JUNE 15.—Enfield.—MAKING-UP STREETS.—U.D.C. of Enfield invite tenders for the making-up of the following private streets in their district, viz.:—Fresco-way, Frewesway, and Frewesway, end of Rd., Frewesway. Plans and specifications can be seen, and forms of tender and all information obtained, on application to Mr. Richard Collins, the Council's Surveyor. Separate tenders for the works (quantity of the forms supplied only), to be sent in to Mr. T. W. Scott, Clerk to the Council, Public Offices, Enfield, not later than June 15, endorsed "Tender for Making-up Streets." Tenders, endorsed "Tender for Making-up Streets," to be sent in to Mr. John P. Dalton, Surveyor, Council Offices, Ryton-on-Tyne, to whom tenders must be delivered, not later than noon on June 15.

JUNE 15.—Crowthorne.—DRAINAGE.—R.D.C. of Uckfield invite tenders for the construction of the following works—About nineteen miles of stone-ware and iron sewers, ranging from 8 in. to 15 in. in diameter, with the necessary manholes, flushing tanks, etc.; Purifiers; works for the treatment of covered settling tanks, double-contact bacteria beds, storm-water tanks, etc.; and other works for Crowthorne and Jarvis Road. Drawings and contract No. 1, in accordance with the specification and plans prepared by Messrs. John Taylor, Sons, and Santo Cramp, civil engineers. Copies of the specification and quantities, with form of tender, may be obtained from, and the drawings inspected at, the offices of the aforesaid firm of engineers, at Caxton House, Westminster, upon payment of 5l. (cheque only). Tenders, endorsed "Crowthorne Drainage: Contract No. 1," are to be delivered to the Clerk's office, Mr. Frederick Holman, Clerk, 86, High-street, Lewes, before 10 o'clock on June 15.

JUNE 15.—Birkenhead.—CULVERTS.—Birkenhead Board of Guardians invite tenders for excavating and making culverts for steam mains at the Union Workhouse, Tranmere. Also tenders for supplying and fixing steam mains at the Union Workhouse. Persons desirous of tendering may obtain copies of quantities upon payment of a deposit of 2l. 2s. Such copies of quantities may be obtained between the hours of 10 a.m. and 5 p.m., upon application to the Guardians' Architect, Mr. Edmund Kirby, F.R.I.B.A., 5, Cook-street, Liverpool. Sealed tenders, signed, and endorsed "Tender for Excavating and Making Culverts for Steam Mains," or "Tender for Supplying and Fixing Steam Mains," as the case may be, to be delivered to Mr. John Carter, Clerk to the Guardians, Poor Law Offices, Conway-street, Birkenhead, on or before June 15 at noon.

JUNE 19.—Brentford.—BROKEN GRANITE.—The Brentford U.D.C. invite tenders for 150 yds. of blue Guernsey granite, hand broken to a gauge of 2 in. Form of tender, on printed forms, to be sent in, together with specification and conditions, may be obtained on application personally to Mr. Nowell Parr, Council's Surveyor, Clifden House, Brentford, on or before June 19 at noon. Sealed tenders to be delivered at the Clerk's Office, New Brentford, before 12 o'clock, June 19.

JUNE 25.—East Ham.—TAR PAVING.—East Ham Education Committee invite tenders for the work of repairing the tar paving of playgrounds at Bessborough-road, Central Park-road, and High-street schools. Forms of tender and specification may be obtained on application to Mr. H. C. Paderic, Secretary, Education Office, East Ham, E. Each contractor will be required to deposit with his tender a 5l. Bank of England note, or crossed cheque of equal value. Tenders, on the printed forms, must be delivered to the Secretary not later than 4 o'clock p.m., on June 25, and should be endorsed "Tender for Tar Paving."

JUNE 27.—Uxbridge.—DRAINAGE, ETC.—Uxbridge U.D.C. invite tenders for works of drainage, construction of manholes, leveling, kerbing, channeling, retaining walls, metalling, and other appurtenant works in the following roads, all situated in the parish of Uxley, Middlesex, close to West Drayton G.W.R. Station:—(1) Tavistock-road, (2) Wimpole-road, (3) Winnock-road, (4) Dock-road, (5) Padcroft-road, (6) Fairfield-road. Drawings may be seen, and a specification, bills of quantities, and forms of tender obtained, at the office of Mr. J. Frecknall Shaw, Engineer and Surveyor, Surveyor's Office, Corn Exchange, Uxbridge, on deposit of 5l. Sealed tenders, endorsed "Uxley Works," must be delivered at office of Engineer not later than 4 p.m. on June 27.

NEXT DATE.—Long Eaton.—ROADS.—The Mutual Land Society, Ltd., Long Eaton, invite tenders for the forming, making, sewerage, kerbing, channeling, etc., extensions of Breerton-street, Curzon-street, and East-street, in the parish of Long Eaton, according to the plans, specifications, and bills of quantities prepared by Mr. J. F. Dodd, Surveyor, Long Eaton. Copies of the bills of quantities from Mr. Herbert W. Sumner, Secretary, "Elierslie," Cleveland-avenue, Long Eaton. Such application must be accompanied by a deposit of the sum of 2l. 2s.

STONE, MATERIALS, AND STORES.

JUNE 4.—East Stonehouse.—STONE.—East Stonehouse U.D.C. invite tenders for the supply of broken and other stone, to be delivered at their works in Stonehouse, East of Stonehouse, specification and form of tender may be obtained at the surveyor's office. Sealed tenders, endorsed "Road Materials," together with samples, must be delivered free of charge, to the office of Mr. B. Townshend, Surveyor, Surveyor's Office, Town Hall, Stonehouse, on or before June 4.

JUNE 4.—Winterton.—GRANITE.—The U.D.C. of Winterton invite tenders for the supply of 600 tons of granite, broken to 1½ in. or 1½-in. gauge, delivered at Winterton Haven, either into carts or stored as may be required. Tenders and samples to be sent to Mr. A. Spencer, Clerk of the Council, Council Offices, Queen-street, not later than June 4. Also tenders and samples for the supply of 200 tons of well-broken slag and 50 tons of screenings, by 8 a.m. on June 4. Also tenders, by June 4, for carting the granite and slag, and screenings, either by carts or traction, and deposited in such quantities and where as the surveyor shall direct.

JUNE 4.—Gosforth.—Whinstone.—Gosforth T.D.C. invite tenders for the supply of broken whinstone, etc., for a period of twelve months. Particulars may be obtained on application to the Surveyor, Mr. George W. Woods, end of Rd., "Supply of Road Material," must be sent so as to reach Mr. R. Sherion Holmes, solicitor, Clerk to the Council, Council Chambers, Gosforth, not later than 5 o'clock p.m. on June 4.

JUNE 6.—Raunds.—ROAD MATERIAL.—Raunds T.D.C. invite tenders for the supply of 260 tons of broken granite and 450 tons of slag to be delivered free at Raunds Station not later than December 31, 1906, in such quantities and at such times as shall be directed in writing by the Surveyor of the Council. Sealed tenders, endorsed "Road Material," quoting per ton, to be delivered to Mr. F. W. Corby, Clerk, Raunds, not later than June 6. Forms of tender may be obtained from Mr. Thomas Yeake, Clerk, Raunds, Surveyor's Office, to whom samples, of not less than 14lb., should be sent.

JUNE 6.—Setton.—MATERIALS.—Setton R.D.C. invite tenders for the supply of materials, etc., for the proposed making up and breaking up of the following townships—Aintree, Ince Blundell, Kirkby Lunt, Newthorpe, and West of Ince Blundell, West of Garsley Rural. Tenders will not be considered unless sent in the printed forms, to be obtained from the Highway Surveyor, Mr. James Roscoe, Kirkby, near Thelwall, on or before June 6 at noon. Sealed tenders to be sent to the Council, Brougham-terrace, West Derby-road, Liverpool. Tenders, sealed, to be marked on the envelope "Tender for June 6," to be sent to a Clerk by 4 o'clock on June 6.

JUNE 11.—Blything.—GRANITE.—Blything Guardians invite tenders (per ton), for the supply and delivery by July 1 next, at Westhaston Station, Southport, of 100 tons of granite, broken to 1½ in. for breaking up in the labour yard. Tenders, sealed, and endorsed "Tender for Granite," to be delivered at the Board-room, Billcamp, not later than 10 a.m. on June 11. Mr. Harold W. Wallis, Clerk to the Guardians, Billcamp, Billcamp, Hellesworth.

JUNE 12.—Baldon.—LIMESTONE.—Baldon U.D.C. invite tenders for the supply of 500 tons of 23-in. broken limestone, to be delivered at Baldon Station. Tenders, endorsed "Limestone," to be sent to Mr. J. Ben, Clerk to the Council, Baldon, on or before June 12.

JUNE 12.—Hetton.—ROAD MATERIALS.—The U.D.C. of Hetton invite tenders for supplying the under-mentioned road materials, namely—200 tons of rough slag; 200 of 2½-in. machine broken slag; 100 tons of 1-in. machine broken slag; and 100 tons of ½-in. slag ravel. Further particulars, together with form of tender, to be obtained from the Surveyor of the Council, Mr. John Harding, Hetton-le-Hole, R.S.O., to whom samples of slag proposed to be supplied are to be sent by 10 a.m. on June 12. Sealed tenders, addressed to Mr. John George Baty, Clerk to the Council, Houghton-le-Springs, R.S.O., endorsed "Tender for Road Material," to be sent not later than 10 o'clock on June 12.

JUNE 13.—Northfleet.—ROAD MATERIAL, ETC.—The U.D.C. of Northfleet invite tenders for the following items, from July 1, 1906, to June 30, 1907, both inclusive:—(1) The supply of 700 tons of Guernsey granite, as per Guernsey State weightbridge certificate weight, broken to gauges of 1½ in. and 2 in., for metalling roads. (2) The supply of such quantity of cement as per ton from time to time as may be required by the Council. (3) The supply of 1,600 yds. of surface-picked flints for metalling roads. (4) The supply, within five days after notice, free of all cartage, river, and other dues and charges (except wharfage), on to such wharf within the district as may be directed, barge freights of clean Thames ballast, 100 tons of cubic yards of ballast, and 500 tons of five days after notice, free of charges except cartage to a railway station on the South Eastern and Chatham Railway, to be named by the said surveyor. (5) The supply of 100 tons of clean district of Northfleet, free of all canal, river, and other dues and charges, as may be directed, such quantity or quantities of selected, best quality, hard blue finely-crushed (½ in. gauge) whinstone, broken to a 2½-in. gauge, for metalling the roads. (6) The supply of 60 tons of granite sets, 4 in. by 4 in. by 8 in., to 10 in. longest, delivered free of all canal, river, and other dues and charges (except wharfage), on to such wharf within the district within twenty-eight days after notice from the said surveyor. (7) The supply, within five days after notice, of a 12-ft-long steam roller, with scraper, and, if required, a 10-ton steam roller without scraper. No forms of tender or conditions can be supplied. Tenders are to be sent to the Council Office in the High Northfleet, not later than 4 p.m. June 13, marked "Tender for—"

JUNE 13.—Bristol.—SPRINGS.—Bristol Guardians invite tenders for the supply of the following articles, to be delivered, cartage free, in such quantities as the Guardians shall order, at their workhouses at Stapleton, Eastville, and Southmead.

or at any of the homes for children, or at St. Peter's Hospital, for one year to June 30, 1907.—Brushes and mops, etc.; bricks and sanitary pipes, etc.; earthenware and glass; timber; oils and colours; ironmongery; furniture; chairs and heavy articles; taps (hot and cold water, etc.); tinware, etc. Patterns of brushes and mops, earthenware and glass, ironmongery, cutlery, taps, etc., may be seen at St. Peter's Hospital, Bristol, and tenders, in forms to be obtained at office of Mr. J. J. Simpson, Clerk, must be delivered not later than 12 o'clock noon on June 14.

JUNE 14.—OSWESTRY.—SUPPLIES.—Cambridgian Railways Company Directors invite tenders for supplies of the undermentioned stores, to be delivered in such quantities and at such times as may be required, during the twelve months ending June 30, 1907.—(1) Oils and tallow; (2) cotton waste; (3) clothing; (4) brushes; (5) bricks, drain pipes, and lime; (6) galvanised wire; (7) carriage trimmings and horse hair; (8) copper, black tin, etc.; (9) canvas; (10) coke; (11) iron tubes and fittings; (12) fencing, wire, files, springs, spring steel and buffer plungers; (16) glass; (17) iron and steel, bar and sheet; (18) pig-iron; (19) india rubber; (20) cement; (21) bolts, nuts, and chair spikes; (22) lead, white and red; (23) lead sheet and piping; (24) nails and crane chains; (25) paints, turpentine, etc.; (26) varnish and cold lead; (27) ropes; (28) printing and stationery (three years); (29) soap; (30) screws and washers; (31) timber, English; (32) timber, foreign; (33) timber, foreign (supplementary); (34) leather. Specifications and forms of tender may be obtained at the Stores Office, Cambridgian Works, Oswestry, and specimens, patterns, and samples may be seen there daily, except on Saturdays, from 9 a.m. to 4 p.m. Sealed tenders should be sent to and reach Mr. C. S. Dennis, Secretary, Oswestry, not later than 9 a.m. on June 14, marked "Tender for No."

JUNE 15.—ELY.—GRANITE.—Ely U.D.C. invite tenders for supply and delivery at Ely Railway Station

of 400 tons (more or less) of 1½-in. Clee Hill, blue Guernsey, or Leicestershire granite (separate prices for machine and hand broken to be quoted), and 100 tons (more or less) of best 3½-in. Hill, blue Guernsey, or Leicestershire granite 7-in. clean screenings; 20 tons of 1½-in. similar granite to Black Bank Railway Station, G.E.R.; also 150 tons of 1½-in. similar granite (separate prices for machine and hand broken to be quoted), to be delivered by water and unloaded on the river bank in heaps at the under-mentioned places, viz.:—50 tons to Adelaide Bridge; 50 tons to Prickwillow Bridge; 10 tons to Burnt Fen Bank, between Prickwillow Bridge and Mr. John Sindall's house; 40 tons for Miles End Drive, to be delivered on Burnt Fen Bank and tipped into carts near Mr. John Sindall's house. Samples of each should be sent to Mr. William McKelvie at the City Surveyor's office in Ely (carriage paid), previous to delivery of tender. Sealed tenders, endorsed "Tenders for Granite," to be delivered or sent by post so as to reach Mr. Geo. Martin Hill, Clerk, Market-square, Ely, on June 18, July 3.—**DARTFORD.—SUPPLIES.**—U.D.C. of Dartford invite tenders for the supply and delivery of the undermentioned goods during the year ending June 30, 1907:—(a) Lubricating and other oils; (b) disinfectants; (c) broken granite; (d) electric meters; (e) house cut-outs; (f) house service cable, isolating material, and accessories for electric lighting department; (g) general stores for electric lighting department; (h) coal. Particulars and forms of tenders will be sent to any applicant on receipt of a stamped addressed look-up envelope, or may be obtained on application to Mr. W. Kay, Clerk to the Council, Council Offices, Dartford. No tender will be considered unless it be upon the prescribed form. Sealed tenders, in envelopes addressed "The Clerk, U.D.C. of Dartford, Council Offices, Dartford," and endorsed "Tender for No." as the case may be, must be sent in not later than 4 p.m. on June 15.—**WATFORD.—GRANITE.**—Watford U.D.C.

invite tenders for 3,000 tons of granite (or such less quantity as the Council may require, machine broken, so as to pass in any direction through a 2-in. ring; also an alternative tender for similar granite broken so as to pass in any direction through a 1½-in. ring, delivered in quantities as required, at Watford or Bushey stations. A sample of granite is to accompany each tender, and the tender is to state the rate per ton of the material. Sealed tenders, addressed to the Clerk to the Council, and endorsed "Tenders for Granite," to be delivered at the offices of the Council not later than noon on June 20.

★ JUNE 21.—ISLINGTON.—ANNUAL CONTRACTS.—The Council of the Metropolitan Borough of Islington invite tenders for contracts for eight months, from August 1, 1906 (except as regards item No. 10, which will be for eight months, one year and eight months, or two years and eight months, at the option of the Council, and as regards items Nos. 11 and 12, which will be for nine months, or two years and nine months at the option of the Council from July 1, 1906), as under:—(1) Horses, harness, and man for van for watering roads; (2) cartage and horse hire; (3) masons' and paviors work; (4) supply of broken granite and chippings; (5) ballast, single, hoazin, hard core, and flints; (6) timber, etc.; (7) wheels and tyres; (8) manhole and other covers, gully grates, guard posts, castings, and other ironwork; (9) iron, steel, and tools; (10) sewers and drains. Forms of tender and contract, and other particulars on application at Town Hall, Upper-street, N., on and after June 11, between 9 a.m. and 5 p.m. Tenders, properly endorsed, to Town Clerk, before noon, June 21.

No DATE.—FOREHOE.—MATERIALS, ETC.—Forehoe R.D.C. invite tenders for the supply of materials and team labour. Particulars and forms of tender may be obtained from Mr. Wm. Partridge Smith, Clerk, Vicar-street, Wyomondham.

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*CLERK OF WORKS	South Shields Educa. Com.	3l. per week	June 8

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*FREEHOLD BUILDING PLOTS, SHENFIELD.—Hutton Hall Estate	Protheroe & Morris	June 11
*BUILDER'S STOCK.—296, Liverpool road, N.	William F. Laing	June 12
*DEALS, BATTENS, Etc.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sims	June 13
*FREEHOLD LAND, TOTENHAM.—At the Mart	Alfred Richards	June 14
*FREEHOLD BUILDING ESTATE, PLYMOUTH.—Law-chambers, Princess-square, Plymouth	Glebeist & Bishop	June 16
*BUILDING SITE, QUEEN-STREET, CHEAPSIDE.—At the Mart	G. A. Wilkinson & Son	June 19, 20
*TOOLS AND IRONMONGERY.—At Plough-court, 50a, Barbican, E.C.	A. S. Cohen	June 20
*FREEHOLD BUILDING LAND, NEW SOUTHGATE.—At the Mart	Harman Bros.	do.
*OLD BUILDING, ADELPHI-GARDENS.—At the Mart	Harman Bros.	do.
*FREEHOLD BUILDING LAND, Etc., ST. LEONARDS-ON-SEA.—At the Mart	Daniel Smith, Son, & Oakley	June 27
*FREEHOLD ESTATE, GREAT AMWELL, WABE.—At the Mart	Norris & Duval	June 27
*BUILDING PLOTS, BUISLIP PARK ESTATE.—On the Estate	Ventura, Ball, & Cooper	July 7

PATENTS.—Continued from page 624.
 window. On drawing back the bolt the catch sets automatically ready for the next closing of the window. The catch being attached to the bolt travels with it, supported on a platform which is an upward extension of the tripper. The inside of the end of the bolt is so shaped that when it engages with the standard it gradually draws the meeting rail together, holding them securely. To control and limit the range of the bolt fixed studs are placed on the plate.
 13,868 of 1905.—J. Mason: *Stair Treads, Manhole Plates, and the like.*
 This relates to treads for stairs and the like, and consists in the employment in conjunction with plates of hard metal of a filling for the recesses, containing corundum and cement.
 15,549 of 1905.—H. E. KAYE: *Ash Bins.*
 This relates to an ash-bin, comprising a gridded tray in its upper part, with a gridded bottom, having a sliding cover, and supported on its sides within the bin, and adapted to be moved in and out from the wall of the bin.
 15,926 of 1905.—C. R. BARKER: *Radiators for Heating Buildings and the like.*
 This relates to a radiator for heating buildings and the like, and has for its object to provide a hood or cover for the purpose of protecting the adjacent wall surface, and preventing its disfigurement or discoloration by the more or less impure air issuing from the radiator. This hood or cover is attached to the radiator by any convenient means, preferably by set screws at each end, and a felt or other pad is interposed between the hood and the wall to prevent the passage of air behind the hood; the top of the hood is curved outward, and is fitted in front with a screen of gauze or like material, which arrests any particles of soot or other impurities, and thereby acts as an air filter. The said screen is detachable for cleaning purposes, and is secured in position, preferably in vertical guides by set screws, or

other convenient means. The screen is provided along its lower edge with a suitable channel or dust-box.
 17,266 of 1905.—F. W. HEAPE (H. HEAPE): *Window Adjusting Appliances.*
 This relates to a window adjusting appliance, and consists in means for opening the upper sash of a double-sash window, consisting of catches on the lower sash adapted to engage parts on the upper sash when the lower sash is moved up, whereby when the lower sash is pulled down after raising the upper sash will be pulled down.
 1,966 of 1906.—R. WHITEHEAD: *Hinges for Window Casements, and the like.*
 This relates to a casement hinge taking the form of a cranked rod having pivoted ends and brackets, upon which casements and the like can swing or turn near the hanging side of the window-frame.
 9,355 of 1905.—P. AALTON: *Method of Joining Cast-Iron Waste Pipes and Lead Pipes.*
 This relates to a method of joining cast-iron waste pipes or exhauling pipes belonging thereto with lead pipes, consisting in casting in the cast-iron pipe a wrought-iron pipe having a non-corrosive lining or covering for the purpose of enabling the lead pipe to be conveniently and impermanently joined to the cast-iron pipe.
 8,497 of 1906.—W. HOUGHTON: *Means for Supporting Pipes, and the like.*
 This relates to a pipe-hanger, comprising a yoke having its arms provided with flanges adapted to engage the rib of a beam and flanges on the opposite side adapted to engage a key, a clamping block having a flange adapted to engage the beam extended between the arms, and having the flange adapted to engage the key, and a key for locking the parts together and causing the block and arms to clamp the beam between them, and means connected with the arms for supporting a pipe or cable.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 15.—By J. & R. ROYF (at Beaconfield), Beacon, Cambridgeshire, etc., eighteen freehold building plots	£1,431
May 17.—By STEPHENSON & ALEXANDER (at Cardiff), Cardiff, Glamorgan, City-rod, etc., E.g. rents 436l., reversions in 52 to 82 yrs. (in lots)	19,241
By NICHOLAS, DENYER, & Co. (at Shrewsbury), Wistanow, etc., Salop. — "Whittingslow Farm," 207 a. 2 18 p. l.	4,100
May 18.—By WYATT & SON (at Emsworth), Emsworth, Sussex.—High-st., freehold house and shop, y.r. 28s.	600
Westbourne, Sussex.—High-st., freehold house and shop, y.r. 48s.	685
By DAVIS & CHAMPION (at Stroud), Stonehouse, Glos.—"Court Farm," 216 a. 3 r. 28 p. l. (in lots)	11,880
May 19.—By GRAIN, MOTES, & Co. (at Cambridge), Waterbeach, Cambs.—Orchard and arable land, 10 a. 3 r. 4 p. l.	465
Various enclosures, about 47 acres, l. (in lots)	1,845
May 21.—By BRODIE, TIMMS, & Co. (at St. James'), 13, Bury-st., ut. 3½ yrs., g.r. 44l. 1s., y.r. 165l.	300
18 and 15, Ryder-st., n.t. 3½ yrs., g.r. 54l. 4s. 10d., y.r. 120l.	530
Regent's Park.—6, Uxter-ter., ut. 17 yrs., g.r. 5l., y.r. 140l.	1,115
48, Albany-st., ut. 18 yrs., g.r. 10l. 10s., y.r. 70l.	460
69 and 71, Osnaburgh-st. (s.), ut. 17 yrs., g.r. 17l., y.r. 100l.	510
83, Osnaburgh-st. (s.), n.t. 18½ yrs., g.r. 10l., y.r. 45l.	250
68, Cumberland-st. (s.), ut. 18½ yrs., g.r. 7l. 4s., y.r. 40l.	315
Albany-st., etc., g.r. 45l., ut. 18½ yrs., g.r. 27l.	175
Albany-st., "The Victory" p.h., ut. 17½ yrs., g.r. 44l., y.r. 200l.	1,325

Kensington—7, Barton-st., u.t. 69 1/2 yrs., g.r. 104, yr. 602	478	By A. BURENSHAW & SON (at Hallsbam). Hallsbam, Sussex.—Summerheath-rd., two plots of land, f.	£120
Penge—Crampton-rd., l.g. rents 207, reversion in 62 and 63 yrs.	450	6 and 8, Batter-rd., l., w.r. 23, 8s.	430
Railway View, l.g. rents 314, 108, reversion in 62 yrs.	650	7, North-st., l., yr. 204	845
By R. C. S. EVERETT.		17 to 20, Wind-rd., f., w.r. 74, u.t. 69 yrs.	920
Lynchmere, Surrey.—Shottonmill, "Penwith" and 2 acres, l., p.	2,825	"Slyes Land," 23 a. 1 r. 23 p. f.	980
By PERCIVAL HODSON.		"Redwells," "Gibraltar," and "Hemplot," marsh grass land, 23 a. 0 r. 7 p., f.	980
Holloway—7, 9, 11, Hercules-rd., u.t. 46 yrs., g.r. 151, yr. 148, 8s., & 30s.	675	By NOVYES & HOWES (at Kensington). South Lambeth—39 and 41, Fendlam-rd., u.t. 22 yrs., g.r. 104, e.r. 904	400
Southgate.—Reservoir-rd., a freehold building plot, 1 acre	100	By MADDISON, MILES, & MADDISON (at Yarnmouth). Calster-on-Sea, Norfolk.—A freehold house, yr. 104	170
Palmer's Green—29, Old Park-rd., u.t. 96 1/2 yrs., g.r. 84, 108, e.r. 464	455	Eight freehold cottages, and 3 r. 29 p., yr. 474, 168.	410
By KENSLEY'S.		May 21.—By H. J. BLISS & SONS. Stratford.—49 to 65 (odd), Louise-rd., l., w.r. 219, 14s.	1,425
Woodford.—Georgiana, the Railway Coffee Tavern, l., p.	1,000	Southend, Essex.—16, Elmwood-rd., u.t. 69 yrs., g.r. 31, e.r. 351	395
George-st., a freehold shop plot	350	By CHESTERTON & SONS. Kensington—59, Campden Hill-rd., u.t. 47 1/2 yrs., g.r. 121, 10s., yr. 174	2,350
By LANGRIDGE & FREEMAN. Carshalton.—Station-rd., l.g. rents 554, 10s., reversion in 90 yrs.	1,050	57, Campden Hill-rd., u.t. 47 1/2 yrs., g.r. 121, 10s., p.	2,250
By MAY & PHILIPOT. Brixton—39, Efford, u.t. 69 yrs., g.r. 151, e.r. 654	585	16, Pertham-rd., u.t. 66 yrs., g.r. 104, p.	385
Streatham—51, Mount Ephraim-rd., u.t. 48 yrs., e.r. 204, 8s., p.	775	By S. B. CLARK & SON. Marylebone—32A, Weymouth-st., u.t. 47 yrs., g.r. 451, reducible to 244, p.	5,800
Alphamton, etc., Essex.—"Hill" and "Wallack's" farms, 138 a. 8 r. 14 p., f.	1,050	By J. G. DEAN & CO. Balham—4, Baskerville-rd., u.t. 73 yrs., g.r. 124, yr. 604	620
By WEATHERALL & GREEN. Edgeware-road—19, Newham-st., l., yr. 40, Notting Hill—15 to 19, 26 to 32, Prince's-ave., u.t. 37 yrs., g.r. 504, w.r. 347, 1s.	630	33 and 35, Guesley-rd., l., yr. 784	500
May 22.—By DEBENHAM, TEWSON, & CO. Fleet-street—11, Crane-st., area 906 ft., building lease for 99 yrs., lot at per annum	1,600	By C. C. & T. MOORE. Spitalfields.—20, Palmers-k, l., w.r. 494, 8s.	700
By ALFRED SAUND & SONS. Alphamton, etc., Essex.—"Hill" and "Wallack's" farms, 138 a. 8 r. 14 p., f.	1,050	Bow—80, Coburn-rd., u.t. 66 yrs., g.r. 104, 10s., p.	200
By WEATHERALL & GREEN. Edgeware-road—19, Newham-st., l., yr. 40, Notting Hill—15 to 19, 26 to 32, Prince's-ave., u.t. 37 yrs., g.r. 504, w.r. 347, 1s.	1,600	Mile End—26, Mayors-rd., u.t. 72 yrs., e.r. 74	195
May 22.—By DEBENHAM, TEWSON, & CO. Fleet-street—11, Crane-st., area 906 ft., building lease for 99 yrs., lot at per annum	1,600	31, 32, p.	140
By GARETT, WHITE, & POLAND. Oxford-street—17, 19, and 21, Dering-st., area 2,175 ft., corporation lease, g.r. 62, 15s., u.t. 474, 5s., yr. 200, 14s.	110	Holloway—7 and 8, Paddington-st., u.t. 51 yrs., g.r. 84, w.r. 544, 12s.	380
Hampstead—113, Inverness-rd., yr. 454	8,000	Claydon—26, Mayors-rd., u.t. 72 yrs., e.r. 74	360
By ERNEST GEWERS. Dalston—40, 42, and 44, Albert-rd., u.t. 41 yrs., g.r. 151, 16s., yr. 114	650	31, Mornington-rd., u.t. 32 1/2 yrs., g.r. 77, e.r. 634	430
By G. TROLOPE & SONS. Chipstead, etc., Surrey.—"Gatwick Farm," 220 a. Dr. 9 p. l., e.r. 325	920	Camden Town—55, Princes-st., u.t. 32 1/2 yrs., g.r. 44, yr. 304	430
Kingswood, Surrey.—"The Red Lodge" and 1 a. 2 r. 15 p., yr. 604	7,000	Hampstead—17, Constantine-rd., u.t. 79 1/2 yrs., g.r. 61, e.r. 404	430
"Hope Cottage" and 1 a. 19 p. 4, yr. 204	1,850	By T. D. PEACEY. Regent's Park—27, Redhall-st., u.t. 17 yrs., g.r. 54, 12s., w.r. 754, 8s.	230
Two cottages, blacksmith's shop, and 0 a. 1 r. 8 p. l., yr. 44	550	10, Chester-pl., u.t. 19 yrs., g.r. 104, e.r. 1004	270
A block of building land, 2 r. 30 p. f.	740	By STIMSON & SONS. Bromley, Kent.—Cowper-rd., l.g.r. 124, reversion in 77 yrs.	275
A freehold holding, 4 a. 2 r. 11 p., yr. 22 1/2, 94	600	Erlth, Kent.—Marion Parade, l.g.r. 124, reversion in 91 1/2 yrs.	1,190
Burgh Heath, enclosure of pasture and several allotments, 13 a. 3 r. 13 p. f.	1,075	Corinthian-rd., l.g. rents 544, 12s., reversion in 91 1/2 yrs.	985
Burgh Heath, "Canon's Farm," 91 a. 3 r. 20 p. f.	5,000	Corinthian-rd., l.g. rents 244, 8s., reversion in 91 1/2 yrs.	525
Setton-rd., an enclosure, 1 a. 2 r. 27 p. f., also l.g.r. 504, reversion in 56 1/2 yrs.	1,650	Kennington—153, Kennington-rd., u.t. 27 yrs., g.r. 104	300
Copt Hill-rd., etc., l.g. rents, 207, reversion in 77 1/2 yrs.	500	8 Ravensden-st., u.t. 25 yrs., g.r. 54, 10s., increasing to 64, 10s., yr. 404	1,025
By G. B. HILLIARD & SON (at Parkings). Barkings—Movers-lane & plot of market garden ground, 2 a. 3 r. 37 p. l.	250	Battersea—31, John's-hill, l.g.r. 204, reversion in 82 yrs.	465
Ripple Level, a freehold grazing marsh, 9 acres	440	Bermundsey—193, Lynton-rd., u.t. 33 yrs., g.r. 54, e.r. 394	230
By BOTOS, SOX, & CO. (at Maldenhead). Maldenhead, Berks.—Rayet, four freehold villas and shop adjoining, e.r. 133	1,025	Camberwell—14, Alderton-rd., u.t. 67 yrs., g.r. 84, e.r. 404	320
By GROVE, MARKS, & BARLEY (at Masons' Hall Tavern). City Road—East-rd., the "Dunstan Arms," p.h., u.t. 21 yrs., yr. 1004, with goodwill.	2,700	Woodwich—491, Woodwich-rd., u.t. 34 yrs., g.r. 44, 4s., yr. 384	250
Great Chart-st., The "Globe," p.h., u.t. 21 yrs., yr. 1004, with goodwill	3,110	Bromley-hy-Bow—288, Devons-rd., l., w.r. 484, 2s.	265
May 23.—By DAVID BURNETT & CO. City—35, Cannon-st., (bank premises, etc.), area 2,800 ft., corporation lease, g.r. 134, 5s. 1d., yr. 6214, 14s. 11d.	14,000	By FRANK SWAIN. Bay'swater—106, Queen's-rd., u.t. 42 yrs., g.r. 104, yr. 954	1,500
By C. RAWLEY CROSS & CO. Acton.—Lynton-rd., "Glendale" and "Kenmuir," u.t. 37 yrs., g.r. 104, 10s., p.	1,065	By DANIEL WATNEY & SONS. Thornton Heath—London-rd., a freehold building estate, 1 1/2 acres, p.	7,575
Lee—55, Leyland-rd., u.t. 58 yrs., g.r. 124, p.	135	Smithfield.—Peter-lane, l.g.r. 704, reversion in 77 yrs.	1,130
By A. & G. GUILVER. Fonder's End—30 to 36 (even), New-rd. ("Smiths cottages"), l., w.r. 674, 12s.	575	Wimbledon—20, Church-rd., with builder's yard and premises, l., e.r. 704	850
By ROBERTS BROS. Old Kent Road—12 and 14, Downes-st., u.t. 69 1/2 yrs., g.r. 104, w.r. 62, 8s.	455	Peckham—28, Dr. 29, and 30th-gr., l., yr. 1304	1,500
204, w.r. 124, 16s.	630	May 25.—By GEORGE BILLINGS. Clapton—248 and 250, Daubeney-rd., l., w.r. 674, 12s.	555
Peckham—1 to 10, Dorset-ter., u.t. 47 yrs., g.r. 504, w.r. 252, 4s.	1,335	157, Powerscourt-rd., u.t. 34 yrs., g.r. 84, w.r. 364, 8s.	215
By RUSHWORTH & STEVENS. Paddington—4, Princes-st., l., e.r. 351	1,800	127A, Glenarr-rd., u.t. 73 yrs., g.r. 54, w.r. 554, 8s.	275
Lambeth.—Waterloo-rd., l.g.r. 124, reversion in 21 yrs.	810	Homerton—30, 32 and 34, Hassett-rd., u.t. 66 yrs., g.r. 124, 12s., w.r. 1014, 8s.	780
Lewisham—23 and 25, Granville-rd., u.t. 29 1/2 yrs., g.r. 24, yr. 504, and e.r. 504	380	By FRANK BURTON. Streatham—42, 86, and 88, Pathfield-rd., u.t. 90 yrs., g.r. 124, 12s., yr. 1024	900
By SADLER & BAKER. Frintley, Surrey.—"Oak Lea" and 12 a. 3 r. 20 p. l., p.	5,800	By WM. CLARSON. Forest Gate—70 and 72, Warwick-rd., u.t. 74 yrs., g.r. 114, w.r. 614, 2s.	380
By R. TIDY & SON. Caenohy.—Hamp-rd., l.g. rents 314, 8s., u.t. 124 yrs., g.r. 224, with reversion	350	Poplar—312, Manchester-rd., u.t. 42 yrs., g.r. 34, 3s., w.r. 44, 4s.	140
By DOUGLAS YOUNG & CO. Kilburn—330, 332 and 334, High-rd. (s.), u.t. 51 yrs., g.r. 454, yr. 554	5,900	19, Toley-st. (s.), l., w.r. 334, 16s.	330
Hampstead—33 and 37, Heathsk. (s.), u.t. 62 yrs., g.r. 204, yr. 1654	2,020	20, Ellerthorpe-st., l., w.r. 314, 4s.	320
Holloway—233, Camden-rd., u.t. 39 yrs., g.r. 154, e.r. 1004	760	By HUNTER & HUNTER. Bay'swater—38, Westbourne Park-villas, u.t. 437 yrs., g.r. 94, 8s., yr. 804	560
Bloomsbury—3, Clark's-mews, u.t. 70 yrs., g.r. 154, p. (including goodwill)	800	Chiswick—502 and 504, Chiswick High-rd., u.t. 65 yrs., g.r. 174, yr. 1004	775
City—1 and 2, Swan-lane (factory and ware-houses), u.t. 4 yrs., g.r. 44, yr. 5804	1,520	Battersea—37 to 45 (odd), and 53, Lancelot-st., l., w.r. 1094, 4s.	750
By SWALEPRICE, ALLEN, & CO. (at Weybridge). Weybridge, Surrey—9 to 13, Jessamy-rd., l., w.r. 694, 14s.	915	Acton—48, Burlington-gdns., u.t. 70 1/2 yrs., g.r. 84, yr. 404	290
Dorchester-rd., "Marion Lodge," l., w.r. 274, 6s.	500		

MEETINGS.

FRIDAY, JUNE 1.
Royal Institution.—Professor H. Moissan on "L'Éthilisation des Métaux." 9 p.m.
 FRIDAY AND SATURDAY, JUNE 1 AND 2.
Incorporated Association of Municipal and County Engineers.—Yorkshire District Meeting to be held at Scarborough, paper on "Municipal Work in Scarborough," by Mr. Harry W. Smith, A.M.Inst.C.E., Borough Engineer.
 WEDNESDAY, JUNE 6.
Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the members, 8 p.m.
Royal Archaeological Institute.—(1) Notes on the Early Architectural History of the Parish Church of Worth, in Sussex. (2) Notes on the Architecture of Denham Church, Bucks, by Mr. W. P. D. Stebbing, F.R.S. 4 p.m.
 THURSDAY, JUNE 7.
Junior Institution of Engineers.—Lecture by Mr. E. P. Howgrave-Graham on "Electric Oscillations and Wireless Telegraphy," at the Flusbury Technical College, Leamard-street, 7 p.m.
 SATURDAY, JUNE 9.
Junior Institution of Engineers.—Visit to Messrs. James Brown's Brick Works at Uppminster. Train leaves Fenchurch-street (Finsbury) at 1.45 p.m.
Edinburgh Architectural Association.—Visit to Hatton House, Kirkcubrighton.

PRICES CURRENT OF MATERIALS.

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

BRICKS, &c.	
Hard Stocks.....	1 s. 0 per 1000 alongside, in river.
Bough Stocks and Grizzles.....	1 5 0 " " " "
Rickled Stocks.....	1 5 0 " " " "
Facings.....	2 15 0 " " delivered.
Flettons.....	1 6 0 " " at railway depot.
Red Wire Cuts.....	3 12 0 " " " "
Best Fenchurch-street (Finsbury) Head, At 1.45 p.m.	1 12 0 " " " "
Best Red Pressed	1 12 0 " " " "
Ruston Facing.....	5 0 0 " " " "
Best Blue Pressed	3 15 0 " " " "
Stoneware.....	3 15 0 " " " "
Do, Bullnose.....	4 0 0 " " " "
Best Stourbridge	3 14 0 " " " "
Fire Bricks.....	3 14 0 " " " "
GLAZED BRICKS.	
Best White and Ivory Glazed	11 0 0 " " " "
Stretchers.....	12 0 0 " " " "
Headers.....	11 0 0 " " " "
Quoins, Bullnose, and Flats.....	15 0 0 " " " "
Double Stretchers.....	19 0 0 " " " "
Double Headers.....	16 0 0 " " " "
One Side and two Ends.....	19 0 0 " " " "
Two Sides and one End.....	20 0 0 " " " "
Splay Glass Chamfered, Squints.....	20 0 0 " " " "
Best Dipped Salt Glazed Stretchers and Headers.....	12 0 0 " " " "
Quoins, Bullnose, and Flats.....	14 0 0 " " " "
Double Stretchers.....	15 0 0 " " " "
Double Headers.....	14 0 0 " " " "
One Side and two Ends.....	15 0 0 " " " "
Two Sides and one End.....	15 0 0 " " " "
Splay Glass Chamfered, Squints.....	14 0 0 " " " "
Second Quality White and Dipped Salt Glazed.....	2 0 0 " " " "
Themes and Pit Sand.....	6 s. 9 per yard, delivered.
Thames Ballast.....	5 3 " " " "
Best Portland Cement.....	25 0 per ton, " "
Best Ground Blue Lias Lime.....	19 0 " " " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.
 Grey Stone Lime..... 11s. 0d. per yard, delivered.
 Stourbridge Fireclay in sacks 27s. 0d. per ton, at ry. dip.

STONE. BARK STONE—delivered on road wagons, Paddington Depot. 1 6 1/2 per ft. cnba. Do. do. delivered on road wagons, Nine Elms Depot, or Fimlico Wharf. 1 8 1/2

PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road wagons, Paddington Depot, Nine Elms Depot, or Fimlico Wharf. 2 1 White Basebed, delivered on road wagons, Paddington Depot, Nine Elms Depot, or Fimlico Wharf. 2 2 1/2

YORK STONE—Robin Hood Quality. Scappled random blocks. 2 10 6 in. sawn two sides landings to sizes (under 40 ft. super.). 2 3 per ft. super. 6 in. rubbed two sides 2 6 in. sawn two sides slabs (random sizes) 0 11 2 in. to 2 1/2 in. sawn one side slabs (random sizes) 0 7 1 1/2 in. to 2 in. ditto, ditto 0 6

HARD YORE—Scappled random blocks. 3 0 per ft. cube. 6 in. sawn two sides landings to sizes (under 40 ft. super.). 2 3 per ft. super. 6 in. rubbed two sides 2 6 in. sawn two sides slabs (random sizes) 1 2 1 1/2 in. to 2 in. ditto, ditto 0 5

Hopton Wood (Hard Bed) in blocks 2 0 per ft. cube, deld. rly. depot. " " " 6 in. sawn both sides landings 2 7 per ft. super. deld. rly. depot. " " " 3 in. sawn both sides random slabs 1 0 " " " 2 in. do. 0 8 1/2

SLATES. In. In. £ s. d. 20x10 best blue Bangor 13 2 6 per 1000 of 1200 at r. d. 20x12 " " 13 17 6 20x10 best quality " 13 0 0 20x12 " " 13 15 0 16x8 " " 7 5 0 20x10 best blue Fort. " " 12 12 6 16x8 " " 6 12 6 20x10 best Eureka up. " " 15 17 6 20x12 " " 18 7 6 18x10 " " 13 5 0 16x8 " " 10 5 0 20x10 permanent green " 12 6 0 18x10 " " 9 12 6 16x8 " " 6 12 6

TILES. Best plain red roofing tiles. 42 " per 1000 at rly. depot. Hip and Valley tiles. 3 7 per doz. Best Broseley tiles. 50 " per 1000 Do. Ornamental tiles. 52 " " " Hip and Valley tiles. 4 " per doz. Best Buckton red, brown, or brimled do. (Edwards) 57 " per 1000 Do. Ornamental do. 4 " per doz. Hip tiles. 3 " " " Valley tiles. 3 " " " Best Red or Mottled Staffordshire " 51 " per 1000 Do. Ornamental do. 54 " " " Hip tiles. 4 1 " per doz. Valley tiles. 3 8 " " " Best " Rosemary " brand plain tiles. 48 " per 1000 Best Ornamental tiles. 50 " " " Hip tiles. 4 " per doz. Valley tiles. 3 8 " " " Best " Hartshill " brand plain tiles, sand-faced. 50 " per 1000 Do. pressed. 47 " " " Do. Ornamental do. 50 " " " Hip tiles. 4 " per doz. Valley tiles. 3 8 " " "

BUILDING WOOD. Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in. 13 10 0 15 0 0 Deals: best 3 by 9 " 13 0 0 14 0 0 Battens: best 2 1/2 in. by 7 in. and 3 in. and 3 in. by 7 in. and 8 in. 11 0 0 12 0 0 Battens: best 2 1/2 by 6 and 3 by 6. 0 10 0 less than battens. Deals: seconds. 1 0 0 less than best. Battens: seconds. 0 10 0 " " 2 in. by 4 in. and 2 in. by 6 in. 8 10 0 " " 2 in. by 4 in. and 2 in. by 5 in. 9 0 0 " " 3 in. and 2 in. by 7 in. 9 10 0 Foreign Saw Boards: 1 in. and 1 1/2 in. by 7 in. 0 10 0 more than battens. 3 in. " " " 1 0 0 " " " " " At per load of 50 ft. Fir timber: best middling Danzig or Memel (average specification) 4 10 0 " 5 0 0 Seconds 4 0 0 " 4 10 0 Small timber (8 in. to 10 in.) 3 12 6 " 3 15 0 Small timber (6 in. to 8 in.) 2 30 0 " 3 0 0 Swedish balks 2 0 0 " 3 0 0 Pitch-pine timber (30 ft. average) 4 0 0 " 4 15 0

WOOD (continued). JOINERS' WOOD (continued)—At per standard. £ s. d. Second yellow deals, 3 in. by 11 in. 18 10 0 " 20 0 0 " 3 in. by 9 in. 17 10 0 " 19 0 0 Battens, 2 1/2 in. and 3 in. by 7 in. 13 10 0 " 14 10 0 Third yellow deals, 3 in. by 11 in. and 9 in. 13 10 0 " 15 0 0 Battens, 2 1/2 in. and 3 in. by 7 in. 11 0 0 " 12 0 0 Petersburg first yellow deals, 3 in. by 11 in. 21 0 0 " 22 10 0 Do. 3 in. by 9 in. 18 0 0 " 19 10 0 Battens. 13 10 0 " 15 0 0 Second yellow deals, 3 in. by 11 in. 16 0 0 " 17 0 0 Do. 3 in. by 9 in. 14 10 0 " 16 0 0 Battens. 11 0 0 " 12 10 0 Third yellow deals, 3 in. by 11 in. 13 0 0 " 14 0 0 Do. 3 in. by 9 in. 12 10 0 " 14 0 0 Battens. 10 0 0 " 11 0 0 White Sea and Petersburg: First white deals, 3 in. by 11 in. 14 10 0 " 15 10 0 " 3 in. by 9 in. 13 10 0 " 14 10 0 Battens. 11 0 0 " 12 0 0 Second white deals, 3 in. by 11 in. 12 10 0 " 13 10 0 " 3 in. by 9 in. 12 10 0 " 13 10 0 Battens. 10 0 0 " 11 0 0 Pitch-pine: deals, 3 in. by 11 in. 18 0 0 " 21 0 0 Under 2 in. thick extra. 0 10 0 " 1 0 0 Yellow Pine—First, regular sizes 44 0 0 upwards. Odments 32 0 0 " " Seconds, regular sizes 33 0 0 " " Yellow Pine—extra, 2 1/2 in. by 11 in. 28 0 0 " " Kauri Pine—Planks, per ft. cube. 0 3 6 " 0 5 0 Danzig and Stettin Oak Logs—Large, per ft. cube. 0 3 0 " 0 3 6 Small " " 0 2 6 " 0 2 9 Wainscot Oak Logs, per ft. cube. 0 5 6 " 0 6 0 Dry Wainscot Oak, per ft. sup. as inch. 0 0 8 1/2 " 0 0 9 1/2 " in. do. do. 0 0 7 " 0 7 " Dry Mahogany—Honduras, Tassaco, per ft. super. as inch. 0 0 9 " 0 1 0 Selected; Figaro, per ft. super. as inch. 0 1 6 " 0 2 6 Dry Walnut, American, per ft. super. as inch. 0 10 0 " 0 1 0 Teak, per load. 17 0 0 " 22 0 0 American Whitewood Planks, per ft. cube. 0 4 0 " 0 5 0 Prepared Flooring—Per square. 1 in. by 7 in. yellow, planed and shot. 0 13 6 " 0 17 6 1 in. by 7 in. yellow, planed and matched. 0 14 0 " 0 18 0 1 1/2 in. by 7 in. yellow, planed and matched. 0 16 0 " 1 0 0 1 in. by 7 in. white, planed and matched. 0 12 0 " 0 14 6 1 in. by 7 in. white, planed and matched. 0 12 6 " 0 15 0 1 1/2 in. by 7 in. white, planed and matched. 0 15 0 " 0 18 6 3/4 in. by 7 in. yellow, matched and beaded or V-jointed brds. 0 11 0 " 0 13 6 1 in. by 7 in. " 0 14 0 " 0 18 0 3/4 in. by 7 in. white " 0 10 0 " 0 11 6 1 in. by 7 in. " 0 12 6 " 0 15 0 6 in. at 6d. to 8d. per square less than 7 in.

JOISTS, GIRDES, &c. In London, or delivered Railway Vans, per ton. £ s. d. Bolled Steel Joists, ordinary sections 7 0 0 " 7 10 0 Compound " ordinary sections 9 0 0 " 10 0 0 Steel Compound Scaffolds 12 0 0 " 13 0 0 Angles, Tees, and Channels, ordinary sections 9 0 0 " 10 0 0 Flitch Plates 9 0 0 " 10 0 0 Cast Iron Columns and Stations including ordinary patterns 7 10 0 " 8 10 0 METALS. Per ton, in London. £ s. d. Common Bars 8 0 0 " 8 10 0 Staffordshire Crown Bars, good merchant quality 8 10 0 " 9 0 0 Staffordshire " Marked Bars " 10 10 0 " 11 0 0 Mild Steel Bars 8 15 0 " 9 0 0 Hoop Iron, basin price 9 5 0 " 9 10 0 Galvanised 17 0 0 " " ("And upwards, according to size and gauge.) Sheet Iron Black—Ordinary sizes to 20 g. 9 10 0 " " 24 g. 10 10 0 " " 26 g. 10 10 0 " " 28 g. 12 0 0 " " Galvanised, flat, ordinary quality—Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g. 14 0 0 " " Ordinary sizes to 22 g. and 24 g. 14 10 0 " " 26 g. 15 0 0 " " 28 g. 16 0 0 " " Galvanised, flat, best quality—Ordinary sizes to 20 g. 17 0 0 " " 22 g. and 24 g. 17 10 0 " " 26 g. 18 0 0 " " Galvanised Corrugated Sheets—Ordinary sizes 6 ft. to 8 ft. 20 g. 14 0 0 " " 22 g. 14 10 0 " " 24 g. 15 15 0 " " Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker 11 10 0 " " Best Soft Steel Sheets, 22 g. & 24 g. 12 10 0 " " Cut Nails, 3 in. to 5 in. 9 10 0 " 9 15 0 (Under 3 in. usual trade extras.)

LEAD, &c. Per ton, in London. £ s. d. LEAD—Sheet, English, 3 lb. and up. 19 10 0 " " Pipe in coils 20 0 0 " " Soil pipe " 22 10 0 " " Zinc—Sheet—Vielite Montagne 32 10 0 " " Silesian 32 5 0 " " Strong Sheet " per lb. 0 1 0 " " Thin " " 0 1 1 " " Copper sheet " 0 11 " " BRASS—Strong Nails " 0 11 " " Thin " " 0 1 0

LEAD, &c. (continued). Per ton, in London. £ s. d. Tin—English Ingots " per lb. 0 1 10 " " Solder—Plumbers " " 0 9 11 " " Timmer " " 0 1 11 " " Blowpipe " " 0 1 0 " "

ENGLISH SHEET GLASS IN CBATES OF STOCK SIZES. 15 oz. thirds " 24d. per ft. delivered. " fourths " 14d. " " 21 oz. thirds " 34d. " " " fourths " 24d. " " 20 oz. thirds " 44d. " " " fourths " 34d. " " 32 oz. thirds " 5d. " " " fourths " 44d. " " Fritted Sheet, 15 oz. " 34d. " " " 21 oz. " 44d. " " "

ENGLISH BOLLED PLATE IN CBATES OF STOCK SIZES. 1/2 Hartley's " 2d. per ft. delivered. " " " 24d. " " " " " 24d. " " " " " " 54d. " " " " " " 54d. " " " " " " OILS, &c. £ s. d. Raw Linseed Oil in pipes " per gallon 0 2 0 " " " in barrels " 0 2 1 " " " in drums " 0 2 3 " " " in pipes " 0 2 0 " " " in barrels " 0 2 3 " " " in drums " 0 2 5 Turpentine in pipes " 0 1 0 " " " in drums " 0 4 3 Genuine Ground English White Lead per ton 23 10 0 Red Lead, Dry " " 21 10 0 White Linseed Oil Fatly, per cwt. 0 7 0 Stockholm Tar " per barrel 1 12 0

VARNISHES, &c. Per gallon. £ s. d. Fine Pale Oak Varnish " 0 8 0 Pale Copal Oak " 0 10 0 Superfine Pale Elastic Oak " 0 12 6 Fine Extra Hard Church Oak " 0 10 0 Superfine Hard-Drying Oak, for seats of churches " 0 14 8 Fine Elastic Carriage " 0 12 6 Superfine Pale Elastic Carriage " 0 16 0 Fine Pale Mistle " 0 15 0 Finest Pale Durable Copal " 0 18 0 Extra Pale French Oil " 1 1 0 Eggshell Flattening Varnish " 0 18 0 White Copal Enamel " 1 4 0 Extra Pale Paper " 0 12 0 Best Japan Gold Size " 0 10 6 Best Black Japan " 0 16 0 Oak and Mahogany Stain " 0 8 0 Brunswick Black " 0 16 0 Berlin Black " 0 16 0 Knottling " 0 16 0 French and Prussian Polish " 0 10 0

TO CORRESPONDENTS. NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for media or samples sent to or left at this office, unless he has specially asked for them. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications. We are compelled to decline pointing out books and giving addresses. Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and ascertain articles offered for acceptance unless they are type-written. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS. Communications for insertion under this heading should be addressed to "The Editor," and must reach not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100, unless in some exceptional cases and for special reasons.] * Denotes accepted. † Denotes provisionally accepted. ABERDEEN.—For the mason, carpenter, slater, plaster, plumber, painter, causewaying, and iron work of bleach and dye works at Garthdee, Aberdeen, for Richards, Ltd., Messrs. Wilson & Walker, architects, 184, Union-street, Aberdeen. Quantities by architects:— Mason: J. Smith. 23,173 0 0 Carpenter: G. Jamieson. 2,165 0 0 Slaters: Merson & Stewart. 1,398 0 0 Iron: G. Thomson. 498 10 0 Plumbers: Thon & Strachan. 448 18 0 Plasterers: J. Scott & Son. 515 0 0 Painters: Gordon & Watt. 64 17 0 Causewaying: McAdam & Co. 188 3 0 [All of Aberdeen.]

ALDERLEY EDGE.—For erecting a new lodge, boundary walls, fencing, etc., at Chelford-road cemetery, for the Urban District Council. Mr. H. Sheldon, Surveyor, Council Offices, Alderley Edge.—
L. Brown & Son, Willuslow

AMPTHILL.—For waterworks (Contract A, seven miles of mains), for the Urban District Council. Messrs. W. R. & W. Phillips, engineers, Luton.—
Johnson Bros. £6,161 0 0 Bower Bros. £4,300 0 0
T. Wood & W. W. Bates

AMPTHILL.—For waterworks (Contract B, engine and producer-house and brick-softening tanks at Clop-hull, and reservoir), for the Urban District Council. Messrs. W. R. & W. Phillips, engineers, Luton.—
Johnson Bros. £3,995 0 0 J. Hodson &
Jovett Bros. 3,327 0 0 Son

AMPTHILL.—For waterworks (Contract C, suction gas plants, gas engines, etc., at Clop-hull, for the Urban District Council. Messrs. W. R. & W. Phillips, engineers, Luton.—
A. Williams & Co. £5,000 0 Isler & Co. (£2,626 0)
Biggs, Wall, & Co. 3,222 10 H. P. Wright (2,476 0)
H. P. Wright

BARROW-IN-FURNESS.—For erecting a mission hall in Hartington-street, for the Wesleyan Methodist Trustees. Mr. H. T. Fowler, architect, 3, Cornwallis-street, Barrow-in-Furness. Quantities by the architect.—
All Trades.
J. H. Neal

CLARK & ROBINSON.—For erecting a mission hall in Hartington-street, for the Wesleyan Methodist Trustees. Mr. H. T. Fowler, architect, 3, Cornwallis-street, Barrow-in-Furness. Quantities by the architect.—
All Trades.
J. H. Neal

CORNWOOD (DEVON).—For erecting two cottages at Cornwood, for Major W. F. Parker. Mr. W. Harvey, architect, Cornwood, Devon.—
F. Watts

Table with 4 columns: Name, Portland Stone, Darley Dale Stone, Credit. Lists contractors for BOSTON.

BRADFORD.—For the installation of atmospheric steam heating and machinery at the Union Hospital, Horton Lane, for the Guardians. Mr. Fred Holland, engineer and architect, 11, Parkinson's-chambers, Huestigate, Bradford.—
Brightside Engineering Co.

BRADFORD.—For the erection of pump-rooms for the Guardians. Mr. Fred Holland, Engineer and Architect, 11, Parkinson's-chambers, Huestigate, Bradford.—
Jones Totty

BRAMCOTE.—For erecting a smallpox hospital at Bramcote, near Nuneaton, for the Nuneaton and District Joint Hospital Committee. Mr. F. C. Cook, Surveyor, Nuneaton.—
J. Dallow & Sons

BRENTFORD.—For remodelling the Rothschild Council School, for Middlesex County Council. Mr. H. G. Crothall, Architect to the Education Committee.—
F. Smith

BRIMINGTON.—For alterations and additions to central schools, Brimington, near Chesterfield, for Derbyshire Education Committee. Mr. W. C. Jackson, architect, 29, Knifesmith-gate, Chesterfield.—
P. B. Dakin

CARDIFF.—For erecting a pumping station and chimney stack, Penarth-road, for the Corporation. Mr. W. Harpur, City Engineer, Cardiff. Quantities by the City Engineer.—
S. Wood

CARMARTHEN (South Wales).—For restoration of Nos. 22, 23, and 24, Priory-street, for Jesus College, Oxford. R. England & Son, architects, Oxford. £481 5.

CLARE.—For water supply works, laying mains, erection of reservoir, etc., for the Rural District Council. Messrs. Sands & Walker, engineers, Milton-chambers, Nottingham.—
Thorneycroft & Norman

CLARE.—For 170 tons of cast-iron water pipes and specials for water supply works, for the Rural District Council. Messrs. Sands & Walker, engineers, Milton-chambers, Nottingham.—
E. Tabor

CORNWOOD (DEVON).—For erecting two cottages at Cornwood, for Major W. F. Parker. Mr. W. Harvey, architect, Cornwood, Devon.—
F. Watts

DUFFIELD.—For sewerage works, in the parish of Duffield, for the Belper Rural District Council. Messrs. S. R. Lowcock & Phelps, engineers, Birmingham, and 50, Queen Anne's-gate, Westminster, S.W.—
J. Hawley & Son

CARDIFF.—For forming and metalling the carriageways of Kimberley-road, etc., for the Corporation. Mr. W. Harpur, City Engineer, Town Hall, Cardiff. Quantities by City Engineer.—

Table with 6 columns: Name of Street, Samuel Wood, Mackay & Davies, J. E. Evans, Frank Ashley, T. R. Williams, E. Osmond & Sons, Charles Davies. Lists street names and contractor details for Cardiff.

DALKEY.—For the construction of 340 yds. of 12-in. sewer at Saval Park-road, for the Urban District Council. Mr. Shirley R. Goings, M. Inst. C.E.I., 36, Sandycroft-road, Kingstown Co. Dublin.—
Przez

DUNDEE.—Recommended for acceptance, for new Board School. Mr. J. H. Langlands, architect.—
Mason: W. Bennet

DUNSTON.—For new latrines, asphaltting, etc., at Council school, W. W. Bushwain, architect, County Education Offices, Durham.—
J. T. Short

EDINBURGH.—For Causewayside Lads' Institute. Messrs. V. S. Spence, J. Selton-place, and J. D. MacLeod, 105, George-street, architects. Quantities by Mr. R. Hogg, 53, Frederick-street. (All Edinburgh).—
Mason and Brickwork: N. McCleod & Sons, 81, Harrison-road, Edinburgh*

ERITH (Kent).—For reconstructing forecourt walls, etc., in forecourt of twenty-three houses in Lower Abbey-road, for the Urban District Council. Mr. Harold Hind, Surveyor to Erith Urban District Council.—
F. Spencer

EVESHAM (Worcestershire).—For drains, road, and footpath, adjoining cemetery, in the parish of Great and Little Hampton, for the Rural Board. Mr. R. Webb, surveyor, Evesham.—
A. Cliff & Co.

FLAMBOROUGH.—For the construction of water-works for the Rural District Council of Bridlington. Messrs. Elliott & Brown, engineers, Burton-buildings, Parliament-street, Nottingham.—
W. H. Hill, Skegness*

FULNECK.—For erecting a new laboratory block in connection with boys' school. Mr. C. S. Nelson, architect, Sun-buildings, 15, Park-road, Leeds.—
Mason and Brickwork: W. Hulton, Fulneck, near Leeds*

GRAVELLY HILL.—For heating and hot-water apparatus in new buildings at the works, for the Aston Guardians. Messrs. C. W. Whitwell & Son, architects, 23, Temple-row, Birmingham.—
B. Parker, Ltd., 121-2-3, Suffolk-street, Birmingham

HANWORTH.—For additions to the Council School, Hanworth, for Middlesex County Council. Mr. H. G. Crothall, Architect to the Education Committee.—
E. Plastow

CARDIFF.—For forming and metalling the carriageways of Kimberley-road, etc., for the Corporation. Mr. W. Harpur, City Engineer, Town Hall, Cardiff. Quantities by City Engineer.—

Table with 6 columns: Name of Street, Samuel Wood, Mackay & Davies, J. E. Evans, Frank Ashley, T. R. Williams, E. Osmond & Sons, Charles Davies. Lists street names and contractor details for Cardiff.

HARLOW.—For new classroom to the Alperion County Council, Middlesex. Mr. H. G. Crotthall, Architect to the Education Committee:—

LADYBANK.—For sewerage and drainage works, for the Town Council. Messrs. Bruce, Proudfoot, & Macrae, C.E. Cupar:—

LONDON.—For condensing water supply works, including brick screening chamber by the River Lee, etc., for Hackney Borough Council. Mr. R. Hammond, Engineer, 64, Victoria-street, Westminster, S.W.:—

LONDON.—For the erection of additional classrooms and science-rooms, cloak-rooms, lavatories, gymnasium, and alterations and additions to the Roan Girls' School, Devonshire road, Greenwich, S.E., for the Governors of the Roan Schools. Mr. A. Berris, architect, 92 London-street, Greenwich, S.E. Quantities by Mr. L. Jacob, 493, New Cross-road:—

Table with columns: Name, Heating, Total, and Remarks. Lists contractors like Kilby & Gayford, Higgs & Hill, W. Martin, etc.

Architect's estimate (without heating), £5,850. Average of tenders, £5,355.

LONDON.—For heating apparatus, Larkhall-lane, Clapham for the London County Council:—

LONDON.—For making-up the carriage-way of Greenwell-street, Fulham, for the Fulham Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.:—

LONDON.—For removing the gallery in room C in the Infants' department of the Hollydale-road school, Peckham, substituting desks and stepped flooring thereon, and providing a glazed partition, for the London County Council. The alterations will involve a reduction of twenty-nine places in the accommodation of the Infants' department:—

Tenders for the Supply of Plumbers' Goods.—For the Education Committee of the London County Council. The Committee recommends:—

LONDON.—For gas engines, new pumping station in Bermondsey, for the London County Council:—

LONDON.—For painting, etc., at asylums, Cleveland-street, W., and Collindale-avenue, Hendon, N.W., for the Managers of the Central London Sick Asylums District. Mr. W. Lockwood, architect, 15, Shirooer-street, Piccadilly-circus, W.:—

Table with columns: Name, Cleveland-street Asylum, Hendon Asylum, Total. Lists contractors like W. Sharp & Co., W. T. Jennings & Co., Mattock & Parsons, etc.

[Fractional parts amounting to 10s. or more have been taken as equal to £1; where less than 10s. they have been rejected.]

LONDON.—For alteration and enlargement of the Bethnal Green fire-station, for the London County Council:—

LONDON.—For the erection of balconies for the provision of alternative means of escape in case of fire, and for general repairs, etc., at No. 61, Strand, for the London County Council.

LONDON.—For street improvement works in Riscot-road and Cambridge-street, for the Town Council. Mr. S. F. L. Fox, A.M.I. Inst. C.E.:—

MIDDLEWICH.—For alterations and additions to the school buildings, Church Minshull, for Chester Administrative Sub-Committee for Nantwich Union area. Mr. H. Beswick, County Architect, Newgate-street, Chester. Quantities by Architect:—

NAVAN.—For erecting fourteen two-story cottages on the Kells-road, Navan, for Navan Urban District Council. Mr. R. Barnes, Architect, Town Surveyor. Quantities by Town Surveyor:—

NEWBIGGIN.—For alterations to Council school, for Durham County Education Authority. Mr. W. Rushworth, Architect, Education Offices, Shire Hall, Durham:—

MAESTEG.—For sewerage works (three contracts), for the Urban District Council. Mr. J. Humphreys, C.E., Town Hall-chambers, Maesteg, Glams.:—

Table with columns: Contract No., Name, and Total. Lists contractors like C. Savors, Carran, Maesteg, Barnes & Chaplin, etc.

NEW SOUTHGATE, N.—For extension of the Infants' department and coking and manual training centres at the Gardfield-road Council Schools, for Middlesex County Council. Mr. H. G. Crotthall, architect to the Education Committee:—

NEWTON PURELL (Oxon).—For the erection and completion of a block of three cottages at Fimmers Station (G.C.R.), for Mr. E. Slater Harrison, J.P. Mr. C. Armstrong, architect, 5, High-street, Warwick:—

NORTH PERSIE (N.E.).—For erecting a mansion-house at North Persie, near Blairgowrie, for Captain Macle, Mr. Lake Falconer, architect, Blairgowrie, quantities by the architect:—

REITON.—For Reiton sewerage (Contract No. 2), for the Rural District Council. Messrs. Wilcock & Raikes, engineers, 63, Temple-row, Birmingham:—

ROTHIEMURCHUS and AVEMORE (Inverness-shire).—For the erection of a manse, for the United Free Church, Mr. J. D. Macleod, architect, 108, George-street, Edinburgh. No quantities. Estimates from full specification, general drawings, and full size detail drawings:—

RYE.—For the erection of an isolation hospital, laundry, and mortuary, for the Rye Rural and Urban District Councils. Mr. E. J. Cory, F.S.I., High-street, Rye:—

SHELTON and HARDWICK (Norfolk).—For the enlargement of school, for Norfolk Education Committee. Mr. A. F. Scott, architect, Cassin Meadow, Norwich:—

SWANLEY (Kent).—For cleaning and painting works at White Oak School, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

SWANN.—For alterations and additions at Pont Llyfni, Carnarvon, for Mr. David Williams, Mr. H. Thomas, architect and surveyor, Castle-buildings, Carnarvon:—

TOOTING.—For fire-resisting and other works to a store building at the Fountain Fever Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

TOTNES.—For erecting a Board-room and offices, for the Gurrilams. Mr. F. W. Tolly, architect, 10, High-street, Totnes:—

Table with columns: Contract No., Name, and Total. Lists contractors like E. S. d., F. W. Tolly, etc.

TOOTING.—For erecting baths at the Broadway, for the Wandsworth Borough Council:—

Name.	Original Design.	Saving on variations.		Credit for old materials.		For amended design allowing for old materials.	
		£	s. d.	£	s. d.	£	s. d.
Myall & Upson	6,622 0 0	644 0 0	30 0 0	30 0 0	5,748 0 0	5,650 18 0	5,904 11 8
J. Nicks & Co.	7,357 14 0	1,076 16 0	70 0 0	70 0 0	5,960 11 8	5,596 0 0	5,596 0 0
W. Holt & Sons	5,647 0 0	1,232 6 4	10 0 0	10 0 0	5,596 0 0	5,596 0 0	5,596 0 0
Potter Bros.	7,139 0 0	1,471 0 0	30 0 0	30 0 0	5,596 0 0	5,596 0 0	5,596 0 0
Kirk & Randall	6,821 0 0	1,225 0 0	30 0 0	30 0 0	5,566 0 0	5,566 0 0	5,566 0 0
Speaner, Santo, & Co., Ltd.	5,847 0 0	1,270 0 0	30 0 0	30 0 0	5,547 0 0	5,547 0 0	5,547 0 0
W. Johnson & Co., Ltd.	6,643 0 0	1,139 0 0	25 0 0	25 0 0	5,466 0 0	5,466 0 0	5,466 0 0
J. & M. Patrick	6,785 0 0	1,142 0 0	138 0 0	138 0 0	5,437 0 0	5,437 0 0	5,437 0 0
E. P. Bullard & Co.	5,696 10 0	1,181 0 0	70 0 0	70 0 0	5,447 10 0	5,447 10 0	5,447 10 0
A. F. Vigor & Co.	6,897 0 0	1,453 0 0	10 0 0	10 0 0	5,434 0 0	5,434 0 0	5,434 0 0
Sabey & Son, Ltd.	6,745 0 0	1,320 0 0	15 0 0	15 0 0	5,410 0 0	5,410 0 0	5,410 0 0
F. G. Minter	6,661 0 0	1,254 0 0	—	—	5,407 0 0	5,407 0 0	5,407 0 0
A. Faulks	6,575 6 11	1,097 9 0	73 0 0	73 0 0	5,494 17 11	5,396 0 0	5,396 0 0
J. Burgess & Sons	6,641 0 0	1,178 0 0	65 0 0	65 0 0	5,383 0 0	5,383 0 0	5,383 0 0
W. H. Hyde	6,643 0 0	1,249 0 0	—	—	5,394 0 0	5,394 0 0	5,394 0 0
Galbraith Bros.	6,700 0 0	1,320 0 0	75 0 0	75 0 0	5,305 0 0	5,305 0 0	5,305 0 0
W. Lawrence & Son	6,674 0 0	1,374 0 0	40 0 0	40 0 0	5,260 0 0	5,260 0 0	5,260 0 0
J. Shelbourne & Co.	6,642 0 0	1,358 0 0	50 0 0	50 0 0	5,234 0 0	5,234 0 0	5,234 0 0
Cowley & Drake	6,443 0 0	1,211 0 0	—	—	5,232 0 0	5,232 0 0	5,232 0 0
Herbert & Co.	6,695 0 0	1,472 0 0	21 10 0	21 10 0	5,201 10 0	5,201 10 0	5,201 10 0
Marlin, Wells, & Co., Ltd.	6,550 0 0	1,300 0 0	50 0 0	50 0 0	5,200 0 0	5,200 0 0	5,200 0 0
J. Garrett & Son	6,616 0 0	1,320 0 0	50 0 0	50 0 0	5,138 0 0	5,138 0 0	5,138 0 0
Rowe & Co., Ltd.	6,443 0 0	1,249 0 0	90 0 0	90 0 0	5,199 0 0	5,199 0 0	5,199 0 0
J. & C. Bowyer	6,437 0 0	1,246 0 0	80 0 0	80 0 0	5,111 0 0	5,111 0 0	5,111 0 0
E. Wall	6,275 0 0	1,132 0 0	35 0 0	35 0 0	5,108 0 0	5,108 0 0	5,108 0 0
G. E. Wallis & Sons, Ltd.	6,349 0 0	1,155 0 0	150 0 0	150 0 0	5,044 0 0	5,044 0 0	5,044 0 0
Wisdom Bros.	6,311 17 6	1,214 3 0	75 0 0	75 0 0	4,992 14 6	4,992 14 6	4,992 14 6
B. E. Nightingale	6,135 0 0	1,078 0 0	66 0 0	66 0 0	5,091 0 0	5,091 0 0	5,091 0 0
C. Gray	6,040 0 0	1,203 0 0	15 0 0	15 0 0	4,765 0 0	4,765 0 0	4,765 0 0

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VOL. XC.—No. 3303.

JUNE 9, 1906.

ILLUSTRATIONS.

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Design for the Peace Palace at the Hague.....	By Mr. John Belcher, A.R.A.
House near Cape Town.....	Messrs. Milne & Sladdin, Architects.
Mosaic Pavement in a House in Pompeii.....	Drawn by Mr. Lionel U. Grace

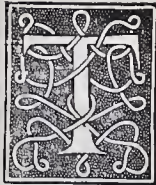
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The Church of Steyning.



STEYNING lies twelve miles north-west from Brighton and is the remarkably picturesque small town of Steyning, of ancient origin, and still retaining various domestic buildings of XVth, XVIth, and XVIIth century dates.

Its history, which might well form the subject of a monograph, is diverse and interesting. From the time of Edward I. up to 1832 the borough of Steyning, which gives its name to a hundred in the mid-division of Sussex, returned two members to Parliament. But its story is far more remote than even the dawn of parliamentary days.

The origin and growth of the place goes back to the VIIIth century, when St. Cuthman, an early Christian missionary of much local celebrity, founded a church on this site. Here, according to Leland and other authorities, the saint's relics were enshrined. This interment, and the miracles associated with his tomb, speedily brought about a large concourse of pilgrims, thus forming the nucleus of the future important town. According to Asser, King Ethelwulf, the father of Alfred the Great, was buried at Steyning in the year 858. Alfred bequeathed his estate here, together with his property at Guildford and Godalming, to his nephew Ethelwold, son of his elder brother, Ethelbert. On the rebellion and death of Ethelwold,

Steyning reverted to the Crown, and Edward the Confessor, early in his reign, granted the lands of Steyning, with all their appurtenances, to the famed Benedictine Abbey of Fécamp, in Normandy.

Steyning was a thriving place of considerable importance at the time of the Domesday Survey, when there were 123 dwellings in the town, an increase of five from the time of the Confessor. The Survey names two churches at Steyning; the one was doubtless on the site of the original church of St. Cuthman, where the present church stands, just outside the town, and the other within the town itself, the site of which is still traditionally known. The latter was probably a chapel of ease for the convenience of the townfolk, and would be the same that is mentioned in the Valor of Pope Nicholas, in 1291, as the chapel of the parish church.

The Conqueror made a full confirmation to the Abbey of Fécamp of all their rights here and elsewhere. The Benedictines of Fécamp retained the manor and rectory and advowson of the vicarage of Steyning, save for temporary forfeitures during wars with France, until 1415, when the possessions of the alien priories were generally forfeited to the Crown. In 1461 the church was conferred by Edward IV. on the newly-founded Abbey of Sion, Middlesex. The important possessions of Fécamp at this place were looked after by a prior and several monks, who had a priory of their own on the north side of the large parish church. There seems no reason

to suppose that this church, as is often assumed, ever served as the conventual church of this small establishment of Benedictine monks. At all events, such a supposition is most improbable, and if it was the case would only apply to the choir, for the nave was always parochial. It is far more likely that the monks had their own small church or chapel, forming part of their conventual buildings. There is no evidence of any buildings actually abutting on the north side of the fabric, which must have been the case had this been the monastic church. During the latter part of the Confessor's reign the Fécamp monks lost their Steyning possessions; on their re-establishment there by the Conqueror six of their number were sent over to again form this priory.

One or two more facts in connexion with the history of the church of Steyning and of the Abbey of Fécamp must be very briefly stated, as they directly bear on the date and development of the church fabric. The alien abbey held an important position in this part of Sussex. The rectory tithes of Steyning were valued at 20*l.* a year in the XIIIth century, and this in addition to the vicarage, which was worth an additional 8*l.* The manor of Steyning, of the annual value of 5*l.* 1*s.* 1*d.*, also pertained to Fécamp, whilst other temporalities brought up the abbey's income from property in the archdeaconry of Chichester to 20*l.* 1*s.* 11*d.* Moreover, the church of Steyning with its clergy, in addition to the priory and its monks, successfully claimed exemption from

the episcopal jurisdiction of the Bishop of Chichester. Ralph de Nevill, Bishop of Chichester, vainly endeavoured in 1230 to get their freedom cancelled, with the result that their exemption was confirmed by the Pope. Moreover, the abbot held the right to hold two weekly markets at Steyning, namely on Wednesdays and Saturdays, as well as two annual fairs, each of two days' duration.

The present church (dedicated to St. Andrew) consists of chancel with side chapels, clearstoried nave with north and south aisles, south porch and western tower. The fabric at one time extended further both at the east and west ends, as is known from foundations that have been uncovered when digging graves. Foundations have also been found on the south side, in the place where an early transept might naturally be expected to stand. In its general features the church is obviously Norman, and to the practised eye the Norman work is equally obviously of two different dates, the one early and of simple workmanship, the other considerably later, and not a little elaborate.

The original front of Steyning "to the holy minster at Feckamp" by the Confessor came into operation about 1045. The grant of this important property was for a time revoked about 1052, when Edward, under the sway of Earl Godwin and his connexions, was obliged to expel his favourite Normans from the kingdom. It will be recollected that Edward began the building of the great Abbey of Westminster on Norman lines in the year 1050. It is natural,

therefore, to suppose that the powerful Abbey of Fécamp, so soon as it got so substantial a foothold as this on the English coastline, would begin not only to build a small priory for a colony of their monks, but an imposing church for the townsmen assigned to them.

In the present fabric it is, therefore, reasonable to look for early Norman work extending over the years 1045-1052, for, although this is some time before the Norman conquest, it would be somewhat ridiculous to call such work Saxon, as it would be executed by Norman masons or, at all events, after a Norman design. In the same way no careful ecclesiologist would think of terming the considerable parts of the Confessor's Abbey at Westminster that still remain "Saxon."

A close examination of the building as it now stands, notwithstanding much clumsy repairs of the "churchwarden" era and two restorations of last century, shows that it incorporates a very great deal of masonry of a period earlier than the elaborately enriched Norman work. The first Norman church on this site in the XIth century (in all probability between 1045 and 1052) was on a larger scale than the present fabric. The nave extended westward by at least two bays more; the choir also extended further to the east, and there can be no reasonable doubt that it had a crossing for a low central tower (possibly never completed), as well as two transepts. We take it that the main part of the nave walls, or rather of the outer walls of the nave aisles, are beyond doubt

of a good deal earlier date than the ashlar stone of the clearstory, and the late Norman buttress on the south side with shafted angles. On the north side of the nave is one of the original small semicircular headed lights of the first Norman church, over a much later doorway. This window is only 9 in. in breadth and 3 ft. 6 in. in height. Faint traces of the position of others of like dimensions can be noticed. It would be idle to pretend that these small plain openings have anything in common with the elaborate clearstory windows above.

On entering the church the enriched arches and capitals of the nave arcades speak at once of the second half of the XIIth century; but it is quite possible that the circular piers, which have a diameter of 3½ ft., as well as the plainly-moulded bases, are more than a century older. In connexion with this surmise, it is interesting to note that we found (after our own conjecture had been formed) that that careful observer, the late Mr. Matthew Bloxam, spoke positively when describing the church in 1863. He said:—"The pier arches on either side of the nave bear evident marks of having been originally constructed of plain block masonry, and subsequently, and at different periods, worked out and enriched with Norman mouldings, and some detail of early English character." ("Sussex Archæological Collections," Vol. XVI., 237.)

When the monks of Fécamp regained their temporarily-forfeited rights over this church and town and manor, they



From Photograph by A. H. Fry.

Steyning Church, Sussex.

appear to have been content with the original Norman church for over 100 years; but as the fashion of a much richer and more ornamental treatment began to prevail in the immediate neighbourhood, it was decided that the importance of the flourishing town of Steyning demanded a more ornate style in their great house of worship. Hence it came to pass, about the third quarter of the XIIth century, that the old arcades of the nave were enriched as Bloxam suggests, and a fine lofty clearstory was substituted for one of lower and more primitive proportions. At this period it seems probable that there was some settlement of the central tower or crossing, and that its removal, together with the two shallow transepts, necessitated a decided change in plan. It was then, we believe, that the chancel or choir chapels, separated from the central portion on each side by a double arcade, assumed their present form, the presbytery itself being extended further east. A tower was considered requisite, and one was erected within the western bays of the nave, thereby shortening its original proportions, which had possibly not been completed when the monks were temporarily dispossessed.

It is usual to describe this heavy western tower as of the XVIth century period, chiefly from a misreading of a date on its west side. But we have no doubt, after careful examination, that the core of this tower is of the late Norman period. Over the present west window there is not only the outline of a semicircular arch, but some of the voussoirs still remain bearing chevron mouldings. And above this, in the second stage of the tower, is the outline of another former rounded light.

The present nave consists of four bays. The capitals of the piers are much diversified, those on the north side being the more elaborate. The arches have three orders of mouldings, which are chiefly of zig-zag and lozenge pattern, with a hood-mould or fourth order of rosettes or floriated roundels. Above the arcade runs a string of nebuly moulding, and from that rise the shafts of the deeply-recessed and large clearstory windows. The exterior treatment of the clearstory on the south or principal side of the church, facing the town, is much superior to that on the north. In the former case the windows have double shafts in the jambs, and a well-defined alternate billet moulding as a hood over them, which is also continued as a string between the lights. On the north side the hood and string is a plain moulding, and there are no outer jamb shafts. On each side there is a Norman corbel-table under the parapet, chiefly of masks. The lofty archway into the chancel is finely moulded; it is 38 ft. high. The length of the nave (without the tower) is about 60 ft., and the width with the aisles 48 ft. The chancel is now about half the length of the nave.

The capitals of the arches at the east ends of the aisles opening into the chapels are beautifully carved, and are nearly as rich as those of St. Peter's, Northampton. A curious bit of figure carving should be noticed in the south jamb of the east arch of the south aisle; it is some little distance below the

capital in a unique position. It is somewhat obscured by the galleries which so unfortunately spoil each side of the nave, and also by the organ which now occupies the south chapel.

The peculiar richness of the late Norman work of the interior of the nave, and the dignity of this lofty early clearstory, have naturally attracted the attention of genuine lovers of church architecture both of the past and present. John Carter, F.S.A., made elaborate drawings and plans of parts of this church in 1807, which were afterwards engraved by H. Le Keux, and appeared in Vol. V. of Britton's "Architectural Antiquities," published in 1826. Britton gives three plates to this church; they include an elevation of one compartment of the north side, both exterior and interior, details of all the capitals of the nave piers and of the south door and of the clearstory, together with a small ground plan. It is clear from these drawings that there were, a hundred years ago, three instead of one of the small lights of the first church remaining in the north wall of the north aisle.

The exceptional beauty and variety of the capitals of the nave piers also excited the attention of Mr. Bond, who has given us several plates of these piers, and of other parts of Steyning Church, from his camera, in his recent great work on Gothic architecture.

The most noteworthy of these capitals is the second one from the west of the north arcade; where the scallops are repeated with great frequency on a small scale, thus producing, as Mr. Bond says, "a very rich and beautiful capital elaborated out of the heavy, unsightly cushion." The next most interesting capital, also figured and described by Mr. Bond, is one of the south arcade, which is a remarkable instance of the rarely occurring semi-naturalistic carving of the late Norman period; on this capital fern leaves may be noted, separated by incurved cones.

The font is a fine example of later Norman work. The great stone of the bowl, which is 3½ in. square, is of Purbeck marble, and has its four faces now plainly channelled with worn triangular ridges, whilst the angles on the top formed by the circle of the basin are also moulded. The base, which has been much renewed, consists of a central shaft and four smaller shafts at the corners. The whole style of the font is similar to the better formed and more enriched one at New Shoreham, and to the remarkable group of seven fonts of like shape and design, but of dark Belgian marble, of which those of the cathedral churches of Winchester and Lincoln are the best known.

There was evidently but very little done to the fabric of this church either in the XIIIth or XIVth centuries save repairs. The east end now possesses three large lancet lights, enriched with tooth moulding, but these are of last century "restoration" date. It is stated in Vol. II. of Horsfield's "Sussex" (1835), where there is a good interior view of the nave taken by Grimm in 1780, that "the eastern part of the chancel was rebuilt by Charles, late Duke of Norfolk; it is of squared flints, and has a fine pointed window divided into three lights, surmounted

with tracery." This in its turn gave way to the present east end, and it is mere guesswork to conjecture its original appearance.

The west window of the north aisle and one of the north windows of the same aisle appear to be about 1400, or a little later. They very possibly indicate some repairs undertaken when the rights of the alien Abbey of Fécamp were finally extinguished in 1415, and the church handed over to the Crown.

Considerable alterations were effected in this church in the second half of the XVth century; as is plainly shown in the fabric. When written history tells us that this church—after perhaps a considerable period of neglect, when the Crown, owing to the French wars, kept seizing its revenues—was transferred to the newly and generously established Abbey of Sion in 1461, it may fairly be assumed that it was put in order shortly after that event. Several windows and minor alterations are of that period, or of the last quarter of that century, as well as the porch and the refacing and alteration of the tower.

The south porch is of unusually large size, but of no particular merit. Over the entrance is the date 1766 on a small slab, giving the year of certain churchwarden repairs.

The west tower, which, as we have said, contains a Norman core, and a few outward traces of that style, was refaced and heavily buttressed at the western angles, in a costly and not ineffective style. The whole surface, including a plain parapet, is chequered with small squared stones and faced flints. There are fairly numerous examples of this kind of work in East Anglian churches, several of which are known to be of late XVth century workmanship. Some of the lights of the tower, as is also the case with windows of the chancel aisles, have been altered in debased times. Over the west window is the date and name of one of these repairs—"1684-7, Dapp." It should be remarked that the present great tower arch into the nave is of recent restoration date.

The church underwent very extensive restoration about 1870, and again in 1888.

Eighteenth century views of the exterior of this church shows that it was then roofed throughout with the thick grey stone that used to be commonly used in the old buildings of this district, and which has a special charm. The roofs now present a curious patchwork effect, which is rather irritating in connexion with an old building. The old grey stone still covers the chancel and its aisles, as well as the south porch; but the south aisle is leaded, whilst the nave, north aisle and tower are roofed with bright red tiles.

There is a remarkable dearth in this church of monuments of any particular age or interest. So far as pre-Reformation days are concerned, this is to be accounted for by both manor and rectory being held by religious houses, which precluded the residence of notable civilians. Priors or monks dying here would be interred in their own church or cemetery. Kelly's "Post Office Directory for the County of Sussex," as well as one or two handbooks, make mention of a "brass" in the



From Photograph by A. H. Fry.

Interior of Steyning Church.

chancel, to the memory of Elizabeth, wife of James Michael Clarke, and daughter and heiress of John Edwards, who died in 1613. This, however, is a mistake; the short inscription is not on a brass, but on a stone tablet in a simple but effective alabaster frame, surmounted by the impaled arms of Clarke (a chevron between three escallops) and Edwards (ermine, a lion rampant). It is placed against the south wall of the chancel, between the two arches that open into the south chapel. The remarkable feature of the inscription is the twofold Christian name of the husband, as more than one baptismal name was a great rarity at that date.

The royal arms of Queen Anne are now to be seen under the tower against the south wall. They have been well painted on panel, but are now somewhat dilapidated. The arms are flanked with the initials 'A. R.'; the date 1703 is above them, and the motto *Semper Eadem* below.

In the vestry formed in the north chapel is a well-carved, early Jacobean altar-table, which has unfortunately been discarded from use in favour of a clumsy and inferior successor. Here, too, is a small, well-made chest, bearing the date 1638; also a hatchment, with the name of Joseph Prowd.

There is very little old woodwork remaining in this fabric, but the two doors that form the south entrance to the church should be noted. Many an old porch lacks any trace of having been closed by a door in olden times; but in this case the heavy massive door is undoubtedly of pre-Reformation

construction, and probably coeval with the building of the porch on its present lines. It is, however, much shattered by the reiterated nailing up of parish notices. The inner door, fitting into the Norman doorway, is in better condition and of greater age; it has a good pair of well-wrought iron hinges extending right across the timbers, and is probably of the period at the beginning of the XVth century, when various alterations were made.

There is a well-proportioned and picturesque lych-gate from the highway in the south-west wall of the churchyard. It is of timber, and roofed with the local heavy stone slate. The use of these slates, and the weathered condition of the woodwork gives it an appearance of age, though only of XIXth century date.

The parish registers begin in 1565, but there is an older and most interesting volume of churchwarden accounts which opens in the year 1519. It includes a variety of entries as to the profits made towards church expenses by the "King's play," and by church ales, which were usual features of the parish church's economy in pre-Reformation days, when such a thing as a compulsory church-rate was unknown. A later notable entry in this book is the list of signatures to the Solemn League and Covenant of the early days of the Commonwealth struggle. Seventy of the inhabitants sign their names to the Covenant, whilst sixty-six make their marks. A good paper on this old parish book appeared in 1855, in Vol. VIII. of the Collections of the Sussex Archaeological Society.

NOTES.

Greenwich
Observatory

In the annual report of the Astronomer Royal, published last week, attention is drawn to the grave dangers with which Greenwich Observatory is threatened by the new generating-station of the London County Council, situated in the Greenwich meridian, and only about half a mile from the Observatory. The establishment at present possesses four chimneys, two of which rise to a higher level than the domes of the Observatory, and it is certain that the smoke and heated gases emitted cannot be useful accompaniments to astronomical work. Inconvenience and inaccuracy are chiefly anticipated in observations of the lower north stars and readings from the obelisk in Epping Forest which denotes the astronomical north from Greenwich, but it is clear that huge boiler chimneys anywhere near an observatory are calculated to interfere with the conduct of all operations in which the maximum possible accuracy is essential. Atmospheric disturbance is bad enough, but vibration of the earth is still worse, and unfortunately there is evidence to show that the reciprocating engines of the generating-station actually have the effect of shaking the Observatory, causing sensible tremors in the mercury trough used for delicate observations of the nadir and of stars. We do not for a moment suppose that the engineers of the County Council anticipated such results as these when developing their tramway scheme,

and it is scarcely reasonable to blame the Council for what has happened. But it really is a most astonishing thing that the Astronomer Royal and the Admiralty should have allowed the project to be realised before raising a word of objection. The capacity of boiler-chimneys to emit smoke and heated gases is well known, and it is common knowledge that vibration from heavy machinery is transmissible for long distances, and sometimes with unexpected intensity. Now that the authorities have awakened, they are said to be deeply concerned at the threatened danger, but what they are going to do we cannot say. If the atmospheric disturbance proves to be of little or no practical detriment, the problem may perhaps be solved by isolating the engine foundations, or by substituting turbines for the present motors. If such remedies are shown to be of doubtful efficacy, either the generating-station will have to be shut down or the observatory removed to some more secluded site. In any event, the rate-payers of London or the taxpayers of the country will suffer heavily for the blunder which has been made.

The Canal Commission. IF no evidence of particularly striking character has been taken so far by the Canals and Waterways Commission, the witnesses examined have brought forward facts and expressed views that fully deserve careful consideration. Mr. de Salis, on behalf of the carrying interest of the Midlands, testified to the vitality remaining in the waterways of England, and stated that it would be hard to find any other industry which had managed to survive for so long a period as the water carriers trade almost in its original state. Mr. Bartholomew, M.Inst.C.E., who has executed numerous improvements on the Aire and Calder Navigation during the past fifty years, referring to the well-known fact that the closing of canals by railway companies had been detrimental to the public interest, pointed out that there would be much difficulty in making good the mischief done in the past. He believed that if selected routes were improved they would prove remunerative and be of great public service. We may add that the experience of the Aire and Calder Navigation shows this to be by no means unlikely. Mr. Waddy, of the Gloucester and Birmingham Navigation Company, suggested that railways and canals could work together with advantage instead of regarding each other as antagonists. This view was distinctly supported by the evidence of Sir Cecil Hertslet, who showed that the Belgian Government, as proprietors of the national railways and canals, have proved that each means of transport has its own appropriate sphere, and that, quite apart from any question of profit, an enormous benefit has been secured by the industrial and mercantile classes by the excellent canal system of that country.

The Shipdon Tunnel. EXPERIENCE gained during the execution of the Shipdon Tunnel, which really comprises two distinct tunnels separated by a distance of about 50 ft., should be

most useful for the future guidance of engineers. Apart from the unprecedented magnitude of the operations, the methods adopted for dealing with the problem of ventilation and for removing the large volumes of cold and hot water encountered, the rapidity with which the work was performed, and the wonderful accuracy attained in driving the tunnels, all constitute valuable object lessons. In 1901 a spring was tapped, causing an outflow of water at the rate of 16,000 gallons a minute, the difficulties and dangers which then arose being so great that independent engineers felt certain the works would have to be abandoned. In 1903 greater difficulties were caused by the tapping of hot springs flooding the workings with water at temperatures ranging from 114 deg. to 130 deg. Fahrenheit, and once more it was feared that the tunnel would never be completed. However, by impounding the hot water behind steel bulkheads, and by cooling the atmosphere, the resumption of work was rendered possible, and in February, 1905, the headings were finally connected. Electric trains now perform the passage in about twenty-three minutes, and the efficiency of the ventilation apparatus is such that the maximum interior temperature is only 83 deg. Fahrenheit, or little more than 4 deg. above that of the external air in summer-time. Cooling sprays will be brought into operation before long, and from experiments recently made it is believed that the temperature in the warmest parts of the tunnel will be reduced to about 66 deg. Fahrenheit. The spray apparatus has already been in use, but cannot be regularly employed until the electric cables and motors have been adequately protected.

A New German Canal. AN admirable example is set by the district council of Teltow, in Prussia, to some similar bodies in this country who are too fond of inaugurating works of glorification and works intended to benefit one class at the expense of others, in preference to undertakings which are of advantage to all sections of the community. The example to which we refer is the Teltow Canal, built at a cost of 2,000,000*l.*, establishing a valuable connexion between the eastern and western canal systems of Prussia. The canal is about 24 miles long, and in addition to effecting a material decrease in the length of the barge route between the east and the west, will have the effect of relieving the existing congestion of river traffic through Berlin. No fewer than fifty road and railway bridges had to be built over the new waterway, and five harbour basins have been constructed at points convenient for the transhipment of merchandise to the capital by railway. In the central part of the channel the canal has a minimum width of 65 ft., and permits the passage of vessels of 600 tons register, with a draught of 5 ft. 9 in. One lock has been provided to adjust the difference of about 9 ft. between the levels of the Upper Spree and the Havel. This work is a double lock, having a system of sluices arranged so that when two vessels are passing through the chambers in opposite directions, only half the usual quantity of water is

required for locking. Haulage is effected by means of electric locomotives running on tracks laid along the banks and drawing current from overhead cables. It is estimated that the initial traffic will not be less than 1,400,000 metric tons per annum, and as towage will be conducted exclusively by the district council, the rates charged will insure a satisfactory return for the capital outlay.

Paving Passages not Thoroughfares. A POINT of some interest has been decided in the case of *Harrison v. The Owner of New-street Mews* ("Current Law Reports"). The appellant was proceeding on behalf of the Council of the Borough of Southwark for penalties under the Metropolitan Management Act, 1855, against the freeholder of the mews for failing to pave with asphalt a passage through the same, not being a thoroughfare to the satisfaction of the Council. The respondent's predecessor in title had in 1892 paved the mews with macadam on the requisition of the Vestry, the predecessors of the Council, and the surface had twice since been repaired by the freeholder. The Court held that under sects. 99 and 100 of the Metropolitan Management Act, 1855, the owner was not liable to pave a second time with different material. The decision, however, only covers proceedings under this Act for penalties, a question upon which the Divisional Court is a final tribunal, and the Court left the question open whether under sect. 81 of the Amending Act of 1862, the Council could not have done the work themselves and recovered the expenses from the owner. The decision, therefore, does not carry the question very far, as the Council in future will adopt the latter course.

Standard Templates for Pipe Flanges. HAVING already settled standard dimensions for pipe flanges by the Report issued in December, 1904, the Engineering Standards Committee have now introduced standard templates for the purpose of enabling pipe-makers and contractors to comply with their recommendations. Engineers and architects are aware of the difficulties experienced in consequence of the fact that flanges, purporting to be drilled to given dimensions, frequently refuse to go together, either because the bolt circles differ slightly, or because the spacing is not quite uniform. Troubles of the kind are not necessarily obviated by the establishment and adoption of standard dimensions, for variations are almost inevitable in the workshops of different firms. With the object of insuring the requisite accuracy in the templates for issue to manufacturers and contractors, the committee caused a complete set of male templates to be made for all sizes and drillings specified in the standard tables for pipe flanges. These templates were produced with extreme care, and having been measured and certified at the National Physical Laboratory were preserved as official standards. The commercial sets of templates are being manufactured by a firm having special machinery for stamping core discs for electrical machinery, and who are accustomed to work of great accuracy. As no sets are issued unless

they have been found correct after comparison with the verified standards, there is every reason for confidence in the exactitude of the templates now offered by the committee. In the interests of the architectural and engineering professions it is desirable that the existence of these templates should be widely known, as without their use the full benefits of standardisation cannot possibly be secured.

A New Use for Oxygen. SERIOUS inconvenience is often experienced in blast furnace practice by the closing of tapholes by solid iron so that they cannot be opened without delay by means of ordinary appliances. The trouble is even more pronounced if the blast tuyeres become closed. Hitherto, the opening of closed tapholes and tuyeres has been effected by driving a steel bar through the metal or by applying heat furnished by coke, petroleum, or furnace gas, or generated by a strong current of electricity. These methods are open to objections which do not apply to the oxygen process recently described by the Chevalier de Schwarz to the members of the Iron and Steel Institute. By the application of compressed oxygen it is found that a closed taphole or tuyere can be cleared in a few minutes. The gas is employed in such a way that the iron commences to burn, and a degree of heat is developed which is said to be about 5,000 times that produced by burning an equal volume of hydrogen. The efficiency of the process is shown by the fact that a solid block of cold iron 16 in. thick has been pierced within two minutes. Several blast furnaces in England, France, Germany, and Belgium have already adopted the oxygen process, the application of which has been extended in Belgium to the cutting of boiler plates and tubes. The apparatus is simple and inexpensive, and the quantity of gas used is very small in proportion to the work performed.

Fatal Electric Accidents. ALTHOUGH the Board of Trade rules for the protection of the employees in electrical works are generally considered quite satisfactory, yet the number of fatalities due to electric shock in this country has been steadily increasing since 1899. In that year a foreman joiner was killed when disconnecting a transformer, but in 1904 eight and in 1905 eleven persons were killed by electric shock. It is important, therefore, to consider the causes contributing to these accidents. Some of them were due simply to foolhardiness, which no rules on the part of employers can prevent. In one case the plugs of a 2,000-volt rectifier were adjusted without using the rubber gloves always provided for the purpose, and in another case the electrician crawled among bare high-tension wires in order to search for a leak. Other accidents were due to pure absence of mind. A particularly sad case occurred last year when a perfectly competent electrician accidentally touched a terminal at 500 volts when warning workmen not to touch it. What impressed us most, however, in reading the list, is the large number which are due to comparatively speaking low voltages. Most electricians would

not hesitate for a moment to cut a wire with pliers when the current is flowing, provided that they knew that the pressure was not more than 200 volts. A master electrician, however, was killed in Kennington last year by doing this. The special circumstances were that he was standing on damp earth with nails in his boots, and his hands were moist. Another case was that of the clockwinder to the Leeds Market Hall clock, the gong of which is operated by an alternating current at 200 volts. It was given on evidence that he had a weak heart. The most inexplicable case of all is that of the sub-station employee of the Scarborough Electric Light Works, who was dusting switches with gloves on, and yet was found dead with his head three inches from the nearest live terminal, the pressure being only 130 volts. It is highly probable that owing to physiological reasons there are a few people who are extremely susceptible to electric shocks.

Westminster County Court. It is stated that the County Court on the west side, upper end of St. Martin's-lane, is to be shortly rebuilt. The Westminster County Court was established in 1846, and for a short while the business of the Court was conducted in the old Court of Requests, formerly a Baptist Chapel, on the east side of Castle-street, Leicester-square—see a plan of St. Martin-in-the-Fields Parish, 1799, in the *Builder*, July 2, 1904. The Court House in St. Martin's-lane was erected, in part, on the site of No. 82, which had been "Young Slaughter's" (or "New Slaughter's") coffee-house since about 1760, when the original house took the name of "Old Slaughter's." The latter was at No. 75, pulled down in the winter of 1843-4 for the laying out of Cranbourne-street. The jurisdiction of the County Court extended over a very wide area bounded by the City between the river-side and Holborn Bars; High Holborn, Oxford-street, and Bayswater-road; a winding line from the north end of the Serpentine to Chelsea railway-bridge; and the Thames on the south-east and south. Those limits are fairly coterminous with the older confines, since reduced, of the parish of St. Margaret. A few years ago proposals were made for removing the Court to the Town Hall in Caxton-street, vacated by the Corporation of the City of Westminster.

The Gateway, Viciars' Close, Wells. AN appeal is made for contributions to a sum of 1,000*l.*, the estimated cost of the repair of the Common Hall, over the gateway leading into Viciars' Close, Wells Cathedral, which is found to be in a dangerous condition of decay. The gateway, of which an illustration, after a drawing by Mr. Roland W. Paul, is published in the *Builder* of August 18, 1894, is one of the two giving access to the Close, which, together with that of the Bishop's Palace, were built by Bishop Beckington, who was consecrated in October, 1443; the three gateways bear his rebus, a flaming beacon and tun, illustrated in our number of February 18, 1888, which appears also on his buildings at Lincoln College, Oxford.

The Viciars' Close was originally built by Walter de Hull, Canon of Wells, and improved in 1348 by Bishop Ralph de Salopia, who rebuilt the college for the residence of the vicars and choristers. Bishop Beckington enlarged the college, and augmented its endowment. The revenues, computed to be 72*l.* 10*s.* 9*d.* per annum in 26 Henry VIII., escaped from forfeiture at the time of the Dissolution, and Queen Elizabeth refunded the college for from fourteen to twenty vicars. Pugin brought out an illustrated volume upon the buildings which constitute one of our most precious and charming examples of domestic architecture of the time. The "Chain Gate" across the Bath-road (see our view of February 18, 1888) communicates, by means of a gallery, with the staircase of the Chapter House, on the north side of the Cathedral. The college has its own hall, with buttery, etc., chapel, and library; the houses occupy two sides of the Close; the chapel, on the north side, was refitted and decorated with sgraffito work by J. D. Sedding and Mr. Heywood Sumner.

FURTHER NOTES ON PICTURES AT THE ROYAL ACADEMY.

We have spoken in our first article, in the week of the opening of the Royal Academy, of the leading pictures of the year. There are, however, many works which, if not of the first importance, are well worth notice, and we may proceed to draw attention to some of these, taking them mainly in the order of numbering.

In the Gallery I. Mr. Albert Goodwin's "Venice" (3) is a fine kind of vision of the beauty of Venice, only a little spoiled by the treatment of the sea, which conveys the idea of colour only without having the appearance of water; there is little or no light reflected from it. In a somewhat similar manner Mr. Wetherbee's beautifully composed little pastoral, "A Sleeping Shepherd" (5), loses a little of its effect from the too solid treatment of the sky—too solid, that is, for the key of the rest of the picture; the sky presses on the foreground too much. The centre of the south wall is occupied by Mr. H. W. B. Davis's "Ceriggwynion, Radnorshire" (13), one of his extended landscape views with cattle in the foreground; the animals are painted with more force than is usual with him, and are thus of great value in throwing back the middle distance. Mr. Briton Riviere surprises us agreeably by a piece of pure landscape, "The Day After the Storm" (9), in which there is no study of animal life except some seagulls which are quite subordinate; the picture is a fine broadly painted study of a cliff coast sloping down to the shore, and among the smaller landscapes of the year is quite one of the best; there is a power of style about it which we miss in Sir E. Waterlow's "Antibes" (17), which forms a pendant to it; a charmingly composed picture, as his always are, but weak in style of execution compared with Mr. Riviere's. Mr. Harold Speed has got hold of rather a new subject in "The Temple at Tivoli by Moonlight" (21); as a piece of general effect it is successful, though one does not quite see why there should be a shimmer of light on the entablature and none on the columns. Mr. Parsons's "Calm Before a Storm" (44) is a true bit of country landscape effect, especially in the appearance one often sees of the harsh green of distant trees as compared with the storm cloud behind them. Mr. Padday, who has established himself as the painter of shipwrecked people, makes a good dramatic effect out of "Sinbad the Sailor" (45) flourishing his turban to catch the attention of an approaching ship, only one is puzzled to know why he did not get out to the rocks on the left, as he evidently might easily have done, instead of remaining ensconced between two cliffs where his figure would be much less conspicuous; the position may be better for the picture, but it gives an impression of

unreality to it. Mr. Sargent's Presentation Portrait of Lord Roberts (41) is rather marred as a picture by the inevitable emphasis given to the uniform and the eminent soldier's numerous decorations; such portraits must be painted on occasion, no doubt, but they are of value as likenesses rather than as works of art. The most satisfactory portrait in the first room is Mr. Cope's half-length of "Viscount St. Aldwyn" (16), a very good example of frank and unpretending portraiture, in which, though likeness is evidently the principal object, all hardness of texture is avoided.

In Gallery II. Mrs. Normand's nude "Echo" (57) is not up to her usual standard, and could hardly have claimed a better position than has been given to it. There seems to be a turn for painting rainbows this year—there are several about, but Mrs. Hunter's "The Bow in the Cloud" (60) suggests a coloured ribbon rather than a rainbow, and is the weakest point in an otherwise clever little picture. Miss Wood's "Spring in Worcestershire" (62) and Mr. MacBride's "Sheep Dipping, Kirkcudbright" (68), are examples of a particular manner of painting landscape which has a good many followers at present, whereby a kind of woolly texture is imparted to the whole, foreground and distance alike, which escapes certainly all charge of realism and makes landscape the art of giving an impression through pigment and not of producing illusion; but somehow it is not satisfactory; one wants to know what has become of the atmosphere and of aerial effect. Mrs. Forbes's "The Winter's Tale" (83) belongs also, in another way, to the region of a rather forced convention; the effect may be called "vigorous" or by such other adjectives, but the result is that it is flat in effect; the patches of sunlight on the bank at some distance behind the three figures are put in so strong that they look at first sight as if they belonged to the figures—parts of their garments fluttering out; it is impossible in nature that lights on the ground could ever have so positive an effect in relation to foreground figures; it is a coarse way of painting, giving the facts but ignoring their relation to each other, which defeats its own end. Mr. Clausen is in the opposite but better extreme in "The Green Fields" (109), which is almost mystical in its evanescent indications of gleams of light and shadow over the landscape; but this is a beautiful and poetic little picture. The Academy must have been rather put to it for a central work for the west wall of Gallery II. (commonly the situation chosen for one of the strongest works of the year), when they filled the place with Mr. Sant's picture of the pathetic event (as the painter seems to have considered it) of the admission of the first Lady Fellow to the Linnean Society. Mr. Sargent's portrait of Mrs. Frederick Guest (116) shows a finely painted and expressive head relieved against a background of dark foliage; Mr. Ralph Peacock shows fine colour and a sweet child's face in his portrait called "Mary" (119); Mr. Swan exhibits his diploma work, "Tigers Drinking" (129), in which more particularly should be noticed the manner in which the framework of the stooping animal is indicated; and Mr. W. G. Simmonds, an artist whose name does not seem familiar to us, has a very pretty work under the title "Sweethearts and Wives" (123), women coming along a cliff among the trees fluttering signals to the first of a line of "King's ships," as they were called in those days, sailing parallel with the shore, but the ships are surely older in date than the dress of the ladies would suggest; there is good colour and landscape effect in the small picture.

In Gallery III. Mr. Ayrer Ingram, in "The End of the Voyage" (133), has tried a new effect of sea about which we are sceptical; the colours the sea takes are endless, no doubt, and we have seen it that brown colour in bad weather, but not, as here shown, under a clear sky. Mr. Gow's "Elijah" (132), running before Ahah's chariot is a terrible sample of what may be called the Family Bible class of picture, as Mr. Penrose's "Queen Philippa" (176) suggests a school history book. In Mr. Ludby's "The Cloud" (136) we come upon another rainbow, and this one does look like an aerial effect and not like solid colour. Mr. Arnesby Brown's "Midsummer" (162) is a very real picture of sunlight coming through

the trees; and painted in a broad, free style. The same artist has tried a new line of subject (for him) in "The Pier" (217), a harbour scene somewhat in the manner of Mr. Forbes, one of whose works it certainly recalls. Among sea pictures Mr. Somerscales paints the rescue of the crew of a Russian barque by a Clyde steam trawler (175); a good sea, but not one of his best; and Mr. A. W. Burgess, in "Hopeless—the Morning After the Gale" (164), gives a rather powerful representation of a water-logged steamer with the surf all over her deck. Mr. Clayton Adams's "Flowers of the Field" (178) is at least a very pretty landscape. Mr. Leslie's "Deserted Mill" (179) is a scene of calm and silence painted in that curious and totally conventional brown tone in which he has seen all landscape for the last few years; there is a unity in the work, no doubt, but it is obtained by the entire sacrifice of the real colour of nature; and if, as we understand, this picture has been purchased with the Chantry bequest, we should say, all things considered, that it is an indefensible purchase, and is just a return to the old abuse of buying in the works of their own members. Mr. Dick Peddie makes a very pretty picture, under the title "Penelope" (182), of a young girl unpicking some work by the light (apparently) of a moonlit window. "Nightfall" (229), a twilight scene with cattle, is perhaps Mr. Davis's best work of the year. We ought not, however, to have passed over Mr. Parsons's "The Road to the Shore" (206), a study of a flat barren sea coast landscape which is excellent in truth and finish.

A good deal has been made of Osman Hamdy's curious picture "Jeune Ennir à l'étude" (237), which appears to us to be hardly good enough for what it intends to be; it is a kind of picture to which very high finish would give a value, but the high finish is not there. Mr. W. R. Symonds's "Sheltering from the Storm" (247) is a very charming picture of a rustic maiden seated under a tree, the face is one of the prettiest to be seen in the galleries. Mr. C. W. Wylie's "The Nymph's Pool" (251) is a clever work, but unsatisfying through want of composition and *motif*, the whole thing looks ragged. Mr. Stoll's "Washing-day" (244), on the other hand, is composition and nothing else; figure and subject are totally uninteresting in themselves, but it has what may be called the pictorial element. Mr. Tuke has a very spirited sketch rather than picture of "Sailors Yarning" (264), in which there is a great deal of character; Mr. Mount Loudan's "Mrs. MacGeorge" (269) is a portrait with a great charm of colour and style; and Mr. Hughes-Stanton's "The Lighthouse, Etaples" (276) and Mr. Davis's "Ben Eay, Ross-shire" (279) are two good landscapes, the distant hills in the latter especially true in effect.

The best thing in Gallery V., among those not before noticed, is Mr. Wirgman's fine seated figure, practically a portrait, entitled "Margaret" (334), very fine both in colour and in its broad sweeping style of execution; one of the best things Mr. Wirgman has ever done. Mr. Solomon's large picture of "St. George" (295) carrying off the smirking princess on his shoulder is clever enough as a painting, and as a conception of the subject about as hopelessly vulgar as anything could be.

In Gallery VI. is Miss Kemp-Welch's principal work "The Joy of Life" (356), a set of horses careering in a field; not one of the most interesting of her works. Below it hangs Mr. Adrian Stokes's fine, calm, and bright landscape, "Islands of the Adriatic" (358). Among some smaller landscapes in this room should be noticed Miss Grace Elliott's "Evening on the Marshes, Lynton" (366); Mr. Inglis's "A May Morning—The Gulls' Chapel, Sark" (396) for an admirable bit of foreground; and Mr. Basil Woodhouse's "The Top of the Hill" (403) as a powerful and suggestive bit of composition in landscape.

In Gallery VII. Mr. Fulleyleve gives a well-painted view of "The Acropolis, from the Pnyx, Athens" (432). Mr. Wylie's large picture, "L'Entente Cordiale" (442), illustrates the arrival of the French fleet in Cowes Roads, one of a class of pictures of which he has painted several; but though of course very ably and learnedly carried out, it is more interesting as a record than as a

picture. The modern battleship, notwithstanding that it has a grandeur of its own, certainly does not lend itself as well to the painter's art as the old sailing three-decker. The same painter's little upright picture, "Low Water, Berc-sur-Mer" (499), should be looked at, it gives so truly the impression of a low tide scene. Mr. Compton's "Saleznaz Glacier" (460) is a rather remarkable and powerful painting of a kind of scene not often treated in landscape-painting; and Mr. J. Farquharson's "Evening's Last and Sweetest Hour" (473) is a good example, as good in its way as could well be, of the art of highly finished realism in landscape-painting, which is not however the true end of landscape-painting, though it is the one that appeals most to the public, who like a picture that looks, as people say, as if you could walk into it.

Gallery VIII. contains two small but excellent sea-pieces, Mr. Wylie's "England's Frontier" (509), a study of pure sea and nothing else, and Mr. Henry's "The Squall" (522), with a boat coming up in the foreground shown with remarkable truth of effect. Mr. Board's crowded scene of "The Departure of John and Sebastian Cabot from Bristol" (533) is a good specimen of the typical "historical picture," well executed and perfectly uninteresting. And near this hangs obscurely in a corner a little upright picture, Mr. John Shapland's "Eve" (538), which will be noticed by few of the ordinary sightseers, but which is one of the best things in the whole Academy. Eve stands with her back to the spectator, a figure most graceful in line, half leaning against a tree on which the iridescent coils of the serpent are wound; both in colour and composition this is an admirable and original little work, a real picture in the best artistic sense of the word. We do not remember the artist's name in the past, but we shall certainly look for it in the future.

In the room of Cabinet pictures, Gallery IX., Mr. Val Havers exhibits a picture, rather larger than most in this room, but with a minuteness of execution which renders it suitable to its position, under the title "Ballad of Dead Ladies" (588); a rather remarkable work both in colour and in conception; it is a kind of procession across the picture of some ladies great in story or legend; the separate figures (one of them a nude) are very carefully studied and the effect of the whole is fine; but the insertion of the legend on a gold strip or ribbon in the upper portion of the canvas is rather a blemish and would have been better omitted, or made part of the frame; it catches the eye too persistently and clashes with the rest of the painting. Among other things to be noticed in this room are Mr. Walter West's tragically suggestive interior with a figure, under the title "The Shadow" (602); Miss Catherine Wood's Still Life study, "Opals" (618); Mr. Val Davis's little figure in a rich costume, "The Answer" (621); and Mr. T. Maybank's perfectly charming picture of nude children dancing on the seashore—"Come Unto These Yellow Sands" (661).

Mr. Corbet's "Presepio" (683) in Gallery X. seems rather like a kind of translation of the story of the Nativity into actual life; it is rather scattered in composition and uncertain in intent, but has a great deal of good work in it, and the figure of the mother with her infant reclining in the stall is very charming. In "The Ebb-tide" (692) we have a very good landscape by Miss Walford; a stretch of flat marshy land round an ebbing river, and a foreground very carefully studied. Mr. Albert Goodwin exhibits a study of the effect of "The Tropic Night—Jamaica" (706), which is singular in effect but may be true for all we know to the contrary. Then we have Miss Fortescue Brickdale's powerfully treated allegory, "The Uninvited Guest" (707), which seems to be a great puzzle to many of the visitors. The scene is a wedding, and the uninvited guest is Love, who sits among thorns and briars looking with a nobly-expressed indignation after the bride, going off with her husband, but wholly occupied with her dress. The work is not so satisfying in colour as some of Miss Brickdale's, but it is finely composed and expressed. Higher up on the same wall is another and much larger allegorical picture of which the same cannot be said—Mr. Goetze's "The Ever-Open Door" (710), a religious allegory in bad colour and bad

composition, but perfectly intelligible to the average spectator, to whom it is a kind of godsend. Mr. Lorner has a pretty nursery picture, "Hush!" (712), the scene of which is the same room with the same open window which he used some years ago for a picture of an unhappy bride summoned to the wedding by her child bridesmaids. Mr. Frank Bramley's portrait of Earl Cairns (713), in a dark uniform of some kind, is a fine work of its class. Mr. Farquharson presents us with another realistic landscape, a snow scene (720), also exceedingly complete and illusory. What does Mr. Waugh mean by calling his sea-piece "Mid-Atlantic—the Roaring Forties" (737)? The foreground water has all the effect of shoal water; anything less suggestive of the mid-Atlantic we can hardly imagine.

In Gallery XI. is a sea-painting of another order, in Mr. Hemy's principal work, "Lower Away" (609), another episode in that cruise of a small yacht of which we have seen two others already, the first being the ever-memorable "Youth"; and we have again the splendid painting of the sea and the rush of the boat through the water; the artist has not quite equalled "Youth," but it is the same hand, the same knowledge of the sea and of craft. There is nothing else in the room equal to this; but Mr. Arnesby Brown's "September" (763), with its two hayricks standing up against the sky, is a good landscape made out of very simple materials; and Mr. T. C. Gotch's "The Culprit—A Comedy" (766) is a clever and bright piece of humour in the representation of children.

THE MANCHESTER ROYAL EXCHANGE.

FROM A CORRESPONDENT.

THE erection of a new Exchange, or an additional wing to the present one, is now under consideration in Manchester.

The building is one of the most important commercial marts in existence; and difficulties have gradually arisen as the building has become overcrowded. When it was erected, during the years 1866-9, accommodation was provided to meet the estimated requirements of at least a century in advance, so far as the experienced Board of Directors could foresee; but business has grown so rapidly in Lancashire during recent years that the Exchange, though a large building, 210 ft. long by 195 ft. in width, is now too small for the requirements of the day.

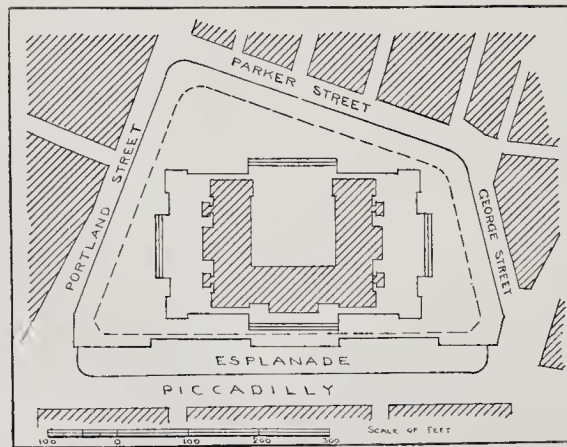


Fig. 1.

The annexed plan (Fig. 1) represents one of the suggestions which have been made. The largest open space in the centre of Manchester was bought some few years ago by the Corporation for 400,000. At present it is occupied by the Royal Infirmary. The Trustees, to provide funds for a new one, which is now being erected by a London

architect, sold it to the Corporation. The sketch plan shows the present infirmary buildings opened in the centre, with a considerable open area around, enclosed by Piccadilly, Portland-street, George-street, and Parker-street, and overlooked by warehouses and hotels. Portions of this site, now, as stated above, municipal property, have been utilised to widen the surrounding streets, as indicated by the dotted lines. The suggested new Exchange is also shown. It will be noticed that it would be considerably larger than the present infirmary buildings, supposing it were made half as large again as the present Exchange; nothing less would suffice. In order that such a building should be erected by the Corporation the Exchange would have to become public property, instead of being owned as at present by a private company; and this preliminary is now being hotly discussed by the ratepayers, by the City Council, and by the frequenters of the Exchange from different points of view. The latter are a most important body, about 8,000 strong, and, as they pay a three-guinea annual subscription each, they probably form the controlling factor. The essential point is that of finance, as the amounts involved run into more than a million, and there is a strong local feeling against increasing the municipal debt, which is already the largest in the country.

When the infirmary site was purchased it was proposed to utilise it for the erection of a Reference Library and an Art Gallery, which would have formed a group of buildings corresponding to the well-known Walker's Art Gallery and Picton Reading-room in Liverpool. The estimated expenditure would be approximately as follows:—For the purchase of the present Exchange, about 800,000l.; for the erection of a new one, as shown on the sketch, at least 250,000l. Both these amounts would be in addition to the cost of the site given above. The sketch plan shows that there would not be space left on the site for a Library and Art Gallery, and no combination is conceivable by which the three buildings could be united into one, as all three would require top light, and could not be above the first-floor level. Additional central sites would have to be purchased for the Library and Art Gallery. A most important and interesting competition would take place should the ratepayers during the next few months decide in favour of such a vast expenditure

ably object to what would after all only be a makeshift, as it would be quite impossible to transform an Exchange into a good library. The former is a building consisting essentially of one large room, in this case with a floor area more than an acre in extent, whilst the requirements and subdivisions of a large library are much more complicated.

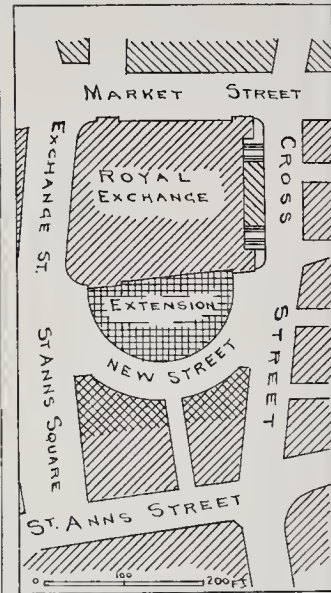


Fig. 2.

The alternative scheme is shown in the sketch plan (Fig. 2). The Exchange would be retained by the present owners, and Corporation aid and funds would not be required. The sketch shows the Exchange as it was rebuilt forty years ago, surrounded on all sides by streets, of which three are important ones—Market-street, Cross-street, and Exchange-street. On the south side a semi-circular addition, or wing, would be added, extending over the site of the less important of the four streets, which would be set back as shown, following the curve of the new building; it is named on the sketch plan "new street." On the concave-side of the new street a new block of shops and offices would be erected, the elevations of which would take their keynote from the present Exchange. The narrow street running into St. Ann's-street could be modified into an ornamental-covered arcade of shops; but that is not essential. There can be little doubt that this suggestion, made by a Manchester architect, is the only possible solution of a difficult problem.

The Board of Directors of the Exchange, owing a building bounded on all sides by streets, found themselves compelled by the persistent increase of members to provide additional floor space, but they were quite unable to suggest any means of enlarging their building; they, therefore, a few weeks ago formally suggested to the Corporation the erection of a larger Exchange on the infirmary site, as already described.

The scheme shown on Sketch No. 2 was then worked out and submitted to them, and one of the two now described and sketched, probably the latter, will be carried out with as little delay as possible so as to relieve the overcrowding on market days. The rentals which would be earned by the second scheme would make it pay for itself, and it would add an important street improvement to the centre of the city just where good shops and offices are in demand.

The present Exchange was designed by Messrs. Mills & Murgatroyd, two well-known Manchester architects of the last generation, several of whose buildings

have been illustrated in the *Builder* during the last fifty years. The commission was obtained in an open competition, which was discussed in the *Builder* at the time and could be readily referred to. The erection of the building was a task of considerable difficulty; it had to be built in two sections, as the site included that of the old Exchange, which continued in use whilst the first half of the present building was being erected. It is in the Corinthian style, with massive columns and pilasters, and the semi-circular addition shown on the sketch plan is so sited as to maintain the architectural dignity and importance of the present elevations, to which it would be subordinated.

A clumsy addition, either in plan or elevation, would ruin the present elevation. An oblong or square addition would throw the present elevations out of the centre, but the extension proposed would leave them intact, as it grows naturally out of the present building. Several other suggestions have been made, but they are so evidently the work of amateurs, and are open to so many objections, that they need not be seriously discussed.

PROVINCIAL FIRE-STATIONS.

The means of dealing with outbreaks of fire in many of our large towns are far from complete or effective, and in rural districts matters are even worse. Under sect. 12 of the Local Government Act, 1894, any parish council may obtain power to borrow money for such purpose. The amount that may be borrowed must not exceed one-half of the assessable value of the parish, and the annual repayment of the principal and interest must be included in the sixpenny rate to which the council is limited. Money borrowed for the general purposes of the Lighting and Watching Act of 1855 must be determined annually by a parish meeting, and raised by special rate, in which land is assessed at one-third only of its full value.

Under the provisions of the Local Government Act, 1894 (sect. 6), there are transferred to the parish council the powers, duties, and liabilities of the vestries and of the overseers, so far as regards the provisions of fire appliances and their maintenance. These powers are stated in sect. 29 of the Poor Law Amendment Act, 1867, as follows:—

"If the vestry of any parish where there is no town council, local board, or other authority competent to provide the same, after due notice, shall resolve that the overseers shall provide any fire-engine, ladders, or fire-escape for general use in the neighbourhood, the overseers shall provide the same, and pay out of the poor rate the cost thereof, and of procuring a proper place wherein to keep the same, and of maintaining it, as well as such engine, ladder, or escape acquired by the parish in any manner for such use, in a fit state of repair, and the charges of such persons as may be necessary for the use thereof, and the cost of suitable implements and accoutrements."

Other Acts relating to the subject of fire-protection have been passed from time to time, including:— Fire-prevention (Metropolis) Act, 1774; Fire-prevention (Metropolis) Act, 1785; Fire-prevention (Metropolis) Act, 1838; False Alarm of Fires Act, 1895.

The Local Government Act of 1894 provides for the grouping of small parishes, which might be taken advantage of in matters of fire-protection.

The planning of a fire-station must obviously depend upon the number of men and the quantity of appliances to be housed therein. All the structural and other arrangements should be directed to the provision of means for the prompt discharge of the engines, apparatus, and men to the locality of the fire. The engine-room walls should be preferably of glazed brick. The doors should be set back from the footway for the safety of the public, and provided with some kind of quick-opening automatic gear, working in conjunction with the ringing of the fire alarm, and should automatically switch on the lights of the engine-room, stables, firemen's bedrooms, etc., and also communicate the alarm to the stables if situated any distance.

A fire-station usually comprises engine-house, recreation-room, workshop, watch-room, stables, and the necessary bedrooms, etc., for the housing of the staff. In the case of small towns, where the firemen give their services voluntary or otherwise, they are communicated with by a system of call bells or housed in cottages near the fire-station.

The site of a fire-station should occupy a central position in the business part of the town, with easy access for the purpose of making a quick exit from the station. Sites situated in a narrow street or lane or at the foot of steep inclines should be avoided, and also those where great congestion of traffic is possible. In small towns the fire-station is usually incorporated with municipal buildings, or may be incorporated with the public baths and wash-houses.

In a fire-station of any pretension stables should be provided communicating direct with the engine-room, the harness being hung in position overhead or over the engines. Horses are, however, frequently hired for the purpose by payment of an annual sum as retaining fee, which varies according to circumstances, plus an agreed sum per horse for every turn out. The stables should be located as near as possible to the fire-station, and in electrical communication with it or a police station, or otherwise according to arrangement. As the majority of fires occur during the evening or night it is often possible to requisition the horses of the authorities employed for other purposes. In any case, stabling should be provided either at or near the fire-station, so that the horses are immediately available in case of an alarm of fire. An enclosed yard for drilling and engine-cleaning purposes should be provided in a fire-station of any size.

Formerly watch-towers were provided as a means to locate outbreaks of fire. It is not a little curious, perhaps, that it was in the Barbican, which has recently been the scene of so disastrous a fire, that the Romans kept watch in a certain tower, the remains of which still existed to the north of that thoroughfare until early in the XVIIth century, in order to give notice of conflagrations or the approach of an invading army. Watch-towers are now superseded by alarm-posts, etc. Towers are, however, frequently erected for architectural effect, and for the purpose of drying the hose after its use, as it retains moisture which, if not attended to, is a serious matter, the life of fire-hose depending almost entirely upon the treatment it receives; that is, of course, assuming that it is of satisfactory quality.

The well of the staircase is also sometimes used for the purpose of drying the hose, which is usually in 50 ft. or 100 ft. lengths. Provision should be made for the hoisting-tackle necessary and drainage of the drip-pings from the hose. The process of drying and draining should be as short as possible. A hose, properly cleaned and dried and stored in a dry and well ventilated place when not in use, has its life considerably lengthened.

The staircase of fire-stations should either be central or placed so that every man has an equal chance of reaching the engine-room as quickly as possible from his sleeping apartments. Short, wide flights and wide landings should be provided. Winders must not be used under any circumstances, being fatal to the quick assemblage of men in case of an alarm. Sliding-poles, or slides, communicating direct from the sleeping floor to the engine-room are frequently provided so that the men may quickly and easily reach it.

When the firemen are housed on the premises slipper baths, supplied with hot and cold water, should be provided for the use of the men after a long attendance at a fire, the grease, oil, and smoky dirt accumulated being difficult to remove with cold water.

Mains for fire-extinguishing purposes should not be less than 4 in. internal diameter under any circumstances; 6 in. is considered a satisfactory minimum.

It would be very difficult, if not impossible, to state any exact rules that should govern the fire-protection of towns, as scarcely two towns are alike in the matter of danger from fire. The equipment of provincial fire brigades is rapidly approxim-

ing that of the Metropolitan Fire Brigade. Liverpool, it is said, possesses the two biggest fire-engines in the world. These are further said to be the most powerful known, capable of throwing 1,800 gals. of water per minute and a jet 140 ft. high. The force of the jet is estimated as able to kill a man at a distance of 50 ft. The new motor fire-engines used in Paris weigh 2½ tons each, and travel twenty-five miles an hour. The pumps deliver 2,000 gals. a minute. The first fire-engine sent from America was sent to England in 1731.

In the equipment of a fire-station the selection and size of a steam fire-engine depends chiefly upon the characteristics of the locality. For a fairly flat district an engine with a pumping capacity of 350 gals. per minute is desirable, whilst for a hilly district an engine with a pumping capacity of 250 gals. per minute is preferable, and one possessing lightness with strength. It should be of simple design, and of a type affording the greatest facilities for actual working. The steam fire-engine does not, as a rule, turn out to every alarm of fire. It is somewhat of a reserve appliance—undoubtedly an important one—for use when a hydrant stream of water is not sufficient either on account of the extent of the fire, or the distance from the hydrants, or where the nearest available water supply takes the shape of a river, canal, or pond. The principal of the smaller appliances are the hose and hand escapes, hose-carriage, hand pumps, stand-pipes, etc.

After years of experience the fact still holds good that open pails and buckets filled with water and kept in suitable places in case of fire have not yet been surpassed in efficiency as "first aids" in fire-extinguishing, and that more fires are annually put out by such pails and buckets than by all the other appliances put together. The chief difficulty found in their use is that the water is apt to be found wanting at a critical time, either because of evaporation or its use by some borrower and failure to replenish the supply. To obviate this an inventor has adopted the following means to prevent this occurring. The hooks by which the pails, or buckets, are suspended are fitted up with pieces of spring steel strong enough to lift the pail when nearly empty, but not sufficiently so as to lift a full pail of water. Just over each spring, in such a position as to be out of the way of the handle of the pail, is set a metal point connected with a wire from an open circuit electric battery. So long as the pails are full their weight when hung on their hooks keeps the spring down, but, as soon as the water is removed, or the pail loses a considerable portion of its contents by evaporation or otherwise, the spring of its hook rises and comes in contact with the metal point, and thus closes the battery circuit and rings a bell, at the same time showing an annunciator where the trouble is; the bell continues to ring until the weight of the delinquent pail is restored by being filled with water.

The great fires that have occurred in London during the last few years have brought into prominence the desirability of being able to readily concentrate a large body of men with greater promptitude than had been formerly practicable with the provision of more men and appliances. It has been proposed that large fire-stations should be built, to be supplemented by the provision of a number of small street stations in the immediate neighbourhood of those central stations; an alternative scheme being to include a smaller station in a given district, with a substation in addition, which should be supplied with horses, engines, etc., and in that way the brigade would be scattered rather than concentrated, it being much easier in the event of a large fire to concentrate from the suburbs than it would be if there was a number of stations in a central district.

The risk of damage to property by fire is never absent. The carelessness of workmen, servants, friends, or neighbours, or the explosion of gas, etc., may frustrate the most vigilant precautions of the owner. There are now in most Government buildings, hospitals, museums, etc., independent organisations for watching and for immediately getting hydrants, etc., to work

pending the arrival of the brigade. Several large firms also take the precaution of having some of their employees instructed to this end. At many theatres one man, at least, is employed to act as fireman if required, though these men are not all trained and skilled firemen; it is important that they should be, and kept for fire duty only. Not only abroad, but in many provincial towns, men from the fire brigade attend at theatres during the performances, and in case of an outbreak of fire a message of a proper character can be relied on. The importance of properly qualified firemen being employed in theatres is that they are men who have often seen panic, and have been accustomed to work in a crowd, and, besides knowing how to extinguish fire, appreciate the importance of promptly calling the brigade.

But while the brigade should undoubtedly receive the earliest possible intimation of a fire, this intimation must be a reliable one, otherwise not only is the effort of the brigade wasted, but it may happen that an outbreak during the interval, whilst men and appliances are out in response to a false alarm, may not be promptly attended to with adequate assistance. An important fact which cannot be too widely known is that the firemen are not on the look-out for fires, and cannot act until they receive information of an outbreak of fire. The best method, therefore, of calling the brigade is to pull the nearest fire-alarm or to telephone if the outbreak is at some distance from the station. It may, however, be pointed out that it is a very serious matter to run the risk of giving false calls to the brigade.

The following prices of outfits may be useful to councils and committees and others about to establish a fire brigade:—A captain's outfit can be purchased for 9l. 18s. 6d.; superintendent's, 7l. 11s.; foreman and engineer, 6l. 10s.; foreman, 5l. 12s. The cost of appliances obviously varies with the requirements; a hand fire-pump, with three buckets and 10 ft. of hose, suitable for theatres, music-halls, lodging-houses, and factories may be purchased for about 4l. 10s.; for about 47l. a hand-carriage fire-engine may be purchased, capable of drawing water from well 28 ft. deep from ground surface to water-line. It is capable of being drawn from place to place by one man, and of pumping 55 gals. per minute and 60 ft. high when worked by eight men, or can be used by two men when needed for irrigation purposes, etc. The more general use of motor fire-engines will affect the planning of future fire-stations and necessitate alterations to existing ones. A. C. PASSMORE.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A YORKSHIRE district meeting of the Association of Municipal and County Engineers was held in the Council Chamber of the Town Hall, Scarborough, on Friday, June 1. Mr. A. E. Collins (Norwich), President, was in the chair, supported by Messrs. W. Weaver (Kensington), H. A. Giles (Westminster, Assistant Secretary), J. P. Norrington (London), J. S. Brodie (Blackpool), T. C. Beaumont (Driffield), A. Beaumont (Beverley), F. Baker (Middlesbrough), H. Bottomley (Bingley), B. Ball (Bexhill-on-Sea), S. Dyer (Bridlington), T. Henry (Retford), A. M. Kerr (Warrington), W. Loveday (Stoke Newington), E. R. Matthews (Bridlington), F. W. Spurr (York), E. J. Silcock (Leeds), T. H. Tarfit (Lofthouse), and others.

The Mayor, in receiving the President and members, said there was no body of officials that a Mayor and Corporation could more fully welcome than a body of borough and county engineers, because all local authorities owed very much to their engineers.

The President, having taken the chair, thanked the Mayor for the kind welcome he had extended to the Association.

The President then stated that they had to deplore the loss of the Yorkshire Secretary, Mr. W. H. Hopkinson, of Keigley, who rendered very valuable service indeed to the Association, and who died in April after a very short illness.

Mr. Beaumont (Driffield) moved the election of Mr. H. W. Smith, of Scarborough,

as District Secretary for Yorkshire, which was seconded by Mr. Baker (Middlesbrough), and carried unanimously.

Mr. H. W. Smith thanked the members for his election.

Municipal Work, Scarborough.

Mr. H. W. Smith, A.M.Inst.C.E., Borough Engineer, read a paper on "Municipal Work in Scarborough." He said Scarborough had for many years enjoyed a reputation for the excellence of its tar-paved roadways, being one of the pioneer towns in respect of this particular class of work. Much of the success attained was largely due to the care and attention of the late Mr. J. Peitch. The author felt that this class of roadway might be more generally adopted in many boroughs where the traffic was light, as it possessed the advantage of being dustless, sanitary, and economical, the cost of the upkeep being reduced to practically a minimum.

There were many forms of tar-paving now on the market known by various names; but he only proposed to give a short description of the methods adopted in Scarborough which differed from these.

The subsoil of the borough was boulder clay, and, as one of the chief factors in the life of a tar-paved roadway was an absolutely dry foundation, the foundation of a roadway of this class consisted of 3 in. of sand, upon which were laid 7 in. of local sandstone or broken bricks, hand-paved, all interstices being filled in with a layer of gravel 3 in. thick (obtained from the beach).

This formation was consolidated and shaped with either a heavy horse-roller or light 8-ton steam-roller when it was ready to receive the tar-paving, which consisted of three coats as follows:—

The first coat was composed of local limestone gathered from the beach along the coast and broken to a 1½-in. gauge, then placed on the hot plates or drying kiln about 8 in. thick, and left till thoroughly dry. After all moisture had been driven off the stone was turned off on to a platform and mixed, whilst hot, with cold gas-tar direct from the works, about ½ cwt. to 1 ton of stone. It was then deposited in heaps ready for use, and was better for being kept two or three months, which remark applied to all classes of tarred stone.

The second coat was composed of water-worn gravel from the beach, screened to 1½-in. gauge, and was prepared as follows:—A layer of gravel, about 5 in. thick, was put on to the hot plates, and was covered by 1½ in. screened gas-works cinders about 1 in. thick, then another 5 in. of gravel, covered with a thin layer of cinders, the whole making about 12 in. thick. When the material was thoroughly dry it was turned over, mixed, and tarred as above—about ½ cwt. of tar to 1 ton of material. The finishing coat was a mixture of fine gravel and ashes, both screened to ½ in. About 5 in. of gravel were first put on to the hot plates, covered with 3 in. of ashes, then another layer of 5 in. of gravel, and a further covering of 3 in. of ashes—in all 16 in. thick. When dry it was turned over and thoroughly mixed, and then incorporated with tar in the proportion of 2 cwt. of tar to 1 ton of material.

Each coat was well rolled in with an 8-ton roller as it was laid on, and the finished surface was sprinkled with local limestone chippings, which considerably brightened the appearance of the road. The total finished thickness when rolled averaged about 4½ in. After an interval of about twelve months, or sooner if required, in about the months of May and June, in fine weather when the road surface had absorbed the heat of the sun, the surface was painted over with cold tar, and sprinkled with fine gravel and limestone chips, and rolled with steam-roller.

This process was repeated every two or three years as necessary, and was the main factor in extending the life of the road. The cost per yard superficial of a roadway of this class, without foundation, was about 2s. 6d. The cost of tarring and dusting (including such light repairs as might be necessary) was about 13d. per superficial yard. The author had experienced some difficulty latterly in obtaining tar of an equal quality to that supplied some years ago before the attention of gas companies was directed to the extraction of the by-products. Never-

theless, by care and rejection of inferior samples, it was still possible to obtain satisfactory results from the tar now obtained without the addition of other ingredients.

The author did not claim for the above form of tar-paved roadway that it was a superior form to a similar roadway constructed of properly tarred limestone broken to a gauge, but ventured to draw the attention of members to it on account of its low cost, and as showing that it was possible to produce a satisfactory roadway from material which could not be described as "ideal" for the purpose.

The footpaths of the borough consisted of York flags and Limer asphalt in the main thoroughfares, the remainder being of tar-paving.

The tar-paving footways were laid on a foundation of sand and 4 in. broken brick, and consisted of a coat of water-worn beach gravel broken to a 1½-in. gauge, with a finishing coat of fine cinders and gravel similar to that described for tar-paved roadways; this was well rolled with a 5-cwt. hand-roller, and a sprinkling of Derby spar or West Riding chips added to brighten the surface. These footpaths were tarred and dusted in a similar fashion to the roads, with the exception that the materials used were of a finer nature.

The cost of the footways, exclusive of foundations, was 1s. 3d. per yard super. A number of important street-improvement works in the nature of widening and improving streets had been carried out, involving an expenditure, including the purchase of property, of 50,789l.

The sewers of the town were divided into two systems discharging direct into the sea, the southern system having its outlet near the east pier, and the northern at Scalby Nab, about a mile north of the borough.

The new marine drive, now in course of construction, formed the connecting-link between the promenades on the South Fore-shore-road, in the south bay, and the Royal Albert-drive, in the north bay, and would, when completed, form one of the finest marine drives possessed by any watering-place in the United Kingdom, it having a total sea-frontage of about 2½ miles. The drive encircled the base of the bold headland known as Castle Hill, and served the twofold object of providing a magnificent and unrivalled marine carriage drive and promenade, and protecting an historic landmark from the erosive action of the sea. Its length of 4,100 ft. from the end of the Albert-drive, in the north bay, to the junction with the east pier, in the south, did not convey any idea of the magnitude of the work. To realise this one must needs first have viewed the beach at the foot of the Castle Hill before the commencement of the work. This beach was strewn with titanic boulders which had fallen from the cliffs above as the result of centuries of buffetings from north-east gales and the action of the wind and weather. Before a single foundation block of the wall could be laid these had to be removed by blasting and steam cranes. The sea-wall, which was built upon the Oxford clay (or shale) forming the base of the cliff, varied in thickness from 17 ft. 6 in. to 33 ft. 8 in. at its base to 6 ft. and 10 ft. at the top, and in heights from 32 ft. to 38 ft. according to its varying degree of exposure to the forces of the north-easterly gales; it presented a concave face to the sea, and was constructed of cement-concrete blocks, backed up by concrete in mass, the blocks varying in weight from 9 tons in the toe blocks to 14 tons as the top of the wall was reached. Over 71,000 cubic yds. or 113,000 tons, of concrete had been used in the construction of the wall. The level of the top of the sea-wall was 19 ft. above high-water mark at O.S.T., whilst its toe for the greater portion of its length was slightly below low-water mark, a circumstance which had added considerably to the difficulty of the work. The space at the back of the wall had been filled in by material taken from the cliff, over 237,000 cubic yds. of material being required for the purpose. Upon this filling was formed a carriage road and footpath 60 ft. in width. The footpath was 20 ft. in width, and was on the sea side of the road. The space between the roadway and the base of the cliff was fenced in by a stone

dyke wall, and protected the roadway from any boulders or loose stones which might fall from the cliff. The work was commenced in the spring of 1897, and the time of completion expiring in 1899. Owing to the exceptional difficulties which were met with in the laying of the foundations and the loss of the gantry erected for the purpose of the works by gales, it was September, 1904, before the two ends of the wall (which were proceeded with simultaneously) were joined up, the last block being laid on October 1, 1904. There yet remained to finish the paving of the surface of the drive, at an estimated cost of 8,000*l.*, and the erection of toll-houses, at an estimated cost of 1,200*l.*, and the reinstatement of certain proportions of the wall which were damaged during construction by gales. Previous to the commencement of the work and during its progress the Corporation had the benefit of the advice of several eminent engineers skilled in sea defence works, whilst the actual superintendence of the work had been carried out under the direction of Mr. J. B. Everett, Assoc. M. Inst. C.E.E., Mr. E. T. Beard, M. Inst. C.E.E., and latterly by the author, who was completing the work. The estimated cost of the work was approximately 110,000*l.* A system of electric tramways will traverse the drive from end to end connected with the tramway system in other parts of the borough.

In order to form an approach road to the marine drive at its southern end and connect it with the South Foreshore-road, the Corporation had cleared away a number of old warehouses and cottages abutting on the harbour, and had constructed a roadway with a minimum width of 60 ft. This work had been carried out by the author, in conjunction with the late resident engineer of the marine drive, at a cost of about 15,000*l.*

The question of sea-defence works was one of great importance, and in this respect Scarborough differed little from other towns on the east coast which were suffering severely from the erosion of the cliffs by the action of the sea.

A sum approaching 150,000*l.* had already been expended on the construction of sea-walls, and the author was strongly of opinion that the time had arrived when steps should be taken to obtain some aid, either by a grant from the National Exchequer or by sanctioning loans at a low rate of interest and the extension of the period for the repayment of same.

The construction of the sea-walls had created additional scour, and it had been necessary from time to time to construct and extend aprons in front of the same. These remarks particularly applied to the Royal Albert drive, in the north bay, where the bed of the sea consisting of shale had been eroded to a depth of 7 ft. since the construction of the wall in 1888.

The author was now constructing four experimental wooden groynes, and already an improvement in the state of the beach was observable.

Considerable attention had been paid by the Council to the provision of lavatory accommodation in the borough, and he had constructed a number of lavatories for both sexes, both under and above ground, at a total cost of over 4,920*l.*

Attendants (male and female) during the season were provided at such of the lavatories as were fitted with washing accommodation, etc.; the remainder had automatic locks fitted to the water-closets, and were visited periodically by an attendant. A revenue of 565*l.* was obtained from this source during the past year.

Scarborough was very happily situated in respect of public parks and pleasure-grounds, there being no less than eleven of these distributed over the borough. Whilst none of them were of any great extent, they present many unusual and interesting features, owing in the main to their being constructed upon the sides of cliffs in both bays.

The author had laid out the St. Nicholas Gardens (which adjoined the Town Hall), the Esplanade, and extension of Holbeck Gardens, Falsgrave Park, Manor-road Recreation Ground and Bowling Green, in addition to the establishment of a nursery garden, in which plants and shrubs for the above were reared.

The Corporation had been from time immemorial the owners of an estate known as

the Weaponness Estate, comprising 557 acres. The estate comprised agricultural land and farm-buildings, woods and plantations (which were open for the enjoyment of the public), and building land.

The author had laid out and developed a large area of this estate in building sites, which should in years to come afford a considerable relief to the rates.

Mr. W. Weaver (London) proposed a vote of thanks to Mr. Smith for his paper. He remarked that intelligent appreciation had been taken of the natural advantages of Scarborough to turn them by artificial means to the very best account. The marine drive was a work of considerable magnitude, which was being carried out in the face of very strong opposing forces of Nature, and it called for considerable skill and ingenuity on the part of the engineer to combat those forces. The tar-paved roadways of Scarborough had always been referred to at their meetings with admiration. At present traffic was in a transition state, and, with the displacement of horses in favor of motor traffic, they would have to go still further in the way of amendment of the highways to do away with the plague of dust and noise.

Mr. Brodie (Blackpool), who seconded, remarked that Scarborough had always been regarded as the Mecca of the tar-paving surveyor. He also referred at some length to the work in connexion with the marine drive, and said they would be more than human if they could guarantee against all the attacks of the forces of Nature.

The vote of thanks was accorded. The marine drive was then inspected; after which the members were entertained to luncheon at the Grand Hotel by Mr. H. W. Smith and Mr. Rowntree, a member of the Council. In the afternoon the depot was visited and the tar-paved roads inspected.

The Mayor and Mayoress entertained the members to tea at the Town Hall.

On Saturday there was a visit to the water-works.

THE QUANTITY SURVEYORS' ASSOCIATION (INCORPORATED).

The annual general meeting of this Association was held on Wednesday, May 30, at the Holborn Restaurant, the President (Mr. Walter Lawrence, F.S.I.) in the chair.

The minutes of the previous meeting were duly read and confirmed, and the result of the election for members of Council for the ensuing year declared, showing the following elected as London members—Messrs. A. J. Gate, F.S.I., A. G. Cross, F.S.I., W. R. Hood, F.S.I., H. England, R. L. Curtis, jun., H. W. Crickmay, W. W. Barber, and S. Chatfield Clarke, F.S.I.; as provincial members—Messrs. H. Curtis-Card, F.S.I., R. J. Tollit, Arnold Harris, F.S.I., and W. Hoffman Wood.

The President, reviewing the work done by the Council during the past year, congratulated the Association upon the steady increase of membership the total number on the roll being 155 members and four students, and also upon its eminently satisfactory financial position. Out of fifteen candidates who entered for the examinations, which, by the courtesy of the Governors, were held this year at King's College, the following passed the final examination—Messrs. G. Sylvester Taylor, E. G. Huggins, W. G. Walder, L. C. Veale, A. Stratton, and F. M. Gilbert; while in the preliminary examination qualifying for admission as students the following satisfied the examiners—Messrs. D. A. Roberts, E. T. Parr, and Donald Hewitt. An examination was held simultaneously in Pretoria, the results of which had not yet been received. A rather important departure had been made in the professional examination this year by the elimination of papers on abstracting and billing, an additional day being devoted to the subject of "taking-off."

After alluding to the useful work done by the Committee on Professional Practice, which had dealt with a considerable number of questions raised by members, and to the formation of the Belfast Quantity Surveyors' Society of which body the original members are also members of this Association, the President stated that, in order to redeem the promise made to the members a year ago, the Council had recently issued a scale

of fees, which, however, is intended to apply to works undertaken for public bodies only. This scale of fees had been sent to upwards of 1,800 public authorities in England and Wales, and, from the numerous replies and letters on the subject the Council had received, it was hoped it would be generally adopted, and so to a great extent that undesirable practice of a public body inviting men to tender for the supply of their professional services would cease, although the Council admitted that its failure to secure the co-operation of the Surveyors' Institution towards mitigating this evil was a matter for regret.

The President next referred to the "Standardisation of Quantities," saying that this question had been under consideration by the Council practically since the formation of the Association, and had been fully discussed after a paper on the subject had been read by Mr. A. G. Cross. Subsequently a paper by the late John Leaning was read at the Surveyors' Institution, and letters on the same subject had appeared in the professional papers. The Council recognised that, except with the co-operation of the other bodies interested, it was impossible to move in the matter, and had, therefore, approached some of the leading institutions or societies to whom this question should appeal, with a view to the holding a conference on the subject. Pending the receipt of definite replies the matter must remain in abeyance.

In conclusion, the President expressed his own personal regret, and the regret of the Council generally, at the resignation of Mr. F. B. Hollis, the late Honorary Secretary and Treasurer, and his thanks to the members and to the Council for their courtesy during the two years in which he had occupied the chair.

Mr. H. T. A. Chidgey, in moving the adoption of the Council's Report and balance-sheet, congratulated the Council upon its year of office and the work accomplished. He associated himself with the President in his expression of regret at Mr. F. B. Hollis' resignation, and referred to the great service Mr. Hollis had rendered to the Association from its inception. Although very glad that the Council had issued a scale of fees intended to be used by public bodies, the Council was, in his opinion, very wise in not publishing one to apply to private work.

Mr. W. R. Hood, F.S.I., seconded the motion.

Mr. C. W. Ball (Southsea) expressed the fear that the Council's action in issuing the scale of fees broadcast among public bodies would prove to be inimical to the interests of some of the members. His work lay almost exclusively among public bodies, and the fees he received were very considerably in excess of those laid down in the scale.

The President, in reply, stated that if Mr. Ball practised in London he would very soon learn that the majority of London authorities pay ridiculously inadequate fees to their quantity surveyors, and instanced a recent experience of his in which he was asked to quote for preparing the quantities for some building for a London Borough Council. The building was to cost 3,000*l.*, the quantity surveyor was expected to correct the specification, and his charge was to include the supply of fifty copies of the bills. The lowest tenderer (happily not a member of this Association) was appointed to do the work at an inclusive fee of 28*l.*

Mr. R. J. Tollit, as a provincial member of Council, wished to assure Mr. Ball that the interests of the provincial members were not neglected by the Council. He personally heartily agreed with Mr. Ball in his statement that the scale of fees which had been issued was a very low one, and that, as the outcome of its publication, some of the provincial members would suffer, and for this reason he had opposed its issue. From some of the statements made by members of Council while the matter was under discussion, and also from the President's remarks that afternoon, he had arrived at the conclusion that London quantity surveyors accepted very small fees indeed.

Mr. T. Woodbridge Biggs, who supported the motion for the adoption of the Report, stated, as his opinion, that if the newly-issued scale of fees were thoroughly established as a recognised scale in London (which would be a very difficult matter to achieve), and

the provincial surveyors would support it and get similar fees for themselves, the provincial members would be in an infinitely better position than the London members, as the cost of preparing the work (always done at high pressure in London) was lower in the provinces.

The motion was then carried unanimously.

A vote of thanks to the Auditors (Messrs. E. D. Nixon and H. J. West, F.S.I.) was then passed on the motion of Mr. W. R. Hood, F.S.I., seconded by Mr. C. A. Kennett, P.A.S.I.

Mr. England moved a vote of thanks to the Scrutineers, which was seconded by Mr. E. A. Wylie, and carried unanimously, to which Mr. C. A. Kennett replied.

Mr. A. J. Gate, F.S.I. (Vice-President), in proposing a hearty vote of thanks to the President, referred to the arduous duties Mr. Lawrence had performed on behalf of the Association during the last two years and to the difficulties and the opposition with which the Association had to contend at the outset of its career. But for the tact and skill the President had displayed the Association would not have been carried through some of its earlier troubles.

Mr. A. G. Cross, F.S.I. (Hon. Secretary), in seconding the vote of thanks, remarked that future generations of quantity surveyors would recognise what a debt of gratitude they owed to Mr. Lawrence, the first President of the Association, the existence of which Association was, in his opinion, essential (he felt almost justified in saying) to the continued existence of the quantity surveyor.

The President, in replying, thanked all those with whom he had been associated during the time he had had the honour of being President, and hoped that the members would adhere to the scale of fees the Association had issued, whatever self-sacrifice that course might entail.

The meeting then terminated.

A Council meeting was subsequently held, at which, we learn, Mr. A. J. Gate, F.S.I., was elected President, and Mr. H. Curtis-Card, F.S.I., and Mr. W. R. Hood, F.S.I., Vice-Presidents for the ensuing year. Mr. H. T. A. Chidgey was elected to the vacant seat on the Council caused by the resignation of Mr. A. G. Cross, F.S.I., who was elected Honorary Secretary.

BOOKS.

The Model Village and its Cottages: Bournville, Illustrated. By W. ALEXANDER HARVEY, Architect, London. (B. T. Batsford, 94, High Holborn, 1906.)

MR. HARVEY has made into a book a paper read before the Architectural Association in 1904 on Bournville and the model village. The subject is a very large one, interesting from whatever point of view it is approached; most interesting when the full significance of the foundation of such communities is understood in all their bearings. The foundation of a model village on proper lines depends very much on the unselfish efforts of the thinking section of society; their success must needs be left to the judgment of future generations. At a time like the present, when, architecturally, each man does what seems right in his own eyes, a little beneficent tyranny would be a good thing. Our suburbs spring up with alarming rapidity, and the wretched character of the houses, combined with the smallness of the gardens, cannot but be detrimental to the moral and physical health of the class that live in them.

The evil of the existing state of things is realised, there is no need to enlarge upon it here. The author of the book before us has been able, in company with the founder of Bournville, to give a great deal of time and thought to the production of a model village suitable to the requirements of the case. The housing problem is equally pressing both in the town and in the country. In town districts the artisan should be near his work and yet live in suitable surroundings; in rural districts cottages for the labourer should be obtainable to prevent the rural exodus. Bournville is an attempt to solve the problem on the fringe of a great city. It has enjoyed, what in the present state of things we believe to be an advantage, a beneficent dictatorship in the person of its founder. Mr. Harvey, the

architect of the village, is, to a certain extent, at least in sympathy with the problem before him (we speak, of course, entirely from the witness of the book before us). He realises what many educated people do not, including, we fear, many architects, that the beauty of a house does not depend upon the amount of ornament crammed into it, but rather upon its fitness, both in its shape and in the materials of which it is composed, for the purpose for which it is intended. We must get back to that; the picturesqueness and quaint beauty of the old work which we all so much admire, was not a self-conscious effort, it was the result of doing the thing in the right way with the materials at hand, the outcome of generations of consecutive work and thought.

This country is rich in cottage architecture of the past; nearly every county shows its local tradition of the way the work was done; therefore, wherever a model village is founded the methods and materials of the old cottages of the neighbourhood should be studied for the lessons they have to teach. If this rule were conscientiously carried out by the wish of architect and client alike, how greatly would the appearance of acres of modern buildings be improved?

Mr. Harvey's cottages at Bournville, in the majority of instances, show the sound characteristics of the old work; the well-pitched shapely roof giving the feeling of homeliness and protection; windows of adequate but not too great an area, properly placed; and chimneys well grouped in large stacks. The cottages are in pairs or groups of three or four, each pair or group differing from the next. Attractive as are the larger groups, the pairs are the best from the practical point of view. Gardens are more easily divided up with semi-detached cottages than with rows, and in the model village the garden is of the first importance; moreover, in groups of cottages, the centre ones are much more difficult to plan successfully. There is much useful information in the book, though the tables of cost of the executed work are likely to fill fellow-architects with despair, so low are they compared with the cost of building in the south. Here and there the senseless and ugly sloping buttress and battered chimney is allowed to creep in, and in some examples the plans show unfortunate lapses into slovenliness, but these faults occur only in a small minority of the examples shown.

Chinese Art. By S. W. BUSHELL, C.M.G., B.Sc., M.D. Vol. II. (London: Board of Education, South Kensington, 1906.)

MR. BUSHELL'S second volume on Chinese Art is perhaps not of so special an interest to architects as was his first; yet the six chapters on Pottery, Glass, Enamels, Jewellery, Textiles, and Pictorial Art, which go to make it up, cannot fail to please the lover of beautiful things. Perhaps the keynote of the success of Chinese artists, both past and present, may be found in the following passage which occurs in the chapter upon glass:—"A snuff-bottle of plain glass," says the author, "is occasionally painted by hand with the picture pencilled in sepia or filled in with colours. In this case the colours are painted on inside to preserve them from friction; the execution of the brushwork through the narrow opening of the bottle on the inner surface of the glass being a perfect marvel of skill and patience tripping over self-imposed restrictions, such as only a Chinese artist could delight in and bring to a successful result." It is, indeed, this tripping over self-imposed restrictions which seems to have invested all Chinese *objets d'art* with a subtle charm; and what is true of their work upon glass is equally true with regard to porcelain or enamel.

In the small space at his disposal Mr. Bushell has managed to write a fairly-detailed historical description of the various branches of art under consideration. In the opening chapter one learns that Chinese ceramic art "is, in all probability, an indigenous culture, and has been developed continuously from the rudest origin in Chinese soil." Porcelain, its "highest achievement," Mr. Bushell would assert, was unquestionably a Chinese invention. He traces in no dull fashion the progress of the art through the various dynasties. He points out that "pottery has always been an important adjunct to Chinese architecture." A

common practice for many years has been the use of moulded antefixal ornaments of terra-cotta, and the roofing of buildings "with enamelled tiles coloured in obedience to strict sumptuary laws." The method of application is compared to that of the fixing of salt-glazed ware in Europe. Porcelain itself is divided into five classes arranged chronologically. The numerous illustrations with which this chapter is enriched enables the reader to understand upon what broad lines this most interesting branch of art has progressed. One could only wish that the author had been able to give coloured plates. It is occasionally a little difficult to realise correctly the true magnificence of a particular vase or bowl from a photograph. In an exceedingly useful appendix to this essay Mr. Bushell gives lists of the various marks to be found on Chinese ceramic work.

The two succeeding chapters on glass and the various sorts of enamels are considerably shorter, but fully illustrated. Enamelling itself seems to have been introduced into China at a comparatively late period from Western Asia. Some very fine enamelled vases are shown, so fine, indeed, as to make a visit to the museum seem almost a matter of necessity. Jewellery is given a separate chapter, though not of very great importance; but, as the author remarks, "in the art of filigree-work the Chinese jeweller has attained such proficiency as to make it in some degree distinctive of the country." Silk has always been an important material in China, and some of the work on silk is of extraordinary beauty.

The last chapter on pictorial art makes an important finish to an interesting book. Mr. Bushell calls attention to the graphic quality of Chinese painting, remarking that the artists are "first of all draughtsmen and calligraphists." Their colour, too, is no less remarkable than their composition. The introduction of Buddhism into the country had an enormous influence upon its art, though the author does not consider, as some have maintained, that it absolutely brought it into being. The volume is an admirable exposition of a difficult subject, and the illustrations, which number 135, are thoroughly representative. The book is correctly printed.

The Old Stone Crosses of Dorset. By ALFRED POPE. (London: Chiswick Press, 1906.)

THE extant remains of old crosses are not nearly so numerous in Dorsetshire as in other western counties. Much diligence has apparently been expended in gathering together information as to the crosses of this shire, with the result that the total, including a variety of mere stumps or bases, is somewhat under sixty. All the more interesting of these are well illustrated in a series of photogravure plates which give the chief value to the volume. Mr. Pope, in his preface, says:—"I am an architect"; he might have added, "nor am I an archaeologist." These two facts are quite apparent throughout the letterpress. For instance, the very first plate in the book depicts the "Cross and Hand" stone on Batcombe Down, which appears to be a highly-interesting example of a Saxon filleted pillar stone; but it is assigned by Mr. Pope to the XIVth century. The somewhat slipshod character of the descriptions may be gathered from a brief sentence as to this pillar:—"It is said to be of Purbeck marble, but this seems doubtful. If a Dorsetshire gentleman is not capable of recognising Purbeck marble, it is scarcely wise of him to write about the stone crosses of his county. And if he did not possess that faculty, he might surely have appealed to someone better informed ere writing such a sentence."

There is a good plate of the fine old cross standing in the High-street, Stalbridge, and another of the beautiful restoration of the cross at Shillingstone, effected by Mr. C. E. Ponting.

Dorchester (Dorset). By F. R. and SIDNEY HEATH. London: The Homeland Association, 1905-6.

THIS guide, being No. 46 of the Homeland Series, gives a very full and well-written description of this most interesting west-country town. As its name implies, it was an important place in Roman times, and in

the County Museum will be found many evidences of the fact. In the immediate neighbourhood are the earthworks of Poundbury and the great British work at Maiden Castle, and a large number of valuable examples of mediæval work, both churches and houses. Among the latter are the fine houses at Athelhampton, Wolfeton, and Melcombe's Bingham, the first and last showing in some of their detail and ornament a strong resemblance to work of a similar kind in South Somerset. Not far north are the remains of the Abbey of Cerne, while within a few miles south is the charming chapel at Abbotsbury and the picturesque, though scanty, traces of the abbey. The page illustrations are chiefly from photographs; the illustrations in the text are not, however, up to the standard of excellence reached in many of the volumes of the series; that of the gateway of Cerne Abbey is particularly poor. To the majority of visitors the picturesque neighbourhood will recall the works of Mr. Thomas Hardy, whose early training as an architect doubtless has had no slight influence on his vivid descriptions of the buildings and places in his "Wessex" novels. He has written a "foreword" to this guide, and has revised a list of places of interest mentioned in his works.

Dorking and Leatherhead. By JOSEPH E. MORRIS. B.A. London: The Homeland Association; 1906.

THIS is one of the Homeland Handbooks, in this case constituting a guide for the cyclist or pedestrian (if there are any of the latter tribe left—we know of one at all events) through one of the most beautiful districts with easy reach of London; a part of Surrey where one finds beauties wherever one turns. Mr. Morris has done his work very well, giving a fund of information about local history and associations which serve to add to the interest of the district, and the book is accompanied by a detailed map reprinted by permission from the inch-to-a-mile Ordnance map, and which gives of course the by-roads and lanes as well as the main roads. Dorking is taken as the centre point of the map, which includes the country for six or seven miles east and west of it.

A History of Westmoreland. By R. S. FERGUSON. (Cheap Edition.) London: Elliot Stock, 1905.

WE are glad to welcome a second and cheap edition of the late Chancellor Ferguson's popular history of Westmoreland. We considered it one of the best of Mr. Stock's series when first issued, and it is pleasant to think that there is sufficient demand for so accurate and interesting a work to justify its republication. One of the most interesting sections is that which deals with the Jacobite outbreaks of 1715 and 1745. In the concluding chapter there are many admirable observations on the domestic architecture of Westmoreland, which was so largely influenced by the circumstances under which the inhabitants lived, for they were continually exposed to raids and forays from the North. The kernel of many an old farmhouse, both in Westmoreland and Cumberland, is the lower story of a "peel tower," round which the rest of the buildings gradually gathered.

BOOKS RECEIVED.

BRITISH CANALS: IS THEIR RESUSCITATION PRACTICABLE? By Edwin A. Pratt. (John Murray. 2s. 6d.)

CONCRETE-BLOCK MANUFACTURE. By Harmon Howard Rice. (Chapman & Hall.)

CLASS ILLUSTRATIONS FOR THE STUDY OF ARCHITECTURAL HISTORY. (FOUR SERIES OF PLATES.) By Banister F. Fletcher. (B. T. Batsford. 15s. 6d.)

CORRECTION.—In our last issue, on page 623, under the heading "Miscellaneous," we printed a paragraph stating that the new War Office building, Whitehall, is heated by apparatus patented and supplied by the Brightside Foundry and Engineering Company, Ltd., Sheffield. It appears that this is incorrect, and that the system which has been carried out is that of the Atmospheric Steam Heating Company, Ltd., Gray's Inn-road, London, W.C. The Brightside Foundry and Engineering Company, Ltd., installed the system under the Atmospheric Steam Heating Company's licence.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XXII.

THE SLIDE-RULE IN TECHNICAL CALCULATIONS (continued).

Division.

IN Article XIX, the method of performing division by means of scales C and D was explained sufficiently, but no reference was then made to the upper scales of the slide-rule.

Scales A and B.—When scales A and B are employed for division, the rule for finding the number of digits in the quotient is different from that to be observed in connexion with scales C and D.

Rule (1).—Moving the slide towards the right, if the process of division can be completely performed on the left-hand portion of scale A, the quotient read on the same scale above the left-hand index of B will contain one more digit than the difference between the number of digits in the dividend and divisor respectively. But if the process involves the use of both portions of scale A, the number of digits in the quotient is the same as the difference between the number of digits in the dividend and the divisor respectively.

This rule can be applied to decimal fractions as well as to whole numbers by taking the number of digits in any decimal fraction as 0, or a minus quantity, according to the number of ciphers immediately following the decimal point.

Inverted Slide.—As in the case of multiplication, the inversion of the slide makes it necessary to reverse the ordinary method of procedure. Consequently the process of division must be conducted like multiplication, otherwise the results would be products instead of quotients, because—as explained in Article XXI—the factors on scales B and C of the slide are automatically converted into the reciprocals of the numbers represented by the values on scales when the slide is used in normal position.

The rules for the number of digits in the quotient are the converse of those adopted with the slide in normal position (see Rules (7) and (8), Article XIX.).

Example (1): Divide 48 by 3.

Set the R.H. index of C¹ opposite 48 on D, and read 16 on D below 3 on C¹.

The difference between the number of digits in the dividend and divisor is (2-1) = 1, and as the slide projects to the left, the number of digits in the quotient, by the converse of Rule (8), Article XIX., is (1+1) = 2. So the required quotient reads 16.

Successive Multiplication and Division.

Many of the calculations necessary in architectural and engineering practice involve the resolution of expressions stated in fractional form, the numerator and denominator each having several terms.

Example (2): Find the value of *x* in the equation

$$x = \frac{2.5 \times 48 \times 15 \times 180}{3.15 \times 1.1 \times 7.8 \times 32}$$

Here we do not multiply together all the terms of the numerator and all the terms of the denominator, and then divide the latter into the former. This would waste time and lead to inaccuracy, as two unnecessary readings and one unnecessary setting would be required, each offering an opening for error.

The proper method is to proceed by alternate division and multiplication, taking the terms in order from beginning to end of the expression as follows:—

(1) Set 315 on C to 2.5 on D, bring the cursor to 48 on C; (2) set 12 on C to the cursor, bring the cursor to 15 on C; (3) set 7.8 on C to the cursor, bring the cursor to 180 on C; (4) set 32 on C to the cursor and read the result 343 on D below the R.H. index of C.

The number of digits in the numerator, less the number of digits in the denominator, by Rules (5) to (8), Article XIX., is (1 + 2 + 2 + 3) - (1 + 2 + 1 + 2) = 2, and as the slide only projects to the right once in multiplication (2), and once in division (3), the deduction of one digit for the former and the addition of one digit for the latter leaves two digits in the result.

Therefore, the value of *x* = 34.3, which is very close to the exact value 34.3406, and as the entire computation can be performed by the slide-rule in less than sixty seconds, the practical utility of the instrument is very clearly demonstrated.

A very convenient way of registering the effect of division with the slide projecting to the right, is to make the sign | (= plus) every time this happens, and to make the sign — (= minus) every time multiplication is performed with the slide to the right, superimposing one sign over another when signs of opposite signification are necessary.

Thus, if we have three operations of division with the slide projecting to the right and two of multiplication with the slide in the same position, the signs || | — — would be written — + +, the first two pairs being regarded as cancelled and | sign as remaining to indicate that one digit must be added to the difference between the number of digits in the numerator and denominator respectively.

Involution and Evolution.

Squares.—As explained in Article XIX., the square of any number on scale D can be found immediately above it on scale A, the cursor being used to assist the eye in reading the value.

In dealing with squares it must be remembered that, if the left-hand portion of scale A is considered as representing numbers commencing at 1, the right-hand portion really represents numbers commencing at 10, and the two portions must not be regarded as two separate and equivalent scales.

Reference to Fig. 16 will make clear the reason for this reminder. If the two portions of scale A were equivalent, we should have 2² = 4 on the left-hand part of A, and 6.325² = 4 on the right-hand part. But, reading the right-hand half of scale A as the continuation of the left-hand half, the first 4 stands for 4 units and the second 4 for 40 units.

It should now be noted (1) that the square of every whole or mixed number from 1 up to, but not including, √10, comprises one digit only, or one digit fewer than twice the number of digits in the number itself; and (2) that the square of every whole or mixed number from √10 up to, but not including, √100, contains twice the number of digits in the original number.

As √10 = 3.162 occurs in the middle of scale D, we are able to deduce the following rule:—

Rule (2).—Every square of a whole number or mixed number read on the left-hand portion of scale A contains, to the left of the decimal point, one digit fewer than twice the number of digits in the number itself, and every square read on the right-hand portion of scale A contains twice the number of digits in the number itself.

This rule applies equally when, for the purposes of computation, the figures and divisions on the two parts of the scale are regarded as having been multiplied by any positive power of 10, but, as shown in the subjoined table, *even* powers must be applied to the left-hand portion, and *odd* powers to the right-hand portion.

TABLE XVII.—POSITION OF THE MULTIPLES OF NUMBERS ON UPPER SCALES OF SLIDE-RULE.

Power.	L. H. Portion Reads.	Power.	R. H. Portion Reads.
10 ⁰	1 to 9	10 ¹	10 to 99
10 ²	100 to 999	10 ²	1,000 to 9,999
10 ³	10,000 to 99,999	10 ³	100,000 to 999,999
10 ⁴	1,000,000 to 9,999,999	10 ⁴	10,000,000 to 99,999,999

In dealing with decimals, Rule (2) requires modification as follows:—

Rule (3).—Every square of a decimal fraction read on the left-hand portion of scale A contains, to the right of the decimal point, one cipher more than twice the number of ciphers to the right of the decimal point in the fraction itself, and every square of a decimal fraction read on the right-hand portion of scale A contains twice the number of ciphers to the right of the decimal point in the fraction itself.

This rule applies equally when the figures and divisions on scale A are regarded as having been multiplied by any negative power of

10 as shown below, *even* powers being applied to the left-hand portion, and *odd* powers to the right-hand portion, as before.

TABLE XVIII.—POSITION OF SUB-MULTIPLES OF NUMBERS ON UPPER SCALES OF SLIDE-RULE.

Power.	L. H. Portion Reads.		Power.	R. H. Portion Reads.	
	to 9+	to 9+		to 9+	to 9+
10 ⁰	1	to 9+	10 ¹	10	to 99+
10 ¹	10	to 99+	10 ²	100	to 999+
10 ²	100	to 999+	10 ³	1000	to 9999+
10 ³	1000	to 9999+	10 ⁴	10000	to 99999+

Example (3): Find the square of 245.

Set the cursor to 245 on D, and as the coincident number 6 is found on the left-hand portion of A, the number of digits in the square by Rule (2) is $(3 \times 2) - 1 = 5$, and the result is taken at 60,000. The exact square = 60,025 will be obtained if we add the square of the last figure.

Example (4): Find the square of 775.

Set the cursor to 775 on D, and as the coincident number 6 is found on the right-hand portion of A, the number of figures in the square by Rule (2) is $(3 \times 2) = 6$, and the result may be taken at 600,000, which is very near 600,625 the exact square.

Example (5): Find the square of 0.01845.

Set the cursor to 1845 on D and read 34 on A. As the reading is made on the left-hand portion of A, the number of ciphers by Rule (3) is $(1 \times 2) + 1 = 3$, and the square is taken at 0.00034. This is very close to 0.0003404025, the exact square.

Example (6): Find the square of 0.00583.

Set the cursor to 583 on D, and read 34 on A. As the reading is made on the right-hand portion of A, the number of ciphers by Rule (3) is $(2 \times 2) = 4$ and the square may be taken at 0.000034, the exact square being 0.0000339889.

The squares of numbers can be found by multiplication in the ordinary manner, a method by which results may be obtained on scale D somewhat more accurately than by direct reference to scale A, as described above.

Square Root.—The operation of extracting a square root is simply a reversal of the process adopted in finding the square of a number.

Consequently, we have the following rules for whole or mixed numbers and decimal fractions.

Rule (4).—For a given whole number or mixed number on the left-hand portion of scale A, the number of digits to the left of the decimal point in the square root equals half the number of digits contained in the given number plus one, and for a given number on the right-hand portion of scale A the square root contains, to the left of the decimal point, half the number of digits contained in the given number.

Rule (5).—For a given decimal fraction on the left-hand portion of scale A the number of ciphers before the first significant figure equals one fewer than half the number of ciphers to the right of the decimal point contained in the given fraction minus one, and for a given decimal fraction on the right-hand portion of scale A the square root contains half the number of ciphers before the first significant figure to the right of the decimal point contained in the given fraction.

The next thing wanted is a rule showing whether any given number whose square root is required must be read in the first instance on the left-hand portion or the right-hand portion of scale A.

Reference to Tables XVII. and XVIII. above shows (1) that numbers and fractions on the left-hand portion of scale A must contain an *odd* number of digits, or an *odd* number of ciphers to the right of the decimal point, and (2) that numbers and fractions on the right-hand portion of scale A must contain an *even* number of digits, or an *even* number of ciphers to the right of the decimal point.

Example (7): Find the square root of 625.

As the integer of this number contains an odd number of digits, it must be taken on the left-hand portion of A; the significant figures of the square root being indicated by the cursor as 25. Then, by Rule (4), the number of digits is $(1 + 1) \div 2 = 1$, and the square root reads 25, which is the exact root.

Example (8): Find the square root of 62.5.

As the integer of this number contains an even number of digits, it must be taken on the right-hand portion of A, the significant figures of its square root being indicated by the cursor as 7.9. Then, by Rule (4), the number of digits is $(2 \div 2) = 1$, and the square root reads 7.9, the exact value being 7.90569415.

Example (9): Find the square root of 0.0001696.

As this fraction has an odd number of ciphers immediately after the decimal point, it must be taken on the left-hand portion of A, the significant figures of the square root being 13. Then, by Rule (5), the number of ciphers is $(3 - 1) \div 2 = 1$ cipher, and the square root reads 0.013, the value to nine places of decimals being 0.013023056.

Example (10): Find the square root of 0.00006649.

Setting the cursor to 6649 on the right-hand portion of A, we find 815 on D, and, by Rule (5), the number of ciphers is $(4 - 2) = 2$. Hence the required square root reads 0.00815, which is correct as far as it goes.

Example (11): Find the value of the expression

$$\sqrt{\frac{1660 \times 75}{154}} = 90$$

This example shows the importance attaching to the rule that numbers containing an *odd* number of digits are to be taken on the left-hand, and numbers containing an *even* number of digits on the right-hand of scale A. Following this rule we set 154 on B, opposite to 1660 on A, and bring the cursor to 75 on B, reading 810 on A, and $\sqrt{8100} = 90$ on D.

If the left-hand and right-hand portions of A and B were used haphazardly, we might have got results equivalent to

$$\sqrt{\frac{1660 \times 75}{154}} = 28.4$$

or

$$\sqrt{\frac{166 \times 75}{154}} = 2.84$$

A more accurate method of finding square roots is to use scales C' and D.

It must be noted, however, that for numbers containing an *odd* number of digits, the right-hand index of C', and for numbers containing an *even* number of digits, the left-hand index of C' is to be employed.

The mode of procedure is:—Set the proper index of C' opposite the number on D whose square root is required, and by the aid of the cursor find two numbers on scales C' and D which are opposite each other. The value so indicated represents the significant figures of the required root.

Example (12): Find the square root of 62.5.

Set the left-hand index of C' to 62.5 on D, and it will be seen that the coincident numbers on C' and D are about 7.905, the correct value being 7.90569415.

Fifty Years Ago.

FROM THE *Builder* OF JUNE 7, 1856.

PUTNEY BRIDGES.

THE conservance of the Thames is supposed to be in the Corporation of London, which enjoys an arbitrary rule from Gravesend to Staines. Its conservance concerns every citizen, since on free navigation and proper regulation depends much of our commercial prosperity, as well as the health of the inhabitants. Some wants may be difficult to supply; there is, however, one very simple matter that comes under their jurisdiction, and that is the due allocation of bridges—first, that the design is a good one; next, that the position is right; and lastly, that it obstructs no way: yet it would seem that little, if any, attention has ever been paid to these things, much as they concern the free intercourse both on the land and water.

Old Putney Bridge has long been the standing reproach of our *pontifical* corporation: it is a sort of mole to obstruct navigation, a relique of antiquity little adapted to vessels and boats such as now navigate the Thames: being about 700 ft. long, it has no fewer than twenty-five pile buttresses, between most of which there is but 15 ft. of space. Scarce a beam of its structure but has been drawn

and replaced so often, that it is all at jars: still, being the property of a private company, the patchwork is kept together so as to pay a dividend, the directory making it a point to discourage traffic on the Lord's day by charging *double tolls!* That is, however, their affair. Railways find that it pays better to encourage the multitude by charging *less on Sunday.*

Another bridge has been lately constructed close to the old one, but diverging from it at an angle of 10 deg.: it is built on the new principle of the tube, with buttresses of concrete compacted in iron cylinders, having four columns on each pier: the design might have been handsome, and, at a comparatively small increased expense, it would have served the purpose of an aqueduct, a footway, and also a carriage-way; yet this bridge *obscures the view of the river, and the aspect of the hamlets of both Fulham and Putney, is dedicated solely to the object of an aqueduct!* The steamers plying up or down had formerly difficulty enough to steer clear of the buttress beams: they have now another breaker ahead in the aqueduct piers. Having cleared Scylla, Charybdis is at hand: there is scarce room in the old bridge waterway for a Richmond boat—our little skiff, on steaming up, hugged close on the timber: then stopped and sidled through.

What on earth were the corporation about when they tolerated the erection of a second bridge alongside the old one? What were the proprietors of crank shares in Old Putney Bridge dreaming of, when they omitted, or forgot, or refused to agree with the water company, to erect a more solid and more permanent structure, that *might have served for all purposes?*

Illustrations.

FRONT OF THE PICCADILLY HOTEL.

THIS is a reproduction from the drawing exhibited in the Royal Academy and described at some length in our last notice of "Architecture at the Royal Academy."

The full title on the plate, which is as written out by Mr. Norman Shaw, explains the position. The plan and construction of the hotel are being carried out by Mr. W. Woodward and Mr. Walter Emden, but the Office of Woods, the ground landlords, required that the exterior architectural design should be furnished by Mr. Norman Shaw, as in the case also of the new elevation to Regent's Quadrant. We should, however, have given the plan of the hotel, but there were difficulties in the way of getting a plan prepared in time, the one first sent by the architects not having been in a form which could be suitably reproduced.

The set back of the building above the second story, with the open colonnade across it, which is the finest feature in the design, is a fortunate substitution, by Mr. Shaw's desire, for a lofty street front with a well behind which was, we understand, first intended.

The line of frontage next Piccadilly will be set back so as to give a width of 80 ft. to Piccadilly. The building internally consists of a sub-basement, with Turkish baths, etc.; a basement; a mezzanine between the basement and the ground floor, and the various stories above shown on Mr. Norman Shaw's elevation.

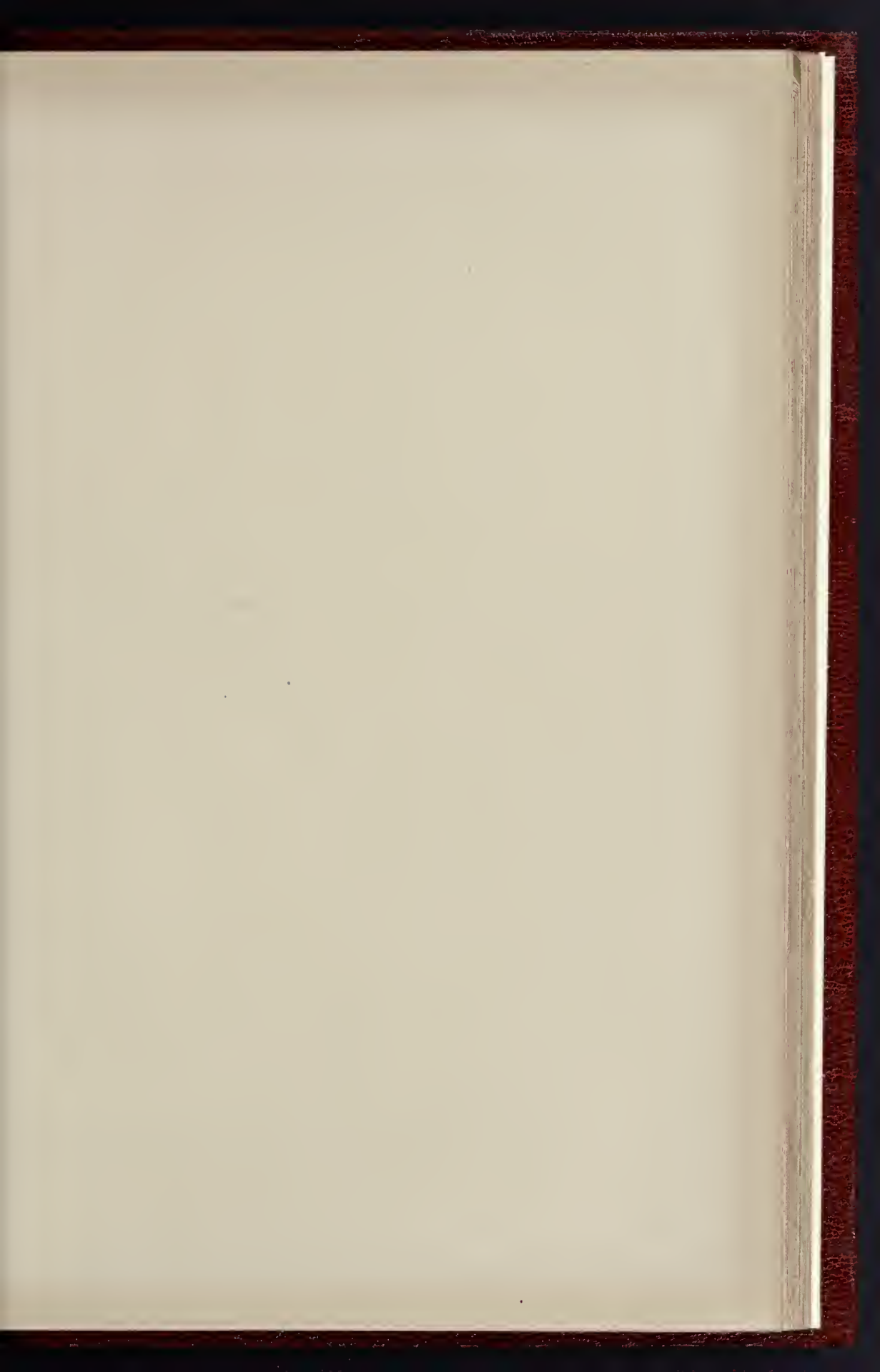
The shape of the site has made it an awkward one to deal with, but the difficulties have, as far as possible, been overcome. The exterior result will be, as we have already said, an exceedingly fine addition to the architectural ensemble of Piccadilly.

DESIGN FOR THE PEACE PALACE AT THE HAGUE.

The illustration shows the principal elevation and two plans of the design for the Peace Palace sent by Mr. John Belcher, A.R.A.

The object kept in view in the design was to produce a dignified effect by uniting the two parts of the building, which were to be kept entirely distinct in their functions, by means of a large central ball and dome.

The administrative offices are on the first floor next the façade, and the large and small Courts of Justice, with their corridors, etc., balance the library on the other side.



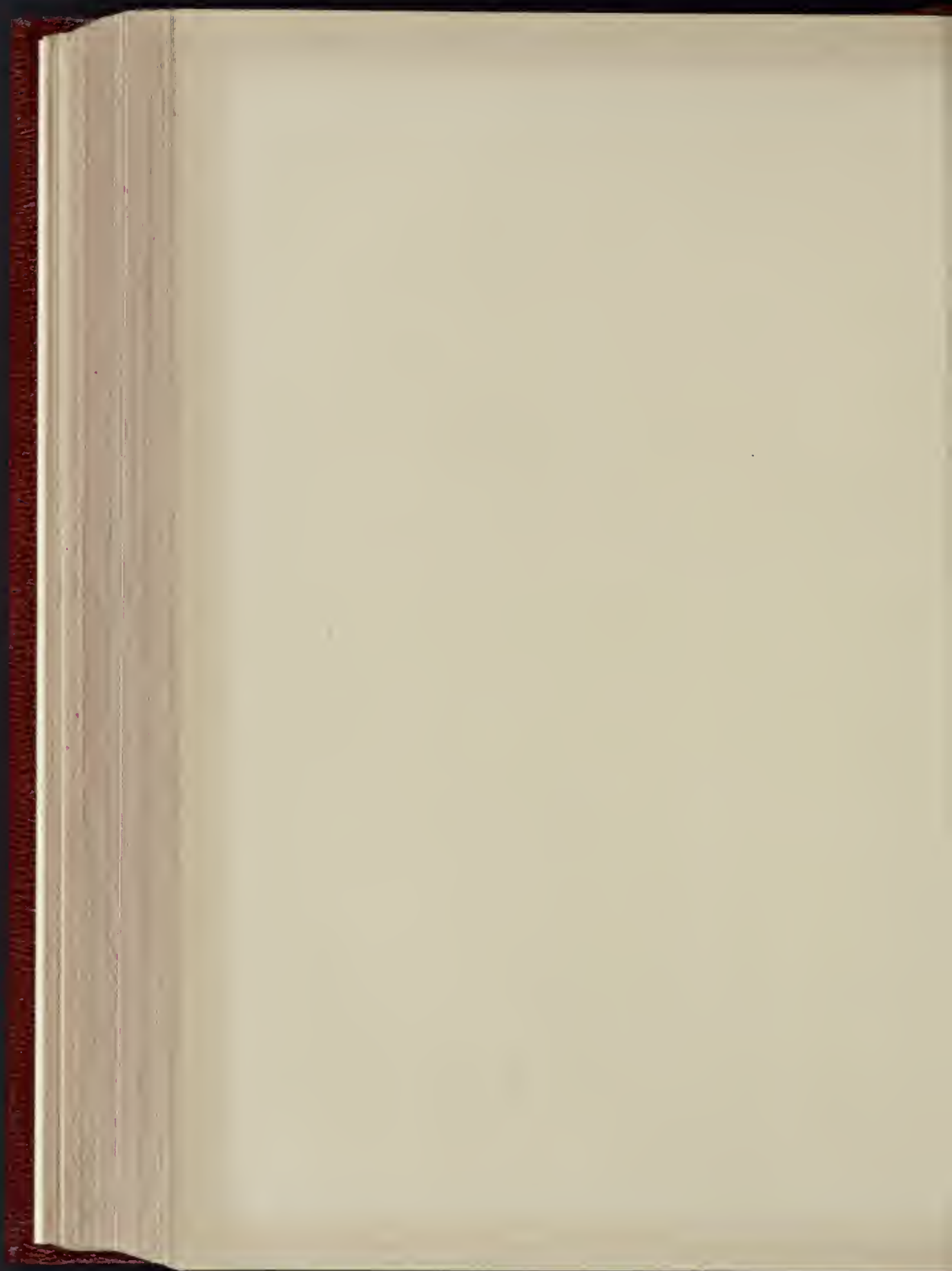


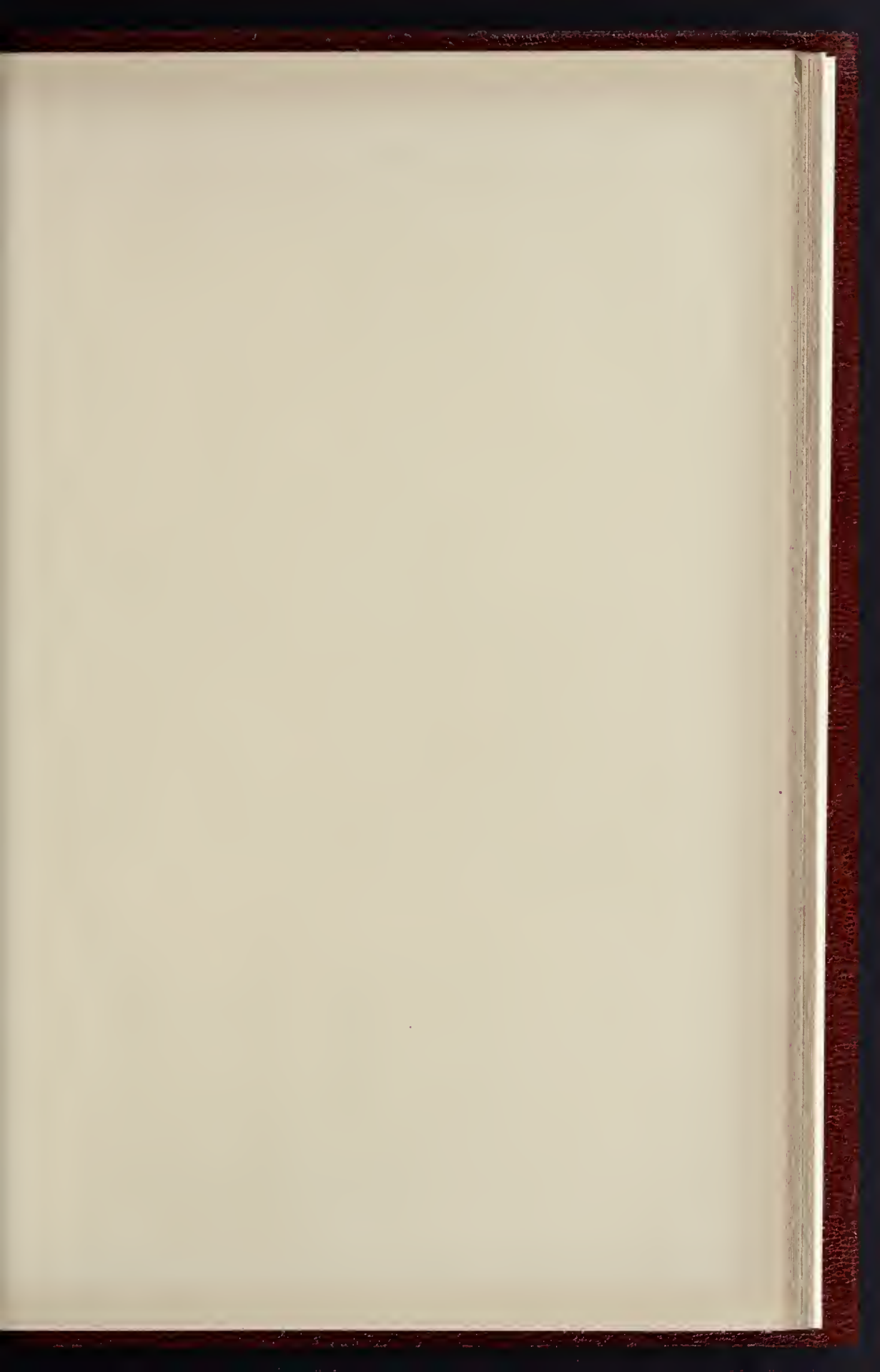
FRONT OF THE PICCADILLY HOTEL—NOW BUILDING FROM
FROM DESIGNS PREPARED FOR THE OFFICE



INK PHOTO GRAPHIC - C. L. & A. S. EAST HARTING STREET FETTER LANE, E.C.

BY MESSRS. WM. WOODWARD, F.R.I.B.A., AND WALTER EMDEN
MODELS BY MR. R. NORMAN SHAW, R.A.







FACADE

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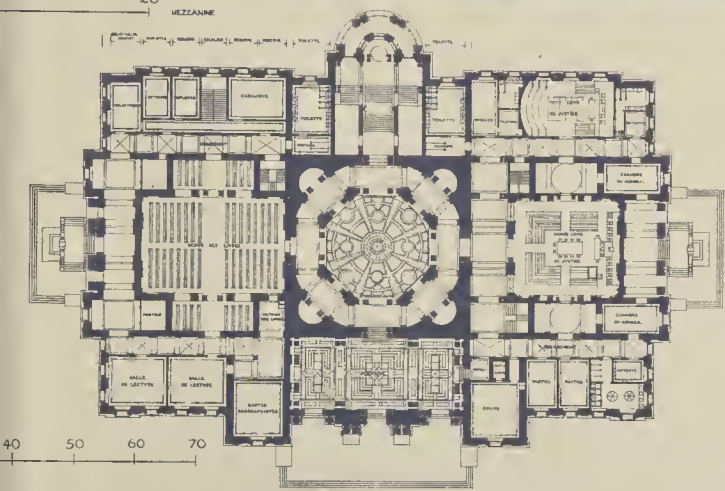


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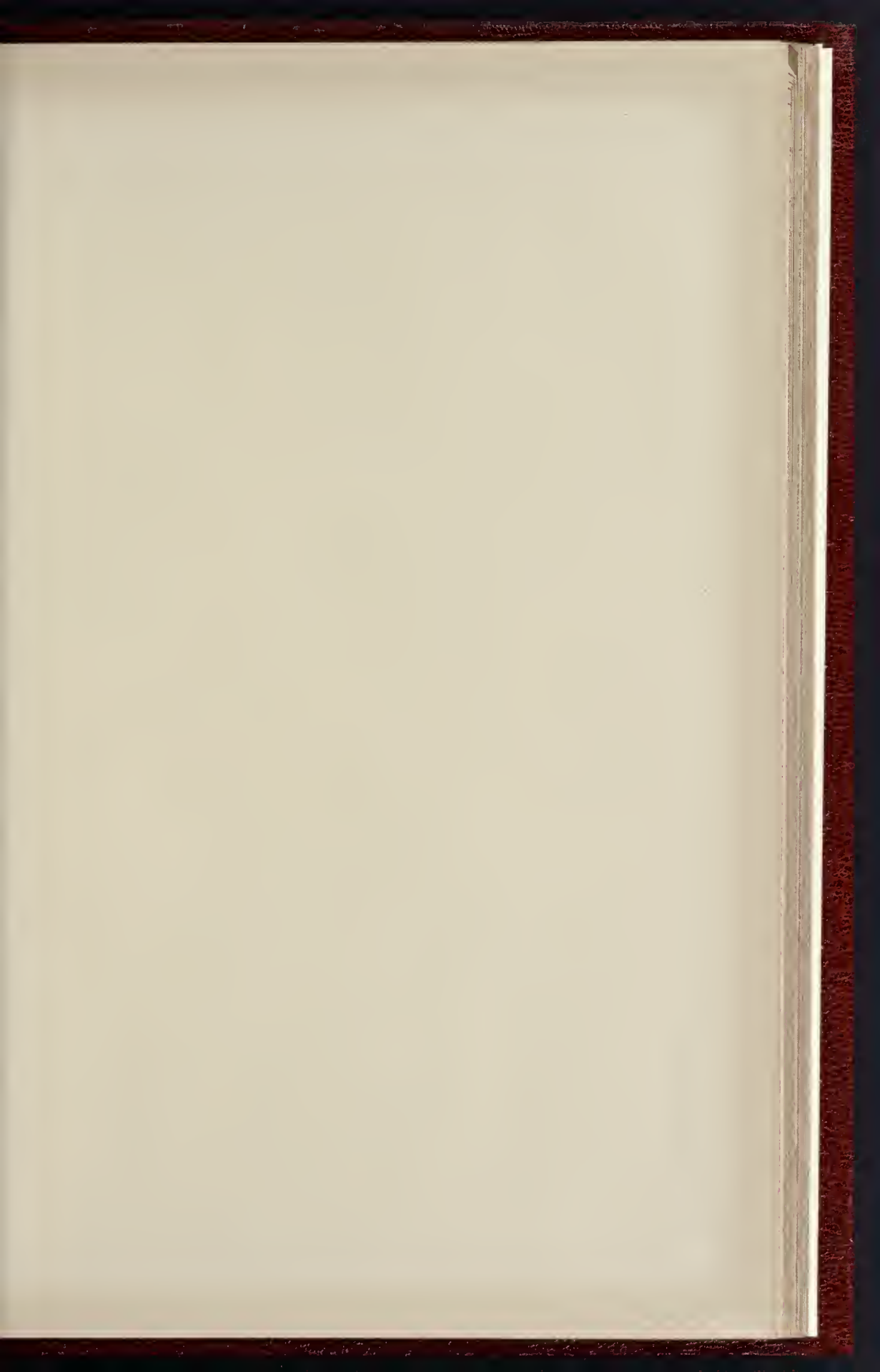


PRINCIPALE

20
MEZZANINE



N. PHOTO SPRACLE & C. L. 4 R. S. EAST HARDING STREET PETER LANE E. C.



THE BUILDER, JUNE 9, 1906

DETAIL OF MOSAIC
PAVEMENT · CASA DEL · CINGALE ·
POMPEII

APRIL 1904.



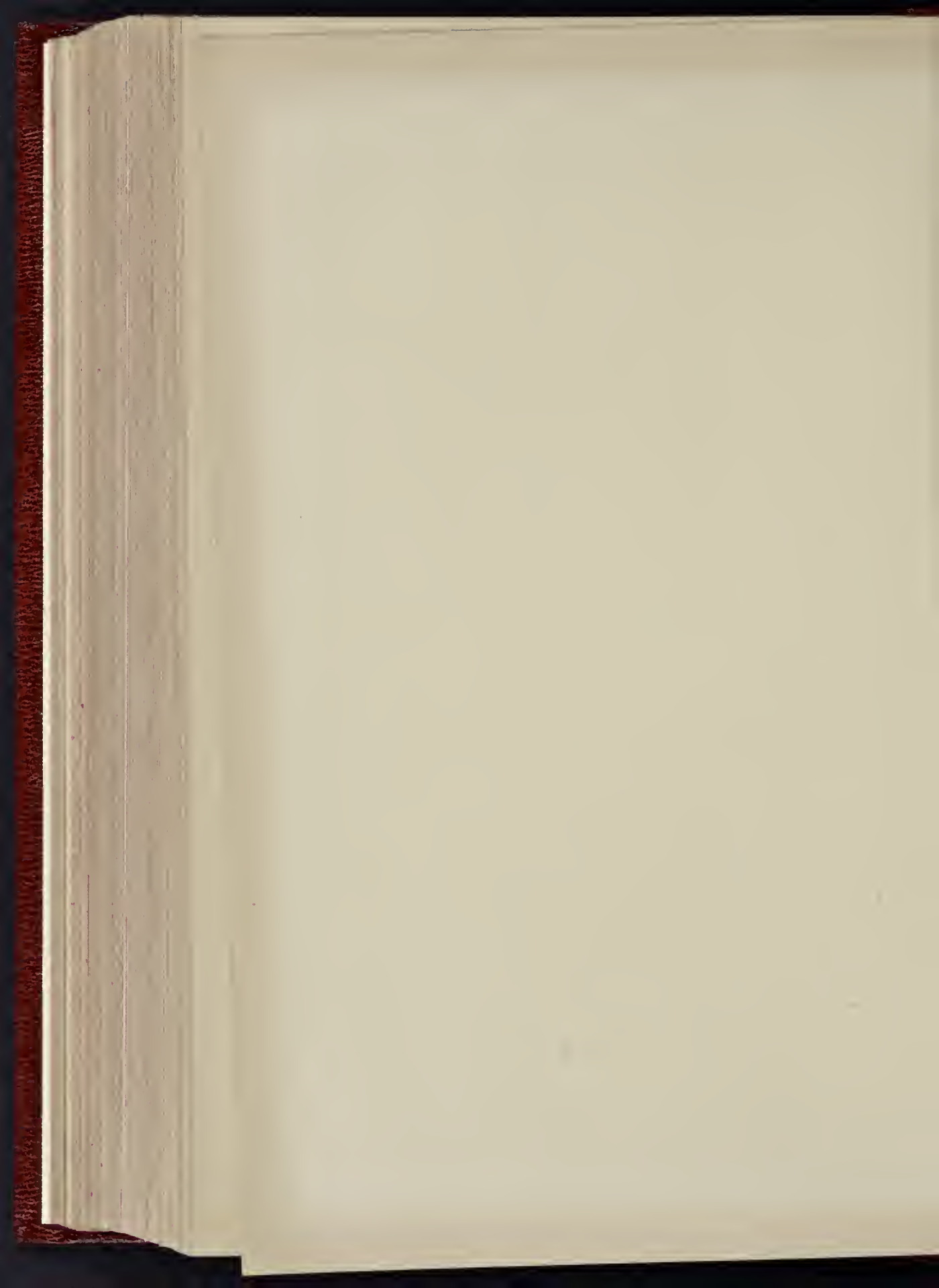
James H. Stiles '1904'

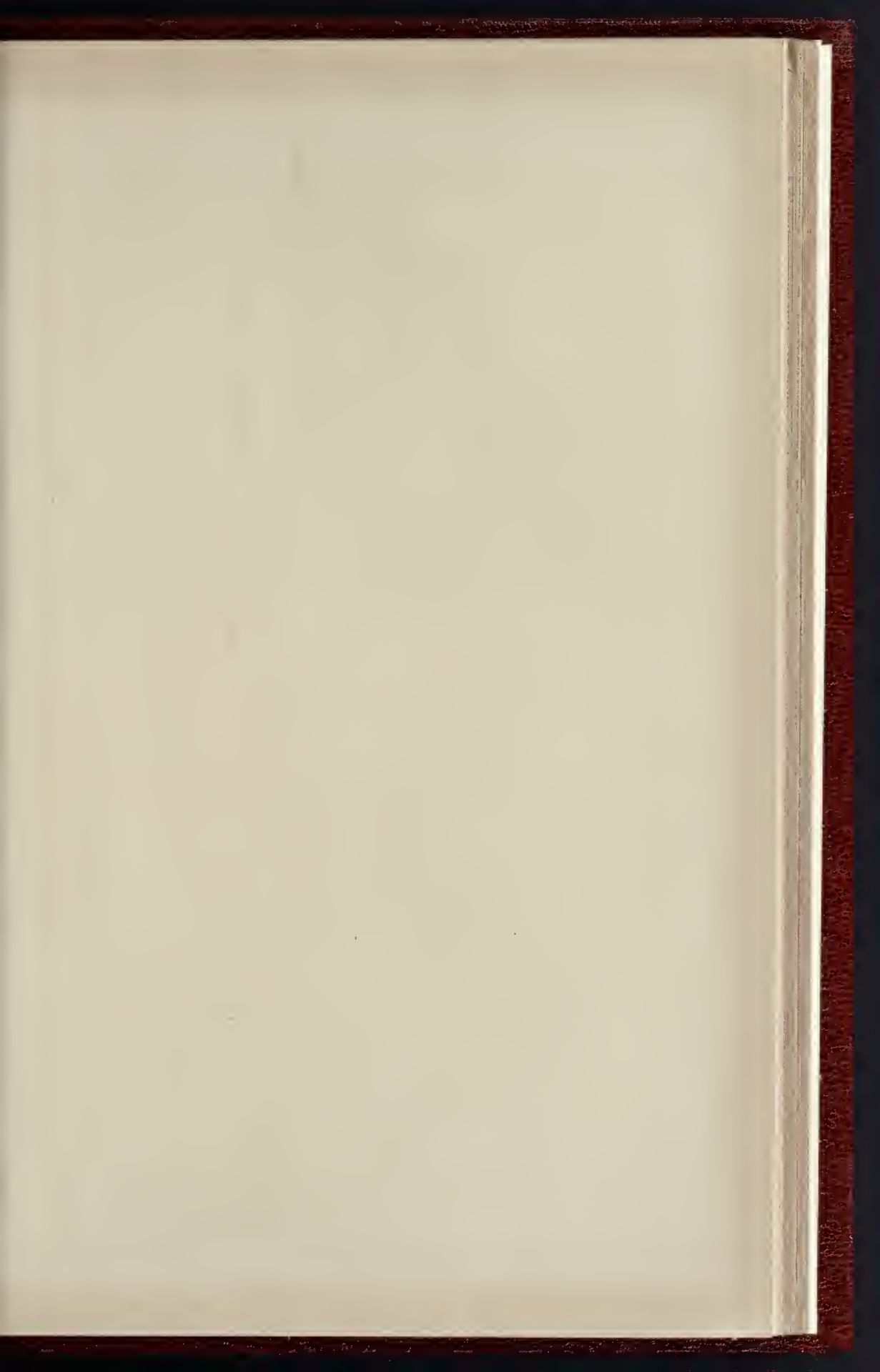


Lionel C. Grace,

INK PHOTO SPRAGUE & CO. LTD. LONDON

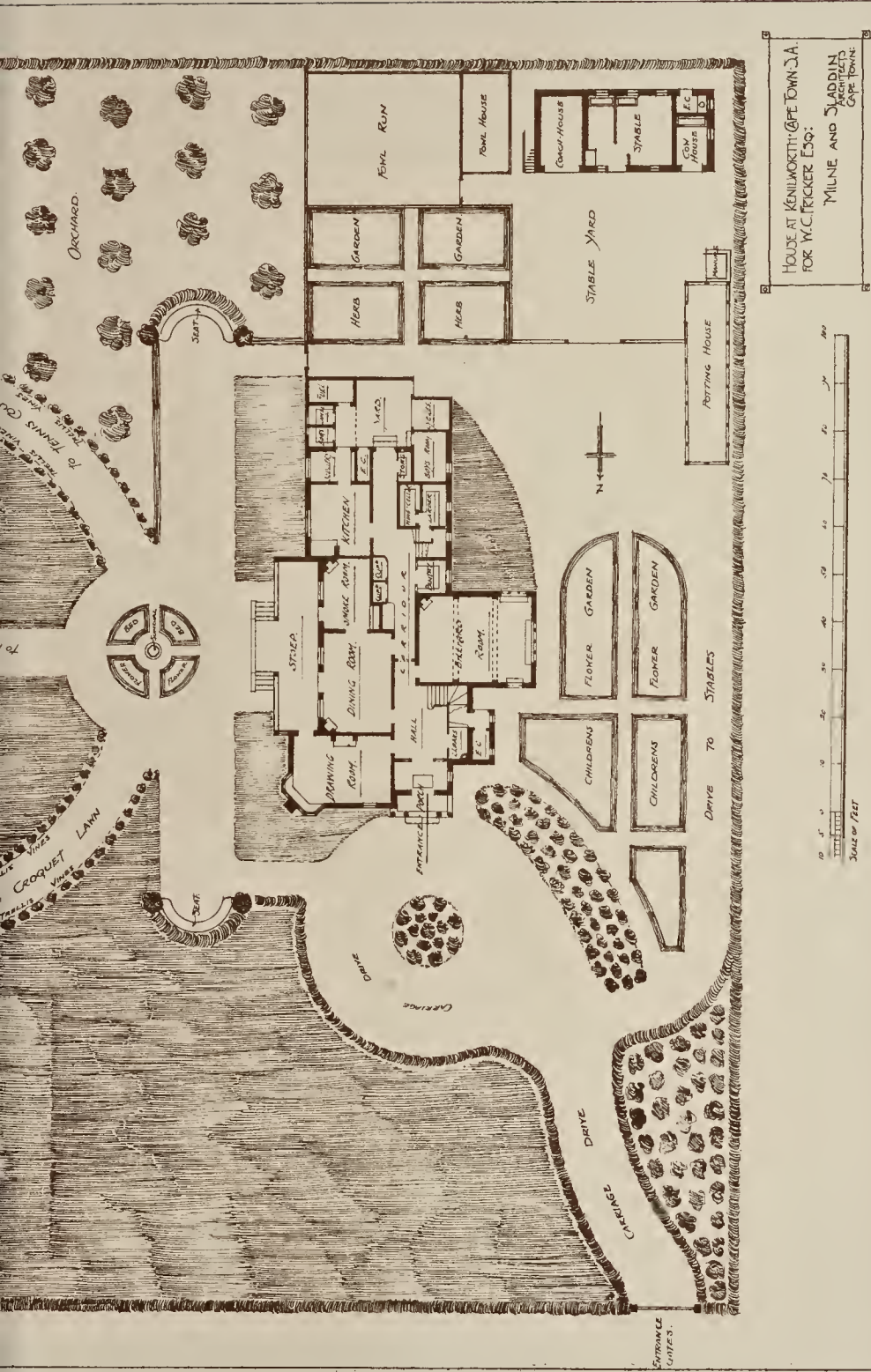
**MOSAIQUE PAIEMENT IN VESTIBULE
CASA DEL CINGALE POMPETII**





THE BUILDER, JUNE 9, 1906





HOUSE AT KENILWORTH, CAPE TOWN, S.A.
FOR W.C. TRICKER ESQ.
MILNE AND SLADDIN
ARCHITECTS
CAPE TOWN.



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HOUSE NEAR CAPE TOWN, SOUTH AFRICA.—MESSRS. MILNE & SLADDIN, ARCHITECTS.

HOUSE NEAR CAPE TOWN.

This is an illustration of a house in South Africa built by English architects, Messrs. Milne & Sladdin, practising in Cape Town.

As far as general character is concerned the house might be English, but the influence of climatic conditions will be seen in the plan, where the drawing-room, with its comparatively small windows, faces north and east, instead of south and west as it probably would be placed in a house on English soil.

Some consideration has been given to the laying out and arrangement of the garden, but the photograph was evidently taken before the garden had been cleaned off and finished.

MOSAIC FLOOR, POMPEII.

This floor, which is illustrated from measured drawings by Mr. Lionel U. Grace, is in the Fauces of the house at Pompeii now called, in consequence of this floor, the "Casa del Cignale" ("House of the Boar").

The mosaic is executed in slate-coloured marble on a cream-coloured ground. The figure of the boar is given to larger scale, in addition to the general design.

Trade Catalogues.

MESSRS. A. RANSOME & Co., of Newark-on-Trent and London, send us a copy of their 1906 general catalogue of wood-working machinery, which includes detailed particulars and numerous photographic blocks and woodcuts illustrating an immense variety of machinery and auxiliary appliances, not only for the forestry, sawmill, and general wood-working industries, but also for railway carriage and wagon builders, shipbuilders, wheelwrights, box and packing-case makers, and others. Owing to the dimensions attained by the general catalogue, particulars and illustrations of coeprage machinery and sawmill accessories are issued in separate form. In this brief paragraph we cannot attempt to mention even the chief types of machinery illustrated, and must content ourselves by referring readers to the volume itself for particulars.

We have received from "Vulcanite, Ltd.," a pamphlet containing views of many large buildings which have been roofed with their material, showing that it is coming into extensive use among architects. The illustrations of some roof gardens, and of two or three large buildings which hold tanks or ponds of water on roofs waterproofed with vulcanite, are striking proofs of its reliability in this respect.

We have received from "Simbury Decorations" a large book of illustrations of Lin-crusta Walton decorative ceilings and wall coverings, which can be made in almost any colour, and afford an opportunity for a rich decorative covering. Some of the designs we have seen before; their general character in regard to design is exceedingly good, and there is nothing that is in bad taste. "Cameoid," which forms another feature in the book, appears to be an application of the same type of design for friezes and ceilings in high relief, the Lin-crusta-Walton work being in low relief. Among these there are some very fine floral designs for friezes; we may mention especially those named "Italian," "Glenalmond," "Romola," and the two scroll designs under. There are some effective ceilings also in Cameoid.

Mr. Percy Pitman, of Ledbury, sends us some circulars relative to his specialties. One of these is a form of Pelton waterwheel having a new pattern variable discharging nozzle which is said to effect a great saving in the quantity of water consumed, and when the apparatus is fitted with a governor it is claimed that the speed variation under sudden changes of load does not exceed two per cent. The Hector water-motor, for duties

from 4th h.p. to 24 h.p., is described on another sheet, this being a neat and serviceable-looking machine for domestic purposes. The Hector water-motor and dynamo constitutes a compact direct-coupled generating set for charging accumulators. It can be operated with water from the ordinary domestic supply or from hydraulic power mains, and is made in a standard stock size measuring only 12 in. long by 9½ in. wide by 7 in. high, with an output of 50 watts.

Correspondence.

"LIVE AND LET LIVE."

Sir,—The subject matter in Mr. Mayston's letter in the *Builder* of June 2 touches many architects nowadays very forcibly and unpleasantly; indeed, there are few of us who are not in one way or another deprived of the means of reasonable existence by methods that seem very far removed from the opening precept of these remarks. Let the trade element by all means adhere to its own business, but let it free itself from the guilt of encroaching on the domain of other people; it is pretty well known that the brains that produce the "art" fostered by such firms are, even if fairly remunerated, rarely given the credit, which goes to the "firm" only.

It appears from the daily papers still to be immoral to rob from the person, but quite reasonable to rob a railway or a bank, or to absorb the profits made by brains which one strives to live. Our good name seems to be of no importance whatever. I noticed a case recently where, after competition, the work of the winner was used as a medium for the personal profit and gratulation of an official who may have improved, or otherwise, on the work of the competitor, but who probably thinks himself worthy of the credit to himself. In our intense love of our art we seem too ready to give away our talents to those whose only appreciation of them is a financial one to their own benefit.

We are told that the non-employment of the "working classes" is a serious matter. Why not of the "professional classes" also? They bear at least an equal share in the burdens of the State, and are certainly not idlers.

The only remedies for such untoward conditions are to pray for a public with some greater sense of the proportion of things in giving honourable employment to those who deserve it; and to apply the laws of copyright to ourselves, as musical composers and publishers are urged to do. With unity of our forces this should not be an impossibility. If these remedies fail there seems nothing left for us but to follow the example of the proverbial rat, who is said to "leave the sinking ship." May we all be spared from such a *pis aller!*

E. SWINFEN HARRIS, F.R.I.B.A.

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday last week, Alderman Sir Alfred James Newton presiding, in the absence of the Lord Mayor.

Renovation of Artisans' Dwellings.—The Improvements and Finance Committee recommended that the Artisans' Dwellings in Stone-lane, Houndsditch, should be repaired and repainted at an estimated cost of 2,200l.—The Court agreed.

Proposed Enlargement of the Cleansing Depot.—The Streets Committee reported on the question of providing accommodation at the depot in Upper Thames-street for the Superintendent and Assistant Superintendent of Cleansing, and submitted for approval sketch plans for providing house accommodation above the Gravel Store No. 80, Upper Thames-street, at an estimated cost of 1,050l., including the cost of alterations and repairs necessary to the rooms over the Depot No. 82, Upper Thames-street.

Paving Works.—In consequence of the alterations recently made to the pavements of Cater-street, Houndsditch, the same committee recommended that the existing contracts with the Limer Asphalt Company for maintaining the cartway, and the French Asphalt Company for maintaining the footways of this thoroughfare, should be cancelled, and that fresh tenders should be obtained for paving the widened thoroughfare, at an estimated cost of about 460l., exclusive of the cost of altering any mains, etc., that it may be found necessary to divert.—This was agreed to.

Delegates for the Sanitary Institute Congress.—Mr. H. F. Hepburn, Chairman of the Sanitary Committee, Mr. R. W. Edwards, and the Medical Officer of Health (Dr. Wm. Collingridge), were appointed delegates to represent the Corporation as the sanitary authority for the City of London at the Congress of the Royal Sanitary Institute, to be held at Bristol in July next.

City of London School for Girls.—The City of London Schools Committee were authorised to

expend on structural alterations to the school building and improved equipment of this school, the balance in hand on the construction account, viz., 869l. 16s. 6d., and to draw on the interest funds a sum not exceeding 358l.; and further to expend, out of the City's cash, a sum not exceeding 100l. on repairs to the interior.

WESTMINSTER CITY COUNCIL.

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

Ebury Bridge Depot and Grosvenor Canal Property.—The Highways Committee submitted a report dealing with the acquisition of this property, stating that they had received a letter from Messrs. Boodle, Hatfield, & Co., to the effect that the Duke of Westminster had accepted the Council's offer of 95,000l. for the purchase of the Grosvenor Canal and the land adjoining; that the withdrawal of the restrictions on the use of the mortuary at Ebury Bridge forms no part of the provisional agreement, but could be arranged, provided a covenant was given not to erect a mortuary or use any existing building for that purpose on the frontage of the land proposed to be sold facing Buckingham Palace-road or Commercial-road in any position facing directly the property of the Duke of Westminster on the opposite side of Buckingham Palace-road or Commercial-road, and provided that the Council transferred to the Duke all their interest (if any) in the areas at the rear of Nos. 104 to 111, Mount-street, Grosvenor-square. The Committee considered the requirements reasonable, and recommended that the terms should be accepted. This was agreed to.

Government Property, Exemption of, from Provisions of the Public Health Act.—On the recommendation of the Public Health Committee it was agreed to appoint Councillors J. Owin Evans and Col. G. B. B. Hobart to represent the Council at a proposed conference of Borough Councils on this matter.

Lighting of Parliament-street and Whitehall.—A lengthy report by the Works Committee dealing with the lighting of these thoroughfares, was referred back.

Charing Cross Subway.—Messrs. Fowler & Hugman were appointed to take out the quantities in connexion with the work of reconstructing the Charing Cross underground conveniences consequent upon the formation of a subway by the Baker-street and Waterloo Railway Company.

General Building News.

CHURCH, SLEEKBURN.—The new church of St. John's, Sleekburn, situated within one or two hundred yards of Bedlington Station, has just been consecrated. The church and fittings are designed in early Perpendicular style by the diocesan architect, Mr. Arthur B. Plummer; Mr. J. Goulding, of Messrs. J. Goulding & Son, of Blyth, being the contractor. The church and boundary enclosures are built with Bedlington Colliery Company's bricks with best stone dressings and tracery. The two aisles are divided from the nave by seven arched arcades. The west window is a seven-light and the east window is a three-light traceried window. The vestries and aisles have cusped triplet windows of slight and varied designs. The whole of the roofing is open timbered and moulded. There are main entrance doors with inner wood porches at the south-west and north-west corners of two aisles. The nave and aisles combined measure 46 ft. across, and the length is 75 ft. The chancel is 35 ft. by 21 ft., with organ chamber in addition, and with clergy and choir vestries in connexion. The church will seat 500 people; the nave is seated with pews and the aisles at present with chairs. The bell is in a turret or fleche over the west end of the nave. The interior piers and all aisle and other arches and door window arches, mullions, buttresses, weatherings, water tables, quoins, and gable crosses are of stone. Miss Easton has given carved oak chancel fittings, viz., choir and clergy seats, Communion-table and rails, and reredos and pulpit; also organ and organ case and screen and mosaic pavement, with marble steps to chancel, and a painted east window by Messrs. Clayton & Bell, of London. The heating apparatus has been carried out by Messrs. Henry Walker & Son; the mosaic pavement by Messrs. Emley & Sons, of Newcastle; the oak carving by Mr. Ralph Holley; and the font by Mr. Robt. Beall; the glazing by Messrs. Atkinson Bros., all of Newcastle. The boundary railings and gates were undertaken by the Star Foundry, of Blyth.

CHRIST CHURCH, EALING.—At a sitting of the Consistory Court of London on May 29, Dr. Tristram, K.C., Chancellor of the Diocese, agreed to issue a faculty authorising some alterations and decorations in the church at the charges of the parishioners. The alterations include the removal of the organ from the north chapel, the erection of a screen or grille between that chapel and the north aisle, the placing of a new organ in a gallery

* We had the drawing printed with Mr. Grace's decorative lettering, and did not notice till too late that the word "Cignale" was spelt wrong. There is no such word as "Cignale" in Italian. Mr. Grace need not feel specially troubled about such a mistake; he has plenty of fellow-sinners to keep him in countenance; it is only one of many instances in our experience of the indifference as to architectural draughtsmen as to the spelling of foreign words which they may have to introduce in a drawing or a description. It would surely be worth while to look in a dictionary and see that a word is right before putting it into print or printed lettering.—En.

at the west end, etc., under Mr. G. F. Bodley's directions and superintendence. Mr. Bodley has prepared a scheme for the decoration of the north chapel, which embodies a standing figure (under life-size) of Our Lord in the act of blessing, and the painting of the roof in the same style as that of the rest of the fabric. Christ Church was built in 1851-2, after Sir G. G. Scott's plans and designs, for the foundress, Miss Lewis.

PRIMITIVE METHODIST CHURCH, DIPTON.—On the 26th ult. the foundation-stones of a new church and Sunday-schools for the Primitive Methodists of Dipton were laid. The church will accommodate 500 worshippers, while the schools will hold 300 children. The building will be of stone, with ornamental frontage to the street. The school is at the rear, and embraces several class-rooms, hall, kitchen, etc. The internal woodwork will be of pitch pine; and the windows will have lead glazing. The architects are Messrs. Davidson & Philipson, of Newcastle, while the contractor is Mr. T. Reynoldson, of Dipton. The total cost of the scheme is about 1,800l.

BAPTIST CHURCH AND SCHOOLS, CONSETT.—The foundation-stones of this church were laid on Wednesday last week. The buildings, which are designed in a late period of Gothic, are faced externally with red brickwork, with white dressings. The present contract for the church, including tower and vestries complete, amounts to 2,619l., and the building will accommodate 448 persons. Messrs. J. Guthrie & Son, of Darlington, are the contractors; and Messrs. George Baines & Son, London, are the architects.

WESLEYAN CHURCH AND SCHOOL, DEANBANK.—It is intended to erect a new Wesleyan Church and school at Deanbank, at an estimated cost of 2,000l. Plans have been prepared by Mr. J. Walton Taylor, architect, of Newcastle-on-Tyne, and the trustees have decided to proceed with the school to seat 300, and afterwards undertake the erection of the church and vestries. The contract for the building of the school and classrooms has been let to Messrs. R. Blackett & Son, of Darlington, and Mr. J. J. Taylor, of Newcastle, is the clerk of the works.

NEW CHANCEL, HECKMONDWIKE CHURCH.—On the 26th ult. the Bishop of Wakefield consecrated a new chancel and side chapel added to the Heckmondwike Parish Church. The new portion is the first instalment in the carrying out of a scheme for the entire rebuilding of the church. It has been built to designs by Mr. C. Hodgson Fowler, of Durham. By extending the new chancel further eastward than the old one a portion of the site of the previous chancel has been utilised for lengthening the nave, and that, in turn, has permitted the making of other improvements. Advantage has also been taken of the opportunity to provide new vestries, and two have been built on the north side of the church, one for the clergy and another for the choir. All the new parts are lighted by electricity. At a cost of nearly 300l., the organ has been rebuilt, and some new steps put in, besides provision being made for it to be electrically blown. From the old portion of the church, built in 1839 out of the money provided by the "Million Act," two side galleries have been removed, and the whole of the interior has been renovated. The cost of the whole of the new work is about 3,000l.

CHURCH EXTENSION, HIRST.—The parish church of St. John's, Seaton Hirst, has been enlarged by the extension of the nave, the addition of an aisle on the south side, and a parish room, at a cost of about 2,000l. The architects were Messrs. Hicks & Charleswood; the builders being Messrs. R. & G. Brown (Amble).

RESTORATION OF WALTON CHURCH.—The dedication of St. Leonard's Church, Walton, after restoration at a cost of about 10,000l., took place on the 28th ult., by the Bishop of Manchester. The new nave has been erected practically on the same site as the old one. There are only two pillars, placed in the transept opening. The architect was the late Mr. J. P. Seddon, who died before the completion of the building.

SCHOOL, DUNDEE.—The contract has been let for the work of erecting a new school in the east end of Dundee. Mr. James H. Langlands is the School Board architect, by whom the plans were prepared. The site has a narrow frontage, but widens out at the back, and has a backyard full of about 9 ft., advantage being taken of this fall to secure an extensive basement. The ground is divided into two parts, and the school placed exactly in the centre, so that the boys' playground is on the south and the girls' on the north. The school is oblong in plan, the end being turned towards Eliza-street, where the main entrance is situated. The basement contains caretaker's house ranged along the frontage facing Eliza-street, two large manual instruction classrooms and drawing classroom, with lavatory and teachers' accommodation running along the south wall. Behind the corridor are stores. Above the north wall are placed staircases, with entrances from the playground, while to the north is the boiler-house and switchboard-room. Along the centre of the basement runs the main air duct, 6 ft. wide, which throws out air from the towers on the west front. The air is propelled along this duct to each apartment by an electric

fan. The main floor has two entrances from the street, an inquiry room on one side and a janitor's room on the other, just outside the glass door. In the main central hall are placed twelve class-rooms, each to accommodate from forty-five to fifty pupils, and cloak-rooms. On the north side of the second floor are the museum cases and art classrooms, which can be made into three separate rooms or one large room as desired. In the north-west corner is the art master's room. On the south side are the cookery rooms, which, like the art classrooms, can be made three separate rooms or one large room. Along the end next Eliza-street is placed the library wall. At the other end are two rooms, which can be converted into one. In the north-west corner is the housewife department, which is as near as possible a replica of a small villa. It comprises an entrance hall, bath-room, kitchen, scullery, parlour, on first floor, and two bedrooms on the upper flat. In the mezzanine are placed teachers' rooms, four in all, for headmaster, headmistress, and assistant teachers. The heating is by low-pressure steam, and the air is heated as it enters the class-rooms. The foul air is carried off by shafts leading to exhausts in the roof. The staircases are all to be constructed of reinforced concrete, covered with tank. The building will be lighted with electric light, but gas will be carried into each kitchen range, so that gas cooking may be taught the pupils if desired. A system of telephones will also be introduced to enable the headmaster to transmit his orders direct to each teacher, and as a precaution against panic in case of fire. The school has classrooms for 1,110 pupils, and subsidiary accommodation in addition. The list of accepted tenders will be found in our Tenders column.

SCHOOLS, WOLVERTON.—New elementary schools for girls and infants, with cookery centre, are now in course of erection at Wolverton, under the Bucks County Education Committee. The principal front of the schools faces Aylesbury-street. The schools will be two stories high, built with heather facing bricks and Bath stone dressings. The basement dimensions are 27 ft. 8 in. by 24 ft., with heating chamber for low-pressure heating apparatus, and coal, coke, etc., stores. The ground floor (infants) consists of eight classrooms, providing accommodation for 402 children, and has a hall 41 ft. 5 in. by 31 ft., with entrance hall 7 ft. to 10 ft. wide, and commodious cloak-room and lavatories. The mezzanine plan consists of teachers' room and store-room, with lavatories for the staff of both girls and infants. The girls' school on first floor consists of eight classrooms, giving accommodation for 418; also with 10 ft. entrance hall and large hall 41 ft. 5 in. by 31 ft., and cloak-rooms, etc. The infants' entrance is on the ground floor from Aylesbury-street, and the girls enter by two staircases from playground, and there is also an infants' exit to playground. There are two playgrounds, also cooking centre, with scullery, coal and coke store, cloak-room, porch, lavatories, etc. The floors are of concrete, and the sanitary arrangements are being superintended by Mr. Alfred E. Abbott (Surveyor to the Stony Stratford and Wolverton Rural District Council). The principal glazed bricks are used. The work is being done under the superintendence of Mr. H. Waterhouse, foreman for Mr. E. Archer, contractor, Northampton, in Old English bond. The contract is about 9,000l.

HOSPITAL, BAGNALL.—The new North Staffordshire Joint Small-pox Hospital, which has just been opened at Bagnall, is designed for thirty-nine beds. This includes the temporary corrugated iron buildings erected some time ago, but not the two concrete sites, which are prepared to receive, at any time in case of a severe epidemic, a sixteen-bed pavilion on each. The present permanent scheme includes an administration block, consisting of doctor's sitting and bed rooms, dispensary, nurses' and matron's rooms, kitchen, scullery, stores, etc., and eleven bedrooms, with an iron fire-escape staircase outside; a discharging block, consisting of undressing, dressing, bath rooms, etc.; the isolation pavilion, comprising four wards, entirely separate from each other, two double and two single-bedded, with clothes and food stores and nurses' duty rooms; a laundry, stables, harness-room, ambulance-shed, disinfecting rooms, and boiler-house. The two concrete sites provided are each suitable for immediately erecting a sixteen-bed pavilion in case of serious epidemic, and each is provided with the necessary drains, roads, etc. In addition there is an incinerator, refuse receptacle, a mortuary block and a water storage tank; a rubble stone wall, about 6 ft. 6 in. high, and built to an average thickness of 2 ft., forms the boundary to the road sides of site, the two remaining sides being enclosed by a close wood fence, 6 ft. 6 in. high. The new buildings are constructed of brick work with red-pressed brick arches, stone on the walls and tiled roofs. The whole of the ground floors to the buildings, with the exception of the living-rooms to the administration block, are constructed with concrete, with a smooth granolithic finish, the upper floors and living-rooms in the administration block being boarded. The whole of the work has been carried

out from the designs and the direct supervision of Mr. Elijah Jones, Architect to the Board, Hanley. The buildings and concrete sets are the work of Mr. James Moss (Milton); drainage, roads, paths, etc., Messrs. J. Horobin & Son (Cobridge); and the sewage disposal works were carried out by Mr. J. Bagnall (Fenton); the whole of the plastering, Messrs. Hill (Hanley); plumbing and painting, Mr. W. Fradley (Hanley); the ironmongery, Mr. G. Hollins (Newcastle); the wrought-iron lamp brackets were carried out by Mr. W. Durose (Tunstall); the baths and lavatories supplied by Messrs. F. Winkle & Co. The cost of the buildings, including boundary walls, fencing, roads, paths, drainage, and sewage works, is about 7,050l.

HOSPITAL EXTENSION, HARROW.—The new block at the Harrow Isolation Hospital in Pinner-lane was opened a short time ago. The block consists of two wards, male and female, the female ward being 36 ft. by 26 ft., with six beds. The male ward was 24 ft. by 26 ft., with four beds. There is a nurse's duty-room, 16 ft. square, bath-room, discharging-room, and to each ward a sanitary annexe; in the hall are provided linen cupboards. The block faces the south, and has a verandah to each ward. The plans were prepared by Mr. J. P. Bennett, Surveyor to the Council, and the contractor was Mr. Simmonds.

FIRE STATION, WESTMINSTER.—The new Fire Station erected in Greycoat-place, Westminster, by the London County Council, was opened recently by Mr. Lewen Sharp, the Chairman of the Fire Brigade Committee of the Council. The work of erecting the station was commenced by the Works Committee in January, 1905. The architect's estimate of the cost of the building was 12,250l. Mr. W. E. Riley, the Superintending Architect of the Council, was the architect of the building. On the ground floor are two appliance rooms; the larger, at the western end of the site, is 38 ft. 9 in. by 35 ft., with accommodation for a steam fire-engine and a long ladder, and stalls for four horses; the smaller, at the eastern end, is about 28 ft. by 35 ft., with accommodation for a horse escape and stalls for two horses. The walls of the rooms are lined with white-glazed bricks, the floors paved with ironstone tiles, having panels of blue stable bricks in same to assist the horses to start. The stalls are drained into covered enamelled iron guttering which is flushed automatically. The watch room, 14 ft. by 10 ft., is placed centrally in the building, and commands (a) appliance rooms; (b) the separate entrance, and approach to the staircase to the quarters on the upper floors; and (c) the yards and offices. Writing-room, lavatory, etc. A small writing-room, a lavatory and dressing space at the foot of the sliding pole are entered from the western end of the larger appliance room. The laundry, 24 ft. by 14 ft., is lined with white glazed bricks and paved with granitic concrete, with hot closet and stoker's adjoining, is entered from the yard, and is approached from the quarters by a secondary staircase from the first floor level. From the yard, which is paved with ironstone tiles, are approached the hose drying tower, the openings of which have been protected for drill purposes; a rest-house for two horses, with fodder store adjoining; workshop stores for coal in bulk, coal in sacks, coke, oil, and wood, and for general purposes, and a coal store to each set of quarters. On the first floor, the western side of the central staircase is occupied by single men's quarters, consisting of a mess-room, 11 ft. by 12 ft. (the planning of which is arranged for a contemplated future addition to the number of quarters), a lavatory and two bath-rooms, and six cubicles about 9 ft. 6 in. Two sliding poles lead to the larger appliance room below. On the eastern side of the staircase is one set of married men's quarters, and the recreation-room, 27 ft. by 18 ft., capable of containing a full-sized billiard table. Two sliding poles lead from this room to the smaller appliance room. On the second floor are two sets of three-room quarters (four rooms), one set of three-room quarters, and two sets of three-room quarters and two common bath-rooms. On the third floor are three sets of three-room quarters, and one set of two-room quarters, and two common bath-rooms. On the fourth floor are two sets of three-room quarters, two spare rooms, and one common bath-room. The building is lighted by electricity. The elevation to Greycoat-place and the short return to same are of Portland stone to a height of 18 ft., and above that of red brick with cut and rubbed brick pilasters and cornice. The appliance room and the single men's corridor, from which the water cubicles are entered, are heated by hot water. A subsidiary boiler is provided for this purpose in the stoker's.

PUBLIC LIBRARY, TIPTON.—A new central public library at Tipton was opened on the 30th ult. The site of the new library is at the corner of the park in the Victoria-road. The contract was given to Mr. E. Secker, erected from plans prepared by Mr. George H. Wynn, architect, Tipton. The exterior of the building is of buff terra-cotta and red bricks. Above the

public entrance to the library is a tower, 66 ft. high, in which it is intended eventually to place a clock tower and a set of chimneys. The library is all arranged on the ground floor, and the whole of the public apartments are entered through folding doors from a large central hall which is approached through an open porch. It is divided into five departments, namely, the lending library, newsroom, magazine-room, juvenile reading-room, and reference library. In the lending library shelves are provided for over 7,000 volumes, and there is accommodation for about 12,000. The magazine-rooms is divided into two by an oak screen, one portion being for the sole use of ladies, the total accommodation being for forty readers. The juvenile reading-room is not yet erected, but is planned as a future extension. The reference library is temporarily provided for in a part of the lending library, but provision has been made for an extension of the building to give increased accommodation for this department when required.

HOTEL, INXIELEAV, N.B.—On the site of the old Royal Hotel, Inxellav, which was destroyed by fire two years ago, a new hotel has been erected. Designed in the Scotch Baronial style, it has been built from plans prepared by Mr. Higgins, of Glasgow.

NURSES' HOME, WEST KIRBY.—An addition to the West Kirby Convalescent Home for Children, in the shape of a nurses' home, was opened on the 26th ult. The new building, erected in three stories, comprises nineteen bedrooms and three furnished sitting-rooms, one on each floor. Altogether the building has cost 2,600*l.*, and has been erected by Mr. W. H. Forde (Birkenhead) to the designs of Mr. Edmund Ware.

BATHS, SUNDERLAND.—The new Hendon-road Baths and Washhouses, which have been rebuilt by the Corporation, were opened on the 29th ult. The building, which was designed by the Borough Engineer (Mr. J. W. Moneur), was erected by the Corporation.

SPA HYDRO, RIPON.—A new spa hydro is to be erected at Ripon from plans prepared by Mr. Sydney D. Kitson, M.A., of Leeds. The principal contract is that of Messrs. W. Wilson & Sons, builders, of Leeds, for a total amount of 25,281*l.* The sub-contractors are:—For joiners' work, Mr. J. H. Coldbeck; painters' work, Mr. J. S. Lowley; and slating, Messrs. Baynes & Beck, all of Ripon. There were altogether eleven tenders for the principal contract, and a number of sub-contractors.

RAILWAY OFFICES, YORK.—The new central offices of the North Eastern Railway Company at York are now nearly completed. The building covers 2,750 yds., and has a frontage of 275 ft. and a depth of 100 ft. In it is provided accommodation for the headquarters and divisional stations—183 rooms in all. The design won the silver medal at the French Exposition two years ago, and is the result of the co-operation of two architects, Mr. W. Bell, chief architect of the North Eastern Railway, and Mr. Horace Field, of London.

Stained Glass & Decoration.

MEMORIAL WINDOW.—ST. MARY'S COLLEGIATE CHURCH, WARWICK.—A painted window has just been dedicated to the memory of Mr. C. E. John William Margets in this church. Mr. C. E. Kempe is the artist. The four lights are filled with the figures of St. Peter, St. James the Great, St. John the Baptist, and St. Martin.

Sanitary and Engineering News.

FISHGARD HARBOUR.—A work of considerable engineering importance now virtually completed on the coast of Pembrokeshire is the harbour in Fishguard Bay, constructed by the Great Western Railway Company. The new port has been established on a somewhat unpromising site, at a place where only a few years ago the sea was bounded by precipitous hills rising more than 300 ft. above water level. By blasting away the rock for a distance of 150 ft. and a height of 200 ft., some two million tons of material have been obtained for the construction of a quay 1,120 ft. long and a breakwater 2,500 ft. long, providing a sheltered water area of about 700 acres. On the land rendered available by blasting operations and reclamation works, the company have erected a large passenger station, and other buildings for dealing with goods traffic, as well as a generating station to provide current for electric light and power. The primary object of the new harbour was the opening of the Fishguard and Rosslare route to Ireland, but the hope is that Fishguard will eventually become a port of call in St. George's Channel for ocean liners plying between Liverpool and Glasgow on one hand and Canada, the United States, South America, Australia, and the East on the other. Considering the remarkable success which—in spite of the half-hearted

co-operation extended by the South-Eastern and Chatham Railway—has attended the efforts of the Harbour Board to convert Dover into a port of call for ocean liners, there is every reason for believing that Fishguard has a great future in the same direction, particularly as it was built and equipped by a railway company whose special objects are to popularise the port and to encourage traffic.

HIGH-LEVEL BRIDGE OVER THE TYNE.—The new high-level bridge which has been built across the Tyne, connecting Gateshead and Newcastle, is to be opened in July. The viaduct is of four spans. The girders are of steel, resting on three river piers and on granite abutments on the north and south banks. The span on each side of the centre pier is 300 ft. long, that from the north pier to the abutment is 232 ft., and from the south pier to the abutment on the Redheugh bank is 191 ft.; while a series of arches form the approaches on each side of the river, those on the southern bank being in two series to the east and the west, so as to give access to the main line south and to Gateshead Station in the north. The sides of the bridge are of plain lattice work, 27 ft. deep, with the usual bracing and struts. The parapets are of steel. The under side of the bridge gives a clear height of 87 ft. above high-water level, and this is sufficient to admit of the passage of the largest sea-going vessels. The span on each side of the centre pier is 300 ft. long, that from the north pier to the abutment is 232 ft., and from the south pier to the abutment on the Redheugh bank is 191 ft.; while a series of arches form the approaches on each side of the river, those on the southern bank being in two series to the east and the west, so as to give access to the main line south and to Gateshead Station in the north. The sides of the bridge are of plain lattice work, 27 ft. deep, with the usual bracing and struts. The parapets are of steel. The under side of the bridge gives a clear height of 87 ft. above high-water level, and this is sufficient to admit of the passage of the largest sea-going vessels. The span on each side of the centre pier is 300 ft. long, that from the north pier to the abutment is 232 ft., and from the south pier to the abutment on the Redheugh bank is 191 ft.; while a series of arches form the approaches on each side of the river, those on the southern bank being in two series to the east and the west, so as to give access to the main line south and to Gateshead Station in the north. The sides of the bridge are of plain lattice work, 27 ft. deep, with the usual bracing and struts. The parapets are of steel. The under side of the bridge gives a clear height of 87 ft. above high-water level, and this is sufficient to admit of the passage of the largest sea-going vessels.

COMBINED DRAINS IN EAST HAM.—The report of the Chief Sanitary Inspector of East Ham, which has just been issued, contains the following passages with regard to combined drains:—"As nearly the whole of the drains which have been reconstructed are old properties, the cost of carrying out the work would have fallen upon the district but for the passing of the East Ham Improvement Act, which directs a drain to be laid to include all combined drains within its meaning. It will be seen that this section is a great financial boon to the borough, for considerably over 1,000*l.* worth of work of this character has been executed during the past year. In the event of stoppage the Council send two men who are wholly employed for this special work of drain clearing, and are intimately acquainted with the construction of the drains, knowing exactly the position of the inspection chambers, and in the event of the drains becoming stopped they know where to open to clear, while strangers usually commence by breaking pipes to unstop a drain. In the absence of public health the Council's system of clearing drains is to be highly commended, for if the work is left to the individual owner to do he usually calls in a person whom he thinks to be a 'cheap man,' with the result that permanent damage is done and covered up, and not until perhaps disease arises does the drains being tested is the work of the jobber disclosed. During the year 2,703 house drains have been cleared by the Council's men, and it is essential to all concerned that stoppages should be cleared speedily and efficiently."

MAIDENS AND DUNURE LIGHT RAILWAY, SCOTLAND.—The Glasgow and South Western Railway Company have just completed the construction of a light railway, twenty miles long, from near Ayr to Girvan, with a hotel at Turnberry. At present the line has but a single track, except at the stations of Alloway, Dunure, and Maidens, which form the only passing places, and at the end junctions and the more important covered ways and bridges. The sixty-five bridges vary from 10 ft. to 70 ft. in span, and there are two viaducts having spans of 100 ft. and 118 ft. respectively. The bridge across the Doon is constructed of masonry, with brick arches; the copes, string course, and ring-heads being of concrete. Concrete or masonry was used for the abutments of the bridges over public roads, the superstructures being of arch plates and cast-iron girders. The steepest incline has a gradient-rate of 1 in 66, and about one million cubic yards of material were removed in the course of the work.

Foreign.

FRANCE.—The project for the forming of a deep-water harbour in the front of the town at Cherbourg has been abandoned. On the other hand, a decree authorising the building of a cement quay on the south side of the commercial basin will shortly be issued. The total cost of the work is estimated at 10,800*l.*—The Medal of Honour in the architectural section of the Salon has been awarded to Mr. Godefroy, pupil of M. Laboux, and architect of the new Prefecture at Limoges, the drawings of which were noticed at some length in our article on "Architecture at the Paris Salon." The medal in painting, we record with regret, has been awarded to M. Rochegrosse for his brutal picture "La Jolie Rouge." In sculpture the

jury have divided the honours between M. Antonin Carlès, sculptor of the Hériot monument, and M. Georges Bareau, sculptor of the "Vision du Poète," which belongs to the Paris Municipality.—The marble altar of the Church of St. Pierre, at Martinique, which was destroyed in the eruption of Mont Pelée, is now being reconstructed in the square of the Church. The architect is M. Marquette, sculptor, and M. Rives, architect, have together completed the model for the monument which a subscription committee propose to erect to the memory of M. Waldeck-Rousseau. The monument consists of a portico under which is a stole carrying a portrait bust, and accompanied by a winged figure. The pedestal is decorated with bas-reliefs. The monument is intended for the Tuileries Gardens, but the Government has not as yet sanctioned its erection.—A school of arts and crafts is to be built on the site of the former abattoirs of Villejuif.—At the Museum of Versailles two new rooms have been opened, devoted to works of art connected with the period of the Revolution, the First Empire, and the Restoration.—The Société des Amis des Arts de Calais are organising an exhibition to be held in that town from September 2 to October 2.—A new Mairie, of graceful architectural design, has been built at Villiers-le-Bel, from the designs of M. G. G. M. Glasquin, architect, of Epinal, has been elected president for the year of the Société des Architectes de l'Est de France.—The picturesque old bridge at Cahors, dating from 1250, is to be rebuilt, as it has fallen into a dangerous condition of dilapidation.—A monument has been erected at Chalon-sur-Saône to the memory of the Duc de Rochefoucauld-Liancourt, founder of the school of arts and crafts in that town. M. Max Blondel is the sculptor.—The municipality of Ancenis have commissioned M. Michel, engineer, of Nantes, to establish a sewerage system in the town, at an estimated cost of 900,000 francs.—The Municipality of Nice have had a bridge built over the Paillon for the accommodation of the inhabitants of the village of Ariane.—The death is announced, at the age of 82, of M. Aubert, the painter, whose *genre* pictures, representing for the most part scenes of ancient Roman life, had a certain success under the Second Empire. He obtained, in 1844, the Prix de Rome in the section of engraving, and received several awards of medals and the cross of the Legion of Honour. He studied painting in the atelier of Delacroix.

SOUTH AFRICA.—The Municipality of Umata are now having drawn up complete plans for a new town hall, at an estimated cost of 16,000*l.* According to a local correspondent there is an unprecedented activity in the building trade in Umata.—The buildings in Cape Town have received a notable addition by the erection of the new premises for the South African Mutual Life Assurance Society, the architects of which are Messrs. W. H. Stucke and W. E. Bannister. The building was begun in 1903, Mr. William Eyre acting as clerk of works.—The new town is to be erected in Cape Town to the order of Mr. J. D. Logan, M.L.C. It will be known as the "Selborne," and the estimated outlay on the building is 120,000*l.* The hotel will have two frontages, one of 87 ft., and one of 150 ft., and a depth of 145 ft. Steel will be largely used in its construction.

THE WALLS OF CADIZ.—Mr. Keyser, the British Consul, in his annual report to the Foreign Office, writes:—Cadiz is almost an island, a fortress surrounded on all sides by a wall, through which there is a gateway into the town. Beyond this entrance stretches a long, narrow belt of sand, dividing the Atlantic from the bay. As circumstances now are it is impossible, within town limits, to extend the available building area. It has been, to quote an oft-written local expression, "a long cherished dream" of the people of Cadiz to demolish a certain portion of these picturesque but now useless walls, in order to obtain space for erecting factories and developing the business portion of the town. This "dream" is not without interest to the foreign traveller, since it includes the laying out of gardens and building of modern hotels. It is proposed to utilise the material obtained in lengthening existing piers and reclaiming land from the sea, thus enabling vessels to load and discharge cargo alongside of wharves instead of, as at present, by means of lighters in the bay. In the prevailing distress through lack of employment local authorities and influential merchants have found opportunity to forward their scheme, and with such energy have they pushed it that at the time of writing (May) the walls are being demolished, and all who desire work can obtain it as they wish wage. It is probable, however, that ultimately the work in all its branches will be handed over to the contractors of the harbour works, for which the material obtained from the walls is intended to be used.

ROSARIO (ARGENTINE REPUBLIC).—The Municipality have recently called for tenders to pave sixty squares or blocks of the more important streets of the town with alga-roba hardwood, to be laid

on a foundation of Portland cement. The stones which comprise the present street pavement will be removed and used in paving sixty blocks of the town further out, hitherto unpaved. A large quantity of cement will be required for this work.

The new central market, a fine building, has been completed and opened to the public. The provincial Government have also completed and opened a public school for girls. Owing to the increasing population and demand for houses, capitalists are investing largely in building, and some fine houses are being put up. It is estimated that buildings to the value of 1,000,000, are now under construction.

ASPHALT FROM SICILY.—According to an official report the quantity of asphalt rock exported from Sicily during last year was 85,497 tons, of which 11,308 tons were sent to the United Kingdom.

PUBLIC WORKS IN NEW SOUTH WALES.

From the Report of the Under-Secretary for Public Works to the Government of New South Wales it appears that of the total expenditure for the year 1905 the amount of 849,922, was laid out on roads, bridges, harbour works, dredging, and other items considered as not giving a direct return on the expenditure, although such works are very necessary for the settlement and prosperity of the country. On railways, water supplies, ferries, sewerage, river, and wharfe works, which yield actual or immediate revenue, the outlay amounted to 1,010,618, and work on public buildings was executed to the extent of 132,933, an expenditure which, if not deducting actual revenue, saves a direct outgo of rent.

Dredging, wharfe, and harbour works have been undertaken on a somewhat extensive scale in the coastal districts, being absolutely necessary to enable produce to be sent to Sydney by sea; and in the absence of railway communication the keeping open of the water highway is really the pivot on which the prosperity of this part of the country turns.

Among water supply works the most important in progress is the Cataract Dam, near Sydney, intended to hold up water to the height of 150 ft., and to create a reservoir with the capacity of 21,000,000 gallons. Satisfactory progress is being made with the dam, and it is hoped that this valuable addition to the Sydney water supply system will be completed about the middle of 1907.

During last year works to the value of over 160,000, were executed on the Central Railway Station, Sydney, designed by Mr. W. L. Vernon, Government architect. The total expenditure upon the station to June 30, 1905, amounted to more than 458,983, excluding the value of surplus lands, and at the time when the Report was written it was hoped that the new premises would be available for the Railway Commissioners by the present month.

So far as the general public are concerned, interest centres largely upon the Roads and Bridges Department, and, although the expenditure last year was more than usually restricted, existing works were well maintained, and the construction of various new roads was commenced, one of the most noteworthy being a highway giving access to the sea at Coff's Harbour, by which a very large tract of Crown land will be opened up between Coramba and Dorrigo. Here, as elsewhere in the State, the timber industry finds employment for many hands, especially on the Dorrigo, where pine and other soft woods are being cut at the rate of millions of feet per annum. Between Maitland and Cessnock increased expenditure has been incurred in opening up roads to and through the new coalfield, and in the neighbourhood of Cobar the expansion in mining has necessitated outlay on similar work. The public are said to be growing rather exacting in the matter of road surfaces, for grades and tracks that a few years ago were considered good are now held to be almost unfitted for traffic requirements.

The State appears to be well supplied with bridges, there being not less than 3,508 in existence, the bulk of which are to be found in the coastal and central districts, and generally it may be said that provision has been made for reasonable means of access at all times along the more important arteries of traffic. These important works, the Pymont and Glebe Island bridges, which cost 145,189, and 107,000, respectively, continue to fulfil their purpose in a satisfactory manner. The traffic over Pymont Bridge last year included 4,000,000 pedestrians and 1,909,315 vehicles, while 10,576 vessels passed through the swing span. The Glebe Island Bridge the traffic included more than 1,000,000 persons and 948,270 vehicles, while 9,369 vessels passed through the opening span.

Further consideration has been given to the great scheme by which it is intended to irrigate an immense area of country adjacent to the Murrumbidgee River, across which a dam, 200 ft. high, will be erected to impound 33,880,864,000 cubic feet of water. Surveys, plans, and estimates, have been prepared, and the whole proposal is now under the consideration of the Public Works Committee.

Taking the Report as a whole, it is evident that, in spite of the restricted funds at the disposal of the Public Works Ministry, a large amount of useful work was performed during 1905, and, so far as we are able to judge, all money available has been expended in a thoroughly judicious manner.

THE CEMENT TRADE ABROAD.

In the consular reports now coming to hand from British representatives in foreign countries there are numerous references to the cement trade. Some of the more important and interesting of these references we subjoin:—

AUSTRIA-HUNGARY (TRIESTE).—The consumption of Portland cement in Austria during 1905 has been a large one. All Austrian cement manufacturers supplied important quantities for the new Austrian railways. The combine of Austrian Portland cement manufacturers and the convention with those of Hungary, caused prices to rule high. The Austrian cement export to foreign countries has been very limited, as, although freights were low, prices offered abroad were not such as to invite special attention to this market.

ITALY (CIVITAVECCHIA).—Cement continues to be one of the principal industries of the district, and the two local factories are yearly increasing their output. So far the cement manufactured at Civitavecchia, which is generally recognised to be of a very superior quality, has never been exported outside of Italy, but some attempts have been lately made to place it on foreign markets.

CALIFORNIA.—Mr. Consul Bennett writing from San Francisco shortly before the earthquake disaster, remarked:—Commenting on the cement trade, my correspondents point to the figures given below of imports of cement into California from 1890 to 1905. There were also certain imports of cement from Japan, but they have now practically ceased, and may be left out of the account:—

Year.	Quantity in Pounds.		
	Belgium.	Germany.	United Kingdom.
1890.....	17,472,800	24,370,000	132,865,400
1891.....	50,827,600	30,157,600	146,148,800
1892.....	19,100,800	1,838,000	58,256,800
1893.....	15,407,200	5,055,400	83,582,000
1894.....	21,540,000	9,258,800	94,880,000
1895.....	31,951,600	22,133,600	61,764,800
1896.....	28,858,400	37,689,200	61,296,200
1897.....	40,015,610	17,694,800	30,191,658
1898.....	55,890,714	23,515,200	37,416,000
1899.....	55,234,000	27,005,200	37,541,000
1900.....	122,182,290	73,412,251	68,432,000
1901.....	63,105,982	42,198,477	22,800
1902.....	81,651,782	75,073,005	4,395,999
1903.....	77,520,507	85,499,154	11,353,200
1904.....	36,162,358	35,101,734	96,774
1905.....	23,626,846	27,596,558	28,180

It will be seen that, as a general rule, as British imports decreased Belgian and German increased, and that since 1894, after various fluctuations, the British trade has consistently shrunk, whilst Belgian and German imports consistently expanded. In the meantime large cement plants have been laid down locally at Suisun and Napa, and can to-day turn out cement practically as good as that imported. During the whole period under review the plants have been gradually growing in capacity of output, and the local price has been kept just a little lower than that of imported cement, on which the duty at present is 8 c. per 100 lbs. The imports for the current year, however, are expected to be heavier than those of 1905, as the local manufacturers, owing to the enormous demands made upon them, sold their product without waiting for it to become seasoned, the result being that it caused great dissatisfaction to the users. This has caused heavy orders to be sent to Europe. The cement works at Suisun and Napa are both running at full time, and a new plant is being established at Santa Cruz, which is expected to come into operation this year. Several other cement plants are projected in different parts of the State.

FRANCE (BOULOGNE).—Cement exports were low, but 780 tons were shipped to the United Kingdom; this seems a somewhat abnormal direction for the traffic, even although the quality of the local product is undoubtedly good. In local building considerable use is made of "cement arm" (steel and concrete) for flat roofs and warehouse floors, which, at a relatively low cost, bear heavy weights and are fireproof; piles constructed of these materials are now being used in consolidating foundations of quay walls, and seem to be driven very easily. Fibro cement, a mixture of cement and asbestos, is manufactured locally. It is used for roofing, as being lighter and better able to resist wind than tiles or slates; strips used to enclose electric wires minimise the dangers of short circuits; it is also moulded in imitation of wood panels for use in fireproof buildings; the material is easily cut to shape and nailed, and takes paint readily.

FINLAND.—The ever-increasing cement imports amount for 1905 to 30,077 metric tons, against 25,136 metric tons in 1904. Nearly 22,000 tons came from Germany, the rest from Sweden, Denmark, Russia, and Belgium. As in 1904, the United Kingdom was completely unrepresented.

MOSCOW.—In the Moscow district there are ten cement works, of which only one is a large concern. I should doubt (writes Mr. Consul Grove) their having done much last year, owing to the disturbed course of events. I understand also that there are hardly any building projects for the present year. The import has been:—

Total import.....	Value in roubles.		
	1901	1902	1903
United Kingdom.....	121,000	175,000	137,000
Germany.....	16,500	31,000	3,000
China.....	91,000	120,000	78,000
			41,000

Total import.....	OTHER CEMENTS.		
	1901	1902	1903
United Kingdom.....	278,000	330,000	297,000
Germany.....	81,000	49,000	84,000
	119,000	101,000	146,000

The balance comes from Sweden and Japan.

BILBAO.—The importation of Portland cement has further diminished. It is true that no new works of importance were undertaken during 1905, requiring the British product, but as the building of new quays is in contemplation, tenders for it will most probably be called for in the near future. The importation of cement from France and Belgium fell last year some 2,700 tons, but this may be put down to the fact that fewer building operations were undertaken, as well as to the introduction here of the native article from surrounding districts, of which, however, there was only an increase of 600 tons to be noted. The price of native cement in Guipuzcoa for quantities of some importance is about 53 pesetas per ton (11. 15s. 4d., at 30 pesetas per 11.) f.o.b., Bilbao. The most important works are situated in the province of Guipuzcoa, and in view of their success others are being opened for the production of large quantities in Navarre, as well as in other places in Spain.

PORTLAND, U.S.A.—The demand for cement increased as the year progressed, and stocks held at the beginning of the year were rapidly depleted. The supplies in sight are not nearly sufficient. This trade, however, does not appear to be cultivated by the British maker, as not one cask was received from the United Kingdom during the year. Prices have advanced, and the article is being used much more in buildings, streets, etc., and there is an extraordinary demand for railway purposes and irrigation works throughout the district. At this time there is practically none in the market, with prospects of a scarcity for some time to come. Prices have temporarily advanced to 13s. per cask. Market prices during the year ranged from 8s. 4d. to 10s. Receipts from California were about 35,000 bags; quality of this is reported irregular, and the capacities of factories is not equal to the demand. Japanese cement will be received more largely in future. There seems to be some probability of cement works being started at Bellingham on Puget Sound, where very satisfactory working tests have been made of raw material found there.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Hubbard & Moore, architects, are removing their offices from 85, Gresham-street to 112, Fenchurch-street, E.C.—Mr. H. T. Neilson, quantity surveyor, has removed his offices from Chancery-lane, Burlington, to Queen's-square, Leeds. (In last week's notice the name was incorrectly given as "Neil.")

A REVOLVING TOWER DERRICK.—A novel type of steel frame derrick now being used in the construction of the new municipal buildings, Washington, consists of a four-sided pyramidal steel tower, about 30 ft. high, with bearings at the top and bottom for a vertical mast, the lower end of which is pivoted at the bottom upon a fixed base-plate, and projects for a considerable portion of its length above the top of the tower. A horizontal boom, with unequal arms, is rigidly attached to the mast and gayed by steel ropes. The long arm of the boom carries the track for a hoist suspended from a trolley, which can be moved in either direction by means of the hoisting cable and other ropes extending to the outer end. The short arm of the boom is fitted with a platform, upon which are placed counterweights for balancing the loads hoisted. At the four corners of the tower there are long vertical screwed rods so arranged that the tower can be raised from story to story of the building as the work progresses. Each end of the mast has a steel cap, the lower one being provided with an annular groove revolving on the fixed base. The top of the tower consists of a fixed horizontal plate, provided with a large bearing ring, which keeps the mast in alignment and transmits the horizontal thrust to the tower. The mast and boom can be revolved through a complete horizontal circle by ropes engaging a bull-wheel attached to the mast just above the top of the tower, and led together with the hoisting tackle, to the foot of the mast, whence they are taken in the usual way to the drum of the hoisting engine. The derrick is

essentially a balanced cantilever crane, with traversing motion for the load, and capable of being revolved through a complete horizontal circle. Therefore materials can be collected from and deposited upon any point within the circular area described by the boom, except in the space occupied by the base of the supporting tower. The apparatus was originally designed by Mr. James L. Parsons, of Washington, for the demolition of a six-story building in that city. The structure was so dilapidated that great care was necessary to prevent its collapse, and it was considered essential to remove it by an independent derrick, by which materials from the upper part of the building could be lowered to the ground without risk of developing any stresses in the old work. The apparatus proved so satisfactory that it was afterwards employed for the erection of the new building on the same site, and similar derricks have since been employed in the execution of several important building contracts in Washington, including the new War College, Marlborough and Stoneleigh Court apartment houses, and the municipal buildings already mentioned.

MEMORIAL TO ARCHBISHOP TEMPLE.—At St. Paul's Cathedral on the 31st ult. a memorial was unveiled to the late Archbishop Temple. The memorial, which takes the form of a bronze panel and tablet and is the design of Mr. F. W. Pomeroy, has been placed in the first bay of the south aisle. It shows, in high relief, the figure of Dr. Temple kneeling in the attitude of prayer, and is in pose and composition a replica of the monument erected in Canterbury Cathedral. On the right are the arms of the See of Canterbury, and underneath a processional cross.

PUMPS AND SAND.—The Pulsometer Engineering Company forwards a letter received by them from the North Antrim Mining Syndicate, who have been using two of the Pulsometer pumps in sinking operations at their Ballycastle mines, which is of some interest in regard to the general difficulty of dealing with sand. They were about four months pumping water and sand; "the Pulsometers kept men constantly shovelling thousands of tons of sand from the drain into which the sand and water was deposited."

PHOTOGRAPHS OF TREE STRUCTURE.—The Country Press, from whom we have before received some useful photographs of the detail of British ferns in the form of picture postcards, have now issued a set of twelve photographs in similar form, six of them showing the ramification of the beech, chestnut, horn-chestnut, maple, oak and walnut (photographed in winter when the trees were bare), and six of the detail of trunks of the same trees. These are very useful in promoting a true knowledge of the forms of trees. The photographs are taken by Mr. F. G. Heald. It is proposed to issue similar illustrations of other trees.

THROUGH HOUSES AND BACK-TO-BACK HOUSES.—At Leeds City Council recently, in bringing forward the minutes of the Plans Committee, Mr. Baxter, the Chairman, referred to the statement showing the number of buildings completed during the past six years, as compared with the previous six years. He called attention to the fact that during the first period—1895 to 1900—the number of through houses built was 8,859, while in the second period—1901 to 1906—the number was 5,634, an increase of 1,784. On the other hand, there was a decrease in the number of back-to-back houses built—from 9,569 to 8,642. These figures, he said, would be an encouragement to those who favoured through houses as against back-to-back houses. He added that the Committee had had before them plans for five or six large estates which would ultimately be used for building purposes. The building trade was beginning to revive, and the Committee were very hopeful for the future.

CAYTHORPE CROSS.—The remains of the very beautiful XIV. century churchyard cross at Caythorpe, Lincolnshire, have been erected on the old foundation, and the upper part of the shaft and the canopy restored. The cross stands upon three steps, each 1 ft. high. The base to the shaft is an octagon, and from this springs the delicate shaft, crowned by a four-sided canopy, with pinnacles and spirelet. In the base and in the lower part of the shaft are some holes, plugged with lead. Mr. W. Samuel Weatherley, architect, of London, had charge of the work. The carving was done by Mr. W. Hearn, of Kensington, and the masonry mouldings and tracery for the canopy work by Mr. W. Cragg, builder, of Caythorpe.—*Standard.*

A CENSUS OF PRODUCTION.—The text of the Bill introduced by the President of the Board of Trade some days ago has just been issued. The schedule contains "a list of persons required to make returns," namely—(a) The occupier of every factory or workshop within the meaning of the Factory and Workshop Act, 1901; (b) the owner, agent, or manager of every mine and quarry; (c) every builder, that is to say, a person who by way of trade or business undertakes the construction, alteration, repair, or decoration of a

building or any part thereof; (d) every person who by way of trade or business executes works of construction, alteration, or repair of railroads, tramroads, harbours, docks, canals, sewers, roads, embankments, reservoirs, or wells, or of laying, altering, or repairing gas or water pipes, or telegraphic, telephonic or electric lines or works, or any other prescribed works; (e) every person who by way of trade or business gives out work to be done elsewhere than on his own premises; and (f) every person carrying on any other trade or business which may be prescribed.

MIDDLESEX COUNTY COUNCIL AND GIPSIES.—The Police and Sanitary Committee of the House of Commons, of which Mr. J. W. Wilson is Chairman, have agreed to accept modifications of a clause affecting gipsy encampments in the General Powers Bill promoted by the Middlesex County Council. As amended by the Committee the clause will provide that no gipsy shall use a dwelling-place within 50 yds. from any street or dwelling-house for more than twenty-four hours so as to cause injury to residents in the neighbourhood or to cause a nuisance or danger or injury to health; and that no owner of land shall cause or suffer such land within 50 yds. from any street or dwelling-house to be occupied by gipsies, tents or vans, for more than twenty-four hours, so as to cause injury to the residents or to be a nuisance or a danger or injury to health. Applications are to be made to a Court of Summary Jurisdiction for orders against offenders; and in the case of disobedient fines may be inflicted and the use of the land for encampment purposes also to be prohibited during such period as the Court shall determine.

CITY AND GUILDS OF LONDON INSTITUTE.—The annual meeting was held last week at Mercers' Hall, Lord Haldry presiding. In the report, which was adopted, the Council announce that the fees will be raised from 30l. to 36l. a session for all students admitted after the close of the previous session. Last session more than 41,000 students attended classes in technology throughout the country and in the Colonies. The number of students in the Central Technical College during the winter term was 431, including fifty-nine from the Royal College of Science and School of Mines; a total increase over that of any previous year. With the aid of contributions and of 10,000l. assigned from the general funds the new wing of Finsbury Technical College has been completed. The Corporation of the City have renewed their former contribution of 500l. for the next five years, the Mercers' Company have renewed also to their original contribution of 2,000l., and the Vintners' Company have raised their subscription from 100l. to 150l. The total income for the twelve months is 56,443l. A special committee has been appointed to confer with the President of the Board of Education in the matter of the re-organisation of subsisting or proposed institutions for instruction at South Kensington. At a recent interview of the Executive Committee of the Institute (of which Sir J. Wolfe Barry is Chairman) with the Departmental Committee upon the Science Schools at South Kensington, the former expressed their desire to continue to be identified with, and to be largely concerned in, the conduct and control of the Central Technical College, whilst they are quite willing to join in an arrangement which would bring all branches of physical science into correlation and effect an interchange of students at various stages in their careers.

IMPROVEMENTS, BEXHILL.—Major C. E. Norton, R.E., of the Local Government Board, held an inquiry at the Bexhill Town Hall on the 29th ult. into the application of the Town Council for sanction to borrow 1,350l. for the purpose of making up the Marina with tar macadam, and 1,850l. for public lavatories on the Marina. The Clerk (Mr. T. E. Rodgers), in regard to the tar mac, said about eighteen months ago the Surveyor reported that it was necessary for the road to be properly made up. A committee visited Brighton, and after inspecting Madeira-road, expressed approval of what they had seen. They recommended to the Council that tar slag macadam, prepared in this way, would make a better road than ordinary macadam, and the report was approved by the Council. The Surveyor (Mr. G. Bell), questioned by Major Norton as to utility, said that at Scarborough a road thus treated had worn well. Major Norton: Can you explain to me why you are making up this road with a new surface, after the present surface has only been in use for five and a half years?—The Surveyor replied that the wear was due to the excessive amount of traffic and the development of the Marina. The road was much worn, and he recommended to the Council that it would be an economy to repair it with three inches of tar macadam.—Respecting the second application the Clerk supplied the necessary information to the inspector, pointing out that it was the intention of the Council to purchase and improve certain lavatory buildings.—Councillor Jesty spoke in support of the application, and the inquiry was closed.

MEMORIAL FONT, GAMBERLEY.—The font which has been erected in St. Michael's Church as part

of the memorial to the Rev. F. M. Middleton, was recently dedicated. It is constructed of Mansfield stone, and is supported on pillars of Devonshire marble. The leaden basin belonging to the old font has been embedded in the new bowl, and the cover is constructed of oak. The designer of the font is Mr. A. H. Hoole, of London.

Legal.

SUCCESSFUL APPEAL BY BRICK-MAKERS.

Is the Court of Appeal, before the Master of the Rolls and Lord Justices Koser and Cozens-Hardy last week, the case of Bold v. Crompton and Company (Croston), Ltd., was heard on the appeal of the respondents from the award of the County Court judge of Chorley, sitting as the arbitrator under the Workmen's Compensation Act, 1897, in favour of the applicants, the representatives of a man killed while at work for the respondents.

The short facts of the case were these:—The respondents owned certain brick-works where they carried on the business of brick-making. About 700 yds. away from the brick-works they had a field in which they had a clay pit, and in which the deceased man was employed in excavating clay. Whilst so engaged some clay fell upon him, and he was fatally injured. The brick-making yard was constituted a factory within the meaning of the Act by reason of there being machinery worked by steam, and the learned County Court judge held that in the circumstances of the case the deceased man was employed "on, in or about a factory" within the provisions of the Act, and made an award in favour of the applicants.

Mr. C. A. Russell, K.C., on behalf of the employers, contended that the learned County Court judge had misdirected himself, and that the award was erroneous and ought not to be allowed to stand.

Mr. Lord having supported the award of the County Court judge, their lordships in the result allowed the appeal with costs, holding that the deceased man could not be said in the circumstances of the case to have been working at the time of the accident "on, in or about a factory" within the meaning of the Act.

Patents of the Week.

APPLICATIONS PUBLISHED.*

14,298 of 1905.—E. J. PROPPER and F. BACH-SCHMID: *Artificial Building Stone Blocks.*

This relates to an artificial stone building block, in the form of a rectangular cross, in which the angles or inner corners of the arms are formed with rib-shaped lugs or projections, and the outer corners or edges of the end faces of the arms are formed with corresponding grooves.

14,628 of 1905.—H. JOHNS: *A Gate Fastening.*
This relates to a gate fastening, consisting of a straight pivoting part passing through the head of the gate and cranked parts continued therefrom to form respectively the handle portion and the catch of the fastening, the catch being adapted to engage a hook on the gate post, and the handle portion being formed either with or without curve parts for gripping with a whip and loop for enabling the fastening to be locked.

14,956 of 1905.—J. G. WALKER: *Means for Opening and Closing Ventilators, Sashes, Doors, Shutters, or the Like.*

This relates to an apparatus for opening and closing doors, sashes, shutters, and the like by means of fluid pressure and suction, and consists in the combination of a fluid pump and operating mechanism, which may be situated at a distance from the sash or the like, to be manipulated and connected by means of a pipe or passage with a cylinder and piston in close proximity to the sash, the said piston being connected to the said sash or the like.

15,763 of 1905.—S. KEELLET and F. W. RICHARDSON and BUTTERMERE GREEN SLATE COMPANY, LTD.: *Manufacture of or Ornamentation of Slates.*

This relates to the manufacture or ornamentation of slates, and consists in the application of the slates of salts of iron or of other metals, such as chromium, having coloured oxides, or forming with the material of the slates suitable colours with heat, and then roasting to produce the various shades of red, green, purple, yellow, and the like. For example, iron or oxide of iron is dissolved in acids, such as nitric, hydrochloric, sulphuric, hydrofluoric, acetic, and formic acid, or the iron salts of these acids obtained as waste

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

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xvi.; Auction Sales, xxvi. Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

Contracts.

BUILDING.

* **JUNE 9.—Angleton and Parc Gwyllt.**—BUILDINGS.—The Committee of the Glamorgan County Asylum invite tenders for the re-construction of two temporary blocks at Angleton and Parc Gwyllt in accordance with drawings and specification prepared by Mr. George H. Hine, architect, 35, Parliament-street, Westminster, S.W. Application for bills of quantities, with 1*l.* deposit, to be made to Mr. W. E. R. Allen, Clerk to the Committee of Visitors, Glamorgan C.C. Offices, Cardiff, on or before June 9, when further information and time for sending in tenders will be given.

JUNE 9.—Ballater.—CHURCH.—For mason, carpenter, slater, painter, plumber, and painter's works of new church, St. Saviour's, Ballater. Plans may be seen with, and schedules obtained from, Mr. J. Simpson, Union Bank, Ballater, or Messrs. A. Marshall Mackenzie & Son, architects, 345, Union-street, Aberdeen. Tenders to be lodged with the architects on or before Saturday, June 9, at 10 o'clock a.m.

* **JUNE 9.—Watford.**—NEW INFIRMARY, ETC.—Tenders are invited for erection of new infirmary, laundry, and phthisis wards at the Union Work-house, Watford, under the Guardians, according to plans and specifications by Mr. C. W. Ayres, Burvalde, Watford, to whom application for bills of quantities, accompanied with 2*l.* 2*s.*, should be made, not later than June 9.

JUNE 11.—Greenock.—BRICK PURIFIER HOUSE.—Greenock Corporation Gas Committee invite tenders for the erection of a brick purifier house, concrete foundations, iron roof, and slater work, and two 49 ft. by 30 ft. purifiers, with connexions. Specification and plans can be seen and tender form had by applying to Mr. William Ewing, Engineer and Manager, Inchgreen Gasworks. Sealed tenders, marked on outside "Tender for Purifier House," to be returned to Mr. Colin MacCulloch, Town Clerk, Greenock, not later than 10 a.m., June 11.

JUNE 11.—New Holland.—SCHOOL.—Lindsey C.C. Education Committee invite tenders for building a new elementary school at New Holland. Bills and quantities and form of tender may be had on application to Messrs. Scorer & Gamble, architects, Bank-street Chambers, Lincoln, on or before June 11. The drawings and conditions of contract may be inspected at the offices of the architects. Tenders must be delivered to the Secretary, Mr. S. Maudson Grant, Lindsey Education Office, 285, High-street, Lincoln, in the envelope provided for the purpose, before 10 a.m. on June 11.

JUNE 12.—Bargoed.—WALLS AND ARCHES.—Gelligaer and Rhigos R.D.C. invite tenders for the erection of abutment walls and arches required to be done in the extension of a culvert in Hanbury-road, Bargoed, in the parish of Gelligaer. Specification can be seen, and bill of quantities obtained, from the Council's Surveyor, Mr. James P. Jones, Council Offices, Heigoged, *via* Cardiff. Sealed tenders, endorsed "Culvert Extension," to be sent in to Mr. Frank T. James, Clerk, 154, High-street, Merthyr Tydfil, on or before June 12.

JUNE 12.—Maesteg.—ADDITIONS TO CHAPEL.—The erection of additions to Bethel Chapel, Maesteg. Plans and specification may be seen with Rev. Mr. Rhys Davies, Maesteg, and at the offices of the architect, from whom bills of quantities may be obtained. Tenders to be sent to Rev. Mr. Rhys Davies, Brynnaur place, Maesteg, on or before June 12. Mr. W. Beddoe Rees, architect, 3, Dumfriess-place, Cardiff.

JUNE 12.—Nottingham.—ALTERATIONS.—Nottingham Education Committee invite tenders for alterations, etc., at the Leen-side Council School. Plans may be seen at, and copies of the specifications, bills of quantities, and forms of tender obtained from the office of the City Architect (Mr. Frank B. Lewis), Guildhall, on payment of a deposit of 1*l.* 1*s.* Sealed tenders, addressed to Mr. W. J. Abel, Clerk, Education Office, 10, Victoria-street, properly endorsed, to be delivered not later than 10 a.m. on June 12.

JUNE 12.—Penarth.—ALTERATIONS AND REPAIRS.—Alterations and repairs at Penarth Congregational Church, near Llanfair Caereinion. Plans and specifications to be sent with Mr. J. P. Jones, Glog, Llanfair Caereinion, to whom sealed and endorsed tenders should be sent on or before June 12.

JUNE 12.—Wantage Road.—HOUSE.—Great Western Railway Directors invite tenders for the erection of a house at Wantage Road Station. Plans and specification may be seen, and forms of tender obtained, at the office of the engineer, at Reading Station, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to Mr. G. K. Mills, Secretary, Paddington Station, London, and marked outside "Tender for House at Wantage Road," will be received on or before June 12.

JUNE 13.—Blandford.—MALTING.—New malting at the Town Brewery, Blandford for Mr. J. L. Marsh. Builders willing to tender are requested to send their names to the architects on or before noon, June 13. A deposit of 1*l.* 1*s.* is to be forwarded at the same time for a copy of the bills of quantities. Messrs. Williams, Bradford & Sons, architects and brewers' consulting engineers, Carlton Chambers, 12, Regent-street, London, S.W.

JUNE 13.—Linthwaite.—HOUSES.—The various trades (except carpenters' and joiners') required in the erection of eight dwelling-houses, at New Road, Manchester-road, Linthwaite. Plans may be seen, and quantities obtained, at the office of Arthur Shaw, architect, Golcar, from June 6 to June 13, on which latter date sealed and endorsed tenders must be delivered not later than 6.30 p.m., free of charge.

JUNE 15.—Maesteg. ABERGWYLL, NEATH, ETC.—School Works.—Glamorgan C.C. invite tenders for the following works, viz.:—(1) Plasnewydd Council School, Maesteg—fixing partition, altering drainage, etc.; (2) Abergwyl Council School—re-roofing cloak-room, building retaining wall, and altering offices; (3) Neath Higher Council School, Glyn Neath—building new offices and playsheds, relaying drains, and sundry alterations; (4) Danyang Council School—building new cloakrooms and heating chamber and sundry alterations; (5) erection of a new department, as well as extensions and alterations at the Hawthorn Council School; (6) alterations at the Sally Council School—extensions and alterations; (7) construction of footpaths in Usk-street and Church-street, Barzod. Plans may be seen, and specification and form of tender obtained, for:—Work No. 1, at the Maesteg Police-station; for work No. 3, at the Glyn-Neath Police-station; for work No. 4, at the Danyang Council School; for work No. 5, at the Barzod Police-station; for work No. 6, at the Barzod Police-station. Plans and specification may be seen, and copies of the bill of quantities and form of tender obtained, for work No. 2, at the Abergwyl Police-station, and for work No. 5, at offices of Mr. W. E. R. Allen, Deputy Clerk of the C.C., Glamorgan County Offices, Westgate-street, Cardiff, where also plans, specifications, etc., of all the works may be seen or obtained. Sealed tenders (made out on the form supplied) are to be delivered to Clerk, together with the full names and addresses of two substantial sureties, not later than June 13, marked outside "Tender for Plasnewydd Council School," or "Tender for New School at Hawthorn," etc., as the case may be.

JUNE 15.—Shillington.—CHAPEL.—Erection of a chapel at Shillington, Beds., for the Primitive Methodist Church Committee. Plans and specification may be seen at Mr. H. Stapleton's, Bury-road, Shillington. Sealed endorsed tenders to be sent in to Mr. J. Shilcock, architect, Hitchin, on or before June 13, at 10 o'clock a.m.

JUNE 14.—St. Cleer.—ALTERATIONS.—The Cornwall Education Committee invite tenders for carrying out certain alterations to master's houses at St. Cleer Council School, according to plan and specification, which may be seen at the school, or at the office of Mr. B. C. Andrew, Architect to the Committee, Biddick's Court, St. Austell, Cornwall, by which all tenders must be made, may be had from the Architect or the Secretary. Sealed endorsed tenders to be sent to Mr. F. R. Pascoe, Secretary, Education Office, Truro, on or before June 14.

JUNE 14.—Strathunay.—COTTAGE.—The mason, carpenter, plumber, slater, plaster, and painter works alterations on house and seading and new outtage to be erected at Strathunay. Plans and specifications may be seen at the office of Mr. John Witte, architect, Elgin, with whom offers must be lodged on or before June 14.

JUNE 15.—Cleethorpe.—SCHOOLS.—The extensions of the Wesleyan Church Sunday Schools, Cleethorpe. Plans and copies of the quantities at the offices of Mr. Herbert C. Scarping, architect, Court Chambers, Grimsby, from June 8 to June 14. Tenders endorsed "Sunday Schools," to be delivered to Mr. W. T. Chapman, St. Peter's-road, Cleethorpe, on or before June 15, at noon.

JUNE 15.—Cowesby.—FARM BUILDINGS.—Building new turnip house and cart shed, together with extensive alterations to existing buildings at Ruddings Farm, Cowesby, for Mr. W. A. C. Lloyd. Specifications and bills of quantities will be ready by June 15, and will be sent to builders on application to Messrs. Jackson & Fox, architects, 7, Rawson-street, Halifax.

JUNE 15.—Lepton.—SCHOOL.—West Riding Education Committee invite tenders in connexion with additions, etc., to Lepton Provided School for Boys, and further particulars apply to Mr. Vickers-Edwards, County Architect, County Hall, Wakefield. A deposit of 1*l.* will be required. Sealed tenders, properly endorsed, to be sent to the architect, not later than June 15.

JUNE 15.—Rothwell, Lenton, Botton, etc.—SCHOOLS.—The West Riding Education Committee invite whole or separate tenders for:—New school at Robin Hood, Rothwell; alterations and repairs at Vickers-Edwards, County Architect, County Hall, Wakefield. A deposit of 1*l.* will be required. Sealed tenders, properly endorsed, to be sent to the architect, not later than June 15.

JUNE 15.—Rothwell, Lenton, Botton, etc.—SCHOOLS.—The West Riding Education Committee invite whole or separate tenders for:—New school at Robin Hood, Rothwell; alterations and repairs at Vickers-Edwards, County Architect, County Hall, Wakefield. A deposit of 1*l.* is required for each of the above schools. Cheques are to be sent to the West Riding Treasurer. Sealed tenders, properly endorsed, to be

sent to the Architect, not later than 10.30 on the morning of June 15.

JUNE 15.—Turnbridge.—MILL SHED.—For the masons', bricklayers', joiners', plumbers', saters', painters', concretors', iron and steel fitters', and patent glaziers' works required in the erection of a mill shed at Turnbridge. Plans may be seen, and quantities obtained, at Huddersfield offices of Messrs. Lunn & Kaye, architects and surveyors, Huddersfield and Minshigh, from June 8 to June 15, on which latter date tenders are to be sent in free of charge.

JUNE 16.—Camborne.—PREMISES.—Tenders are invited for rebuilding business premises at Camborne for Mr. Henry H. Berriman, according to plans and specifications, which may be seen (by appointment) at the office of Mr. Sampson Hill, architect, Green Lane, Redruth, or at the proprietor's residence, Chapel-street, Camborne, where sealed endorsed tenders are to be sent not later than 10 o'clock on June 16.

JUNE 16.—Lanchester.—STORE.—Anfield Plain Industrial Co-operative Society, Ltd., invite tenders for the erection and completion of new branch store at Lanchester, Co. Durham (including three shops, warehouse, manager's house, stabling, etc.). Drawings, specifications, and conditions of contract may be seen, and forms of tender obtained, at the architect's office, 9, Market-street, Black-hill, Co. Durham. Tenders to be sent in to Mr. Wm. R. Pigg, Secretary, Co-operative Store, Anfield Plain, R.N.O., endorsed "Tender for New Branch Store at Lanchester," on or before June 16. Mr. Geo. Thos. Wilson, architect.

JUNE 16.—Penzance.—ALTERATIONS.—For alterations to stores in Jerlingham-street, Penzance. Plans and specifications may be seen on application to Mr. R. J. Chappell, of No. 53, Chapel-street, Penzance, to whom sealed endorsed tenders must be sent, not later than Saturday, June 16. Any further particulars may be had of Mr. N. C. Whear, jun., architect, Penzance.

JUNE 18.—Colwyn Bay.—POLICE-STATION, ETC.—Builders desirous of submitting tenders based on bills of quantities to be supplied for the erection of a new county police-station and magisterial quarters, to be erected in Colwyn Bay, are requested to forward their names, together with a deposit of 1*l.* 1*s.*, to the County Architect and Surveyor (Mr. Walter D. Wiles), 42, High-street, Wrexham, on or before June 18.

JUNE 18.—Pontrypid.—GENERATING STATION.—Pontrypid U.D.C. invite tenders for extensions to the generating station engine house, foundations for new sets, and all contingent works. Plans may be seen, and specification and form of tender obtained, on application at the office of the engineer and surveyor, Mr. P. R. A. Willoughby, A.M.Inst.C.E., upon receipt by Mr. Colenso Jones, Clerk to the Council, District Council Offices, Pontrypid, of a deposit of 1*l.* 1*s.* Tenders on the prescribed form sealed, and endorsed "Engine House Extension," must be received by the Clerk on or before June 18, between the hours of 10 a.m. and 5 p.m., from June 6 until June 18. Bills of quantities, if not sealed, to be obtained at the office of Mr. J. Houghton Spencer, architect, 5, Hammel-street, Taunton, and sealed tenders should be addressed to him, and endorsed "All Saints' Church Building Tender," not later than June 18.

JUNE 18.—Wheatley Hill.—CEMETERY CHAPEL.—Tenders are invited by the Wheatley Burial Committee for the erection and completion of a new cemetery chapel, lodge, entrance gates, boundary fencing, and draining at Wheatley Hill. Plans and specifications may be seen at the offices of Mr. Jas. Garry, F.R.I.B.A., architect, West Hartlepool, on and after June 11, where quantities may be obtained on deposit of 5*s.*, which will be returned on receipt of a bona-fide tender, sealed and delivered to Mr. Thos. Willis, Clerk to the Burial Committee, Wingate, S.O., not later than 12 o'clock noon on June 18.

JUNE 18.—Ynysydd.—SCHOOL, WORK.—Mendouthshire Education Committee invite tenders for alterations and extensions to the Ynysydd Council School. Plans and specifications may be seen at the office of Messrs. Roberts & Co., Architects, and bills of quantities obtained on payment of 2*s.* Sealed tenders, endorsed outside "Ynysydd School Extensions," are to be delivered to Mr. C. Dauncey, C.C. Offices, Newport, on or before June 18.

JUNE 19.—Norton.—SCHOOL, ALTERATIONS.—Durham County Education Authority invite tenders for alterations and alterations to Norton Council School. Plans and specifications, and conditions of contract may be seen at the school and at the architect's office. Quantities may be obtained on application to the architect, Mr. W. Rushworth, F.R.I.B.A., County Education Office, Durham. Sealed endorsed tenders to be delivered to the architect not later than June 19.

* **JUNE 19.—Paddington.**—W.—ALTERATIONS AND ADDITIONS TO PREMISES.—Tenders are invited for the alterations and additions to Beckington District Post Office W., for the Commissioners, H.M. Office of Works. Drawings, specifications, copy of conditions of contract, and bills of quantities, application to Mr. J. Wager, H.M. Office of Works,

Westminster, S.W. Bills of quantities may be obtained from the Office of Works on deposit of 1/2 s. Tenders, addressed to the Secretary, Office of Works, 17, Cannon-st., and endorsed "Tender for Paddington District Post Office," to be delivered before 12 o'clock on June 19.

* **JUNE 19.—Paving Stones.**—Contractors (all trades, except plasterers' and slaters' work) desirous of tendering for the alterations and additions to the stores in Saller-row, Portraetraf, for the Industrial School, are requested to forward their names, before June 12, to the architects, Messrs. Garside & Pennington, Portraetraf and Castleford, when quantities will be supplied. Sealed tenders, endorsed "Alterations to the stores in Saller-row, Portraetraf," to Mr. W. A. Chappell, Secretary, Saller-row, Portraetraf, not later than 12 o'clock noon on June 19.

* **JUNE 19.—Springwell.**—SCHOOL ALTERATIONS.—Durham County Education Authority invite sole tenders for alterations to Springwell Council School. Plans, specification, and conditions of contract may be seen at the school and at the architect's office. Quantities may be obtained on application to the architect. Sealed tenders to be delivered to Mr. W. Rushworth, F.R.I.B.A., architect, County Education Offices, Durham, not later than June 19.

* **JUNE 20.—Cheltenham.**—SCHOOL.—Cheltenham Education Committee invite tenders for the erection of a new school building, for the erection of 1,200 children, for the Haverstock district of Cheltenham, in accordance with plans, specifications, and conditions of contract, to be seen at the offices of Messrs. Young, Hall, and Co., architects, 17, Southampton-st., Cheltenham. Early application is requested for bills of quantities, which will be supplied by the architects upon receipt of a deposit of 2/2 s. Tenders, sealed, endorsed on must be delivered to Mr. William Preston, Secretary, Education Offices, Rodney road, Cheltenham, by 12 o'clock on June 20.

* **JUNE 20.—Hampton.**—HOSPITAL BUILDINGS.—The Committee of the Metropolitan General Hospital invite tenders for the erection of extension buildings to the new hospital situated at Inverstock-hill. The drawings and bills of quantities and form of contract, form of contract, and form of bond can be inspected, and the bills of quantities and form of tender obtained, at the offices of the architects, Messrs. Young, Hall, and Co., architects, 17, Southampton-st., W.C., between the hours of 10 and 4, upon depositing the sum of 5/1. Both tender and priced bills of quantities are to be delivered at the hospital not later than 12 o'clock on June 20.

* **JUNE 20.—Haverstock Hill.**—HOSPITAL EXTENSIONS.—The Committee of the Metropolitan General Hospital invite tenders for the erection of extension buildings to the new hospital at Haverstock Hill. The drawings, specification, condition of contract, form of tender, and form of bond can be inspected, and the bills of quantities and form of tender obtained, at the office of Messrs. Young and Hall, architects, 17, Southampton-st., Bloomsbury, W.C., on and after June 10 before 10 and 4 upon depositing 5/1. Tenders, sealed, form with priced bills of quantities, to be delivered at the hospital before 12, June 20.

* **JUNE 20.—H.M. Works and Public Buildings.**—The Commissioners of H.M. Works and Public Buildings invite tenders for the erection of a new post office at St. Andrews. Drawings, specification, and a copy of the conditions of contract, on deposit of 1/2 s., on application to the Postmaster. Bills of quantities and forms of tender may be obtained from Mr. W. T. Oldrieve, H.M. Office of Works, Parliament-st., London, E.C., and endorsed "Tender for St. Andrew Post Office."

* **JUNE 20.—Ware, Herts.**—NEW SCHOOLROOM.—Tenders are invited for erection of new schoolroom at Ware, Herts., and alterations to the Wesleyan Chapel, New-road, Ware, Herts. Plans to be seen, and specifications obtained, at the vestry, as above, between 10 and 4, and 2 s. on deposit of 1/2 s. on and after June 19. Tenders to be addressed to Rev. James Parkyn, 23, Ware-road, Hertford, not later than 4 o'clock, June 20.

* **JUNE 20.—Watford.**—OFFICE EXTENSIONS.—The Watford U.D.C. invite tenders for the erection of addition to and alterations of Council Offices. The plans and specifications can be seen, and bills of quantities obtained, on application to Mr. D. Waterhouse, Council's Surveyor, 14, High-street, Watford, on and after May 28, on payment of 1/1 s. Sealed tenders, endorsed "Tender for Office Extensions," to be delivered to Mr. H. Morten Turner, 14, High-street, Watford, before 12 noon, June 20.

* **JUNE 21.—Armsley.**—SCHOOL.—Leeds Higher Education Department invite tenders for the erection of the proposed Secondary School at Armsley. Names to Mr. W. S. Braithwaite, Architect's Department, Education Offices, Leeds. The notification of a desire to tender should be accompanied by a deposit of 1/1 s. Tenders are to be sent in to Mr. James Graham, Secretary for Higher Education, Education Offices, Leeds, not later than 12 o'clock noon, June 21, endorsed "Tender for Secondary School, Armsley."

* **JUNE 21.—Cardiff.**—POSS SIGNAL HOUSE.—The Trinity House Corporation invite tenders for the erection of a fire signal house, dwelling, etc., on Flatthorn Island. The plans may be inspected, and forms of tenders obtained, either at Trinity House, 25, or on application to the officer-in-charge, Trinity House, Cardiff. Applicants, when receiving a form of tender and specification, must deposit 1/1 s. on producing receipt for which at the offices of Messrs. Borden & Co., 25, Abchurch-lane, London, E.C. Anne's-gate, S.W. they may obtain the surveyor's quantities. Tenders endorsed "Tender for New Fire Signal House, etc., Flatthorn," to Mr. A. A. Owen, Secretary, Trinity House, E.C., on or before June 21.

* **JUNE 22.—Holywell.**—SCHOOL.—Holywell County School Governors invite tenders for the carrying out and alterations and extensions to the County Intermediate School, Holywell, in the County of Flint. Plans and specifications may be seen at the offices of the architect, Messrs. Evans & Jones, North and South Wales Bank Buildings, High-street, Mold, from whom bills of quantities may be obtained on

payment of a sum of 2/2 s. Tenders to be made out on forms to be supplied and sent in to Mr. Fred Lawson, Architect, Clerk to the Holywell County School Governors, Town Hall, Holywell, North Wales, on or before June 22, in sealed envelopes, marked "Tender for Extensions at Holywell County School."

* **JUNE 23.—Shrewsbury.**—WOODEN BUILDINGS.—The erection of wooden buildings, stage, etc., for the Shropshire Educational Society's annual show in August next at Shrewsbury. Plans and specifications will be supplied on application to Mr. Walter Richards, Swan Hill, Shrewsbury, on payment of 1/2 s. The work will be divided as follows:—(1) Buildings and boardings; (2) horse track, stage, and fittings; (3) drainage; (4) plumbing. Tenders will be received for any or all sections, and must be sent in by June 23, addressed the Chairman of Committee, endorsed "Tender for Erection," to the care of Messrs. Adnitt & Nauaton, Hon. Secretaries, The Square, Shrewsbury.

* **JUNE 23.—East Ham.**—REPAIRS, ETC.—East Ham Education Committee invite tenders for repairing, painting, and sundry work at Bessborough-road, Central Park-road, High-street, Kensington-avenue, and Shrewsbury-road Schools, and for minor repairs at Essex-road and New Beckton Schools. Specifications may be seen, and forms of tender obtained, at the offices of the architect, Mr. J. H. Curtis, 11 and 12, Finsbury-square, E.C. Each contractor must deposit with his tender a 5/1 Bank of England note or crossed cheque of equal value. Tenders are to be sent in and delivered to Mr. H. C. Padgett, Secretary, Education Office, East Ham, E., not later than 4 o'clock in the afternoon of June 23, and should be endorsed "Tender for Repairing Schools."

* **JUNE 25.—Epsom.**—ENGINE HOUSE, ETC.—For the construction of an engine house, section gas house, and various other necessary works at the Council's water works, East-street, Epsom, for the Epsom U.D.C. The work to be carried out to the specification and to the satisfaction of the Engineer-in-Charge, M. J. C. E. Queen Anne's-gate, Westminster, where drawings may be seen and copies of specification and bills of quantities obtained on payment of 5/1 s. Sealed tenders, not later than 12 o'clock, endorsed "Tender for New Engine House, etc.," must be forwarded to Mr. E. G. Wilson, Clerk, Church-street, Epsom, not later than 12 o'clock on June 25.

* **JUNE 25.—Sevenoaks.**—ISOLATION HOSPITAL.—The Sevenoaks R.D.C. invite tenders for an isolation hospital at Offord, Sevenoaks, Kent. The drawings, specifications, and conditions of contract, prepared by the architect, Mr. M. Maberly Smith, can be seen at the offices of Messrs. Glead & Belcher, of 8 and 9, Cannon-street, E.C., to whom intending competitors are to send their names before June 15, and from whom bills of quantities, together with forms of tender, can be obtained on and after June 20 on payment of 1/2 s. Tenders to Mr. E. Gurnell, Clerk, The Council, Sevenoaks, before noon, June 25.

* **JUNE 25.—Tooting, S.W.**—ELEMENTARY SCHOOL.—Tenders are invited for the erection of an elementary school at Tooting, S.W. Drawing may be seen, and specifications and bills of quantities, forms of tender, etc., obtained, at Education Offices (Architects' Dept.), 15, Victoria-st., London, W.C., on deposit of 5/1 s. Tenders, in envelopes provided, must be delivered at above offices (Room 119) not later than 11 a.m., June 26.

* **JUNE 26.—Wrexham.**—NEW POST OFFICE.—The Commissioners of H.M. Works and Public Buildings invite tenders for new post office at Wrexham. Drawings, specification, and conditions of contract, and form of contract may be seen on application to the Postmaster between 10 a.m. and 5 p.m. Bills of quantities and forms of tender may be obtained on application to Mr. W. C. Storey's-gate, S.W., on payment of 1/1 s. Tenders before 12 noon, June 26, addressed to Secretary, H.M. Office of Works, Storey's-gate, W.C., endorsed "Tender for New Post Office, Wrexham."

* **JUNE 27.—Wallis's-yard, S.W.**—ERECTOR OF NEW BOILER ROOM, ETC.—Tenders are invited for the erection of a new boiler room, etc., and extension of the workhouse in Wallis's-yard, Buckingham Palace-road, S.W., for the St. George's Guardians. Plans and specifications may be inspected, and bills of quantities obtained, on application to the architect, Mr. Francis J. Smith, Parliament-mansions, Victoria-street, S.W., between 10 and 4 p.m. from June 6 to June 12. Tenders to be addressed and delivered to the Clerk to the Guardians, St. George's (Innovers-square) Hall, Mount-street, W., before 10 a.m., June 27.

* **JUNE 28.—Seaford.**—STALLING, ETC.—The Seaford Vestry company, Ltd., invite tenders for stabling, riding school, and house at Seaford. Names to be sent at once to Mr. Wm. Lambie, Estate Office, 4, Brunton-road, Seaford, Sussex, from whom quantities and other particulars may be obtained in due course, on payment of 3/1 s. All tenders to be sent, sealed, to the Estate Office by noon, June 28.

* **JUNE 28.—Beverley.**—HOUSE AND SHOP.—The County Borough of Croxson Education Committee invite tenders for the erection of a school for 1200 children in Davidson-road, Croxson. Bills of quantities and forms of tender may be obtained on application to the architect, Mr. J. Carter Peck, architect, Thornton Heath. Bills of quantities and forms of tender can be obtained at the Education Office, Kibbards, Beverley, on payment of 1/1 s. Applications should reach the Clerk to the Committee not later than June 23, and tenders must be delivered before noon, July 10.

* **JUNE 28.—Beverley.**—HOUSE AND SHOP.—Bricklayers' and plasterers' work for house and shop to be erected on Grovehill-road, Beverley. Plans and specifications seen at Mrs. Stokes, 1, Bently-terrace, Grovehill-road, Beverley.

* **JUNE 28.—Cambridge.**—HOUSES.—Tenders are invited for the erection and completion of eight or nine new houses and annexes at Dolsooth road, Cambridge, for Mr. J. T. Richards, Bag 3111, Tuckingsmill. Plans and specifications may be seen (by appointment) on applying to above address. Five new houses at Evenwood. Apply Mr. Johnson Welch, Evenwood, Bishop Auckland.

* **NO DATE.—Festiniog.**—OFFICES.—Merioneth Education Committee invite tenders for building new offices, and carrying out drainage works, at the Festiniog Council School. The plans, specification, and further particulars may be obtained on application to the County Architect, Mr. A. M. Howard, Jones Plas Nys, Borth, R.S.O.

* **NO DATE.—Halton.**—PAVILION.—Halton Cricket Club Committee invite tenders for the construction of a cricket pavilion, about 23 ft. by 9 ft. 6 in. Further particulars may be had on application to Mr. E. H. H. Secretary.

* **NO DATE.—Longton.**—CLASSROOMS, ETC.—Erection of new classrooms and other alterations and additions to Heathcote-road Wesleyan Mission, Longton. Names to Mr. William Wood, architect and surveyor, Longton.

* **NO DATE.—Mosterton.**—COTTAGE.—Building a cottage at West Farm, Mosterton, for Mr. Joseph S. Hill. For particulars apply to Mr. F. T. Malby, A.M.I.C.E., architect and surveyor, Bechester.

* **NO DATE.—Neatham Down.**—COTTAGE.—A labourer's cottage on Neatham Down (Chawton House Estate). Applications to be made to Mr. J. Alfred Eggar, architect and surveyor, 74, Castle-street, Barnham.

* **NO DATE.—North Rington.**—LODGE.—A lodge at Moor Hill, North Rington, near Weston. Apply to Messrs. Joseph F. Walsh & Graham, valuers, architects and surveyors, Halifax and Ilfracombe, for quantities.

* **NO DATE.—Nottingham.**—FACTORY.—For pulling down existing premises in Nottingham and building four-story factory. Written application at once to Messrs. Heazell & Sons, architects, Burton Buildings, Nottingham.

* **NO DATE.—Wortley.**—REPAIRING WALLS.—For pointing and repairing the boundary walls of Wortley Cemetery. Particulars may be obtained from Mr. E. Kirk, Cemetery Lodge, Wortley, Leeds. Tenders to reach him by June 12.

* **NO DATE.—Wrexham.**—CHAPEL AND SCHOOL.—Tender invited for the erection of new Wesleyan Chapel and school, Wrexham. Bills of quantities may be seen, and quantities (limited number) obtained, at the office of Mr. James Orwin, architect and surveyor, 20, Collingwood-street, Newcastle-on-Tyne.

ENGINEERING, IRON, AND STEEL.

* **JUNE 11.—Keighley.**—PIPES.—The Gas Committee of the Keighley Corporation invite tenders for the supply of cast-iron pipes and other castings, etc., required for ordinary repairs and renewals during the twelve months commencing July 1. Particulars and schedule can be obtained from Mr. John Laycock, Gas Engineer, Gas Offices, Cook-lane, Keighley, to whom tenders must be sent not later than June 11.

* **JUNE 11.—Preston.**—PIPING.—The cleansing and pipings of about 250 lin. yds. of pipes in Stakes-road, Preston, for the Seacotes R.D.C. Drawings and specifications can be seen on application to Mr. William H. Wellsted, Engineer to the Council, Kirk's Dock-chambers, Hull, and bills of quantities obtained. Sealed and endorsed tenders to be delivered not later than 12 o'clock noon on June 11.

* **JUNE 12.—London.**—PIPS.—The Metropolitan Water Board invite tenders for the supply and delivery of about 5300 tons of 42in. and other cast-iron pipes and castings. Forms of tender and contracts, with specification, may be obtained, and drawings inspected, upon application to the engineer at the Firs, Southern-road, Fortis Green, East Finchley, N., between the hours of 10 and 4 (except on Saturdays). Tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, Metropolitan Water Board, Savoy-court, Strand, W.C., and endorsed "Tender for Pipes and Cast-iron Status Reservoirs," must be delivered at the office of the Board not later than 10 a.m. on June 12.

* **JUNE 13.—Hackney.**—STEAM FANS.—Hackney Guardians invite tenders for providing and fixing two steam fans at their workhouse, Homerton, N.E. Specification, conditions of contract, and tender form, to be obtained at office of Mr. Frank P. H. H. Clerk, Hackney Union Offices, Sidm-road, Homerton, where the plans (prepared by Mr. L. J. Todd, consulting engineer) may be inspected. Sealed tenders, endorsed "Steam Fans," must be delivered at office of Clerk by 2 p.m. on June 13.

* **JUNE 13.—Kingston.**—BRIDGE.—Kingston-upon-Thames Corporation invite tenders for the taking down, removal, and re-erection of an iron foot-bridge, now situate near Portland-road, in accordance with the specification and drawings, to be seen at the Borough Surveyor's Office. Tenders, endorsed "Foot-bridge," to be sent to Mr. Harold A. Winer, Town Clerk, Town Clerk's Office, Kingston-upon-Thames, not later than June 13.

* **JUNE 13.—Pare Gwyll, etc.**—HEATING.—Glanorgan County Asylum Committee of visitors invite tenders for the reconstruction and extension of the heating apparatus in two of the patients' wards at Pare Gwyll Asylum and Angelon Asylum respectively, near Bridgend. Separate sealed tenders, marked outside "Tender for Pare Gwyll Heating," or "Tender for Angelon Heating," as the case may be, giving the names and addresses of two substantial sureties, are to be received by Mr. W. E. Allen, Clerk of the Committee of Visitors, Glamorgan C. Offices, Westgate-street, Cardiff, not later than June 13.

* **JUNE 14.—Bottle.**—WATER MAIN.—The U.D.C. of Bottle invite tenders for the supply, delivery, and laying of about 1520 yds. of 4 in. water main, and the necessary valves in connexion with the same, from the town of Bottle to the Bottle Union Workhouse. Sealed tenders, endorsed "Tender for Mains, etc.," and addressed to Mr. Charles Sherr, Clerk to the U.D.C., Bottle, to be sent in not later than 12 at noon on June 14. Plan, specification, and general conditions may be inspected at the offices of the Clerk, at Bottle, Mr. Charles Sherr, Clerk.

* **JUNE 14.—Bude.**—PIPS.—For 1800 lin. yds. of 3 in. cast-iron spiral and socket water pipes of the following description:—Length of pipe, 5 ft. 6 in. depth of socket, 3 in.; thickness of joint, 2 in. or 2 1/2 in.; weight of each pipe, 120 lb., for the Stratton

and Bude U.D.C. All pipes to be coated with Dr. Angus Smith's solution whilst hot, both inside and out. All pipes to be tested at the works before being laid. Head of a water of 600. Tenders to be sent to Mr. K. A. Foster Melliar, Clerk, Council Offices, Bude, marked "Water Pipes," on June 14.

JUNE 14.—Dublin.—Electric Lighting.—Dublin Public Libraries Committee invite tenders for the electric lighting of three public libraries, situated in Capel-street, Thomas-street, and Charleville-mill, respectively. Specification, with general conditions and form of tender, may be inspected at the office of the City Electrical Engineer, Fleet-street, Dublin, and may be obtained from him, on payment of 10s. 6d. Tenders, sealed, and marked "Tenders for Electric Lighting of Public Libraries," must be addressed to the Chairman, Public Libraries Committee, City Hall, Dublin, and be delivered not later than 12 o'clock noon on June 14. Tender must contain the names of two sureties, who will be prepared to execute a joint and several bond for the due performance of the contract in a sum of 20 per cent. of the contract price.

JUNE 14.—Porth.—Retort House.—Rhondda U.D.C. invite tenders for the erection of a retort house and an installation of three tubular regenerators and settings at the Porth Gas Works. The drawings and specifications may be seen, and forms of tender supplied, upon application to Mr. Octavius Thomas, the Engineer and Manager, Gas and Water Offices, Pentre Glam upon depositing the sum of 2s. Tenders to be addressed to the Chairman of the Gas and Water Committee, endorsed "Contract No. 35," and office of Mr. Walter J. Nicholas, Clerk, Council Offices, Pentre, Glam, on or before 10 a.m., June 14.

JUNE 15.—Nottingham.—URINAL.—Nottingham Health Committee invite tenders for the erection of a urinal, Pennyfoot-street. Plans may be seen, and copies of the bill of quantities and form of tender obtained, from Mr. Frank B. Lewis, City Architect, Guildhall, on payment of 1s. 3s. Sealed tenders, addressed to Mr. Samuel G. Johnson, Town Clerk, and endorsed "Tender for Urinal, Pennyfoot-street," to be delivered at the Guildhall before 10 a.m. on June 15.

JUNE 15.—Rhondda.—PIPES.—Rhondda U.D.C. invite tenders for the following:—For the supply and delivery of cast-iron pipes required from July 1, 1906, to June 30, 1907. Specifications and forms of tender can be obtained on application to the Engineer and Manager, Mr. Octavius Thomas, Gas and Water Offices, Pentre, Glam. Tenders to be addressed to the Chairman of the Gas and Water Committee, endorsed "Tender for Cast-iron Pipes," and delivered at office of Mr. Walter P. Nicholas, Clerk to the Council, Council Offices, Pentre, Glam, not later than 10 a.m. on June 15.

JUNE 15.—Southampton.—QUAY.—The Southampton Harbour Board invite tenders for reconstructing part of the Town Quay, Southampton (contract No. 2). Drawings, specification, and conditions may be seen on application to Mr. E. Cooper Poole, A.M.I.C.E., Engineer to the Board, Town Quay, Southampton, between 10 a.m. and 4 p.m. Bills of quantities and forms of tender may be obtained upon payment of a deposit of 5s. Tenders (which must be on the printed form supplied), sealed and endorsed "Tender for the Reconstruction of Town Quay (contract No. 2)," and accompanied by the priced bills of quantities in separate sealed packet, must be delivered to Mr. J. E. Pailthorpe, Clerk to the Board, at the offices of the Board, Town Quay, Southampton, not later than 12 o'clock noon on June 15.

JUNE 16.—Tunstall.—HEATING.—Tunstall Educational Committee invite tenders for thoroughly overhauling the heating apparatus at the Victoria Institute (including free library and museum), and keeping the same in repair for one year from August 1 next. The apparatus can be inspected on application to the tender proper, and may be endorsed, to be sent to Mr. Arthur P. Jewell, Secretary, Education Committee, Tunstall, on or before June 16.

JUNE 18.—Stoke-upon-Trent.—PIPING.—Stoke-upon-Trent Electricity Committee invite tenders for the supply and delivery of various piping. Specification and form of tender may be obtained from the Electricity Works, Stoke-upon-Trent, on payment of a deposit of 2s. Tenders to be sent in, addressed "The Electricity Committee, Stoke-upon-Trent," not later than June 18, endorsed "Tender for Piping."

JUNE 19.—Skipton.—HURDLES.—Skipton T.D.C. invite tenders for the supply and delivery free at Skipton of about 470 lin. yds. of unclimbable wrought-iron hurdles, 6 ft. in height, with the necessary gates, etc. Specification and further particulars may be obtained (on payment of 10s. 6d., which will be returned on receipt of a *bona fide* tender), on application to Mr. John Mallinson, Surveyor to the Council, Town Hall, Skipton, and sealed tenders, endorsed "Hurdles," are to be sent to him not later than June 19.

JUNE 19.—Willesborough.—BRIDGE.—Reconstruction of Willesborough Bridge, near Ashford, for Kent C.C. Plan and specification and bills of quantities and tender forms between the hours of 10 a.m. and 5 p.m., on deposit of 2s. Sealed tenders, endorsed "Willesborough Bridge," are to be delivered to Mr. Frederick W. Ruck, County Architect, Maidstone, not later than 5 p.m. on June 19.

JUNE 20.—Lynn.—CONDENSERS.—Lynn U.D.C. invite tenders for the supply and erection of condensers, with 9-in. valves and connections, suitable for dealing with 120,000 cubic ft. per day. For particulars and specifications apply to the Engineer, Mr. W. L. Donaldson. Sealed tenders, with detailed drawings and specification, to be delivered not later than June 20, addressed to Mr. W. Mullaik, Clerk to the Council, Council Offices, Lynn, and endorsed "Tender for Condensers."

JUNE 20.—Middleton.—WATER SUPPLY.—Middleton (Ireland) T.D.C. invite tenders for certain extensions and improvements to the existing water supply of the urban district, including the construction of a town reservoir. The plans and specifications can be seen during office hours at office of Mr. Jerome J. Bonnyne, Town Clerk. The contractor will be required to accompany his tender with the

names of two sureties who will enter into a bond for 100% for the due performance of his contract. Tenders to be received at Town Clerk not later than 11 o'clock a.m. on June 20.

JUNE 25.—Dublin.—ENGINES.—Great Northern Railway Company (Ireland) invite tenders for the supply of two three four-wheeled coupled passenger engines, in accordance with the company's drawing and specification, copies of which can be obtained on application to Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street, Dublin, on payment of 1s. 1s. (not returnable). Tenders, marked "Tender for Engines," must be lodged with the Secretary not later than 10 a.m. on June 25.

JUNE 25.—Dundalk.—WATERWORKS.—Dundalk U.D.C. invite tenders for the work to be done in the providing and laying of about two and a half miles of 10-in. diameter, cast-iron water main, together with the providing and laying of hatch boxes on the new and existing mains, the building of a meter chamber, and hatch box chambers with drainage therefrom, and all other work shown on the plans, etc., prepared by Mr. Maurice Sellars, C.E., Town Surveyor, which can be seen at his office, Town Hall, Dundalk, during office hours and from whom forms of tender can be obtained on the deposit of 3s. Sealed tenders, endorsed "Extension of Waterworks," giving the names and addresses of two solvent securities willing to join in a bond of 50% for the due performance of the contract (the cost of such bond must be paid by the contractor), to be lodged at the office of Mr. J. M. O'Connell, Town Clerk, Town Hall, Dundalk, not later than 12 o'clock noon on June 25.

JUNE 25.—Hornsea.—SEA WALL, ETC.—Hornsea U.D.C. invite tenders for the construction of a concrete sea wall, promenade, and groynes upon or adjacent to the foreshore at Hornsea, in the County of York. Contract, drawing, terms, and conditions of tender for sea defence works are on application at the office of Mr. T. Hornsey, Clerk, Public Rooms, Hornsea, or to the Consulting Engineer to the Council, Mr. W. T. Douglas, 15, Victoria-street, London, E.C. 1. Plans and bills of quantities may be obtained upon application to the Consulting Engineer, upon payment of 10s. 6d., which sum must first be deposited with the Consulting Engineer, on payment of 10s. 6d., which sum is non-returnable. Sealed tenders, which will only be received upon the forms supplied, endorsed "Tender for Sea Defence Works," to be delivered to the Clerk at the Public Rooms, Hornsea, at or before noon on June 25.

JUNE 26.—Hornsey.—RESERVOIRS.—The Metropolitan Water Board invite tenders for the construction of covered reservoirs and other works at Forts Green, Hornsey, in the County of Middlesex. Forms of tender and contract, with specification and bills of quantities, may be obtained and the drawings inspected, on application to the Engineer, at The Firs, Southern-road, Forest Green, East Finchley, N., on production of an official receipt for the sum of 2s., which sum must first be deposited with the Comptroller, at the Board's Central Offices, at Savoy-court, Strand, W.C. Such payments and applications must be made between the hours of 10 a.m. and 4 p.m., on Saturdays. Tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, Metropolitan Water Board, Savoy-court, Strand, W.C., and endorsed "Tender for Reservoirs, Forts Green," must be delivered at the offices of the Board not later than 10 a.m. on June 26.

JUNE 26.—Risca.—BRIDGE, CULVERT, ETC.—For the undermentioned works of construction as follows:—(1) To be a bridge over the River Rye, near Rye, in the County of Devon, ballasting, metalting, and fencing, etc., at the boundary of the districts near Watville, for the joint councils; (2) a road, 36 ft. wide, from a point near Watville to the River Rye; (3) a bridge, 10 ft. wide, over the Rye, near Rye, for the Mynddislwyn Urban Council. Plans and specifications may be seen, and bills of quantities and forms of tender obtained, from Mr. J. H. Barrett, Brown, & Co.'s Colliery, for the Mynddislwyn Urban Council. Plans and specifications may be seen, and bills of quantities and forms of tender obtained, from Mr. J. H. Barrett, Brown, & Co.'s offices at Pontlanfraith, between the hours of 10 a.m. and 4 p.m., by appointment, and on the deposit of the sum of 2s. 2s. The person or persons whose tender is accepted will be required to enter into a contract to be prepared on behalf of the councils, together with bond with approved sureties for 50% in respect of each of the said works. Tenders, marked "Tenders for Bridge and Road," must be sealed and delivered to Mr. T. S. Edwards, 24, Stow-hill, Newport, Mon., on or before June 26.

JUNE 27.—London.—PUMPING MACHINERY.—The Metropolitan Water Board invite tenders for two triple-expansion steam pumping engines for the Hammersmith Pumping Station of the western district. Forms of tender and contract, with specification, may be obtained on application to the District Engineer, Stanish-road, Hammersmith, W., on production of an official receipt for the sum of 5s., which sum must first be deposited with the Comptroller at the Board's Central Offices, at Savoy-court, Strand, W.C. Such payments and applications must be made between the hours of 10 a.m. and 4 p.m. (except on Saturdays). Tenders, enclosed in sealed envelopes, marked "Tenders for Pumping Engines, Western District," must be delivered at the offices of the Board not later than 10 a.m. on June 27.

JUNE 27.—Beverly.—BOILER.—Beverly Gas Committee invite tenders for the supply and delivery of a Cornish boiler, 20 ft. long by 5 ft. 6 in. diameter, with their gasworks, the drawings may be seen, and copies of the specification and full particulars obtained, on application to Mr. F. W. Oldfield, engineer, Gas Offices, Hill road, Beverly. Sealed tenders, endorsed "Tenders for Boiler," must be delivered at office of Mr. J. Willis Mills, Town Clerk, not later than June 25, at 10 a.m.

JUNE 9.—Teignmouth.—WATER SUPPLY.—Teignmouth U.D.C. invite tenders for the supply and laying of about 17,110 lin. yds. of 9-in. and about 1,120 lin. yds. of 6-in., and about 5,850 lin. yds. of 4-in. British Mannesman steel pipes, including fittings of pipes, valves, and other fittings, for a separate contract having been entered into for the

supply of the pipes), together with the erection of a meter house, and the provision of necessary service air, and other valves, washouts, meters, chambers, and incidental works, including the crossing of the tidal River Teign, about one-fourth of a mile in width. Plans may be seen, and copies of the general conditions, specification, bills of quantities, and form of tender obtained, on application at office of Mr. Chas. F. Gettings, Engineer, Town Hall, Teignmouth, on payment of the sum of 5s. Sealed tenders, in the form supplied, addressed to Mr. A. Percival Dell, Clerk to the Council, Town Hall, Teignmouth, Devon, and endorsed "Teignmouth Water Scheme, Contract No. 2," must be delivered on or before July 9.

MISCELLANEOUS.
JUNE 11.—Byker Hill.—PUMPING.—Tenders invited for pumping water out of Byker Hill Quarry Pond. Particulars may be obtained from the City Property Surveyor, Town Hall, Newcastle-upon-Tyne, to whom sealed tenders, endorsed "Byker Hill Pond," must be delivered not later than June 11.

JUNE 11.—Newcastle-upon-Tyne.—TIMBER STANDS.—The supply, erection, and removal of timber stands required in connexion with the forthcoming Royal Victoria Jubilee to the City Treasurer of Tyne, drawings may be seen, and specification and form of tender obtained, at the City Engineer's Department, Town Hall, Newcastle-upon-Tyne, on or before June 11. Tenders, to be endorsed "Tender for Stands," to be addressed to the Right Worshipful the Mayor of Newcastle-upon-Tyne, and delivered at the City Engineer's office not later than 10 o'clock a.m. on June 11.

JUNE 11.—New Forest and Romsey.—CARTING.—The C.C. of Southampton invite tenders for the carting of material, to be used for main or branch drains, in the Romsey Division. Specification and form of tender from Mr. W. J. Taylor, County Surveyor, The Castle, Winchester. Tenders, endorsed "Tender for Hauling," must be delivered on or before June 11.

JUNE 11.—Wharfedale.—WINDOW AND DOOR FURNITURE.—Wharfedale Guardians invite tenders for the supply of window and door furniture for all workhouses or other institutions, to apply to Mr. Kaye, Clerk of Works, The Workhouse, Otley. Tenders to be sent to Mr. Edgar C. Newstead, Clerk to the Guardians, Union Offices, Otley, not later than June 11.

JUNE 12.—Belfast.—GALLERY.—The erection of a gallery and sundry improvements at Fountainville Presbyterian Church. Plans and specification may be seen at the office of Messrs. Young, Mackenzie, architects, Scottish Provident Buildings Belfast, and quantities obtained from Mr. C. W. Hunter. Sealed tenders, addressed to the Rev. Alex. Gallagher, A.M., to be lodged with architects on or before June 12.

JUNE 14.—Shipley.—ELECTRIC LIGHT INSTALLATION.—Shipley U.D.C. invite tenders for electric lighting installation at new baths and workshops. Specifications and plans may be obtained from the Electrical Engineer to the Council, Electricity Works, Dockfield, Shipley, on payment of a deposit of 1s. 1s. Sealed tenders, endorsed "Writing," must be delivered to Mr. J. Lindsay, Clerk to the Council, Manor House, Shipley, not later than 12 o'clock noon, June 14.

JUNE 14.—Ware.—DRYING CLOSET.—Ware Guardians invite tenders for a drying closet, with heating stove and six drying horses; one hand-power 40-50 shirt washing machine; and one 25-in. hydro extractor. Full particulars can be obtained on application to the Master, Ware, on or before June 14. Sealed tenders, marked "Tender for Laundry," to reach Mr. G. H. Gibby, Clerk to the Guardians, addressed to the Town Hall, Ware, on or before June 14.

JUNE 21.—West Ham.—COM and COKE.—The County Borough of West Ham invite tenders for supply of coal and coke for their pumping station, Abbey Mills; the Public Baths, Balmain-street; the Fever Hospital, Plaistow; and other departments within the borough. Forms of tender, etc., may be obtained at the Borough Engineer's office, West Ham, E., upon payment of 1s. 1s. Sealed tenders, endorsed envelopes supplied with the forms, to Mr. Fred. E. Hillyear, Town Clerk, Town Hall, West Ham, E., be sent in, on or before June 21.

JUNE 22.—Salford.—MOTORS.—Salford Education Committee invite tenders for four direct-current motors, as follows, namely:—One 40, two 15, and one 1 brake horse-power. Specification and further particulars may be obtained upon application to the Director of Education, Chapel-street, Salford. Tenders to be delivered not later than June 22.

JUNE 25.—Stonehouse.—RANGE.—East Stonehouse Guardians invite tenders for the supply of a cooking range for the Stonehouse Workhouse, for about 120 inmates, including two steam jacketed boiling pans, large single steering chamber, and one vertical steam boiler, to be set in a brickwork tank for baths. Sealed tenders, with plans and specifications duly endorsed, to reach Mr. R. Robinson, Clerk to the Guardians, 52, Union-street, East Stonehouse, Devon, not later than June 25, at 12 noon.

JUNE 25.—Leyton.—CLEARING SITE.—The Leyton U.D.C. Education Committee invite tenders for pulling down of Mrs. Green's House, Leyton, and the clearing the site. Specification, conditions, and form of tender on written application on or before June 20 at the Council Offices, etc. Further information on E.C. Sealed tenders, in endorsed envelopes supplied, before 7 p.m., June 26.

NO DATE.—Lancaster.—HEATING.—The Visiting Committee of the County Lunatic Asylum, Lancaster, invite tenders for reconstructing and improving the steam heating arrangements and hot-water service of the above asylum, and will consider tenders from any firm willing to make a survey, free of cost, to the Committee, etc. Further information on application to the Medical Superintendent.

PAINTING, etc.
JUNE 11.—Staford.—PAINTING.—Staford Corporation invite tenders for painting the Markets and the Infectious Diseases Hospital, Blakelock-lane. Forms of tender, specification, and other particulars can be obtained on application to Mr. W. Blackshaw,

Borough Engineer and Surveyor, Borough Hall, Stafford. Sealed tenders (in official covers) to be delivered at the Town Clerk's Office, Guildhall-street, Stafford, on or before 10 a.m. on June 11.

JUNE 11.—Tilbury.—PAINTING, ETC.—Orsett R.D.C. invite tenders for certain painting and tarring work on the Council's cart and stores shed, Tilbury-road, Tilbury. Specification may be obtained on application to Mr. S. A. Hill-Willis, Assoc. M.Inst.M.E., Engineer and Surveyor, Council Offices, Sealed tenders, enclosed in envelopes for "Painting, etc.," to be delivered to Mr. James Beck, Clerk to the Council, Council Offices, 2, Orsett-road, Grays, not later than 12 o'clock noon, June 12.

JUNE 12.—Lewisham.—REPAIRING AND PAINTING.—Lewisham Borough Council invite tenders for repairing and painting the footbridge over the London, Brighton, and South Coast Railway at Sydenham Park. Specifications may be seen and forms of tender obtained at the Town Hall (Surveyor's Department). The tenders must be on forms issued by the Council, enclosed in an envelope, sealed and endorsed "Tender for Painting and Repairing Foot-bridge," and must be delivered by 4 o'clock on June 12, 1906, at the Town Hall, and placed in the box here provided for the purpose.

JUNE 13.—Bristol.—PAINTING, ETC.—Bristol Education Committee invite tenders for the painting, colouring, etc., of certain schools of the Committee. Specifications and contracts may be obtained from Mr. Peter Adde, at the City Valuer's Office, Council House, on payment of a deposit of 1s. Each tender to be sent in sealed envelope, endorsed with the name of the school to which it refers, and must reach Mr. William Avery Adams, Secretary, Guildhall, Bristol, not later than noon on June 13.

JUNE 13.—Portsmouth.—PAINTING AND CLEANING.—Portsmouth Education Committee invite tenders for painting and cleaning certain schools, in accordance with a specification to be sent by the surveyor, Mr. A. H. Bone. Form of tender and all information may be obtained from the surveyor, Mr. A. H. Bone, at his offices, Cambridge-street, Portsmouth. Tenders should be delivered at the Committee's Offices, Town Hall, Portsmouth, not later than 10 a.m. on June 13.

JUNE 13.—Bolton.—PAINTING.—Bolton Corporation invite tenders for painting, etc., at the Fever Hospitals, Hillon-lane, Bolton. A copy of the specification may be obtained at the office of the Borough Engineer, Town Hall, Bolton, under seal, and endorsed "Tender for Painting Hospitals," to be delivered to Mr. Samuel Parker, Town Clerk, Town Hall, Bolton, addressed to the Chairman of the Sanitary Committee, not later than 10 a.m. on June 13.

JUNE 13.—London.—PAINTING, ETC.—Chelsea Guardians invite tenders for painting, whitewashing, cleaning, etc., at their infirmary in Grosvenor-street, Chelsea, S.W. Persons desirous of tendering may obtain a specification of the work from Mr. Joshua Dowling, Clerk to the Guardians, during the hours of office, at their infirmary, and send in a sealed envelope and endorsed "Tenders for Painting and Cleaning, etc., at the Infirmary," and be sent to the Guardians' Offices, 253, King's-road, Chelsea, not later than noon on June 13.

JUNE 13.—Paddington.—W.—PAINTING, ETC.—Tenders are invited for painting and other works at the Infirmary in Harrow-road, for the Paddington Guardians. Specifications and form of tender may be obtained from the architect, Mr. E. Howley Simpson, 14, Norfolk-street, Strand, on deposit of 1s. (cheque). Tenders, enclosed in envelopes for "Painting the Infirmary," to be delivered at the Guardians' Office before 5 o'clock on June 13.

JUNE 25.—Lepton.—PAINTING, ETC.—The Lepton Education Committee invite tenders for the cleaning, painting, repairs and alterations to schools to be executed during the summer vacation. Specifications, conditions, and form of tenders may be obtained on application to Mr. William Jacques, architect, 2, Pen-crest, E.C., on depositing 1s. Sealed tenders, in endorsed envelopes provided, must be delivered at the meeting of the Council at 7 p.m., June 25.

NO DATE.—Gateshead.—CLEANING AND PAINTING.—Gateshead Education Committee invite tenders for the cleaning and painting of various schools during the summer vacation (August). Specification and other particulars may be had on application at the Education Offices—By order, Mr. E. J. Harding, Secretary.

ROADS, SANITARY, AND WATER WORKS.

JUNE 9.—Leeds.—PAVING.—Leeds Highways Committee invite tenders for the paving and flagging of the following streets—Argyle-road, Barborough-street, Raincliffe-grove, Raincliffe-street, Everleigh-street, Temple View-terrace, Parkside-place, Everleigh-grove, Chantrell-grove, and Chantrell-place. Plans and specifications may be seen at the City Engineer's Office, Municipal Buildings. Tenders on printed forms, enclosed in envelopes for the purpose, must be sent to the Town Clerk's Office on or before June 9, addressed to the Highways Committee, and endorsed "Tender for Private Street Works."

JUNE 9.—Penistone.—SEWERAGE SCHEME.—D.C. invite tenders for taking up and relaying about 9½ in. yds. of 9 in. earthenware pipes and the construction of two lamp eyes. Plan, section, and specification may be inspected at the Council Offices, Penistone, during office hours. Quantities and forms of tender and other information to be obtained from the engineers, Messrs. Winks, Pilling, 39, Park-road, Leeds, on payment of 1s. Specifications and forms of tenders enclosed in envelopes for "Penistone Sewerage," to be delivered at the Council Offices not later than Saturday, June 9.

JUNE 14.—Guildford.—PAVING.—Guildford Education Committee invite tenders for preparing and laying down Kentish grass tar-paving therein. A specification may be seen on application to Mr. Edward L. Lunn, surveyor, at the Education Committee's Office, Guildford. Sealed and endorsed tenders are to be sent in to Mr. F. S. Miller, Clerk to the Education Committee, Bridge-street, Guildford, not later than 12 o'clock noon on June 11.

JUNE 11.—Northampton.—PAVING.—The Corporation of Northampton invite tenders from experienced paving contractors for the paving of a certain granite-paved concrete paving in the cattle pens at the Cattle Market. Plans and specifications may be seen, and bills of quantities and forms of tender enclosed in envelopes, to Mr. Alfred Egan, Borough M.Inst.C.E., Borough Engineer, Guildhall, Northampton, on and after Thursday, May 31, on deposit on a cheque for 2s. 2s. Sealed tenders, endorsed "Paving of Cattle Market," and addressed to Mr. Herbert Hankinson, Town Clerk, Guildhall, Northampton, must be delivered at the Town Clerk's Office, Guildhall, Northampton, on or before 12 o'clock noon on June 11.

JUNE 12.—Gosforth.—SEWER.—The Gosforth U.D.C. invite tenders for the construction of a sewer in Gosforth-grove and Moor-road, Gosforth. The work consists of laying about 400 yds. of 12 in. pipe sewers, with the necessary manholes. Plans and conditions of contract may be seen, and specification, quantities, and form of tender obtained on payment of 1s. as, on application to the Engineer, Mr. Harry W. Taylor, A.M.Inst.C.E., St. Nicholas-churchyard, Newcastle-upon-Tyne. Sealed tenders, enclosed in envelopes for "Grove Sewer," are to be sent to Mr. R. Sheridon Holmes, Clerk to the Council, Council Offices, Gosforth, Northumberland, on or before 12 o'clock noon on June 12.

JUNE 12.—Tottenham.—ROADS.—Tottenham U.D.C. invite tenders for making up Donzola-road (second section), Frinton-road, Hale-road, Hampden-road (remainder), Merton-road, and Highgate-road (first section), Holmdale-road (remainder), Marden-road, Stainby-road, The Avenue (third section), and Thorpe-road. The plans can be seen, and general conditions, specifications, bills of quantities, schedule of prices, and forms of tender, can be obtained on application to Mr. W. H. Prescott, A.M.Inst.C.E., Engineer, to the Council, at their offices, Council Buildings, The Grove, Tottenham. The sum of 10s. 6d. will be charged for each set of quantities. Persons tendering will be required to deposit with the tender a sum of 10s. 6d. in Bank of England notes, or cash, the sum of 1s. for each road, which will be forfeited by the person whose tender is accepted if the contract be not executed within seven days from the date he is informed it is ready for signature. Sealed tenders, on the form supplied, endorsed "Tender for —," (as the case may be), to be delivered to Mr. Edward Crowne, Clerk to the Council, Tottenham, by 12 o'clock noon on June 12.

JUNE 13.—Farnworth.—ROAD IMPROVEMENTS.—Farnworth U.D.C. invite tenders for the widening, draining, and reconstructing of a portion of Bladder-lane. Plans and specifications may be inspected at the offices of the Surveyor, Mr. W. J. Lumax, 11, Bold-street, Farnworth. Tenders, under cover, endorsed "Bladder-lane Improvement," to be received by Mr. W. Tyldesley, Clerk, Council Offices, Farnworth, S.O., not later than noon on June 13.

JUNE 13.—Rawtenstall.—ROAD WORKS.—Rawtenstall Corporation invite tenders for the manual and team labour and materials required in excavating, widening, forming, and relaying of footpaths, and in several streets situate at Crawshaw-wood, Cough-ford, and Waterloo, within the borough. Plans, specifications, and conditions may be seen, and forms of tender obtained, on application to Mr. James Johnson, C.E., Borough Surveyor, Municipal Offices, Rawtenstall, on payment of the sum of 10s. 6d. in Bank of England notes, or cash, to be addressed "The Town Clerk, Rawtenstall," sealed and endorsed "Tender for Private Street Works," to be left at his office at, on, or before noon on June 13.

JUNE 13.—Saltwood.—SEWER.—Elham R.D.C. invite tenders for the construction of about 475 in. yds. of 9 in. earthenware pipe sewer, with two manholes and three manholes on the line of Sandring-road, Saltwood. The plans and specification may be seen between the hours of 10 a.m. and 4 p.m. at office of Mr. R. C. G. C. Clerk, 21, Clifton-place, Falmouth, and tenders, endorsed "Tender for Sewer, Saltwood," must be delivered not later than 12 at noon on June 13.

JUNE 14.—Aberdeen.—SEWER.—Aberdeen City Parish Council invite tenders for constructing an outfall sewer from the Aberdeen Poorhouse, to join the existing City Sewerage System in Queen's-road, near Hollybank. Plans may be seen in the office of Messrs. Jenkins and Marr, 16, Bridge-street, who will supply schedules of quantities to intending offerers. Sealed tenders, endorsed "Sewer," to be lodged in proper form with Mr. C. B. Williams, Inspector of Pools, 20, Union-terrace, Aberdeen, on or before June 14, at 6 o'clock p.m.

JUNE 14.—Covepen.—ROAD WORKS.—Covepen U.D.C. invite tenders for making up Newsham-road, back Harper-street, and other back streets (representing a total area of about 3,700 sq. yds.) within their municipal district. Plans, sections, and specifications may be seen, and forms of tender obtained, at the office of Mr. Robert Grievie, Surveyor to the Council, Seaforth-street, Blyth. Sealed tenders, endorsed "Tender for Street Works," must be delivered not later than 4 p.m. on June 14.

JUNE 14.—Hackney.—ROAD-MAKING.—Hackney Borough Council invite tenders for the kerbing, channelling, paving, making-up, etc., of (a) Aberdeen, Crescent, Upper Clapton; (b) Lee Conservancy-road, Tottenham; and general conditions of contract and specifications and plans and sections may be inspected, and copies of the bills of quantities and forms of tender obtained, on application to Mr. Norman Sawyer, M.C.E., Borough Engineer and Surveyor, and on payment of 1s. Sealed tenders, endorsed "New Street Works," must be delivered at the Town Hall, Hackney, N.E., not later than 12 o'clock noon on June 14.

JUNE 14.—Warrminster.—DRAINING.—Warrminster U.D.C. invite tenders for under-draining the Sewage Farm at the Marsh, Warrminster, which consists of an area of 200 acres. Plans and specifications may be seen, and further particulars obtained, at the surveyor's office, High-street, Warrminster, and sealed tenders, endorsed "Under-draining," must be delivered to Mr. Herbert J. Wakeman, Clerk to the Council, Council Offices, Warrminster, not later than 12 o'clock on June 14.

JUNE 16.—Liversedge.—SEWAGE WORKS.—Liversedge U.D.C. invite tenders for alterations to the existing septic tank, graise chamber, and receiving channels, and the construction of additional precipitation tanks, bacteria beds, and land filters, with channels, wells, culverts, and other appurtenant works, for the improvement of the Liversedge Disposal Works at Liversedge. Drawings and specification may be seen, and bills of quantities and form of tender obtained, at the offices of Messrs. Chas. Gait & Sons, M.Inst.C.E., Engineers, to the Council, 8, Charles-street, Bradford, on deposit of the sum of 2s. 2s. Sealed tenders, endorsed "Liversedge Sewage Works—Tender," are to be delivered to Mr. Thomas Mickleton, the Clerk of the Council, at the Public Offices, Liversedge, not later than 12 o'clock noon on June 16.

JUNE 16.—Newton.—BACTERIA BEDS.—U.D.C. of Newton-in-Makerfield invite tenders for the construction of two bacteria beds at the Central Sewage Works. Plans can be seen, and bills of quantities obtained, on application to the surveyor, Town Hall, Earlestown. Tenders are to be sent in to Mr. C. Cole, Clerk to the Council, Town Hall, Earlestown, not later than 10 a.m. on June 16.

JUNE 18.—Canberwell.—NEW SEWERS, ETC.—Tenders are invited for the following works in Rotherfield, New-road:—(a) New 12 in. pipe sewer, with manholes, gullies, etc.; (b) underdrain, channelling, and making up road. Specifications and forms of tender can be obtained from the Borough Engineer, and tenders must be delivered to Town Hall, Peckham-road, S.E., not later than 10 a.m. on June 19, addressed to Public Health Committee; for (b), addressed to Works and General Purposes Committee, before 5.30 p.m., June 19, 1906.

JUNE 18.—Finchley.—SEWAGE WORKS.—Finchley U.D.C. invite tenders for the construction of sewage filter beds and storm water beds, open, septic, and under tanks, together with channels, culverts, valves, and other works. Drawings may be seen, and copies of bills of quantities, specification, and form of tender obtained, on application to the offices of the engineer and surveyor, Mr. C. H. Fryer, N. 1, on payment of 3s. 3s. Sealed tenders, endorsed "Sewage Purification Works," and addressed to Mr. E. H. Lester, Clerk to the Council, Council Offices, Church End, Finchley, N., to be sent in by not later than noon on June 18.

JUNE 25.—Balham.—UNDERGROUND CONVEYERS.—The Wandsworth Borough Council invite tenders for underground sanitary conveniences, Station-road, Balham. The specification, drawings, form of contract, etc., may be seen, and form of tender and copy bills of quantities obtained, at the Surveyor's office, 215, Balham High-road, S.W., on payment of 1s. 1s. Tenders, sealed, and endorsed "Tender for Conveniences, Station-road, Balham," to be sent to the Council House, Wandsworth, S.W., not later than June 25.

JUNE 25.—Bromley.—ROAD MATERIALS.—The Town Council of Bromley invite tenders for supply of various road materials. Samples of each description tendered for must accompany the tender. Tenders must be made on printed forms, to be obtained at the office of the Borough Engineer, Municipal Offices, Bromley, and must be delivered, addressed to Mr. Fred H. Norman, Town Clerk, Municipal Offices, Bromley, Kent, before 5 p.m. on June 25.

JUNE 25.—West Ham.—ROAD-MAKING.—The County Borough of West Ham invite tenders for relaying on various streets, etc. Bills of quantities can be seen, and specification, form of tender, etc., obtained of Mr. John G. Morley, Borough Engineer, Town Hall, West Ham, on or before 11 a.m. Tenders, endorsed "Tender for Private Street Works," to Mr. Eric J. Hillyard, Town Clerk, Town Hall, West Ham, E., before 4 p.m. on June 25.

NO DATE.—Child's Hill.—ROAD.—Tenders are invited for construction of a new road, to be laid under the superintendence of Mr. Frank Selby, 44, Chancery-lane, W.C. Bills of quantities can be obtained by applying to Messrs. Northcott, Nicholson & Nicholson, 9, Regent-street, London, W.C., between 10 and 5 from June 14 to 18 inclusive.

STONE, MATERIALS, AND STORES.

JUNE 11.—Aylesbury.—COKE BREZZE.—Aylesbury U.D.C. invite tenders for supplying about 60 tons of coke breeze (4 in. to 3 in.) on rail. Tenders must be delivered to Mr. Percy A. Wright, Clerk to the Council, Town Hall, Aylesbury, marked "Coke Brezze," not later than 12 o'clock on June 11. Further particulars can be obtained from Mr. W. H. Taylor, Surveyor to the Council.

JUNE 12.—Ashton.—MATERIALS.—The U.D.C. of Ashton-in-Makerfield invite tenders for the supply of the following materials between July 1, 1906, and June 30, 1907:—Salt glazed stoneware sanitary pipes, junctions, etc.; slag, macadam, flags, kerbs, channels, disinfectants, sanitary pans, socket and wooden cast-iron pipes and specials, galvanised tubes and fittings, galvanised steam tubes and fittings, gasnettes (ordinary and pre-painted), cast-iron lamp columns, gratings, and copper lanterns. Tenders are invited for the purchase of all surplus tar and ammoniac liquor made at the Gasworks between the dates before mentioned. Tenders must be upon forms which may be had from Mr. A. G. G. Surveyor, Clerk to the Council, Council Offices, Ashton-in-Makerfield, upon application, and further information may be obtained from the Council's Surveyor, the Gas Engineer, or the Sanitary Inspector so far as concerns their respective departments. Sealed tenders for supplies, endorsed "Tenders," to be delivered at the Council's Office, Council Offices, Ashton-in-Makerfield, not later than June 12.

JUNE 12.—Cormsby.—MATERIALS.—The supply of materials required at Cormsby Colliery for the twelve months ending June 30, 1907, comprising pit timber, iron, steel, and metal castings, wire ropes, nails, and grease. Forms of tender may be had on application to Messrs. Ferriss & Low, Market-place, Durham. No tender will be received except on the printed forms, not later than June 12.

JUNE 13.—Elham.—GRAVITY.—Elham R.D.C. invite tenders for the supply and delivery of granite, hand broken to 2 in. gauge, and 3 in. chips, as follows—100 tons of 2 in. to Lynton Railway Station (South-Eastern and Chatham Railway), 20 tons of 3 in. to Lynton Railway Station (South-Eastern and Chatham Railway), 300 tons of

2 in. to Westenhanger Station, 20 tons of 3 in. to Westenhanger Station, 350 tons of 2 in. to Sandling Station, 50 tons of 3 in. to Sandling Station, 20 tons of 3 in. to Elham Station. Forms of tender may be obtained from the Secretary, Lymington, Kent, and samples of granite must be sent to same address by June 11, carriage paid. Sealed tenders to be sent to the Clerk to the Council, 11, Chertton-place, Folkestone, by June 13, marked "Granite."

JUNE 13.—London.—STEEL FENCING, PICKS, ETC.—The East Indian Railway Company invite tenders for the supply and delivery of (1) steel palisade fencing for platforms; (2) picks, kholas, shovels, etc.; (3) files; (4) hammer handles, mallets, etc., as per specifications to be seen at the company's offices. Tenders are to be sent to Mr. C. W. Young, Secretary, Nicholas-lane, London, E.C., marked "Tender for Fencing," or as the case may be, not later than 12 o'clock noon on June 13. Fees, which cannot under any circumstances be returned, are charged for the specifications as under, viz., for Nos. 1, 2, and 3, 21s. each; and for No. 4, 10s. 6d.

JUNE 13.—Madras.—CEMENT—2,000 tons of Portland cement, delivered in barrels at Madras. Specifications may be obtained (by manufacturers only) on application to Messrs. Rendel & Robertson, 8, Great George-street, Westminster, at whose offices tenders must be delivered not later than noon on June 13.

JUNE 13.—Royston.—MATERIALS—Royston U.D.C. solicit tenders for the supply of the following materials etc., during year ending May 31 next:—(1) kerbs, flags, and setts (solid rock); (2) earthenware drain pipes and other sanitary goods; (3) Portland cement; (4) pitch and creosote oil; (5) sewage precipitant; (6) scavenging brooms. Specifications and forms of tender in respect of the first two classes of materials may be obtained on application to Mr. Thomas Bleasdale, Clerk to the Council, Town Hall, Royston, near Oldham, on or before noon, June 11. Sealed tenders (on the forms supplied in the case of stone and pipes), stating description and particulars of goods tendered for, endorsed "Tender for —," must reach the Clerk not later than 10 a.m. on June 13.

JUNE 13.—Aberdeen.—STORES—The Directors of the Powell Duffryn Steam Coal Company, Ltd., invite tenders for the supply of the undermentioned stores from July 1, 1906:—(1) Bar and other iron; (2) bolts, nuts, rivets, etc.; (3) brass fittings; (6) indiarubber and asbestos; (7) collars' tools, etc.; (8) leather goods, etc.; (9) ironmongery; (10) girders, channels, and rails; (11) nails; (12) oilskins; (13) steel; (14) steam tubes and fittings; (15) waste and brattice cloth; (17) chains; (19) lumber, deals, etc.; (20) printing; (22) horse feed; (24) French pitwood; (24a) Swedish pitwood; (25) Cement and lime; (26) electrical fittings. Forms of tender and all particulars can be obtained on application to the Stores Manager, Aberdeen Office, near Aberdeen. Tenders to be addressed to the Directors of the Powell Duffryn Steam Coal Company, Ltd., 101, Leadenhall-street, London, E.C., and posted so as to be received not later than 10 a.m. on June 13.

JUNE 13.—London.—STORES—Great Western Railway Directors invite tenders for the supply of the undermentioned stores from July 2, 1905, to June 29, 1907:—(1) Laminated timbers, and volute springs, (3) tyres, (4) straight axles, (5) steel crank axles and forgings for built-up cranks, (6) iron bars, (7) steel plates and sheets, (8) steel bars and blooms, (9) steel castings, (10) iron forgings, (11) chain and special iron for chain manufacture, (12) tubes and fittings, (13) cast-iron socket pipes, (14) tool steel. Specifications and forms of tender (upon which alone tenders will be received) may be obtained on application to Mr. G. K. Mills, Secretary, Paddington Station, London, or to the Stores Superintendent at Swindon. Tenders, addressed to the Secretary, and marked outside "Tenders for Stores," will be received on or before June 13.

JUNE 13.—Macclesfield.—MATERIALS—Macclesfield Gas Committee invite tenders for the undermentioned materials required for twelve months commencing on July 1 next, viz.:—(1) The best hand-picked Buxton lime, delivered fresh at Macclesfield free from dirt and ash, in such quantities as may be ordered; (2) wrought-iron lap-welded steam tubes and fittings; (3) cast-iron mains and irregulars; (4) oils, white lead, and other druggists' sundries. The committee are also prepared to receive tenders from local painters for the painting of their two gasholders in Tythingington; and towers, scrubbers, etc., at the Gasworks. Forms of tender and all other information can be obtained on application to the Engineer, Gasworks, Macclesfield. Sealed tenders to be sent in not later than June 13, addressed to the Chairman, Gas Committee, Town Hall, Macclesfield, and marked outside "Tender for —."

JUNE 13.—Thornhill.—SAG—U.D.C. of Thornhill invite tenders for the supply for the year ending March 31, 1907, of the following materials:—Best hand-picked furnace slag, best hand and machine broken furnace slag, slag clippings. To be delivered at such stations within the district of Thornhill, and in such quantities as the Council shall during the above period from time to time order. Forms of tender and specification may be obtained on application to Mr. A. Robson, engineer and surveyor. Tenders, on the form supplied, and accompanied by a sample of each of the materials quoted for, must be delivered to the Clerk to the Council not later than 5 p.m. on June 13, marked "Tender for Sag."

JUNE 13.—Walton.—GRANITE—Walton-on-Thames U.D.C. invite tenders for the supply of 1,200 tons of 4-in. broken granite, delivered as required during the period ending March 31 next. Specification and form of tender may be obtained on application to Mr. R. Wilds, Surveyor, Council Offices, Walton-on-Thames, to whom tenders, sealed, and endorsed "Tender for Granite," must be delivered not later than mid-day on June 13.

JUNE 20.—Enfield.—GRANITE—U.D.C. of Enfield invite tenders for the supply of 2,500 tons (more or less) of broken Cleve Hill Dhu or best blue Gurnsey granite, and 1,150 tons (more or less) of broken Leicestershire or other approved granite, to be

delivered free in such quantities and at such times prior to March 31, 1907, as may be ordered by the Council's Surveyor at the several railway stations in the district. Tenders (on forms to be obtained only of Mr. Richard Collins, the Council's Surveyor), endorsed "Tender for Granite," together with samples as to size and quality of the granite proposed to be supplied (no tender will be considered unless accompanied by samples), to be sent in to Mr. T. W. Scott, Clerk to the Council, Public Offices, Enfield, not later than noon on June 20.

JUNE 21.—North Walsham.—GRANITE—North Walsham U.D.C. invite tenders for 350 tons of granite (broken to a 13-in. ring gauge), and 30 tons of granite chips, the whole thereof to be delivered free to either of the North Walsham Railway Stations in September or October next as required by the Council's surveyor. Sealed tenders, endorsed "Tender for Granite," to be sent on contractor's North own form, with samples, to Mr. E. J. Simpson, North Walsham, Surveyor to the Council, on or before June 21.

JUNE 27.—Middlesbrough.—STORES—Middlesbrough Streets Committee invite tenders for the supply of sanitary pipes, timber, plate bricks, common bricks, concrete flags and kerbs, Portland cement, annealed scoria blocks, Whinstone setts, broken Whinstone, broken slag, manhole covers and frames, gully grates, flushing boxes, etc., delivered during the ensuing twelve months. Specifications may be seen, and quantities obtained, on application at the Borough Engineer's Office, on payment of 10s. 6d. Tenders, sealed, and accompanied by a sample, addressed to Mr. Alfred Sackett, Town Clerk, Municipal Buildings, Middlesbrough, not later than 10 a.m., June 27. Mr. Frank Baker, C.E., F.G.S., Borough Engineer, Borough Engineer's Office, Municipal Buildings, Middlesbrough.

JULY 2.—Bedford.—GRANITE—Bedford Corporation invite tenders for the supply of about 2,100 tons of broken granite for road-making, to be delivered at the railway station at Bedford in such quantities as the surveyor shall from time to time order during the year ending September 3, 1907. Forms of tender and further particulars as to gauge, etc., may be obtained on application. Tenders, endorsed "Tender for Granite," to be sent to Mr. Hedley Baxter, Town Clerk, Town Hall, Bedford, on or before July 2.

JULY 2.—Sunbury.—GRANITE AND FLINT—Sunbury-on-Thames U.D.C. invite tenders for the supply and free delivery at Sunbury Railway Station for the coming season of not less than 400 tons of Bardon Hill (Leicestershire) granite, broken as was through a 12 in. ring. Also for the supply and delivery of not less than 500 cubic yds. of Kentish brown pit flints, delivered at Clark's Riverside Wharf, Sunbury-on-Thames. Further particulars may be obtained of Mr. Harold F. Coates, the Surveyor to the Council. Sealed tenders, endorsed "Granite" and "Flints" respectively, to be delivered to Mr. Charles E. Goddard, Clerk to the Council Offices, Sunbury-on-Thames, before 4 p.m. on July 2.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*SURVEYOR AND INSPECTOR OF NUISANCES	Chinford U.D.C.	250 ^s . per annum	June 23
*TEACHER, BLDG. CONSTRUC., Boves-rd., New S'gate Centre	Middlesex Education Com.	12s. 6d. per lesson.	Not stated

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*STOCK, PLANT, AND MACHINERY—At the Yard, 60, Gravel-lane, S.E.	Izard & Izard	June 11
*RESIDENCE AND BUILDING ESTATE, REULAH SPA, S.E.—At the Mart	Chesterton & Sons	do
*BUILDER'S STOCK—200, Liverpool-road, N.	William F. Laing	June 12
*TIMBER, BUILDING MATERIALS, ETC., BRIDGNORTH—Bate's Building Yard, Bridgnorth	Noek, Deighton, & Kirby	June 13, etc.
*FREEHOLD LAND, TOTTENHAM—At the Mart	Alfred Richards	June 13
*FREEHOLD BUILDING LAND, CLAPHAM PARK, ETC.—At the Mart	Douglas Young & Co.	do
*FREEHOLD BUILDING ESTATE, PLYMOUTH—Law chambers, Plymouth	Gilchrist & Bishop	June 14
*BUILDER'S PLANT, ETC., TOTTENHAM—At Clyde-circus, Clyde-road, Tottenham	J. Hibbard & Sons	do
*BUILDING SITE, CHEAPSIDE—At the Mart	G. A. Wilkinson & Son	June 18
*CONTRACTOR'S PLANT, PLYMOUTH—At Outfall Works, West Hoe, Plymouth	Elliott, Ellis, & Co.	June 19
*STOCK OF TOOLS, ETC.—At 30A, Barbican, E.C.	A. Cohen	June 19-20
*TIMBER MERCHANTS', ETC., STOCK—Phoenix Saw Mills, St. Leonard's-road, Poplar	J. Hibbard & Sons	do
*FREEHOLD BUILDING LAND, NEW SOUTHGATE—At the Mart	Hannan Bros.	June 20
*FREEHOLD ESTATE, ADDINGTON, NEAR CROYDON—At the Mart	Hannan Bros.	do
*BUILDING PLOTS, RUISLIP PARK ESTATE—On the Estate.	Ventom, Bull, & Cooper	July 7

PATENTS.—Continued from page 653.
and by-products from chemical works, and the aqueous solutions of these with or without free acid are applied directly to the slates. The slates thus impregnated are placed on end, or otherwise loosely piled in gas, coke, or other ovens or furnaces, in which every part of the load can be substantially evenly heated, and are heated to various temperatures, according to the salt acid, with or without the addition of free air, from a nearly black heat to bright red or yellow, and are then gradually cooled or annealed. In some cases they may be heated with the products of combustion to the maximum point, and then hot air allowed to play round them so as to thoroughly oxidise the salts.

17,901 of 1905.—R. BROWN: *Chills or Moulds for Casting Sash Weights.*
This relates to an apparatus for casting sash weights constructed with a chill or mould in two parts, one part fixed to the frame and stationary, the other part mounted on the frame and capable of movement to and fro thereon, and internal

projections thereon, by which the slots and hole in the end of the sash weight are formed.

18,529 of 1905.—G. BATTY: *Sliding Sash and Hinge Opening Window.*
This relates to a combined sliding and hinged sash or the like, the said sash or the like having a rounded stile to run in a groove in the adjacent stile of the sash frame, and also a crooved stile carrying two semi-rollers which run in the opposite grooved stile of the sash frame, lift-off hinges being provided for enabling the sash to swing when freed by bringing the flat faces of the semi-rollers into the same plane as the inner face of the adjacent stile of the frame, a groove in which partly contains the said semi-rollers.

18,959 of 1905.—J. THOMAS: *Saddles or Supports for Domestic Ovens.*
This relates to a combined saddle or support and end piece for domestic ovens, in which the saddle is reversible, and is provided with a readily-attachable and detachable end piece, which will engage the saddle, the said end piece being also reversible.

19,128 of 1905.—J. BOARD & Co., LTD., and W. S. AKERMAN: *Roofing Tiles.*
This relates to a roofing tile having two T-shaped flanges along the upper edge of its top surface, and a square projecting ridge along the top edge of the under surface, which is also provided with two T-shaped flanges.

20,976 of 1905.—R. M. HAHN: *Sash Fasteners.*
This relates to a sash fastener, and consists in the combination with a non-rotatable sliding barrel or stem provided with a head adapted to engage one of the sashes of a barrel-box secured to the other sash, within which the said barrel is adapted to slide, a screw journaled in the barrel-box and engaging the sliding barrel and means for rotating said screw to cause the barrel to slide into or out of engagement with the cooperating sash.

23,021 of 1905.—E. RUCKGAUER: *Means and Method of Elevating Houses and Similar Structures.*
This relates to a method of elevating entire buildings or the like or the upper parts of same

which consists in mounting under the part to be lifted an upper grating adapted to support the same, a lower grating, a suitable distance below the upper grating, together with screw jacks placed at suitable distances apart so as to support the upper grating and the superincumbent load, either directly or through the intermediary of loose struts, and along the walls of the building a steady guide frame is arranged to guide the building vertically during the process of lifting. The operation consists in working the lifting jacks simultaneously to the end of their stroke, then working the said jacks backward one after the other, and replacing their struts by longer ones, then lifting the upper grating a further distance by the simultaneous working of the jacks, and so on until the desired height has been reached.

26,148 of 1905.—T. H. WATSON & T. EISLEY, Ltd.: *Means for Securing and Opening Emergency Exit Doors or Windows.*

This relates to means for securing and opening emergency exit doors or windows, and consists in the combination of counter levers or weighted levers movable on centres affixed to plates secured to the side of the rafter or framing, one part of lever being cranked and having at its end a small wheel, or a short arm or lever.

26,184 of 1905.—S. BUDER: *Apparatus for Cleaning Chimneys.*

This relates to an apparatus for pneumatically cleaning chimneys, comprising a hollow vessel with a tight joint between it and the chimney walls, which is connected to a compressed air or suction pipe, so that the soot falling into the hollow vessel is pneumatically removed from the same.

502 of 1906.—F. SHUMAN: *Concrete Piles and Method of Making the same.*

This relates to the formation of a concrete pile by sinking or driving a preparatory pile which is either open at the bottom, or is provided with a movable or removable lower end, so as to form an opening in the ground for the reception of the concrete to form the pile, providing the said preparatory pile with an inner tube or casing which surrounds the concrete of the pile throughout any desired portion of its length, and withdrawing the preparatory pile at any desired stage in the formation of the pile, but leaving the inner tube in position.

1,177 of 1906.—F. J. CHEREH and F. W. W. BRAMBLE: *Door Springs or Checks.*

This relates to door springs or checks in which a plunger adjustably connected to the door is adapted to reciprocate in a tubular member under the control of a spring or two springs acting on opposite sides of the plunger piston, and consists in the arrangement between the two springs carried in the tubular member of a collar or plate adjustably carried upon the plunger.

1,485 of 1906.—E. H. McLEOD: *Folding Fire-resisting Shutters or Screens.*

This relates to a flexible fire-resisting shutter or screen composed of sections, the lower edge of each section forming in part a cylindrical surface terminating in an inward bend, the upper edge forming a reverse curve, the lower and portion acting as a fulcrum on the horizontal plane of the inward bend of the adjoining section.

2,187 of 1906.—W. FAIRWEATHER (H. L. JUDD COMPANY): *Curtain Rod Supporters.*

This relates to a curtain rod support, comprising in combination a sheet metal body, an outwardly and upwardly struck up hook integral therewith, and a spring tongue or arm integral with said body and struck up adjacent thereto, and having a free end relatively to the rear of said hook.

2,503 of 1906.—L. SEPULCHRE: *Caps or Tops for Lamp and Other Chimneys, Ventilating Shafts, and the like.*

This relates to an exhaustor for chimneys, ventilating shafts, and the like, comprising a plate or horizontal collar supported by the chimney or shaft, and a horizontal plate of like dimensions, and is characterised by the fact that the plate has upturned edges, and that a ring is arranged to surround the chamber formed by the base plate and the superimposed plate, said ring to provide around the said chamber an annular and vertical passage having at top and bottom two entirely free outlets.

5,355 of 1906.—A. FIBZAMER: *Construction of Wrought-Iron Windows.*

This relates to the construction of wrought-iron windows, and is characterised by the fact that a sash bar of H-section is passed through a sash bar of the usual shape in such manner as not materially to weaken the latter sash bar, the bridge of which is perforated only in the central portion of its breadth and has its rigidity maintained by the considerable breadth of material which remains between the edges of the aperture, and those of the bridges, and that the positions of these apertures are so chosen as to bring one

of the faces of the grooves formed between the flanges of the bars to the other set.

7,438 of 1906.—A. C. MORTENSON: *Doors.*
This relates to doors, and consists of a door supporting frame comprising in its construction metal braces, said braces formed of angular sheet metal, the flanges of which are set into the bars, and bridge the joints between them, the said braces being provided with corner plates adapted to bridge the angles between the top bar and the side bars of the door supporting frame.

8,171 of 1906.—BAUGESCHAFT and CHALET-FABRIK DAVOS ATKLENGESELSCHAFT: *Operating Apparatus for Fanlights of Double Windows.*

This relates to operating apparatus for fanlights of double windows, comprising a rotatable cross bar mounted on the window frame and carrying a lever connected to a link pivoted to the inner fanlight.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

7,438 of 1906.—A. C. MORTENSON: *Doors.*
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Kenilworth—99, Malden rd., u.t. 45 yrs., g.r. 84, e.r. 50t.	5400
34 to 39, Preston-st., u.t. 42 yrs., g.r. 81, 10s.	1420
21, Oak-villages, u.t. 42 yrs., g.r. 81, 10s., w.r. 44, 4s.	315
162 and 164, Alcroft-rd., u.t. 87 yrs., g.r. 107, y.r. 72t.	688
98, Walsingham-st., u.t. 42 yrs., g.r. 81, 10s., w.r. 59, 16s.	245
By NICHOLAS, DENVER, & Co. (at Reading), Ipsden, Oxon.—The Well Place Estate, 372 acres.	4000
The "Red Lion Inn," u.t. 25t.	1300
May 23.—By J. C. PLATT (at Hammersmith), Shepherd's Bush—13 and 17, Ellingham-rd., u.t. 71 yrs., g.r. 104, y.r. 70t.	695
By RAMSAY WATSON & Co. (on Beames), Finbury Park—2, Newton-villas, u.t. 684 yrs., g.r. 124, e.r. 90t.	850
By SERLMANS (at Yarmouth), Broadwell, Suffolk, "Capton Hall Farm," 332 a. 3 r. 19 p. f. (in lots)	7320
"Old Spotted Cow," occupation 10 a. 1 r. 21 p. f.	405
"Shepherd's Market," u.t. 0 r. 13 p. f.	270
Southdown, Shifnock—"Harrey's Dairy Farm," 67 a. 1 r. 3 p. f. p.	2,025
May 24.—By BRODIE THOMES, Co. (at Muswell Hill), Muswell Hill—Cranley-gdns., etc., 18 freehold plots of building land (in lots)	1,935
May 25.—By C. F. LOCKWOOD (at Harrogate), Pateley Bridge, Yorks.—The Barefield and Middlemead Estates, and Lothous Grove Moors, 2,650 acres, f.	36,750
May 26.—By J. CARTER, JONES, & SONS (at Cambridge), Horningsea, Cambs.—The Horningsea Estate, 463 a. 0 r. 14 p. f.	11,400
By JOHN LOOKER (at Huntingdon), Atonbury, Hunts.—A freehold and copyhold farm, 162 a. 2 r. 9 p. f.	1,600
By FOX & VEREY (at Peterborough), West Deeping, Lincs.—The Manor Farm, 141 a. 3 r. 14 p. f., y.r. 272t. 10s.	4,700
May 28.—By BAXTER, PAYNE, & LEEPER, Orpington, Kent.—Kempston, four cottages and 2 a. 0 r. 8 p., w.r. 51t. 4s.	580
Three cottages adjoining, f., w.r. 33t. 16s.	340
By BUCKLAND & SONS, Wraybury, Bucks.—"The Common" enclosure 13 a. 3 r. 9 p.	650
By CROOKS, Edenbridge, Kent.—"Broxbam Farm," 378 a. 0 r. 10 p., l. y.r. 100t. (including the Manor of Broxbam)	4,300
By ELLIOTT, SON, & DOTSON, Finsbury—90, Worship-st. (warehouse), f., y.r. 193t.	3,750
South Kensington—10 and 11, Bramham-gdns., u.t. 67 yrs., g.r. 84 8s., y.r. 450t.	5,000
By JONES, LANG, & Co, Barbican—12 and 13, Bridge-water-st. (warehouses and offices), u.t. 67 yrs., g.r. 170t, y.r. 67t.	2,200
City—0 and 7, Noble-st. (warehouses and offices), u.t. 48 yrs., g.r. etc., 211t, y.r. 560t.	2,000
6, 8, and 9, (Bucks) (offices), u.t. 51 yrs., g.r. 85t, y.r. 800t.	2,500
By MARTIN & CARNABY, Dulwich—43, Lancaster-rd., u.t. 73 yrs., g.r. 154, p.	1,300
By ALEXANDER MORSON, Northolt, Middlesex—"Wood End Farm," 23 a. 3 r. 0 p. f. (in lots)	4,900
By NOLLEY & Co, Hampstead-road—Carrington-st., u.t. 37 yrs., g.r. 6t, y.r. 42t.	430
By A. H. TURNER & Co, Dorking, Surrey—13 and 14, Rose-hill, f., y.r. 70t.	1,100
May 29.—By BEAUFORT WOOD & Co, Kennington—28, Agnes-pk., "Manley Villa," area 7,200 ft., l., e.r. 60t.	1,200
Camberwell—35 and 36, Addington-sq., f., y.r. 85t.	1,480
38, Addington-sq. (laundry premises), f., y.r. 115t.	2,000
Stagden, 12, e.r. 33t, reversion in 50 yrs., u.t. 49 to 39 (old), Caldwell-st., 11 to 13 (old), Champ-ln., and 1 to 17 (old), Bath-pl., area 60,800 ft., l., w.r. 1,089t. 18s.	9,100
By H. R. FAENAN, Lambeth—14 and 15, Sedock-st., w.r. 67t. 12s.	700
Forest Gate—44, Halsey-rd., f., w.r. 22t. 2s.	250

By C. W. DAVIES & SON, Barnsbury—36, Wynford-st., u.t. 124 yrs., g.r. 2t, e.r. 42t.	£240
Holloway—42, 46, 48, 58, and 60, Eldon-rd., u.t. 684 yrs., g.r. 24t. 15s., e.r. 200t. 14s.	1,280
Leightonstone—23, Wallowood-rd., f., e.r. 25t.	345
By FURBERS', Hampstead—King Henry's-rd., l.g. rents 56t, u.t. 564 yrs., g.r. 6t.	1,000
Kilburn—Bridges-st., l.g. rents 90t, u.t. 524 yrs., g.r. 10t.	1,400
By RUTTERS', Laindon, Essex—"Rose House," 10 acres, 1.	850
By RUTLEY, SON, & VINE, Einton-road—102, Einton-st. (6s.) and 70, George-st., u.t. 134 yrs., g.r. 21t, w.r. 135t. 4s.	300
Hampstead-road—68, Robert-st. (s.), w.r. 97t. 18s.	205
Regent's Park—37, Osnaburg-st. (s.), u.t. 164 yrs., g.r. 4t. 5s., w.r. 135t. 4s.	200
Knatch-Town—131, Carlton-rd., u.t. 504 yrs., g.r. 6t. 6s., y.r. 34t.	360
By FREDERICK WARMAN, Walthamstow—86, Upper Walthamstow-rd., u.t. 61 yrs., g.r. 7t. 7s., e.r. 40t.	345
Forest Hill—Fribby-rd., etc., l.g. rents 25t, reversion in 90 yrs.	430
Finsley—46, Ducham-rd., u.t. 864 yrs., g.r. 8t, y.r. 40t.	340
By G. LOVETT & SONS (at Coventry), Stoneleigh, Warwick—"Whoberly Cottage," and 6 a. 3 r. 19 p. f.	1,057
"Whoberly Farm," 8 a. 0 r. 32 p. f.	870
Four freehold plots, 48 a. 1 r. 24 p.	3,248
By G. H. HILLIARD & SON (at Bicester), Four freehold cottages, shop, smithy, etc., f., y.r. 26t. 5s.	650
By BRANCH & LEETE (at Ellesmere), Overton, Flint—"Knolton Bryn Farm," 117 a. 3 r. 25 p. f., y.r. 133t.	4,000
Ellesmere, Salop—"Gastwick Farm," 60 a. 2 r. 4 p. f., y.r. 105t.	3,200
"Little Odias Farm," 44 a. 0 r. 39 p. f., y.r. 75t.	2,130
Gadins, Salop—"The Tan House Farm," 11 a. 3 r. 5 p. f., y.r. 30t.	1,120
By FERMS & PROKEDER, with BENNELL & SYMONS (at Kingsbridge), Stokenham, etc., Devon—"The Scotscombe" (closes), 16 a. 0 r. 19 p. f.	1,200
The Great Orchard, 2 a. 0 r. 23 p. f.	290
Two houses, nine cottages, and 6 a. 3 r. 25 p. f.	1,020
"Combe Park Farm," 32 a. 0 r. 7 p. f., y.r. 54t.	1,450
Loddiswell, Devon—"Blackwell Park Farm," 162 a. 3 r. 18 p. f., y.r. 80t.	1,600
By DREWETT & WATSON, with BELOBER, ADIN, & Co. (at Wantage), Wantage, Berks.—Newbury-st., freehold business premises, p.	1,010
Maunor-rd., "The Willows" and "Rowans," f., y.r. 65t.	150
Grove—two freehold cottages.	800
May 30.—By C. H. BROWN, Pimlico—85, Westminster-st., u.t. 24 yrs., g.r. 16t, y.r. 52t.	245
By EDWIN EVANS, Clapham—28 and 29, Victoria-rd., f., y.r. 140t. 12s.	1,143
15, Hetherington-rd., u.t. 60 yrs., g.r. 8t, e.r. 40t.	315
By FISHER, STANHOPE, & DRAKE, Stamford Hill—35, West Bank, u.t. 78 yrs., g.r. 8t, e.r. 50t.	525
By F. ELLEN & SON, Woolhampton, Berks.—Three tenements, and 0 a. 2 r. 7 p., 13t.	335
The Estate Nursery, 0 a. 2 r. 23 p. f.	100
The "Falmouth Arms Inn," f., y.r. 48t.	1,920
Brampton, Berks.—Four freehold cottages, and 0 a. 2 r. 1 p.	850
By WALTER HALL, Barnsbury—Barnsbury-rd., etc., l.g. rents 45t, reversion in 71 yrs.	1,090
Puteney—Maxfield-rd., l.g. rents 18t. 18s., reversion in 87 yrs.	465
By KNIGHT & Co, Kensington—25, Aurold-rd., u.t. 63 yrs., g.r. 4t, y.r. 50t.	475
Caledonian-road—6 and 6, Balmoral-g., u.t. 56 yrs., g.r. 12t, w.r. 72t. 16s.	305
By E. J. LANE, Hlorrd—15, 17, and 19, Albert-rd., u.t. 980 yrs., g.r. 17t, y.r. 40t. 6s.	680
26, 68, 89, 82, and 86, Richmond-rd., u.t. 987 yrs., e.r. 22t. 12s., y.r. 142t. 6s.	1,255
36 and 38, Cleveland-rd., u.t. 84 yrs., g.r. 12t. 12s., y.r. 56t. 12s.	475
By MADDOSS, MILES, & Co. (at Yarmouth), West Caister, Norfolk.—Freehold half farm and market garden, 6 a. 1 r. 19 p. f., p.	1,060
Morham, Norfolk.—Enclosure of land, 6 a. 1 r. 12 p. f., p.	500
May 31.—By ANTIKLEFF & TAYLOR, Peotenville—10, Southampton-st. (s.), u.t. 18 yrs., e.r. 22t, y.r. 9t.	100
By LESTER, MARSH, & Co, Kensington—17, Upper Addison-gds., u.t. 62 yrs., g.r. 7t. 16s., e.r. 75t.	600
By NEWBORN, SHEPHERD, & EDWARDS, Islington—15, Devonshire-st., u.t. 68 yrs., g.r. 2t. 10s., y.r. 50t.	360
Barnsbury—6, Hemingford-rd., u.t. 30 yrs., g.r. 7t, y.r. 50t.	860
De Beauvoir Town—38 and 80, Mortimer-rd., u.t. 644 yrs., g.r. 22t, y.r. 82t.	710
3, Upper-rd., u.t. 654 yrs., e.r. 8t. 5s., y.r. 32t.	825
Becky Heath—142, Broadway (s.), l., y.r. 36t.	300
Eriford, two named houses, u.t. 894 yrs., g.r. 4t, y.r. 56t.	580
38, Chapel-rd., f., w.r. 29t.	310
St. John's Wood—45, Cochrane-st., u.t. 84 yrs., g.r. 3t. 14s., y.r. 55t.	240

By J. W. COADE. Bloomsbury—10 and 25, Great Ormond-st., n.t. 131 yrs., g.r. 707. 7 1601. £495

By STIMPSON & SONS. Paddington—10, Haverstock-st., n.t. 50 yrs., g.r. 71, w.r. 67, 128. 255

By F. VARLEY & SON. Highbury—2 and 4, Elphinstone-st., f., y.r. 681. 830

By WORSFOLD & HAYWARD (at Dover). Ewell, Kent—"Stone Hall Farm," 137 a. 2 r. 2,846

By HENRY HENDRIES (at Birmingham). Birmingham—138, 140, and 142, Bristol-st., and 56 to 59 Ashley-st., g.r. 561, 28, 104, y.r. 3362, 28. 3,020

By W. B. HALLETT. Stamford-hill—164, Seven Sisters-rd., n.t. 783 yrs., g.r. 21. 850

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f.c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; n.t. for unexpired term; p.a. for per annum; yrs. for years; h. for half; f. for feet; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gns. for gardens; yd. for yard; g. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

Junior Institution of Engineers.—Visit to Messrs. James Brown's Brick works at Uppminster. Train leaves Fenchurch-street (Tilbury line) at 1.48 p.m.

Society of Engineers.—Mr. Gerald Odey Case on "Submarine Groyning." 7.30 p.m.

Royal Institute of British Architects.—The Fifteenth General Meeting (Business) of the Session (1) to receive the reports of the committees appointed to direct the election of the council, standing committees, etc., for the year of office 1906-1907; (2) to proceed with the election of candidates for membership under by-laws 7, 8, and 9; (3) Mr. G. A. T. Middleton has given notice of his intention to move "That the council be instructed to consider the practicability of including all architects practising in the United Kingdom within the scope of the Institute;" (4) adjourned debate on Mr. Paul Waterhouse's paper on "The London Traffic Commission Report." 8 p.m.

Wednesday, June 13. Institute of Sanitary Engineers.—Half-yearly Ordinary General Meeting.

Friday and Saturday, June 15 and 16. Incorporated Association of Municipal and County Engineers.—Scottish District Meeting to be held at Berwick-upon-Tweed.

Saturday, June 16. Northern Architectural Association.—Annual excursion, Beverley.

TO CORRESPONDENTS.

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

We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

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

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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"THE BUILDER" (Published Weekly) is supplied DIRECT from our office to residents in any part of the United Kingdom at the rate of 18s. per annum (24 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Japan, etc., per annum.

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PRICES CURRENT OF MATERIALS.

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

Table with columns for material names (Hard Stocks, Grizles, Pickled Stocks, Facings, etc.), units, and prices. Includes sections for GLAZED BRICKS, PORTLAND CEMENT, and STONE.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Table with columns for material names (BATH STONE, PORTLAND STONE, YORK STONE, etc.), units, and prices. Includes sections for STONE and HARD YORK.

STONE (continued).

Table listing stone types (Hoyton Wood, etc.) and their prices per cubic foot or per 1000.

SLATES.

Table listing slate types (In. In., 20x10 best blue Bangor, etc.) and their prices per 1000 or per 1000 at r. d.

TILES.

Table listing various tile types (Best plain red roofing tiles, etc.) and their prices per 1000 or per doz.

WOOD.

Table listing wood types (BUILDING WOOD, Fir timber, etc.) and their prices per standard or per load.

WOOD (continued). JOINTS' Wood (continued). Dry Walnut, American, per ft. 2 s. d. 2 s. d. super. as inch. 0 10 0 1 0

VARNISHES, &c. Per gallon. Fine Pale Oak Varnish 0 8 0 Fine Pale Copal 0 10 6 Superior Pale Blue Oak 0 12 6

BALLYSHANNON (Ireland). For erecting a new wing and alterations to a dwelling house, for Mr. H. Allingham, Mr. F. G. Townsend, A.M.I.C.E., engineer and architect, Main-street, Ballyshannon. J. O'Kane 472 R. Colhoun, London. E. Clarke 431 dorry 2385

JOISTS, GIRDELS, &c. In London, or delivered Railway Vans, per ton. Rolled Steel Joists, ordinary sections 7 0 0 7 10 0

PUBLISHER'S NOTICES. Nat. Tel. 812, Gerrard. Telegrams, "The Builder, London."

CHARGES FOR ADVERTISEMENTS. COMPETITIONS, CONTRACTS, AND NOTICES ISSUED BY PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, &c., &c.

CHINGFORD (Essex). For completion of two villa residences in the Chingford-road, Chingford, Essex, for Mr. S. J. Newport. Mr. W. A. Longmore, architect. W. Sizer 237 10 J. Poole, Waltham. J. W. Bowden 245 0 stow 2220 15

FLAMBOURGH. For Flamborough waterworks. Messrs. Elliott & Brown, engineers, Burton-buildings, Parliament-street, Nottingham. 4-in. Main instead of 3-in. from Post Office to Reservoir. Extra Cost.

METALS. Per ton, in London. IRON. Common Bars, ordinary 8 0 0 8 10 0 merchant quality 8 10 0 9 0 0

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VOL. XC.—No. 5296.

JUNE 16, 1906.

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The Peace Palace Designs at the Hague.



WE very much doubt whether the Peace Palace at the Hague will ever really be built, and we feel quite sure that if it is built on the plot of land at present proposed, at a turn of the Old Road to Scheveningen and practically outside the town, it will be a failure, if not a laughing-stock. To propose that at the Hague, the city *par excellence* of long vistas of water and trees, a building which is intended to be a kind of European centre of reference and arbitration, should be built outside the town and away from its political centre, on a side plot facing nothing and with nothing to lead up to it, is absurd both in an architectural and an official sense. If it is so placed it will be a failure, as the Imperial Institute here has been a failure, from being relegated to a site too far removed from the Government centre, and it will be in an architectural sense completely misplaced and wasted, as there will be no point from which the building could be properly seen, and no axis of approach connected with it. A building on such a scale and with such a purpose ought to be a central object at the end of a dignified approach on its axial line, the more so in a city which, as observed, is full of straight vistas. If it were not for the old building called the

Gevangen-poort, which is of historical and archeological value, we should have said, get possession of the house property at the west end of the Vyver, the large rectangular piece of water along the south of which stands the old palace of the Binnenhof; at the end of this the Peace Palace would stand splendidly, reflected in the water, and in the midst of the historic centre of the town. But the Gevangen-poort, though not right on the bank of the Vyver, is too close to it to allow much space for building between it and the water, and we admit that to demolish this bit of ancient building would be a vandalism; but it is to be regretted, for the site would otherwise have been an ideal one for the Peace Palace, in an architectural sense at all events. If it is argued that the Peace Palace has no special relation to the Government of the Hague, and therefore need not be connected with its official centre (which is perhaps true), why could not possession be obtained of part of the large open space called Alexander's Veld (which seems to be a kind of parade ground), on the north side of the town, and the Palace be built there on the axis of Park-sstraat and Alexander-sstraat (running north and south) and of the most important public monument, the National Monument of Dutch Independence (1813), which stands centrally in the open space between the two streets? The building would then at least occupy a position of monumental dignity, with an important axial approach to it. To erect such a building on a corner

plot at the turn of a road would be nothing less than an absurd anti-climax to the competition. And, to return to our first idea about the Vyver site, it would be perfectly possible, after getting rid of the unimportant houses at the west end of this piece of water, to extend the ground by building a concrete pier at the west end of the Vyver, which would only cut off a comparatively small part of this large piece of water, and would form a perfectly ideal site for the Peace Palace, at the end of a broad vista of water in which it would be reflected, and in the neighbourhood of the most historic buildings of the town. Surely that is worth thinking of. It would be likely to be a success there; it will not be so if placed where it is at present proposed to place it.

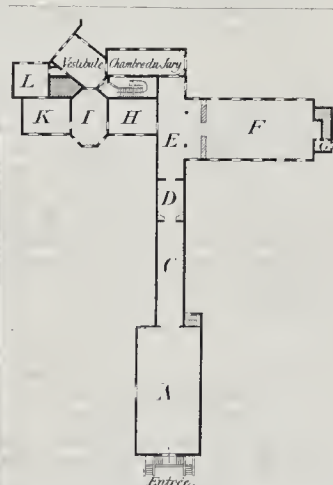
The building was to contain two separate sections; A, the Court-House Section; B, the Library Section. The latter was to be built so as to form a separate part of the Peace Palace, with its own separate entrances from the Park, but to have an interior communication with the Court-House on the principal floor. The Court-House Section, which would form the principal and front portion of the building, was to contain two courts, a larger and a smaller one, and a Council Room in connexion with each court, each Council Room to have its own separate exit to the Park, unless the two were close together, in which case one exit and one set of retiring rooms would serve for both. The upper story was to contain, as its principal apartment, a room for the "Conseil Administratif" of

the Permanent Court of Arbitration; some of the competitors have however placed this Permanent Council Room on the principal floor. With this department there were of course to be various secretaries' rooms, rooms for clerks, messengers, etc. The Library Department was to contain a large storage library for books, two reading-rooms, librarians' rooms, a room for geographical maps, a cataloguing room, etc.; and to this it was added that on the upper story there must be room for the Board of Directors of the Carnegie Foundation; but in this case, as in that of the Permanent Council Room, some of the competitors have included it in the principal floor.

In regard to the arrangement of the plan, therefore, it will be seen that the most important point of distinction between different plans would be in regard to the manner in which the two main portions were related to each other architecturally and on plan; whether they should be treated as two separate blocks of building with merely a corridor of communication, or whether the whole should be combined into one architectural design, only with an internal separation in plan. In regard to the Court section also, as there were two courts to be provided, but one of them larger than the other, it would be a question whether the accesses to the two courts should be made similar and symmetrical, only making one of them smaller internally than the other; or whether the larger court should be given a more important and central position and the smaller one relegated to a side or angle position. There is something to be said for either principle. A good many of the competitors, we observed, have taken a very illogical way of reconciling symmetry of approach with difference of size in the courts, by simply making one court smaller than the other by cutting off portions of the interior for accessory rooms in connexion with the court, which, if they were required in one court, were required in the other.

The designs, 221 in number, are arranged mostly on the ground floor, and also in six rooms on the upper floor, of a rambling old palace entered from The Paleis Straat, the first block of which looks like a brick church, but appears really to have been some kind of assembly-room or banqueting-hall, with an open timber roof. The plan of the ground floor rooms occupied by the drawings is given in the accompanying cut. The upstairs rooms occupied being those over K, I, H, E and D. Room A is the open-timber roof one just mentioned. F is a rather fine-looking room in classical style, with a row of columns down each side, grained to imitate marble, carrying an entablature from which springs a segmental-arch coffered ceiling, leaving narrow aisles between the colonnade and the windows, ceiled in square coffered compartments. The staircase is a poor affair as far as the stairs are concerned, though there is an ill-judged attempt at architectural effect at the top, where there is an open clear-story colonnade formed by pretty substantial-looking columns which stand on the outer edge of a large overhanging cove cornice, with very singular effect:

What should be the style of a Peace Palace in which all the civilised nations of the world are supposed to be equally concerned? In view of its being a Peace Palace, one would say that the expression of repose should above all things be sought for; and in view of its supposed universality of interest (which it is to be feared is more imaginary than real), we should say that it ought to take one of those classic forms of architecture which, since the Renaissance, may be said to belong to no single country but to be the property of the civilised world. M. Cordonnier, to whose design (No. 213—motto "S'G.") the first prize of 12,000 guilders has been awarded, apparently thinks otherwise; and we gather from the published Report of the Jury that he considered that as the Hague has been chosen as the permanent seat of the Court of Arbitration, "the building should in style follow the local traditions of XVIIth century architecture." As the architects' own reports are not attached to their designs, we can only gather the intention of each, at second hand, from the brief remarks in the Jurors' Report. If this design is supposed to represent local XVIIth century tradition, it is that tradition as seen through French spectacles. The



Plan of Exhibition Galleries.

design reminds one very much of a Paris Mairie of the more exuberant type of detail, with a tower added at each end. The centre of the front, in the ground story, shows the three large round-headed doorways which are almost a religious observance in a French Mairie of the approved type. Above these there is a row of large mullioned windows in pairs, divided by piers with terminal figures, each couple of windows being again divided by a wall space with a decorative niche. These windows light the Permanent Council Room in the centre, and the secretaries' rooms and ante-rooms at each end; but these receive just the same fenestration design as the Permanent Council Room, whereas the latter ought certainly to have been emphasised in the exterior design. The centre block

terminates with the usual expanse of high-pitched slated roof with a flèche in the middle, also like the orthodox type of Mairie. The towers, carried to a great height, are fearfully restless and cut up in detail, in the upper portion especially. Anything less suggestive of a "Peace Palace" it would be difficult to imagine; there is no repose anywhere; the whole thing is *cinquant*, though most elaborately and beautifully drawn in every part; and as far as the architecture is concerned we should regard its erection as the representation of the Peace Palace as an absolute misfortune. It is different with the plan; the plan is an admirable one, and we should have supposed that it was to this that the author owed his position in the competition, but for the fact that the Jurors speak rather coldly of it, implying that it emphasises too much the distinction between the two departments of the building, connecting them only by one corridor on the axis line; and we gather that the selection of this design for the first premium was mainly due to its adoption of local architectural traditions. If so, we can only conclude that they are doubly in the wrong; first, in selecting a design for such a building on grounds of local tradition; secondly, in accepting this as local tradition: it is only local tradition Frenchified—very much Frenchified. In regard to the plan, M. Cordonnier treats the plan in two longitudinal blocks,* connected, as before observed, by a single short corridor on the vertical axis of the plan. The store library is in the centre of the Library block, the public entrance at one end of it, and the administrative entrance at the other end. In the front block the entrance-doors give access to a large vestibule running nearly across the front, the two courts placed symmetrically one at each end of it. The internal difference of size between the courts is made by cutting off from the right-hand court, as an ante-room, the amount of space occupied in the other court by the bench. This is a clumsy contrivance, for, as has already been suggested, if an ante-room is wanted in the one court it is wanted in the other. But it is the only fault we see in the plan, unless it is considered a mistake to treat the two departments as separate architectural blocks; the Jurors appear to have thought so, but there is much to be said for either view in this respect. The drawings, which occupy the whole of Room D to themselves, are no doubt a splendid set, and do M. Cordonnier in one sense the greatest credit: we can only regret that we cannot feel more sympathy with the result in an architectural sense.

The other five premiated designs are all on the right side of Room C as one goes from Room A.† The design to which the second premium is awarded (No. 194; "Pax"), by M. Marcel, of Paris, is shown in a magnificent set of drawings, incomparably the finest set exhibited, and which one can hardly speak of

* We are using "longitudinal," throughout this article, to mean blocks or corridors parallel with the line of the principal front, and "vertical" to mean those which are at right angles to it.

† The letter B is assigned to the gallery at one end of A, reached by the staircase in the corner; but none of the designs put up there are of any consequence.

without enthusiasm. It is "Ecole des Beaux-Arts" in *excelsis*, as well in its merits as in its defects, and is a typical example of French draughtsmanship and design in its most monumental aspect. In spite of having given this design the second premium, the Jury Report dismisses it coolly enough, with the remark that "it is only the plan that has at all commended itself," and that "both in the plan and the elevation the lines of the composition notably depart from the noble simplicity which should characterise a building devoted to the serious and dignified purposes of the Peace Palace." It should seem therefore that they have discovered this "noble simplicity" in the first premiated design, in which we can only say that their ideas of "noble simplicity" in architecture must be very different from ours. But why, after this criticism, did they give this design the second place? Were they so human as to be seduced by the mere drawing? There is certainly a good deal of exuberance in the design, but taken altogether it is much finer and more scholarly work than the First Premiated design. The outlines of the plan tend to run rather into curved lines; in other words, it is very much "modelled" in plan as well as in elevation; but we do not know that it is the worse for that. The entrance-hall is on a plan with a segmental curve at front and back, and a smaller semicircular curve at each side, with massive piers at the meeting of the curves. To the left of this is the small court, to the right the grand staircase. The large court occupies (vertically) the central axis of the plan, the council-room connected with it being an oval apartment adjoining the upper end of the court, one-half of it forming a projecting bay on the further margin of the Court House block. Beyond this is a formal garden round which the Library department is built, the book-store making a separate longitudinal block beyond this, and connected with it (or disconnected from it) by two corridors of communication. This is the principal practical defect of the plan, as the book-store is removed to far too great a distance from the reading-rooms to be convenient. The corridors round the Library court or garden are connected on each side with the corridor of the Court block by an open columned vestibule of three bays which would make a good architectural feature; indeed, the whole plan is full of possibilities of interior effect. The architectural treatment of the principal front is a good deal suggested by that of the Petit Palais, including the employment of a large semicircular *fronton* over the central entrance; but the dome is much larger, and consists of a steel-framed dome showing externally, and a built dome underneath it. The design is certainly, as already observed, very exuberant, but there is great force and vigour in it, and the detail is at all events much better than that of the First Premiated design.

The third premium, for the design No. 132—"Concordiâ Parvâ Res Crescunt: Discordiâ Maximâ Dilabuntur"—goes to a German architect, Herr F. Wendt, of Charlottenburg, for a design which is as intensely German as the other two are

French; German in its solid dignity, and also in a certain clumsiness and heaviness of character—qualities both recognised in the Jury Report. The plan, with a large octagonal central hall reached through a vestibule running across the front between the wings, is well laid out for internal effect, but somewhat scattered for practical working. The Library section forms a three-armed block at the upper side of the site, connected only at one point with the main block. The architectural treatment is a sober and rather ponderous classic, with a large Corinthian order and strong cornice carried all round the principal block of building. The ends of the principal front are brought out as boldly projecting wings, the recessed portion being occupied in almost its entire width by what would be a hexastyle portico only that the columns nearest the centre are doubled, and the centre intercolumniation much wider than the others, marking the approach to the great central doorway. Over the cornice is a plain heavy-pannelled attic surmounted by statues; and over the octagon hall a dome raised on a high circular drum very plainly treated; the dome is pannelled in gores in the orthodox manner, and has a large eye at the top, surrounded by what can only be called a *wall*, which makes one of the heaviest and ugliest finishes imaginable. There is not a touch of fancy or originality in the whole thing; it is absolutely academic architecture, and not of the most fascinating kind as such; and yet we cannot but think that it fulfils the architectural ideal of a Peace Palace better than either of the two already named, because it has at all events repose and dignity, and is cosmopolitan rather than local in character and associations.

From the prose of Herr Wendt we pass to the poetry of Herr O. Wagner, of Vienna (No. 17—"L'Art de l'Époque"), who receives the fourth premium for a design which also may be said to be neither local nor national in style, since it certainly does not represent the recognised architecture of any special time or place. From the Report we learn that "in the written memorandum which accompanies this design the author explains that a Palace of Peace, being something new, seems to him to require novel methods of artistic treatment." We should be more inclined to say that a Palace of Peace merited the repose which arises from traditional treatment; an architect who proposes a new style for it surely is of those who "come not to send peace but a sword"; yet we agree with the Jurors that "the result is interesting and not without originality," indeed we should say that it has a great deal of originality, though we do not see exactly how it illustrates "L'Art de l'Époque." His plan shows an immense square forecourt with a columned cloister on each side returned across the front to the central gateway. The columns, however, do not carry an entablature and roof, but only treillage and twining plants. Up the centre of the forecourt is a broad straight drive, at the end of which a monumental column with a statue of Peace stands in front of the entrance to the building. The two Council Chambers occupy the positions

at each end of the front block; the two courts are vertical on the plan, with an ante-room separating them from the council chambers. The side cloisters on each side of the forecourt lead up on each side to a small columned terrace which forms the outer vestibule to the courts. Beyond the ends of the courts a wide gallery runs across the whole building, on the further side of which the grand staircase is projected as an apse. From either end of this wide gallery run corridors connecting the Court block with the Library block; the book-store is across the top of the plan. The communication galleries, however, lead only to what is called a "pièce de reserve" in the Library plan, which would apparently have to become a passage-room on occasion, so that this part of the corridor connexion is rather clumsily managed. The architectural style is difficult to describe. The impression conveyed is that the exterior is intended to be revêted with marble slabs, or slabs of some kind; there are practically no mouldings, except a shallow and wide-spreading cornice with modillions. The windows are square-headed with visible steel lintels, or what look like such. Before the main entrance there is no covered portico, but four columns which carry gilt winged figures. Below the cornice is a series of gilt festoons and a row of the coloured armorial shields of all nations; above the cornice is a blocking with a square pedestal over each pier, carrying a seated gilt statue. The pavilions at each end of the main front, though projecting slightly on plan, are lower than the centre portion and roofed with segmental gilt domes, behind which, a little further, rises on each side a stepped erection reminding one of the outlines of buildings in Assyrian bas-reliefs, carrying two tiers of gilt angels blowing trumpets, and on the apex a gilt figure seated in an archaic chair, flanked by a gilt lion at each side; the figure presumably represents Justice, as this portion of the exterior is immediately over the entrance to the courts. Altogether, it is a strange architectural idea, unlike anything we have seen before; but it is not ugly, and it must be added that the whole thing is harmonious and in keeping, and there is nothing unpractical about it, in spite of its singular appearance.

The fifth premium goes to an American firm (No. 79, with a geometrical device as motto), Messrs. Greenley & Olin, of New York. This, the most quiet and unpretentious of the six premiated designs, is in regard to architectural expression the most refined and most suitable of all, only it is to architectural appearance a one-story building, whereas the Instructions contemplate a two-story one (in addition to the Basement). On the side elevation there are two stories of windows shown, between the columns of the order; the front is entirely a one-story treatment. An order of Ionic pilasters carries an entablature and cornice; the large windows between the pilasters are crowned with a secondary cornice which stops against the pilasters, the spaces between that and the main entablature being occupied by panels filled with decorative design. This wing design is stopped by a higher projecting

block of building in the centre, from which again projects a columned portico with a pediment over and a large deep-set arched portal beneath it; the architrave of the portico order ranges with the cornice of the order on the wings. The centre block is crowned, *more Americano*, with a low stone dome. The whole is most refined and scholarly in treatment, and groups admirably. The Jury Report objects somewhat captiously to what they call "the round ends of the principal façade," which they say injure the effect; they are not "round ends," they are apses projected from the square end, which is quite a different matter. We do not wonder that a jury which gave the first premium to M. Cordonnier's restless design should speak rather coldly of this; but it is a much better and purer style of architecture. The plan has a great deal of merit. The entrance is into a square hall under the dome, the two courts opening right and left, each ending in that apse which the Jury do not like, but which is quite suitable for this sort; the entrances to the two courts are symmetrical as seen from the hall, but the smaller court is reduced by being reached through a short corridor with minor rooms on each side of it. The two departments form one building, the corridor communication running completely round, only interrupted by shutting-off doors between the Court and the Library departments. All the provisions as to special entrances are carried out. The book-store of the Library department occupies a considerable part of the centre of the plan, backing up against the wall of the grand staircase of the Court department. The provision for the side-lighting of the book-store between the bookshelves is cleverly provided for, so as to be as effective and occupy as little wall space as possible. The plan is very compact and covers less ground than the other premiated designs; and altogether this is a most meritorious design and had a right to a higher place in the awards.

The sixth premium is awarded to the design (No. 130—"Eüene") of Herr F. Schweeten, of Berlin. The plan is rather naïve and square-cut, and in spite of the strict symmetry of the exterior the plan is not symmetrical at all, and the corridor plan contains two or three "dead ends," always the mark of inferior planning. In fact the plan is manifestly inferior to any others of the six, and far inferior to that by Mr. Hare which we published in our issue of June 2. That a design like this should have received a premium and that by Mr. Hare have been left out of consideration does not say much for the judgment of the Jury. The fact is that the Jury were five Continental architects to one American and one Englishman, and Continental taste in architecture is radically different from English, which is too sober to suit Continental judges; and we are very much inclined to think that the winners of the two first premiums owed their position as much to the striking character and size and number of their drawings as to more important considerations. Herr Schweeten's design is not unpleasing, but it is weak in points; there is a boldly projected central tetrastyle portico with a Roman Doric order

and a sculptured pediment, in the centre of a block of building pierced with separate windows in the Italian style, which *ordonnance* is simply carried round the corner at each end, with nothing to strengthen the angle or to make any balance to the central portico; and this weakness at the angle is the more noticeable because this part of the building is finished with a visible sloping roof with no balustrade, which makes a receding hip line at the angle. The portico and the wings, in fact do not seem to belong to each other. The square central hall has a double walling, the outer walls carrying a square mass of blocking rising above the roofs and decorated by panelling and angle finials, the inner walls carrying a circular dome of graceful design in itself, but which is badly and clumsily connected with the structure immediately below it.

In another article we will notice some of the best of the non-premiated designs.

NOTES.

No sooner has Mr. Norman Shaw's grand design for Regent's Quadrant become public property, than the bootmakers and drapers and their compeers are up in arms to try to prevent the erection of a design which will deprive them of their beloved plate glass fronts, and give London at least one street of monumental design. We do not believe that their objections will have any effect; but it is impossible to pass without comment the preposterous idea that the improvement of London street architecture is to be stopped because tradesmen imagine it to be necessary that the whole front of their shops should be one sheet of plate glass. If it were of any use to argue with selfishness and stupidity, one might point out to them that a fine class of architecture in shops may turn out eventually, if they could only understand it, to be a better advertisement than the rinning of all architectural character by mounting buildings on sheets of plate glass. But no such considerations can be expected to reach the shopkeeping intellect. It was the shopkeepers of the Strand, it may be remembered, who did all they could, some years ago, to pull down the church of St. Mary-le-Strand, and who would have gladly seen the destruction of a fine architectural monument in order that there might be more room for carriages to draw up at their shops. If they had been listened to, what would people be thinking of the transaction now? This is an agitation on just the same lines; an attempt to stop a great architectural improvement because it does not suit the ideas of shopkeepers. We hope the authorities will remain firm, and let these people see that "trade interests" are not to rule everything.

RESIDENTS in the northern half of London have reason to be satisfied with the decision of two Parliamentary Committees in favour of the North-East London and the North-West London railways. The former of these undertakings will provide a much-needed

line of communication, partly underground and partly in the open, along the main road to the north as far as Waltham Abbey. The latter will furnish similar facilities between Victoria and Cricklewood, with the great advantage of stations for the transfer of traffic to and from the systems of the Metropolitan, London and North-Western, Central London, Brompton Piccadilly and Great Northern, London Brighton and South Coast, and South-Eastern and Chatham railways. These exchange stations will be established at Victoria, Hyde Park Corner, the Marble Arch, Chapel-street, and probably at Edgware-road, and we fully agree with the opinion expressed by Sir Douglas Fox that the scheme, as amended by the extension to Victoria, promises the most valuable north and south connexion not already authorised which could be proposed for the metropolis.

An important point has been decided by the Court of Appeal in the case of *Lowe v. Myers & Son*. They have decided that a "claim" under the Workmen's Compensation Act need not be in writing. This is an important point, as under the new Bill the change in the language, although it would seem to imply that the claim should be made in writing, since it speaks of its "delivery," is not so explicit in its terms as to overrule the above decision. The Departmental Committee advised that the claim should be made in writing, and it seems reasonable that the employer should be given this security; and since it has been decided by the House of Lords in *Powell v. Main Colliery Company* that the claim need not be formal in its form, it would seem that no hardship to the workman would ensue; although in view of the fact that the Bill is to embrace industrial diseases which may be some time in declaring themselves, possibly the present limit of time (six months) within which the claim must be made should be extended. It certainly seems very undesirable that employers should be rendered liable to have a verbal claim for compensation set up months after the accident, which possibly, if given at all, may have been made to some agent.

THE partial opening of the new station of the London Brighton and South Coast Railway will, no doubt, do something to relieve the congestion from which regular passengers have suffered for years past, largely in consequence of the fact that all main line and suburban trains were compelled to enter and leave the terminus on two tracks only, one for up and one for down traffic. The widening of Grosvenor Bridge and the provision of a fan-like extension of tracks outside the enlarged station will save many tedious delays, and the additional platform accommodation will make access far more easy. Until the work of reconstruction has been completed, in about two years' time, local trains will continue to use the west and main line trains the east of the terminus, an arrangement that will ultimately be reversed. One of the most striking features of the new station is the admirable

system of high-pressure incandescent gas-lighting, which is described on another page, and which has been found more satisfactory and more economical than the arc-lighting previously employed. Some difficulties and annoying delays were experienced during the early part of the week owing to the unsatisfactory behaviour of the electrical signalling apparatus, which appears to have been affected by the stiffness of the new points. This, however, was a purely temporary trouble, which has now been practically overcome.

Automobilism. THE *Times* of last Saturday, under this heading, published a Reuter telegram containing an account of the Herkomer motor race. The telegram contained this passage:—"The only accident reported happened to a Berlin car, which ran over and killed a peasant near Melk. The weather was fine but the roads were heavy. The cars will remain here on exhibition to-morrow." A lady took part in the race, and the telegram also speaks of the ovation she received. The extraordinary callousness of motorists as to the lives and safety of others is now a matter of common knowledge, but surely such an account of a fatal accident as this, even in a telegram, is unjustifiable. If the man killed had been a dog or a chicken hardly less could have been made of his death. What would be thought of an account at a cricket match where an onlooker was killed by a ball and his death announced in such terms? Moreover, what would become of cricket if such occurrences were frequent? This breach of decency and humanity serves one good object, and therefore we do not regret its appearance in the Press: it shows the real attitude of the motorist, when he is not on his guard affecting studied moderation to safeguard the enjoyment of his sport.

A Concrete-Steel Failure in America. THE collapse of a concrete-steel building during construction in Atlantic City, N.J., should serve to emphasise the extreme importance of sound design and workmanship in all cases where the new material is employed. The failure to which we refer shows clearly that these essentials were lacking to a lamentable extent. An engineer who has examined the ruins reports that the surfaces of the fallen beams and columns were badly split and broken, and the concrete was so much affected by frost that large portions could be broken off and crushed by a slight effort of the hand. Another circumstance, for which no excuse can be made, was that no satisfactory bond existed between the concrete of the beams and the floor slabs. That the necessity for such union had not been recognised by the contractor was evidenced by the fact that in several instances the beams were formed of trap concrete, while the slabs were of concrete with limestone aggregate. As the designer has evidently included the thickness of the floor slab in the effective depth of the beams, the lack of cohesion between the two classes of members necessarily involved a serious departure from the calculated resistance of the construction, and might in itself be sufficient to account for the failure.

Another defect was demonstrated by the shearing of two beams at the supports, indicating that the reinforcement had not been carried to the points of bearing. Faults such as these may easily occur in reinforced concrete work, even when properly designed, if executed by inexperienced contractors under inefficient superintendence, and the lessons conveyed by this failure are so obvious that comment is unnecessary.

The Palace, Southwell. THE Bishopies Act of 1878 made provision for reforming the "peculiar" of Southwell, and an Order in Council of February 2, 1884, revived and set up the present independent See. For the uses of the new diocese the bishop suffragan of Nottingham bought the remains of the old palace, together with its gardens and part of the park—some 4½ acres in all. The palace, standing about 100 ft. distant, southwards, from the Minster, was formerly a residence of the Archbishops of York, and had been a favourite home of Cardinal Wolsey. It was originally built by John Kempe, Archbishop of York, 1421-52, and was completed by his successors, William Booth and other prelates. It formed a large quadrangular edifice, having a chapel, and on the north side a fine banquet-hall of *temp.* Henry VI. It will be replaced with the new buildings now being erected after Mr. W. B. Caröe's designs for the Bishop of Southwell. The association of Southwell, with the See of York, the most ancient in England, begins with the history of Mercia. Paulinus, consecrated archbishop in A.D. 627, founded at Pinga Ceaster, in the Trent valley, one of the earliest Christian churches in those parts, which afterwards became the collegiate church of St. Mary, Southwell. The site lay in the midst of the Marches, which Penda, having slain in battle Eadwin and Oswald, Kings of Deira, established as the kingdom of Mercia. Archbishops Thomas, Grey, Romaine, and Kempe rebuilt and enlarged the church in the course of the XIth-XVth centuries; they possessed four parks within a radius of 5 miles, at Norwood, Little Park, Hockerwood, and Hexgrave.

Messrs. Waring & Gillois's New Premises. THE new building that Messrs. Waring & Gillois have built for themselves in Oxford-street, from the designs of Mr. Frank Atkinson, their architect, was open to the public on Monday. Apart from the interest attaching to the commercial enterprise displayed in the size and completeness of the undertaking, an interest attaches to the building itself. The pernicious expanse of plate glass is in evidence on the ground floor, though the piers of granite are heavier than those which generally mask the steel stanchions carrying the superstructure. Fortunately the ground floor is the only floor marred in this respect. It is the unbroken stretch of plate glass windows, such as the Regent-street shopkeepers are now agitating for, which is such a blight on the appearance and character of our towns; if the large firms and respectable shopkeepers would set their faces against this unsightliness improvements could

gradually be made—improvements which Messrs. Waring & Gillois's building faintly suggests; or we might get back to the dainty shop fronts of the Georgian period. The new block of buildings is on a fine plan, with a central Rotunda having galleries around it on each floor; there are eight floors, and some idea of the size of the building is gained from the fact that these floors provide about 8 acres of floor space for showrooms. Some of the showrooms are treated in a fine architectural manner, their proportion and design very effectively set off by the fine examples of antique furniture, pictures and hangings; they have ceilings very richly moulded and carved or cast in wood and plaster. Many other showrooms were fitted up as complete flats, showing ranges of furniture at different costs, while there are separate departments for each branch of household requisites.

The Pastel Society. THE eighth exhibition of the Pastel Society is open at the gallery of the Royal Institute of Painters in Piccadilly. It is on the whole a better exhibition than last year, partly because it is not so disfigured with some of the ugly and scarcely decent figure scrawls by one or two French artists which were to be seen last year. Pictures at a Pastel exhibition may mostly be divided, as in this case, into two classes—works which illustrate what can best be done in pastel, and works in which the endeavour is made to simulate the effect of paintings in oil or water-colour. The latter are a mistake, as they only serve to show the limitations of the material. Among those who understand what Pastel is meant for is Miss Marion Gemmill, whose portraits in a free line treatment (Nos. 1, 2, 3, and 119) are very good. In landscape Pastel will do to indicate broad effects of light and colour and composition, as in Mr. Baldry's "Storm Clouds" (20) and "At the Edge of the Marsh" (21), but it does not do to carry landscape too much into detail in this material. Among the very best things are M. Le Gout-Gérard's four marine and shipping scenes, 101 to 104, the first-named especially, Chevalier Formilli treats effectively "The Harbour, Capri," and "The Field of the Angels, Barbizon" (139, 140). Mr. Melton Fisher's "The Poem" (175), among the more highly finished works, is a very pretty figure of a girl reading, though a little too much of an imitation of painting. In the opposite class of work, Mr. Clausen illustrates very well the use of Pastel for rapid sketches of effect (178 to 182), especially in the two sketches "The Rickyard" and "A Willow Tree." Mr. Tuke has made a charming nude study, "Early Morning" (167), which may have been a study for a picture he is exhibiting at the New Gallery, or may be a replica of it in another medium. M. Legraud and Mr. Charles Conder supply the element of vulgarity in figure subjects which unfortunately is seldom absent from an exhibition of sketches and studies; the figure by the latter artist of a low and odious-looking woman listening at "The Keyhole" (77) is a remarkable example of the taste for the ugly and repulsive which is unfortunately so prevalent nowadays with some artists,

and which seems only to arouse the sympathy of the "art critics" of the day. As a contrast we may draw attention to Mr. Bruckman's beautiful little composition, "An Idyll" (147), which, except that the figures are clothed in everyday dress, reminds one of the feeling and style of some of Fantin-Latour's monochrome studies in combination of figures and landscape.

The Goupil Gallery. THE summer exhibition of the Goupil Gallery includes one or two first-rate examples of the art of Mauve (3 and 11), and a fine picture by Herr Israels, "The End of the Day" (15), a dark undulating moor with the western light beyond, across which two weary peasants trudge. Mr. Robert Fowler's "The Rainbow, Conway" (31), is an effect, no doubt, but it hardly makes us forget the paint-pot—perhaps it is not intended to do so. Mr. Weiss's "February on the Seine" (38) is a good landscape; and there is a little Corot sketch (8) with a white house in the middle distance, and a fine sky by J. Maris in the picture called "Entrance to a River" (7). Among the black-and-white works in the outer room some sketches by Mr. Paul Heury, especially "The Top of the Hill," are worth note; and there are architectural subjects by Mr. Hanslip Fletcher and Mr. John Finleylove. Among the small sculpture works by Herr Arosen are some pretty ideal heads in marble, but his colossal head called "Beethoven" is one of several sculptural libels on the great composer which we have come across lately. It may be said that it is an ideal or symbolic head and not a portrait; but why represent Beethoven (as an English sculptor also did in last year's Academy) as a kind of inspired washerwoman?

The Leicester Galleries. A COLLECTION of water-colours by Mr. Arthur Severn which occupies the principal room at the Leicester Galleries consists largely of studies of special and rather brilliant effects of light, which seen altogether give the exhibition rather a sensational appearance at first sight. Perhaps one or two of the effects are rather overdone, but in the main these drawings have the aspect of truth. "The Indian Ocean" (11), a dark cold sea beneath the last glow of sunset, is a fine work; also "Looking towards the Sierra Nevada from a P. and O. Steamer" (15). "Westminster by Moonlight" (4) is a real moonlight effect. Architecture is well treated in "The Salute, Venice" (34), and some other drawings. Of the landscapes, "Coast of Spain, near Gibraltar" (31), and "Lancaster Sands" (43), are among the best things in a very interesting collection. In the other room "Paintings of Dutch Life and Landscape," by Mr. and Mrs. Harold Knight, are very clever, the figure studies (which predominate) especially so. The two artists paint in a very similar style; the lady's work is distinguished by asterisks in the catalogue, otherwise it would be difficult to separate them by any distinction of style. Among the best are "Gossip" (1), in which the figure with the back to the spectator is remarkably expressive; "The Little Brother" (14); "Knitting the Stocking" (18); "The

Mirror" (27); "The Baby's Cot" (28); and "The Window Curtains" (46). Mr. Gwelo Goodman's small "Water-colours in India," which occupy the front room, seem a little inspired, at least as far as the manner of putting in the figures is concerned, by the work of the late Mr. Melville. They are not important work, but they are good water-colour sketches. "The Taj" (32) is one of the best slight views we have seen of this often-painted building; and the drawings give a general impression of truth of colour.

The Fine Art Society. At the Fine Art Society there is a quadruple exhibition going on, of which however the portion contributed by Count Seckendorff. "At Home and Abroad," is the only one of artistic importance. Count Seckendorff's water-colours are well known at the Institute of Painters in Water-Colours, of which he is a member; they are characterised by freedom of style and effectiveness rather than by higher qualities of water-colour art, and a good many of the drawings now exhibited are of rather a topographical character; but he paints architectural groups well, and he is specially successful in some subjects of châteaux rising from among trees on a hilly site—see Nos. 21 and 34. "The Forum, Rome" (59), is a very good representation; and also the foreshortened Rialto in "Venice" (73), and the view of "Camogli" (84) with its tall narrow strips of houses, and the "Porto Venere" (90) with its mass of red-brick building on the opposite side of the canal. But the best thing in the collection is "An Old Oak Tree, Weidelsburg" (19), which seems to have been done under some special influence, as there is a higher style about it than in the others. The other three collections are a set of water-colours of "Veldt and Kopje in Five Colonies," by Miss Agnes Goodall, which are chiefly interesting in a topographical sense, and we imagine chiefly intended so, though they are good drawings; a series of chalk portraits drawn from life by Mr. C. E. Ritchie—good drawings, whether good likenesses we cannot judge; and Mr. George Roller's sketches under the title "Soldiering and Sport," which are hardly things for an art gallery.

Some Pictorial Decorations. MESSRS. CARFAX & Co. have taken the large room of the Alpine Club for the arrangement of a series of decorative views in Italian cities by Mr. Kerr-Lawson, intended for panels in the drawing-room of a private mansion. They are arranged here much as they will be arranged in their ultimate position, each painting in an upright panel, the lower portion of which is occupied by a low-relief floral decoration in plaster, the picture occupying the upright space above. The paintings are kept in a low key of colour and treated with a certain severity of style which is proper to decorative painting, and we should think that in their position in the room they are intended for they will have a very good effect.

Illustration of Egyptian Temples. THE series of water-colour drawings and oil-pictures by Mr. Frederick F. Ogilvie, exhibited under this title at the Modern

Gallery, do not quite answer to the title, as the fact is that the best things among them are the water-colour drawings of various old houses and picturesque corners in Cairo, which are excellent examples of architectural subjects treated in water-colour. The larger illustrations of the temples are less impressive than these, and do not seem to get all out of the subjects that might be got from them. The little view of a corner in the Hall of Columns of the temple of Isis at Philæ (46), with light coming in through the opening, is very good, as also is the larger drawing of "The Main Door of the Mosque of Sultan Hassan, before the Restorations" (64), an admirable piece of architectural illustration. The exhibition includes some special illustrations of the most recent discoveries at the temple of Mentuhetep III. at Der-el-Bahri (which seems to be the latest spelling adopted—we first knew it as "Deir-el-Bahari"), and of the Hathor cow image discovered by Mr. Naville, which are exhibited by the permission of the Egypt Exploration Fund.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Sir John Taylor presiding.

At a private meeting which preceded the resumed discussion on the London Traffic Commission Report, Mr. G. A. T. Middleton moved:—"That the Council be instructed to consider the practicability of including all architects practising in the United Kingdom within the scope of the Institute."

Mr. Cross seconded the motion, and it was carried.

The Annual Elections.

The results of the elections were announced. The Council and Standing Committees were declared duly elected as follows:—

The Council.—President—T. E. Colcutt. Vice-Presidents—J. S. Gibson, E. T. Hall, H. T. Hare, Leonard Stokes, Hon. Secretary—Alexander Graham, F.S.A., Members of Council—Reginald Blomfield, A.R.A., M.A.Oxon., W. D. Carge, M.A.Cantab., (Glasgow), W. D. Carge, M.A.Cantab., F.S.A., W. S. Cross, M.A.Cantab., E. Guy Dawber, W. Flockhart, Ernest George (Past Vice-President), J. A. Gotch, F.S.A. (Kettering), E. A. Gruning (Past Vice-President), E. L. Lutyens, C. E. Mallows, E. W. Mountford, Ernest Newton, W. A. Pite, A. N. Prentice, G. H. Fellowes Pryme, J. Slater, B.A.Lond. (Past Vice-President), Paul Waterhouse, M.A.Oxon. Associate Members of Council—H. A. Crouch, W. A. Forsyth, S. K. Greenslade, H. V. Lancaster. Representatives of Allied Societies.—H. Dare Bryan (Bristol Society of Architects), H. Sutton Chorley, M.A.Oxon. (Leeds and Yorkshire Architectural Society), E. Kirby (Liverpool Architectural Society), W. M. Mitchell, R.H.A. (Royal Institute of the Architects of Ireland), J. M. Monro (Glasgow Institute of Architects), Harbottle Reed (Devon and Exeter Architectural Society), H. O. Tarbolton (Edinburgh Architectural Association), H. H. Thomson (Leicester and Leicestershire Society of Architects), J. H. Woodhouse (Manchester Society of Architects). Representative of the Architectural Association (London)—R. S. Balfour.

Standing Committees.—Art.—Fellows: R. Blomfield, A.R.A., M.A.Oxon., F.S.A., W. D. Carge, M.A.Cantab., F.S.A., E. Guy Dawber, E. George, J. S. Gibson, H. T. Hare, Professor W. R. Lethaby, Ernest Newton, E. S. Prior, M.A.Cantab., F.S.A., Paul Waterhouse, M.A.Oxon. Associates: J. Anderson, R. S. Balfour, A. T. Bolton, W. A. Forsyth, S. K. Greenslade, H. V. Lancaster.

Literature.—Fellows: Reginald Blomfield, A.R.A., M.A.Oxon., F.S.A., A. W. S. Cross, M.A.Cantab., Professor W. R. Lethaby.

E. S. Prior, M.A. Cantab., F.S.A., Halsey R. Ricardo, Professor F. M. Simpson, Professor R. Elsey Smith, R. Phené Spiers, F.S.A., H. Stannus, A.R.C.A., Paul Waterhouse, M.A. Oxon. Associates: W. A. Forsyth, F. Lishman, W. H. Ward, M.A. Cantab., P. L. Waterhouse, M.A. Cantab., A. M. Watson, B.A. Lond., P. S. Worthington, M.A. Oxon.

Practice.—Fellows: W. H. Atkin Berry, H. Brodie, Max Clarke, G. Hubbard, F.S.A., J. D. Mathews, J. Murray, S. Perks, A. Saxton Snell, T. H. Watson, W. H. White. Associates: E. Greenop, E. R. Hewitt, H. Hardwicke Langston, T. E. Pryce, A. W. Tanner, R. Stark Wilkinson. Science.—Fellows: T. W. Aldwinckle, Max Clarke, B. J. Dicksee, Matt Garbutt, E. Hooper, C. S. Peach, S. Perks, H. D. Seales-Wood, A. Saxton Snell, L. Solomon. Associates: R. J. Angel, H. W. Burrows, F.G.S., E. R. Hewitt, G. Pearson, A. W. Tanner, E. A. Young.

The Hon. Auditors are Messrs. Sydney Perks and William Arthur Webb.

New Members.

The following candidates for membership were elected to the various classes by show of hands under By-law 9:—

As Fellows:

- C. H. Ashworth, Dublin.
- T. Baird, Jun., Glasgow.
- A. Balfour, Glasgow.
- R. Sheiketon Balfour, London.
- A. Back, Glasgow.
- G. Bland, Harrogate.
- P. Bown, Harrogate.
- W. H. Brierley, F.S.A.
- J. Dixon Butler, London.
- J. A. Campbell, Glasgow.
- H. E. Clifton, Glasgow.
- J. McLean Crawford, Glasgow.
- N. G. Duff, Glasgow.
- W. N. Dunn, London.
- W. A. Forsyth, London.
- W. V. Gough, Bristol.
- J. Hamilton, Glasgow.
- W. C. Hardisty, Manchester.
- E. G. Hicks, Dublin.
- J. Hunter, Ayr, N.B.
- A. Blomfield Jackson, London.

As Associates.

- E. A. Agutter, Pietermaritzburg, Natal.
- J. Hamilton, New South Wales.
- A. F. Benjamin, London.
- J. P. Wynward Brooke, Manchester.

As Hon. Associate.

C. Harcourt Smith, LL.D., Keeper of Greek and Roman Antiquities at the British Museum.

As Hon. Corresponding Members.

- J. Theodore John | Hermann Muthesius, Berlin.
- Cuypers, C.E., Amsterdam.

Traffic Facilities for London.

At the conclusion of the private business the discussion on Mr. Paul Waterhouse's paper, reported in the *Builder* of May 26, was resumed.

Professor Beresford Pile said that the paper which had been read was perhaps the most important that they as Londoners had had for many years. He ventured to think that new thoroughfares were of great importance to architects, and certainly to them more than to engineers. No doubt it was a matter which had attracted the attention of engineers, and had been dealt with in an engineering manner, but he suggested that it was primarily a matter of building. It was not merely a matter of through traffic. With regard to the matter on which the question had been brought before them, he would only refer in general terms to the extraordinary gift which Mr. Waterhouse possessed of providing that suggestive flavour of humour in his paper which characterised the work of the onion in the salad. Mr. Waterhouse had altogether adopted the directions of the roads proposed by the Traffic Commission, and he would start with the suggestion that the configuration of London was governed by the configuration of the river and the hills. He thought it would be useless to attempt to throw a new line of traffic communication through London irrespective of the weight of buildings adjacent to that line, and that weight of buildings was practically created by the line of the river, and therefore the wide new thoroughfare should be about equidistant from the river. Then with regard to the hills. There was Ludgate-hill, which

was London, and there was Pentonville-hill, with the "Angel" on it, and then the general slope going westwards which lay between Piccadilly and the river. The suggested thoroughfares of the Traffic Commission neglected that configuration of the river, and practically neglected the configuration of London in vertical sections created by the hills. It passed up Pentonville-hill as if the traffic would like to get up it. Taking the great west and east road, they would notice that it terminated practically on the side of the park, and there was no logic in taking a huge thoroughfare to receive the greater part of London's traffic and throwing it upon the edge of Lancaster-gate. The only possible direction suggested by that line was, of course, the immersion of the traffic in the water in Kensington-gardens. Surely the western road ought to reach some focussing point. If it lead to the Marble Arch, it would receive relief in various directions, but leading as it did near the foot of Queen's-road, it seemed to be practically futile for its purpose, and Bayswater-road for at least a mile did exactly the work which it was proposed to be done by the west and east road. With regard to its general direction, it discarded the tendency of all the east and west roads on the north side of the river. If they noticed these roads they would see that they all converged on the City—that they all had practically a due easterly direction. The proposed road, however, had a north-easterly direction, and he could not imagine what section of the population would wish to hurry at electric tramway speed in a north-easterly direction, away from Oxford-street and the shops, and right away from the City to some point near St. Luke's. It seemed to him that the direction of the suggested road was contrary to the tendency of the traffic of London. If they looked to the road eastwards, the same truth applied, though his proposition with regard to the configuration of the river would appear to have had some bearing upon the eastern arm. All the easterly roads of London had a northern tendency, but the proposed great road from east to west would have the effect of driving the traffic from the east not to the City, but in the direction of Old-street and St. Luke's. In the same way, the north and south thoroughfare did not seem to him satisfactory, because it also neglected the tendency to the City. It created a wide road by the side of the great inclosure created by the railways on the north, but did nothing, and could not do anything, to receive and to relieve the north-western access to London. It was unfortunate, of course, that the railway-stations formed, as they did, a great wedge driven into London from the north and preventing freedom of access from the north-west into the centre, but this great north road did nothing but emphasise the existing difficulty, and only created an expensive thoroughfare. When they came southwards, the road in the same way avoided the City, and everyone who came down that road and wished to arrive at the heart of London would have to leave the road to itself and turn into some of the already existing thoroughfares. Generally speaking, the western districts of London at present had an ample number of good thoroughfares. If they took Oxford-street, they found parallel streets to relieve it to the north, such as Wigmore-street and the Euston-road. The Euston-road was a road created by Act of Parliament to be no less than 160 ft. wide, and the buildings were 50 ft. from the road, and it was a fact that when Marylebone Church was erected by Hardwicke it was found that the portico came over the line, and a special Act of Parliament had to be obtained to allow it to remain. But in the past Londoners had been very lax, and this road had become blocked by buildings at different points. It was to be hoped that when the leases fell in London would come into the reversion of the valuable inheritance of an east and west thoroughfare already existing. South of Oxford-street there were not the same facilities. Then they had to recognise the position of the Park. If they took the position of Hyde Park, they would find that the traffic of the north-west went on the north side of Hyde Park and the traffic on the south-west took the Piccadilly line. It would be obvious that any improvement of

the means of access to London should follow the existing tendencies, and should rather take a similar direction to the great Oxford-street in the north and the Piccadilly line in the south. The scheme which had been proposed was very large and drastic. It was, he thought, too large to be possible, and one could imagine such a scheme only being carried out by the creation of an enormous trust to acquire a vast amount of property and hold it for a public improvement, and he hardly thought it was likely that such a trust would be brought into existence. As to Mr. Waterhouse's paper, if one rejoined to hear of the Hotel Russell being under sentence of death, Mr. Waterhouse was absolutely impartial, because the Langham Hotel would also go. He expected that in his anxiety for All Souls' Church Mr. Waterhouse had forgotten that it had a back side as well as a portico, and that did not leave the delicious impression which his circular place had at first sight. Lastly, he would like to suggest that London possessed a very large number of beautiful buildings, and that if they had the chance of really clearing a space and taking the buildings they had in London and grouping them, there would be no capital in Europe which could compete. If, for instance, they took and grouped the Greek buildings they had in Bloomsbury—the British Museum, University College, St. Pancras Church, the entrance to Euston Station—or if they took the great City halls and grouped them, how wonderful they would be! Then they had a wonderful series of Gothic churches of the last half-century, and if these were put into a park, how nice they would be! He would really like to have all the Gothic residences of the last half century put into South Kensington to give the public something to look at. Still, if they had the chance to arrange, what a fine city they could make of London, and he suggested that the proper method was to improve their line of access between these buildings. If they projected the line of Waterloo Bridge northwards, they came into the centre of the British Museum, and if the lines of new streets led to and from great buildings they would do something practical, and which would be more satisfactory to them as architects than the mere driving of a huge new thoroughfare right through the heart of London they knew and loved so well. Then, with regard to the configuration of the river, he would point out that the river was a sort of "S." The upper curve had St. Paul's sitting upon it, and it had for its centre Bethlehem Hospital on the south. The traffic of London was practically on that radius, because it crossed by several lines to the "Elephant and Castle." The lower curve had Westminster upon its shore and at its true centre, from which it struck Hyde Park-corner, and that was a part of London which wanted some relief, and probably the new Vauxhall Bridge would assist radiation from it. If they recognised that configuration it would help them to bring their buildings together. One point was probably the most important, as it was the most practical. Was it possible to have an authority in London which would with steady tradition and with architectural advice proceed to consistently harmonise their street widenings and street improvements so as to give them the means of obtaining relief when it could be done most cheaply and when most needed? They all wanted such a body as that. He ventured to think—and he said it quite prepared for criticism—that he thought they had that body in the London County Council. He could not help thinking that a body sitting with a permanent architectural staff, with the permanent supervision of public buildings, with statutory power with regard to the making of new roads, and with certain control over existing roads, was the body which ought to be strengthened and which ought to be supported, and which should work towards the attainment of the things which London most desired. He was quite sure that the improvement of the London County Council was very necessary, but he would suggest to the Institute that the improvement of the London County Council in architectural matters was wholly in their own hands, and if they were to take up a sympathetic attitude with the Council and seek to assist them on architectural matters in promoting new legislation, they

would be able to do much more good than by merely maintaining a critical attitude. In the last year the London County Council withdrew the greater part of a Bill which would have given them power to make streets up to 100 ft. in width throughout London, and to link together streets which wanted linking together, and which in many ways, and at a small expense, would have given relief to traffic. He ventured to warn them against the falling into existence of a Frankenstein monster without architectural tradition, and with regard to which they might have no control, to drive great boulevards through London and interfere with the existing architecture. He could not help thinking that there must be an improvement in the public in architecture before they ventured to call a new body into existence. He ventured to say that they, as architects, were not in a fit state of mind, or intellect, or art, to design buildings of such streets as were proposed. They did their best, but could produce nothing much better than Shaftesbury-avenue on a large scale, and he must say he was a little pessimistic as to Aldwych. It was the absence of real public interest in architecture which was to blame for this. However, if they were given another half a generation he thought they might be more fit for these new streets.

Mr. E. W. Hudson said that Mr. Waterhouse had on the whole dealt gently with the Royal Commission, but he had given them one telling hit when he referred to them as being tramway mad, and they would all agree with that. The disease had also been caught by the gentleman at the head of the Local Government Board. Mr. Waterhouse had not given them a comprehensive scheme, but had confined himself to offering an alternative line to the proposals put forward in a half-hearted way in the Report, and they would agree that the proposals of the reader of the paper were far more thoughtful. He, however, did not think that east to west or north to south thoroughfares were altogether what were required for London. His idea was that they did not require more such straight streets, but an elliptical line. The road might start from the east, take a curved direction, go over one bridge and pass along the south side of the river, and link up over another, as in some of the best-regulated Continental cities. He suggested that an elliptical line from Regent-street, passing north-east, then east, and then south-east again and over Tower Bridge through Bermondsey, and coming again over Westminster Bridge, would form one of the best elliptical lines which could be suggested. London lost its fortifications so early that it had not the advantage of pulling down the walls and filling up the ditch and of making a magnificent street, but that was what had occurred in Continental cities. The belt system was what he advised as the *ne plus ultra* for London. Looking at cities in America and in their own colonies they found they were all laid down on grid-iron lines, and belt lines were conspicuous by their absence. Besides the avenues in Continental cities there were also belt lines of railway. They had that in the Underground Railway in London, and what a benefit the despised railway had been! That had been copied in Paris. They did not want four lines of tramway anywhere, as had been foreshadowed. The motor-bus had not had a fair chance, and he believed that when improved it would be one of the great reliefs for the traffic of London. Objection had been raised to the newness of London's aspect if the schemes were carried out; but there was no objection surely to newness *per se*. They had seen the design for buildings along Regent-street, and, although the shopkeepers held up their hands in horror, they must admit that their architects could design something of which they might be proud. As to the Advisory Board, Mr. John Burns said one already existed at Spring-gardens, and in that he agreed with Professor Pite, who feared the creation of a new Frankenstein monster, but the public had already created one, and it was to that it was now proposed to grant extra duties. He thought the present duties of the London County Council were quite as much as they could properly carry out. Then it was proposed that there should be a new bridge to the west

of Blackfriars. Could they imagine anything more dreadful than that? It would ruin the finest curve of the finest embankment the country possessed. It was perfectly unnecessary, for Blackfriars Bridge was to be widened, Waterloo Bridge could be widened, and by the addition of two wings to Charing Cross Bridge to carry carriage traffic they would be provided with all the accommodation that was necessary to relieve the Strand and Fleet-street. As to the width of roads, he considered it would be most extravagant to exceed 100 ft. Mr. Waterhouse suggested that it would be better to take the two frontages than only one, but it would be a much more expensive thing. Gray's-inn-road had only just been widened, and he did not think it would be agreed to widen that further. He felt that the fear of trespassing on the precincts of the Temple had been carried a little too far, and that if King's-bench-walk was thrown open it would form a splendid cut from the Strand to the Embankment, and so make Blackfriars Bridge more valuable. Then Mr. Waterhouse had been generous with the Duke of Devonshire in not desiring to interfere with his mansion, but he had not been so kind to the Duke of Bedford, and he (the speaker) suggested that in passing in front, instead of behind, the new St. Pancras Church he would do just as well, and, by widening Seymour-street, take away a lot of poor property and make a fine avenue leading to Camden Town.

Mr. W. Woodward said he could not follow Professor Beresford Pite's reference to the configuration of the Thames, and what that had to do with the traffic and the thoroughfares of London he could not imagine. There was a great deal in the learned Professor's speech he could not understand. With regard to the Euston-road, he knew the history of that thoroughfare, and spent a great deal of energy in preventing the Samaritan Hospital encroaching, of which he believed Professor Pite was the architect.

Professor Pite: No, I was not. Mr. Woodward said that, dealing with the matter in a practical way, they must arrive at the conclusion that there was no possibility of getting new thoroughfares in London now. The present Government would not give them the money, and the London County Council had spent all the money it had, and they could not look forward to them to help them with new thoroughfares. What they must do to make the matter practical was to take advantage of the existing thoroughfares more than they did. If, for instance, the police would drive more of the traffic on to the Thames Embankment and do the same thing in Gower-street and relieve Tottenham-court-road and take advantage of the parallel roads, they would be able to get very considerable relief. He felt that the two lines suggested were quite as good for the relief of traffic as it was possible to design, and he was certainly not one of those who thought that if they got those thoroughfares there were no architects living who could design buildings for them. He felt that they could not adopt a better plan than that referred to in Regent-street, where they had blocks between streets and symmetrical, which was all they could expect, and it was far better than what they saw in Paris, Vienna, Brussels, and Budapest. As regarded tramways, they knew it was proposed that they should run along the Embankment, and he thought they would simply spoil that thoroughfare. As to the width of thoroughfares, Mr. Waterhouse agreed that they should not be too wide, and they knew that Northumberland-avenue was 90 ft. wide, Portland-place 120 ft., and the new Piccadilly near the Circus was to be 80 ft. in width, building to building. Whatever they did in clearances he thought they should preserve as much as possible of old London. He was reading of the wonderful effect of Temple Bar, which now formed the entrance of Theobald's Park, and he hoped that Sir Aston Webb had preserved the beautiful piers which originally stood at Christ's Hospital. If they had to destroy thoroughfares the least they could do was to preserve some remains in a museum. With regard to a Board of Architectural Control, he would be very sorry to see such control resting at Spring-gardens. The London County Council

officials had quite enough to do as it was. Professor Pite contradicted himself by first suggesting that the Board should be at Spring-gardens and then finding fault with Aldwych, which was the child of Spring-gardens. Reference had been made to the education of the public, and he would like to read them an extract from the *Times* by their art critic with regard to the designs of Mr. Norman Shaw for the new Regent-street Quadrant. The critic said:—"It might be made less heavy by abolishing the square blocks that are to interrupt the columns and by greater simplicity of detail generally. Let the architect beware of a recent shocking example—the new Palace of Justice in Rome. It has cost millions, and its decoration, because it is heavy and over-elaborate, is universally condemned. The staidness of the new Quadrant would be improved, not diminished, if the distinguished architect would retrench a few of his details and simplify some of the lines." Well, he thought the buildings would make a magnificent addition to the architecture of London. It was lamentable that the art critic of the *Times* should not make suitable inquiry into the matter on which he wrote. If he had he would have found that the design was one of the most simple in lines and details that it was possible to have. There was certainly no elaboration, and it was a regrettable thing that such an influential journal should not take the trouble to ascertain the facts. He would only add, with regard to the opening of the Mall, that one of the suggestions made in that Institute thirty years ago was now being carried out by Sir Aston Webb. They could trust Sir Aston Webb to do what was right with regard to that, but there was an instance of the want of public spirit. The entry into the road could not be perfect unless Drummond's Bank was removed. It was to be retained, and it would prevent the widening of Whitehall, and they would spoil one of the finest things done in the early part of this century by not pulling down the bank.

Sir Aston Webb said he would not like the occasion to go by without adding his small congratulation, and especially to express the pleasure that he and they all had that one who bore so honoured a name in that Institute should have revived the interest which his father took, and should have read such an excellent paper before them. It was one of the most important subjects that they had ever had before the Institute. Architects, he thought, had spent a good deal of time in discussing the arts and crafts, and while they had been, if he might say so, fiddling over chairs and tables the greater interests of architecture had been apt to slip out of their fingers, and now they found that nearly all their municipal authorities had borough engineers or surveyors, and that the architects had little consideration given them. He thought that Mr. Waterhouse's paper and scheme showed how essential it was that when streets were laid out they should be laid out not only by engineers and surveyors, but in conjunction with architects, and that the very direction of the streets themselves were influenced in many cases by the architectural problems which arose. He was not concerned in saying whether these two streets were or were not on right lines. It was far too great a subject for him to enter into, and Mr. Waterhouse also protected himself by saying that he accepted the recommendations of the Commission as to these being the two best lines, and then he tried to put them into architectural form, and, so far as he (the speaker) was concerned, Mr. Waterhouse appeared to have succeeded. There was one thing he would like to say with reference to straight streets. Mr. Waterhouse was not much in favour of straight streets, but it did depend. At the first discussion Sir Melville Beachcroft gave them an amusing account of how Kingsway was made. They had been told that Mr. Frederick Harrison took up a ruler and drew a straight line upon the map. After all, that was quite right so far as it went, for a street like that ought to be straight. But it could not end there. They might have their straight streets without effect: the matter of importance was the manner they terminated the street. For instance, Harley-street and Wimpole-street had been constantly referred to. Both

streets were straight and wide, but they lacked dignity, and the reason for that was simply because they had no termination. Those streets ran into the Marylebone-road in a mean, poor way, and they had no architectural effect. That was a thing they constantly saw in parks. They perhaps saw a fine avenue leading up to a Georgian house, and the avenue appeared very fine indeed; but if they went into another park and saw a similar avenue, where the house had been removed, the avenue lost half its charm. In his opinion, the great thing in laying out streets was the termination. Mr. Woodward had referred to the Mall, and had urged that Drummond's Bank should be removed. If they stood in the Mall now and looked down towards the Palace they would see that there was a certain dignity. If they turned around and looked in the other direction there was the same road and trees, but a conglomeration of buildings at the end, which took all the effect out of the wide road. If, however, they pulled down Drummond's Bank they would only give a better advertisement to the Grand Hotel and other buildings, and they would not get that dignity which a wide thoroughfare of that kind required. Therefore it was that they were now in the course of erecting a building which would span right across the thoroughfare, and they would then get a wide road, with the Palace at one end and a great building at the other. Professor Pite had told them they would not be able to build on those sites for another half a generation, but it was probable that the sites would not be ready until that time. Then, no doubt, the profession would be ready. The Professor no doubt knew, for he had the young under his tuition, and therefore was speaking as an authority. He thanked Professor Pite for his kind proposal to fill South Kensington Museum with second-hand redwoods, but hoped it would not be carried out. He hardly knew whether the London County Council was the proper authority for great street schemes in London, and he was not sure that some arrangement of that sort with some outside advice attached, and with someone to whom they should be responsible, would not be a good thing. The great thing was that there should be somebody, whether an Imperial authority or a municipal body, who should be the recognised authority responsible for the alterations in their streets, and who should have some scheme. He would like to read to them an extract from a speech delivered by the Bishop of Birmingham, who had put the matter far better than he himself possibly could. The Bishop said: "Again we look through miles and miles of streets in our big cities without open spaces; with nothing except what Dickens called 'an un-interrupted view over the way,' and think of what that means—never to realise or breathe anything of the largeness which comes in open spaces. Then you see lands not built over, not in cultivation, and you ask 'Why?' 'Oh, because they are not ripe for development!' But we say they are ripe for development to-day. They have been ripe for development these years past for the good of the community. We want the whole mass of our cities to be organised, planned, and laid out. Instead of that, the cities grow at the will of the jerry-builder or the property owner—orderless, shapeless, without method, because there is no one to plan and forecast and give the city space and dignity and room and order; something which can make it worthy to be called a city."

Mr. Searles Wood moved:—"That this Council present a memorial to the Government urging that, as the Royal Commission on London Traffic reports it to be necessary to open up new thoroughfares and communications, it is most desirable, in order to preserve the architecture of London, that the profession of architecture should be either represented on that Board or that a professional advisor or advisors should be employed by the Board that will be formed to deal with the laying out of the new thoroughfares."

Mr. Slater seconded the motion, and said that the reason for the present congestion of traffic was that their forefathers had not provided foresight. The congested districts of to-day were the open spaces of a hundred years ago, and what were the open spaces of to-day would be the congested districts of

a hundred years hence unless their municipal authorities looked to it and got powers to protect the public.

Mr. Waterhouse said that he would amplify his remarks for the *Journal*, but there was one thing he would like to say. It was suggested that they were attempting to raise a Frankenstein monster, but they were not raising anything at all. It was the Royal Commission who suggested that a Board should be appointed, and a Bill was actually before Parliament for the formation of the Board. Without wishing to appear to step forward in this matter as the creators of this monster, they might at least make their suggestion that the monster should be assisted by architectural advice.

The Chairman said the more they heard of the enormous work which had been proposed the more they felt themselves indebted to Mr. Waterhouse for having dealt with the subject, and he (the speaker) heartily concurred with many of the views he had expressed, and especially with reference to the utilisation of Kingsway. To create another road and not utilise that would be a great extravagance. He also agreed with the recommendation for the increase of bridge accommodation between north and south in front of the Law Courts. Much of the block which occurred was in the Strand and in Park-street, Westminster, and they were due solely to the want of more bridge accommodation. There was no such accommodation between Westminster and Waterloo Bridges, and what was the result? Thousands of vehicles crossed the existing bridges to get to Charing Cross. They came across Waterloo Bridge and came down the Strand to Charing Cross. If a bridge was across the Thames in a line with St. Martin's Church it would be of enormous service in stopping the congestion of traffic. A great deal might be done by the police in diverting traffic, but they seemed indisposed to be at variance with certain sections of the public. What did they find at Hyde Park Corner? The arch was set back to get rid of the block, but, notwithstanding, the 'busses continued to go straight along Piccadilly and straight by St. George's Hospital. If the police had forced them to go round the way made for them, the block would have been got rid of. The creation of a Traffic Board, he considered, would be a good thing if properly formed. Tramways, he thought, had been overdone, and he did not think the enormous schemes for railways to run out twenty or thirty miles round London were needed just now. There was no difficulty when they once got to the stations, but the difficulty was to get there.

It was announced that the next meeting would be held on June 23, when the Royal gold medal would be presented to Sir Alma-Tadema.

THE SILCHESTER EXCAVATIONS.

The results of the excavations conducted by the Silchester Excavation Fund in 1905, now on view at the Society of Antiquaries, are this time chiefly remarkable for some objects of an architectonic character in stone. These are (a) a fragment of a column in white limestone about 9 in. in diameter and 2 ft. 6 in. high, with a beaded necking broken off, evidently part of a Doric column; (b) a "winged" altar in grey stone, about 2 ft. 6 in. high, roughly square on plan, with a projecting base, top, and two side lugs, or "wings," all worked out of the one stone; and (c) an unfinished couchant lion, also about 2 ft. 6 in. long, and in grey stone.

Neither the altar nor the lion exhibit any detail whatever, and show deep chisel marks, but it can be readily understood that the excavators regard such objects as of much greater importance than the pottery, bones, and various small utensils and ornaments usually found on Roman sites, largely as the latter—and the pottery in particular—bulk at Silchester.

Of other finds, the pottery claims first attention. The most perfect examples were extracted from rubbish-pits discovered from their soft nature in the process of trenching. The results this year excel more in quality than quantity, and include some interesting examples of the British "New Forest" and "Caistor" wares, some complete vases of

various shapes in grey clay, unglazed, and several more or less experimental techniques based on the "so-called" Samian were found wherever Roman remains are known. There are some distinctly fine examples of this ware in the room, particularly some on the central table, exhibiting indented ornamental forms, with remarkably clean-cut edges and listrons glaze.

Perhaps the most interesting pottery fragment of all is an attempt at polychrome design in a grey clay overlaying a red, with a lustrous black glaze, and a thick painted and knobbed decoration in white and orange. This is also on the central table, as are the mortars for pounding meat—flat listron-like bowls about 1 ft. in diameter with draining spouts. In the process of making these mortars had coarse sand thrown on to the surface of the clay when wet, so as to offer a hard, rough ground for the operation of the flint grinder. In process of time the sand got worn off.

The tray of painted plaster fragments, which formed wall-decoration, is an interesting exhibit. It is remarkable how similar ancient paint was in technique, and what precise resemblance these particular fragments have, both in colour and design, to much earlier examples from South Europe.

There are also cases of silver and copper coins, small bronze and bone implements and ornaments, and animal and human bones, including some complete skeletons, but these call for no particular attention here. Notice should be taken, however, of the pane of glass in broken pieces, for all the world like a modern window-pane in cheap green glass.

The excavations are further illustrated by the large general plan hanging on the wall, some detailed plans of particular houses recently excavated, and some photographs.

The exhibition remains open till Tuesday, June 19, when the finds follow the former ones to the Reading Museum.

MAGAZINES AND REVIEWS.

UNDER the head "Some Pressing Questions of the Public Service" the *Burlington Magazine* considers, among other points, the future of the National Gallery and the Tate Gallery under the management of their possible directors. The appointments are now made, and we have much more faith in the appointment to the National Gallery than in that to the Tate Gallery, which we cannot regard as safe in the hands of an art-critic who has shown such a decided leaning towards eccentric and temporary aberrations in modern painting. In regard to the National Gallery we entirely agree that the present policy of its Director ought to be "to make certain of preserving for England the few supreme masterpieces which still remain in our private collections." Mr. Robert Ross's article on "The Place of William Blake in English Art" seems rather to amount to the conclusion that William Blake was himself simply and had no "place," having in fact neither predecessor nor follower; and if that is what is intended, we entirely agree. Blake will never appeal to any but a minority; those who can enter into the extraordinarily imaginative spirit of his designs and his poetry (which at its best is almost as remarkable as his design) will feel that he is not to be classed with anyone else in art, or to be coldly criticised for his faults in technique; you must take him on his own ground of spiritual insight or leave him alone altogether. The attitude of the average citizen towards Blake will always be that which we once heard expressed before the picture of "The Spiritual Figure of Pitt Guiding Behemoth"—"No, upon my word, that is coming it a little too strong!" We think that some of Blake's admirers have done him some harm with the cold outer world by accepting too enthusiastically every strange fancy which he put forth in however strange a garb, and using rather exaggerated language about them. Blake at his best is beyond all exaggeration; but he is not always at his best. Mr. Ross's estimate of him, however, is expressed in perfectly reasonable and well-considered language.

In the *Art Journal* Mr. Rudolf Dircks writes a very good and temperate criticism on the Royal Academy, which is in pleasant

contrast to the sweeping and violent judgments (if they deserve that name) which are too common in contemporary art-criticism. The old subject of the Platin Museum receives some fresh illustration and description from Mr. Edgcombe Stealey.

The *Magazine of Fine Arts* devotes an article to "The Chalk Drawings of William Strang, A.R.A.," all of those illustrated being portrait heads of remarkable force and character. Sir James Linton contributes an article on "The Sketches of Constable," which he characterises as being really "sketches," reference notes for intended pictures; "they are the antipodes," he says, "of most of the so-called sketches of to-day; they are not got up for exhibition purposes." But is not the fact rather that artists do in the present day exhibit, and are encouraged by critics to exhibit, sketches such as in former times would have been considered too rough to be suitable for public exhibition? Among other articles are "Some XVIIIth Century Chairs in Private Collections," by Mr. Stephen Aveling, and "The Portraits of 'Nattier,' by M. Arsène Alexandre.

The *Architectural Record* (New York) contains an interesting account, by the architects, Messrs. Nimmons & Fellows, of "Designing a Great Mercantile Plant," that of Messrs. Sears, Roebuck, & Co.; an immense working warehouse, for what kind of goods is not specified. The account of the construction of a building of this kind, which is stated to have been insured at the lowest rate ever given to a risk of this character, is of considerable practical interest, as also the description of the means employed to facilitate the carrying on of all the different branches of work with the greatest economy of time and labour. Architectural effect in the exterior has not been overlooked, partly from the practical reason that the firm do not want to spoil the amenity of the district in which many of their best customers reside. In relation to the matter of fire-proof construction, we notice that the system of solid wood floors has been adopted; 8 in. by 5 in. yellow pine laid close together, the top of each floor protected by a saturated roofing felt and with maple flooring boards; these floors are so arranged that water used in case of fire will be drained to scuppers in the outside wall or pass down the stairs and elevator shafts. The same issue contains Part I. of a well-written article by Mr. Jean Schöpfer on "Roman Art," a kind of plea for recognising the really great qualities of Roman architecture in spite of its æsthetic defects.

The *Architektonische Rundschau* contains a fine illustration of a noteworthy piece of modern German architecture in a very florid Renaissance style, a portal of a building in the Neue Friedrichstrasse, by MM. Thoemer & Schmalz, which is exceedingly bold and ingenious, though not in a style that we can profess any sympathy with.

The *Berliner Architekturwelt* contains illustrations of a set of buildings erected in connexion with the working of some large sluices on a canal, which are of much interest; they show how a practical erection of this kind can be made really picturesque by a simple and direct treatment and grouping arising out of the requirements of the case, and without any of what are sometimes called architectural features. This is one of the things in which German architects are often specially successful. Herr Friedrich Lahrs is the architect.

The *Nineteenth Century* contains an article by Mr. H. H. Statham on "The Salons and the Royal Academy."

In the *National Review* Professor Milne writes an article "About Earthquakes," a subject which may have a sinister interest for us all even in this country, as is darkly hinted at the close of the article; and Professor Milne's opinions on earthquakes are probably worth more than those of any other person. The following summary as to the movements of the earth's crust will bear quoting separately:—

"From what we can see and measure we know that within the period of a lifetime, and well within the period of reliable history, certain tracts of country have been sinking downwards, whilst others have been bending upwards.

Since 1811 the Sunk Country in the central portion of the United States has still been sinking. Portions of African Turkestan are rising. The southern part of Scandinavia during the last 100 years has

been sinking, while the northern portion has been moving in the opposite direction. Marked indications of corresponding movements are to be found in very many countries upon the globe. These movements imply the bending of rocky strata, evidence of which is met with in almost every mountain range we see. It is even visible in the gentle undulations of our Southern Downs. On a journey from the north-eastern counties towards the Isle of Wight, as we pass by quarries and through railway cuttings, we first see chalk in horizontal bands. From the north of London it dips gently downwards beneath that strata to rise as the North Downs. Still further south the upward fold, the greater portion of which has been effaced by denudation, is again seen to plunge downwards beneath the Solent, to rise steeply in the Isle of Wight. The arrangement is similar to a series of parallel creases or wave-like folds which can be made in a table cloth or in a carpet. In many of these folded districts we see that the strata have been fractured, and that beds on one side of a fracture or fault do not correspond to those on the other side. There have been displacements which may be measured by inches or by thousands of feet. The formation of these faults is assumed to be the result of bending which has exceeded the limits of the elasticity of the bent material. When these displacements are large and take place suddenly elastic relief, together with the jolting and impact of the settling mass, give rise to vibrations and waves which may shake the world."

In the *Century* is an illustrated article on the Elysée Palace, under the heading "Historic Palaces of Paris," and an article by Mrs. Pennell, with some delightful sketches by Mr. Pennell, on "The Lonely Marine from its Source."

In the *Antiquary* Mr. W. J. Fennell, under the general heading "Some Ulster Towns," writes an article on the history and associations of "Bangor, County Down," now a favourite Irish watering-place, but with a long and interesting history behind it. "So great was the reputation of Bangor University that Alfred the Great, Saxon King of England, sent to it to supply professors to Oxford when he founded or restored that University." Mr. A. C. Fryer continues his article on "A Pilgrimage to St. David's Cathedral."

FIRE TESTS OF REINFORCED-CONCRETE FLOORS.

Two Reports issued this week by the British Fire-Prevention Committee afford some interesting and valuable information relative to armoured-concrete floors from the standpoint of fire-protection. In the first of the two tests described the floor was divided by transverse beams into three panels, each of 6 ft. 9 in. clear span; the concrete was made with Portland cement, Thames sand, and furnace clinker, in the proportions of 1, 1, 2½, and the reinforcement was arranged on the Coignet system. Almost immediately after the gas had been lighted the cement plastering on the ceiling began to blow off with slight explosions. After the expiration of about one hour two patches of concrete, each measuring about 3 sq. ft., fell from one panel, exposing the reinforcement, and smaller pieces flew off from the centre of the two other panels; and after about two and a half hours several cracks were to be seen on two of the beams. The application of water had the effect of stripping the concrete from the underside of the same beams, exposing the steel bars for a length of about 6 ft., and showing the metal to be red hot. Considerable erosion was also caused by water on the under surface of the panels, and several of the longitudinal bars of reinforcement were exposed. The maximum deflection of the floor was about 6 in., and the permanent set averaged 5 7/16 in. This test does not show furnace-clinker concrete in a very favourable light, but it is probable that the considerable deflection of the floor beams may account for the large masses of concrete which were detached. The most obvious features demonstrated by the test were the insufficient proportions of the reinforcement and the inadequate protection of the metal against the effects of heat.

In the second test described another Coignet-system floor was tested, but this time the concrete was made with blast-furnace slag, the spans were reduced to 5 ft., the reinforcement was much stronger, and the steel was covered with concrete on the underside to the thickness of 1½ in. in the panels and 1½ in. in the beams. Further, the beams and panels overhung the testing-hut by 3 ft. 4 in. at each side in the direction of the beams, and the panels projected 1 ft. 8 in. at each end. Nevertheless, at the expiration of half an hour, the floor began to deflect,

and continued to do so until the maximum deflection of 4.3 in. was reached, the permanent set being afterwards found to average 1½ in. On the application of water sufficient concrete fell from two of the beams to expose the reinforcement for lengths of 4 in. and 6 ft. respectively, and the steel was seen to be red hot. The under-surface of the panels was also eroded where struck by the jet, and on removal of the load the upper-surface of the floor showed transverse and diagonal cracks. Although this floor was classified as "fully protective," it should be noted that, in spite of the assistance rendered by the overhanging portions of the beams and panels, the reinforcement was not able to resist deflection so fully as could have been desired. No doubt if the steel had been more adequately protected from heat by a greater thickness of concrete the deflection would have been much less, but it is not improbable that some methods of disposing the reinforcement may be better than others for withstanding deflection at high temperatures. This is a point which can only be settled in a satisfactory manner by comparative tests upon different systems of reinforced-concrete floors. In the meantime the important, but by no means new, lesson to be learned from these two tests is the absolute necessity for an ample thickness of concrete to protect embedded steel from the effect of fire.

EXPERIMENTAL SCIENCE AND THE BUILDING TRADES.

On Monday last at the London County Council School of Building, Ferndale-road, Brixton, Mr. Alan E. Mumby, M.A., delivered the first of two lectures on "Experimental Science and what it has done for the Building Trades." In his prefatory remarks Mr. Mumby said that even the antagonist to science nowadays appreciated its applications and the benefit he received from the work of the scientist in the laboratory, but there were very few people who appreciated all that had been involved in making those applications. Those of them who wished to gain information on that point were rather apt to look simply at the harvest without troubling to know anything about the seed-time. Take the case of a man who wanted to rear a house on a very slight foundation. He might object to the cost of putting in deep foundations on the ground that the work would be underground, and that the money would be wasted. The contention might be accurate for a time, but perhaps a little later on the man wanted to add another story. On examination it might be found that the foundations would not permit of that, and that was where they would find themselves if they did not give a little more attention to science in their work. It was particularly curious that so little attention should be given to the claims of science in this country and that so few people appreciated the work done in laboratories. It was the more curious because some of our greatest natural laws had been discovered by Englishmen, and also some of the greatest applications of those laws. The man of science experimented with things that were unknown, and he wanted to learn something more about them. He tried to solve the problem according to some preconceived scheme, he thought out what he was going to do, and then he conducted his experiments with a view of finding out the exact thing. The experiments alone, however, were not the whole of his work. What he did was to make a series of experiments and then to consider in the light of the results whether he could get any general statement from them. It was, however, not enough for the scientist to know that certain things happened—he wanted to find out the cause, and in that respect all workers might emulate the scientist, for it was always a healthy tendency for a man to know in his work why certain things happened. It was by the patient work of the scientist that they had got those two great laws which stood at the basis of all the sciences—the law, for instance, of the indestructibility of matter. That law, which told them that nothing could be destroyed, stood at the very basis of chemistry. Then they had got the great law of the conservation of energy, which told them that energy could not be destroyed, although it

might be transformed. That great law formed the basis of the science of physics. Then they had the law of gravitation, which told them from the way in which two bodies moved how they would act upon one another. If they considered why it was that science had advanced so rapidly during the last century he thought it would be found to be due to those causes. If they looked back one hundred years they would find that science was in a very poor way indeed; there was very little chemistry, physics was a little more advanced, but there were none of the applications of science as they had them at the present day. He did not think the advance in science could be put down to the increase in mechanical skill, to fortuitous circumstances, or to the demands of mankind; they must put it down to those natural laws which had been the basis of all scientific work. By those laws they could predict what would happen under certain circumstances, and at once a whole flood of light was thrown on a thing. They were not at the end of their scientific knowledge or by any means in possession of all the natural laws—in fact, it was not too much to say that we stood at the very threshold of knowledge itself. Vast progress had been made during the last few years, and, therefore, it was very necessary to remember that pure science was not a thing of the past but a thing of the present, and they wanted to develop it just as they wanted to develop their applications. They wanted to take their work into actual research, which would enable them to study new conditions. Work might seem rather tedious, but it would always pay a workman to take up a certain amount of pure science, because it was not as if we were fighting for our hands for a few years ahead; but we were living for the future, and, therefore, it would pay us to make our foundations as broad as was possible. The man who took a real interest in his work would look very much higher than the financial aspect of it, although, of course, that was important. In the national aspect they had got to remember that other countries took very much more interest in science as a rule than we did. The French, the Germans, and the Americans venerated pure science, and it behoved us to take care that we as a nation were doing enough in this direction. It was simply because of their science that Germany had got the large dye trade which was of such great value to them. Let them remember that the work of the laboratory to-day was the work of the workshop to-morrow, and if we did not lay down our work in the laboratory and obtain the help of all these new principles, then we should be left behind in the race. It was the new industries that were the paying industries and which helped to make a country flourish. If they got a nation that was very keen on pure science it would develop it until finally it would yield some direct applications to a new industry, and then that nation would have the whole field for that new industry. Take the cement industry. That, always by its side, had developed on scientific lines of recent years, but at the same time the Germans were going ahead very rapidly with cement, and very valuable public prizes were at the present time being offered there for researches on cement. The result of those prizes probably would be greatly to stimulate research, with the object of finding out the chemical composition of cement in their manufacture and use. There was a great deal yet that we did not know about cement—why it was that it set in a particular way, and what was its exact composition. It seemed likely, therefore, that we should have German cement in the front of the market, because if something was wanted for a particular purpose the relation between its use and its composition would be definitely known. There were three sciences which were particularly applicable to things connected with building work—chemistry, physics, and geology. Physics dealt with energy and matter, so that the suitability of structures, the action of mechanical forces upon things, the expansion of bodies with heat and cold, the question of lighting, hot-water problems, and questions of sound-proof divisions were all based on the science of physics. Chemistry dealt with the ultimate composition of things; its object was to investigate as to what bodies were composed of,

how the particles were put together, and by that means they were able to predict what would happen under certain given conditions. Geology was of value to them because of the enormous number of natural materials which were obtained from the crust of the earth. All our building-stone and timber grew on the earth's shell, and it was very necessary to know something of the way in which that shell was constructed. By the application of chemistry they were able to find out the causes of rusting and decay in materials, and they would find that ordinary decay really consisted of a series of mechanical changes. It was impossible, of course, to prevent decay entirely in building materials, but their object in choosing materials should be that there should be as little decay as possible. The ideal building no doubt would be one built on the principle of the "one-horse shay"—made equally strong in all parts. That would be the ideal building—one in which all the materials were equally strong. Unfortunately, they could not do that; all they could do was to attempt to proportion the strength of their materials to their uses. That was sometimes overlooked, and stronger materials than were really needed were used. They wanted, as far as possible in their building work, to balance the parts and not use herculean materials in one part and very poor materials in another; that was a mere waste of money. The two chief agents in decay were air and water. Rusting would not take place either in air or water; it must be a combination of the two things. In concluding his lecture, which was illustrated by a number of practical experiments, Mr. Munby said that one of the best ways to note the effect of acid gases in the air on sandstone and limestone was to place a small piece of the stone in a bottle and pour on a little diluted sulphuric acid and note the effects.

SAN FRANCISCO.

[FROM A CORRESPONDENT.]

SUFFICIENT time has now elapsed since the devastation of their city in April to enable San Franciscans to look the complex problem of its rebuilding squarely in the face. Some data may be noted in this connection of interest to the British industrial community at large.

A careful canvass of the iron trade in the city reveals the fact that, while many inquiries have been received—one involving 50,000 tons of structural steel is a record—no important orders have been actually placed in this market. Some fairly good orders have been taken within the past thirty days by Belgian rolling-mills. Manufacturers in Belgium understand the physical and chemical requirements as to structural steel for America, and now roll to American standard, at least as far as sections, beams, and channels are concerned. It is stated that these shipments will be largely composed of "longest stock lengths," and such miscellaneous angles, channels, and beams as are used to a limited extent by the riggers of San Francisco. Many persons look upon the placing of orders in European hands as a foolish expedient. They point out that nearly all steel structures erected in their city up to this date have been manufactured and fitted in Pittsburg or Philadelphia, and laid down at their destination complete to the last bolt and ready for building. Everything as regards the up-building of the city depends upon the dispatch with which the insurance companies settle the claims of property-owners. It is safe to say that not more than a score of citizens are ready to proceed with plans until this phase of the question is settled.

Later on, when money is in hand, some business will undoubtedly be done with English manufacturers with specifications for structural steel, punched, fitted, and marked ready for assembling. A serious obstacle may interpose, however, in that the American Labour Union of Riggers may refuse to handle material purchased outside the U.S.A.

The financial aid freely offered by American steel mills will also have a minimising effect on orders to be placed in foreign markets. It is said that a San Franciscan steel importer, who has been rendered practically insolvent by the earthquake, has been offered \$20,000. worth of material "to

be paid for when possible." A banker's letter of credit would have to be in evidence when trading with a foreign supplier.

THE BUILDING TRADES DIRECTORY.

A new edition, the tenth, of their excellent Directory of the Building Trades has been issued by Messrs. Kelly's Directories, Ltd. (182-4, High Holborn, W.C.), which appears to be as carefully compiled as any of its predecessors. The directory is published at intervals of four years, and the first edition appeared in 1870, so that for thirty-six years those connected with the building trade have had within their reach a work which must be as indispensable to them as is the Post Office London Directory to the general public, and which is as well arranged and as accurate as the Post Office Directory. The work is intended to give a complete list of all the trades and occupations connected with the industry, and in addition to a long index of towns and places mentioned in the volume, as well as an index of trades, it includes a list of County and Borough Surveyors in England, Scotland, and Wales; a section devoted to the building trades in the various towns and villages, arranged alphabetically under the various counties of England, Scotland, Wales, and Ireland, the Channel Islands, and the Isle of Man; and a classification of trades in London and suburbs and in the provinces and Scotland and Wales. There are some 2,600 pages to the directory, excluding advertisements, which are wisely kept apart from the letterpress. The work, the price of which is 50s., is a model of what such a book should be.

THE COST OF ERECTION OF SCHOOLS.

The following Report of the Education Committee of the London County Council was submitted at the last meeting of the Council before the Whitsun recess, but its consideration was postponed:—

"On February 20, 1906, we submitted a report with reference to the preliminary plans of new public elementary schools proposed to be erected on sites in (i.) Lawn Lane (Kennington), (ii.) Fountain Road (Wandsworth), and (iii.) Franciscan Road (Wandsworth), and also of a school for special instruction to be erected on the Jan-street site (Poplar). On April 10, 1906, we submitted a further report in reference to the plans of these schools, and it was then decided that certain modifications should be made in the specification with a view to reducing the cost, and that for the purposes of comparison tenders should then be obtained both upon the original and the revised specifications. We have carefully examined the whole question of the cost of erecting schools, and in dealing with the result of our inquiry we think it would be of interest to the Council to prefix our report with a brief statement of the history of the evolution of school planning and the steps taken by the late authority in this matter, to which reference was made by the late chairman of the late School Board (Lord Reay) in his valedictory address at its final meeting on April 23, 1904:—

"We are so used to the sight of the handsome school buildings which are such prominent features in most parts of London, that we are apt to think that the type has been long established. The fact is that, in 1870, a satisfactory plan for a school building was non-existent. The Board had to create it, and the process of evolution was lengthy. It was inevitable that the earlier schools built by the Board should prove defective in the light of accumulated experience, and many of these have had to be altered so as to bring them into harmony with the present standard of efficiency.

From the following remarks it will be seen that the original type of school was erected at a cost per place which could not be maintained when necessary improvements—the result of experience, gradually became adopted.

When the London School Board began its building work, and before it appointed an architect of its own for the purpose, in consequence of the urgent need of more rapid provision of school accommodation, the planning and erection of the first thirty schools were entrusted to various architects. These schools, although handsome in elevation and in some cases built by architects of considerable reputation, were yet ill-adapted for teaching, partly because of the absence of general professional knowledge of the requirements of a good school, and partly because of the very meagre code of the then Education Department, the building of which was of a most elementary description, and such rules and illustrations as existed tending rather to perpetuate error than to stimulate improvement. The classrooms were long, steep, and narrow. Cloakrooms were either insufficient or altogether wanting. Teachers' rooms were practically unknown, as contrasted with the present provision of both head teachers and assistant teachers' rooms. The classrooms were subsequently found to be of unsuitable sizes, and the scholars sat for the most part with their backs to the windows. Most of the rooms were passage rooms one to another, and, in addition, the sites were small and the playgrounds were very insufficient. In respect of these earlier schools the Education Department allowed a building loan of 10s. per child accommodated.

Of necessity, therefore, a great many of these earlier schools, have since had to be improved, halls added, new staircases of a modern type built, and the schools properly equipped with classrooms, lavatories, teachers' rooms, etc.

After the Board appointed its own architect, the earlier schools built by him showed no marked departure in planning from the previous types, but gradually a certain improvement was effected. The dominant idea, however, was still that of a school room holding several classes, supplemented by a moderate number of classrooms. Corridors for reaching the end rooms were introduced, but these were also made too narrow to ensure safety in the event of fire or panic, and the hanging of cloaks in them was inconvenient and dangerous.

In 1883 the School Board began to recognise more especially the importance of light, lighting, and with this object in view planned square classrooms for sixty children, with five rows of dual desks, arranged six deep, as compared with the former size, viz., 29 ft. 4 in. by 22 ft. This arrangement was objected to by the Education Department on the ground that desks should not be more than five deep, but the Board adhered to their plans, which were tacitly accepted. From this time the improvement in school planning has been continuous.

About the year 1898, the late authority, in view of the large and increasing amount expended yearly on maintenance account in pointing the exterior walls, etc., and in painting the internal walls, decided that the brickwork should be built in cement in lieu of lime mortar, and that the internal walls of staircases and corridors and dados of classrooms and halls should be faced with glazed bricks. In considering the use of the increasing use of halls for drill and public meetings, a much heavier and more rigid type of floor construction than had hitherto obtained was adopted. It was not until the year 1901 that the Education Department so far acknowledged the utility of a hall in a school as to grant a special loan for the purpose for every school. Previously the cost of the hall, when provided, had to be included within the before-mentioned loan limit of 50s. per child accommodated unless an allowance was specially made. Consequently the cost was always prohibitive, unless the hall was reckoned in the accommodation, or was of such restricted dimensions as to be more of a corridor than a hall. Since the department allowed a loan of 2s. per foot floor space for the halls, the Board were able to provide them in every new school.

In 1891, the Board, which had for several years neglected the provision of drawing classrooms, determined to provide them, and many spacious and convenient rooms have been built over the halls for this purpose.

Another item in the cost of schools is the amount of decorative detail put into them. The policy of the late authority was almost always to give these structures, as public buildings, some dignity of appearance, and to make them ornaments rather than disfigurements to the neighbourhoods in which they were erected. Where in a few cases, striving after the sternest economy has been observed, plain buildings being erected, as in the case of Trudley's-road (Deptford), Enfield-road (Lickney, C.), Elkeslie-road (Hammersmith), and other of our others, the resentment of those who contrasted the appearance of these with other schools in the neighbourhood led to a reversion to the more ornamental type.

It was found that the difference between the cost of buildings erected on utilitarian lines and those designed with some regard to materials, colour, and style was about 5 per cent. At the same time, this ornamental appearance has been secured either by richness of detail or by a dignified grouping of masses—in some few instances a greater amount of decorative work has been introduced into the buildings than has been permitted to continue after fuller experience of the cost involved.

In recent years, too, the cost of the offices and drainage generally has considerably increased under the stringent requirements of the sanitary authorities. Where the ground is of a treacherous nature, it is customary to use iron soil drains, glazed divisions are provided between each set of latrines, and subject to damage, and requires periodical painting, etc. Further, single pans, with separate water-waste preventers, are provided in lieu of the trough and automatic flusher. The extra cost of these items on a school for 800 children, of the ordinary type of building and site, may be taken approximately as follows:—

- (i.) Building in cement ... £ 350
- (ii.) Glazed brick facings to staircases and corridors, and dados of classrooms and halls ... 930
- (iii.) Additional cost of solid floors of classrooms, and additional strength and rigidity of hall floors ... 545
- (iv.) Additional cost of iron soil drains, single pans and W.W.P., glazed divisions, etc. ... 750

representing about 3s. 5s. per place on these items alone.

It sometimes happens that in consequence of the restricted area of the site a playground has been arranged on the top of the school. This topmost floor comprises playground and science and art rooms (to which latter exception has recently been taken in some cases by the Board of Education) and increases the cost of the building by about 3,400, equal to 4s. per place. Were the playground not so provided a larger area of land would be required on the level, which would probably cost considerably more.

On several occasions the question of the cost of erecting schools was carefully considered by the late authority, the more important investigations being conducted in 1897-8, 1892-3, and the last in 1905. In 1897 a special committee was appointed to investigate and report upon the whole of the existing arrangements relating to the work of the Works Department of the late authority, and as a result of their report the late authority, on February 24, 1899 (i.) adopted a new specification—the joint proposition of Mr. Ewan Christian and Mr. Thomas M. Rickman, the professional advisers called in for the purpose; (ii.) arranged for a more extended

supervision over the construction of buildings; (iii.) introduced a more elaborate and expensive system of heating apparatus; (iv.) arranged for the brickwork to be built entirely in cement in lieu of mortar; and (v.) adopted glazed bricks to a very much larger extent than had formerly been the case. In 1892 the late authority desired to ascertain whether it would be possible to obtain from outside architects any fresh ideas in the planning of its schools, and invited architects to enter into public competition, in accordance with the rules of the Royal Institute of British Architects, for the planning of a school for 1,250 children, capable of being erected on any ordinary site purchased by the Board, the President of the Institute being appointed assessor, and to draw up the terms and conditions of the competition. It was further decided that three premiums, of 150s., 100s., and 50s. respectively, should be awarded, in the discretion of the assessor, to the architects whose plans were most successful.

The site finally selected was a vacant piece of ground in Fulham Palace-road, and the competition, besides being advertised in the daily and trade journals, was specially brought to the personal notice of a large number of architects. One hundred and sixty-one architects applied for the instructions, and sixty-one of them sent in designs, which were afterwards publicly exhibited in the upper hall of the "Hugh Myddelton" school, Clerkenwell. The result of the competition was that the assessor, Mr. Macvicar Anderson, reported that he had not produced a more judicious in respect of plan than had been deemed worthy of approval; and on April 26, 1894, a report was submitted, stating that, as a result of the competition, it was gratifying to find that the schools had not only been erected upon what might be fairly considered the most approved plans, but that the cost appeared to be as moderate as seemed possible, judging from the estimates forwarded by the various competitors of the probable cost of the schools if erected according to the designs submitted by them.

In 1896 the subject was again the matter of careful investigation, and the late authority then decided, as an experiment, in the case of the next six schools to be erected, to revert to the old specification being modified to meet the then requirements of the Board and the Education Department, it being arranged that in the building contracts the quantities should not form part of the contract.

Every detail of the specification was then examined, and, after being tabulated, decisions were arrived at, which became instructions for the description of the building of the schools.

The schools subsequently selected to be built under these special conditions were the following, the accommodation, cost, etc., being as stated in the subjoined table:—

965 places, and cost 29,78s. 4d. a place. The graded portion of both schools consists of a two-story building, the infants being accommodated in a separate one-story building. A comparison was made, item by item, of the various branches of the work done at these schools, and a very full examination was made of materials, quantities, and prices. The sub-committee which then reported arrived at the conclusion that the facts before them showed "that, having regard to the accommodation provided and the character of that accommodation, and the conditions under which the London School Board were required to work, the London Board had their work done quite as cheaply at Invicta-road as the Croydon Board at their Portland-road school." It was ascertained that the cost of the school buildings comprised, excluding offices, works on site, furniture, etc., amounted to 14,800s. for the Invicta-road school, and 14,491s. for the Croydon school.

In the course of the inquiry it was ascertained that it was cheaper to build a school in two separate blocks, consisting of a two-floor building for the graded school and a one-floor building for the infants' department, than in a single block of three or four floors; and in planning new London County Council elementary schools, this practice is adopted wherever the site is of sufficient size for the purpose. This was accounted for by the fact that, although, in the case of a three-story building there is a saving in having to provide only one roof, this saving is more than counterbalanced by the additional cost of the greater thickness of brickwork required for the walls, the extra cost of scaffolding to the upper floors, and the cost of hoisting joists and girders, which is a great height, etc. This fact compelled the Board to scrutinize carefully its system of planning, which, owing to most of the schools being built in the heart of London, has been predominantly one involving three-story structures. It should be stated that it was the practice of the late authority, when securing vacant sites in outlying districts, to acquire sites having a height of 20 ft. or more. The following shows the relative cost of erecting (i.) a three-story building compared with (ii.) three one-story buildings (boys, girls, and infants), and (iii.) two-story building (boys and girls) and a one-story building for infants:—

(i.) Three-story building of ordinary type. Broad-water-road (Wandsworth) (accommodation 520—Total estimated cost, including works to site, offices, etc., but excluding furniture, etc., 20,948s., equivalent to 22s. 15s. 4d. a place.

(ii.) Three one-story buildings. (Woolwich) (accommodation 1,202)—Total estimated cost, including works to site, offices, etc., but excluding furniture, etc., 21,953s., equivalent to 18s. 5d. a place.

(iii.) Two-story building and a one-story building, the "Wandle" (Wandsworth) (accommodation

County electoral area and name of school.	Accommodation.	Date of acceptance of tender by late authority.	Actual cost.	Area of site.	Cost a place (main building complete and ready for occupation, excluding works on site, furniture, etc.).	Centers, etc., erected and included in total cost.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Clapham.</i> Cavendish-road (Designed for future enlargement)	914	23-7-97	£ 22,400 18 7	87,120 sq. ft.	£ 24 10 2	None	One-story building, in cement, three halls, drawing classroom, school-keeper's rooms.
<i>Lewisham.</i> Ennersdale-road (Designed for future enlargement)	756	do.	£ 16,105 3 4	63,480 sq. ft.	£ 21 6 1	None	Three halls, D.C. room, S.K. house, in cement.
<i>Greenwich.</i> Royal Hill (Designed for future enlargement)	552	10-2-98	£ 12,900 1 11	38,685 sq. ft.	£ 23 7 5	None	Three halls, D.C. room, S.K. house (on arches), in cement.
<i>Bethnal Green.</i> S.W. Daniel-street ... (Designed for future enlargement)	1,138	31-3-98	£ 23,682 13 10	50,610 sq. ft.	£ 20 16 3	Cookery, laundry, manual (40)	Three halls, D.C. room, S.K. house, playground on roof, in cement.
<i>Barnes.</i> "Paragon," The (Designed for future enlargement)	1,111	12-5-98	£ 27,746 4 7	67,630 sq. ft.	£ 24 19 6	Cookery, laundry, manual (40) and domestic economy school	Three halls, D.C. room, S.K. house, in cement.
<i>Oakfield-road ...</i> (Complete school)	922	29-6-99	£ 19,794 19 6	35,425 sq. ft.	£ 21 9 5	Manual centre...	Three halls, D.C. room, S.K. house, in cement mortar.

* This school was subsequently transferred to the Penze education authority.

The last occasion on which this question was considered was in 1903, when the resolutions made by the chairman of the Croydon School Board, at the public opening of the Portland-road school, having accommodation for 1,510 children. To the effect that the cost of building (exclusive of site and furniture) had been 13s. 11s. 8d. a place, as against a cost of 28s. 10s. and 30s. 15s. 4d. in two London schools.

It is to be noted that a comparison might be made between two schools, where the conditions of planning, etc., were as nearly as possible identical, the Invicta-road school, Westcombe Park (Greenwich) was taken as corresponding fairly in general arrangement and size with the Portland-road school, Croydon. The Invicta-road school, which was built in 1893, has

1,140.—Total estimated cost, including works to site, offices, etc., but excluding furniture, etc., 23,537s., equivalent to 22s. 9s. 5d. a place.

We now pass to the result of our investigations into the cost of erecting schools in London, as compared with the cost of schools recently built under the jurisdiction of education authorities whose areas are contiguous to London. In this connexion we have consulted the County Councils of Surrey, Middlesex, and Kent, the Boroughs of Hornsey, Wimbledon, and East Ham, the County Boroughs of Croydon and West Ham, and the Urban District Councils of Witleton and Chiswick, from the information which these authorities were good enough to furnish, we were of opinion that the schools erected under the jurisdiction of the Croydon.

Willson, and Horsey authorities were the most suitable to select for purposes of comparison, and several of our members have visited, in company with some of members of the Council interested in the construction of schools, the latest schools built under the direction of these authorities. The subjoined statement shows the accommodation and cost of the schools that were inspected—

department. Both schools were planned very much on the lines of the majority of the three-story buildings recently erected in London, but in neither school was there any provision for science or drawing, the buildings comprising only the halls, classrooms, rooms for the head and assistant teachers, and cloak-rooms.

The first point that was noticed was the economy

observed in the erection of the playing sheds. These were supported on slender iron columns, the roof being carried by a timber plate and covered with zinc. In the staircases and lobbies there is a glazed brick finish surmounted by plain discoloured brackets. As in the case of some of the London schools, economy was effected by providing no fire-places except in the babies' rooms.

With the exception of the roof principals of the two-story hall in Salisbury-road school, the joinery was of the simplest possible character.

Except, perhaps, in the arrangement by which a store-room was provided in a mezzanine above the ground floor corridor, and in the cheaper construction of the sheds in the playground, it did not appear that the schools exhibited any points which should be imitated in the Council's schools. Generally speaking, they appear to have been carried out on the same lines as the Council's schools with the practice of certain small economies.

The plans and specifications of two schools built under the supervision of the Chiswick and West Ham local authorities were also kindly lent to us, and, after a careful perusal of the specifications and a full examination of the drawings as to plan, etc., we have arrived at the conclusion that very little difference, if any, exists—indeed, in one or two cases the specifications involve work of a more costly nature than that adopted in the Council's schools.

We submit a statement, showing for the last seven years the number of new schools for which tenders were accepted, together with the accommodation, the total amount of the tenders, and the total average cost a place (see below).

We also append particulars relating to the cost of municipal schools, the tenders for which were announced the last accepted by the late authority, and in comparing the cost per place in the foregoing and in the following table with the cost per place in the Croydon and Willson schools, it is very important to notice that the average

Name of educational authority.	Name of school.	Total accommodation (pupils).	Date of completion.	Total cost (including furniture, supervision, architect's charges, etc.).	Total cost per place.	Remarks.
(1)	(2)	(3)	(4)	£ s. d.	£ s. d.	(7)
Croydon	Ingram-road	1,166	1901	17,110 0 0	14 13 6	Two-story building for boys and girls; one-story building for infants.
	Portland-road	1,310	1901	18,439 0 0	14 1 6	Two-story building for boys and girls; one-story building for infants.
Horsey	Mattison-road	900	1893-4	23,069 5 0 (excluding special instruction school)	25 11 3	Two-story building for mixed children; one-story building for infants.
	Pemberton-road Higher Elementary School	340	1903-4	16,212 12 0	47 14 2	Two-story building for mixed children.
Willson	Chamberlayne Wood-road	1,224	1902-3	19,060 0 0 (excluding centres and special buildings)	15 10 6	Three-story building, including three halls.
	Salisbury-road	1,560	1901-2	19,695 0 0 (excluding centres, etc.)	15 12 8	Three-story building mixed school, central hall through two stories with balcony, and infants' hall.

We found that in the Croydon schools afforded all the requisite accommodation and presented many points in comparison with the Council's schools.

In the Croydon schools the general arrangement of the roofs and gutters was suggestive of a country school rather than a town school, and were correspondingly cheaper; in the staircases and corridors the glazed brickwork was carried only to the height of the dado, while in the Council's schools it is carried the whole height of the wall. The dipped bricks used for the dados in the Croydon schools, though of a specially cheap make, are more expensive than the soft glazed bricks used in the Council's schools, but there was nothing in the kitchen ranges and no fireplace similar to that to be found in an artisan cottage. The swimming bath was about 40 ft. long, which was too short for the requirements, inasmuch as it involved a somewhat generously steep floor. The gallery was provided with dressing boxes.

Throughout the ground floor of the building, comprising the swimming bath and domestic economy centre, there was a profusion of glazed bricks, and the 22 in. walls were unnecessarily heavy. The housewifery department consisted of a well-furnished sitting-room, bedroom, and kitchen with scullery attached.

We are of opinion that the Council would not secure economy by following the example of the Horsey local authority in any particular except, perhaps, that simple tiled roofs with eaves gutters are less expensive than lofty parapets.

The higher elementary school at Pemberton-road, Horsey, was organised as a secondary school for 340 children under sixteen years of age. The accommodation included a good room for the headmaster, classrooms, a hall about half the size necessary for a secondary school, and unaccommodated by a row of iron columns, a chemical laboratory for twenty-four, an experimental science laboratory for twenty-four, a balance room, a preparation room, a demonstration theatre, and a good art-room, with special wall fittings made to the design of the headmaster. There was, however, no dining room, kitchen, common room, library, or gymnasium, so that the building fell considerably short of the accommodation generally provided in a secondary school.

The brickwork was carried out in lime mortar, with a profusion of glazed bricks, and in particular two 14-in. longitudinal walls were carried right through the building on both upper floors, one on each side of the corridor, the weight of one of these walls on the first floor necessitating the columns in the hall above referred to.

As regards the two schools we visited at Willson, the Salisbury-road school comprises an infants' department and a mixed department. The Chamberlayne Wood-road school is organised as infants, girls, and boys. The former school has an infants' hall on the ground floor and a hall for the mixed department, extending through two stories with a gallery. The latter school has a hall for each

Year ended December 31.	Number of new schools for which tenders were accepted.	Accommodation of schools.	Total amount of tenders.	Average cost per place of main building complete and ready for occupation (excluding offices, works on site, furniture).	Average total cost per place (excluding furniture, supervision, etc.)
(1)	(2)	(3)	(4)	(5)	(6)
			£ s. d.	£ s. d.	£ s. d.
1899	11	9,113	256,580 5 6	17 16 11	24 7 2
1900	10	9,032	257,477 3 4	17 12 3	27 7 7
1901	6	5,188	121,828 0 0	20 1 0	28 17 1
1902	8	6,970	164,653 0 0	17 6 3	23 12 5
1903	18	16,521	367,829 0 0	16 11 3	22 3 6
1904	6	5,832	125,184 0 0	16 1 7	21 19 11
1905	3	2,830	61,300 0 0	16 9 11	22 4 5

County electoral area and name of school.	Accommodation.	Date of acceptance by local authority.	Amount of tender.	Area of site.	Cost per place (main school buildings only).	Total cost per place (including centres, but excluding furniture, etc.).	Centres, etc., included in total cost.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Wandsworth, Hearnville-road	1,002	24-3-04	17,146 0 0	61,960 sq. ft.	13 12 6	17 2 3	—	Two-story building for boys and girls; one-story for infants.
Leisham, Stillness-road	1,124	29-10-03	22,268 0 0	87,120	12 11 0	19 16 2	—	One-story buildings.
Wandsworth, "Southfield"	980	21-7-03	19,919 0 0	258,250	13 7 11	19 16 3	—	One-story buildings.
Stepney, Myrtle-street	923 elementary higher grade	28-5-03	29,031 0 0	30,185	13 12 9	22 1 6	on both buildings	Three-story building with playground on roof, including higher grade school for 392 scholars. £207 18s. 6d. less than School Board voted.
Fulham, New King's-road	892	28-5-03	21,271 0 0	48,345	15 15 1	21 17 1	exclusive of special school	Three-story building.
Wandsworth, Broadwater-road	920	19-3-03	20,948 0 0	77,400	14 14 4	20 19 9	without special school	Three-story building. £197 15s. 3d. less than School Board voted.
Fulham, Macmurdo-road	1,142	24-7-02	24,950 0 0	77,855	16 7 11	21 16 11	—	Three-story building. £53 15s. 4d. less than School Board voted.
Wandsworth, Ensham-street	962	15-5-02	25,522 0 0	93,654	18 11 6	26 10 7	Manual training centre, 40	Three-story building. £1,608 3s. 3d. less than School Board voted.
Leisham, Kilmore-road	808	18-7-01	22,096 0 0	87,120	16 0 0	24 6 8	Do.	Three-story building. £725 6s. 8d. less than School Board voted.

accommodation in the London schools is much lower than that in schools under the Croydon and the Willesden authorities.

The average number of children accommodated in each of these schools is 1,027, the average cost per place of main school buildings only is 15s. 9s. 2d., and the average total cost per place calculated on the total amount of tenders is 21s. 18s. 2d.

It should be noted that in none of the cases referred to in the above statement did the cost exceed

The true test of the cost of a building is its cost per foot cube on the main building, and we venture to assert that no buildings of a public character have been built in the manner in which schools have been erected at a smaller comparative cost. The architectural features of an expensive nature have been reduced to a minimum, and effect obtained by carefully studied proportions and grouping. By way of illustration, three types of schools built within the last three years are given below:—

Electoral area & name of school.	Story.	Accommodation.	Cost per foot cube (main buildings complete and ready for occupation).	d.
Wandsworth.				
Broadwater-road.....	Three stories.....	920	7-90	
Fulham.				
New King's-road.....	Do.....	1,148	8-31	
Dulwich.				
Denmark-hill.....	Two stories (graded departments), one story (infants).....	996	7-83	
Wandsworth.				
"Wandle," The.....	Do.....	1,140	8-85	
Southfields.....	One-story buildings.....	1,126	6-70	
Fulham.				
Townmead-road.....	Do.....	1,124	7-14	

the amount of the loan allowed by the Board of Education on the capital cost. This is the more noteworthy in that the loan for the main building was still only 10s. per child, with certain special allowances which were added from time to time.

When the question of reducing the cost of buildings to be erected for a certain purpose and of an accepted type is under consideration, there are only two ways in which it can be effected:—(i.) by reducing the requirements or being content with a smaller or simpler building, and (ii.) by lowering the standard of the building. With regard to (i.) the required accommodation has to be provided in classrooms, graduated in size according to the numbers for which the school has to be built. These classrooms have to satisfy the code with regard to the number of superficial feet for each child, and the heights are also stipulated for proper ventilation and exits, cloakrooms, containing a peg for each child, adequate lavatories, stock-rooms, teachers' rooms, and offices have to be provided according to a scale laid down in the code, and, no such classroom has to be approached separately, it is evident that corridors or halls have to be provided for the purpose. If the school is planned with proper regard to its use for teaching purposes, the central hall plan is the best and most economical, by reason of the fact that, if properly arranged, the hall supplies the place of corridors, and as the head teacher's desk is placed therein, proper supervision of the whole department is secured. The value of the central hall for school work has been so thoroughly appreciated that it has been decided to spend a yearly sum in providing these and other modern adjuncts to the schools built in the earlier years of the late authority and not provided with them.

As regards the provision of rooms for special purposes, such as art, science, manual, and domestic work, it would appear that an art or drawing classroom is not now considered a necessary adjunct to every elementary school, but that a room for general science is desirable. As regards manual training rooms, it is a question whether such rooms should be built for forty or twenty boys, or should be in the nature of centres for groups of schools or adjuncts to each school. As regards housewifery centres, we can consider an ordinary domestic house suitable therefor, and certainly their construction is never such as to fulfil the requirements of the Building Acts for a public building, which they undoubtedly become as soon as they are used for teaching purposes.

With regard to (ii.) when the alternative tenders, which are about to be obtained for three new schools sanctioned by the Council, are received, there will be an opportunity of ascertaining what the savings under the various heads of the revised specification will amount to. The principal suggestion is for building the brickwork in lime mortar instead of cement. Whatever the saving may show under this head, the late authority and the Council has had experience of the cost and inconvenience involved in retaining buildings, inevitable after a certain time when built with lime mortar; the cost in the case of a school of the ordinary size and type is about 350s., while the nuisance from the dust caused by the raking out of the joints and the erection of scaffolding and the presence of workmen on the premises during school hours, with the consequent risk of accidents to children, pierce, carrying entries and heavy weights must be built of a larger size if not in cement; so that, taking all these matters into consideration, we cannot consider the saving to be desirable, especially considering that the after expenses would fall on the rates of the year.

For a proper comparison to be made of the cost per place, the cost should be based not on total cost, including the site, but on the main buildings complete and ready for occupation. The site difficulty affects the total cost so much that the whole calculation is vitiated by having to be accommodated in sites like Plum-tree (Woolwich), Invel-road (Greenwich), New End (Hammersmith), and others, whereas level rectangular sites like Townmead-road (Fulham) and similar ones present no unusual or costly difficulties. Further, taking the maximum size of a department as for, say, 300 children, and building originally for, perhaps, 250, the hall is built of the requisite size for the full number to be accommodated in the completed school. Generally the cloakrooms, teachers' rooms, lavatories, etc., are also built complete, and this provision for future requirements, while it adds to the initial cost, is really a considerable saving to the Council, as when the additional classrooms are erected the further cost is about 7s. 10s. per place.

We feel confident that, upon a comparison being made between school buildings and buildings erected by the Council for other purposes, the result will be favourable to the schools.

With regard to the planning of the schools and their fitness for teaching purposes, it may be stated that the architect to the Board of Education has published, with permission, plans of some of the modern schools of the Council, as types of what such buildings should be. In this connexion we think it would be of interest to the Council to have before it when considering this report a sheet of diagrams (which will be laid upon the table) showing various types of schools, of which we present the subjoined explanations:—

A and B represent elevation and plan of the Tradesmen's road school (Deptford), a building designed with an effort to reduce cost by erecting a school without any architectural features—simply of plain stock bricks, slate roofs, and without architectural embellishments of any kind, at the same time obtaining the standard of building and the completeness of plan by which a satisfactory school building, apart from its external appearance, is secured.

C and D represent the elevation and plan of a type of school in which the architectural adornment was carried beyond the general standard of the late authority, the walls being faced with red brick, and terra-cotta being introduced to a considerable extent.

E and F is a type of school similar in plan to D, and designed in a similar manner, the walls being faced with stock bricks with red arches and dressings to the windows, terra-cotta being introduced sparingly, and the roofs covered with red tiles. The cost of a school of this design as compared with A works out at about an additional 5 per cent. on account of the architectural features, and is a type which was rejected by the late authority in preference to the bare and barrack-like appearance of A.

G is a plan of a school which was worked out to embrace the minimum of the requirements of the Board of Education for a school of that number. It has been a type adopted with more or less important modifications in classrooms, such as Southfields (Wandsworth), Deansfield-road (Woolwich), Timbercroft-road (Woolwich), and other sites where the area was sufficiently large to admit of the erection of a two-story building.

This is a plan which the architect to the Board of Education has illustrated as the type of an ideal school, and it will be observed that corridors giving access to the classrooms are eliminated altogether, the central hall answering the purpose, giving complete control and supervision over every classroom. It is also a type which is mentioned as costing 6-70s. per foot cube, being, in our opinion, about the cheapest type of school which can be erected.

Conclusions.

There are so many special features to be taken into consideration in regard to the area, the shape and adaptability of each site and the situation of the school thereon, the accommodation required for each department, and the need for future enlargement, that it is not possible to estimate closely the cost which will be incurred in respect of any school proposed to be erected until the plans have been prepared and the quantities taken. There is no doubt that in many cases the elevation of the school and the architectural features in connexion therewith have not been designed with so strict a regard to economy as to the pleasing and dignified appearance which has enabled a school to adorn the neighbourhood in which it has been placed. In this connexion the "Oliver" schools tend to be a notable exception, and here it appears to be a general impression that these could be of a considerably less costly description, approximating more closely to one of the standards in use in the erection of dwellings for the working class. We venture to point out that this impression is hardly borne out by facts, and that such a standard would scarcely suffice in view of the rough usage to which the school fittings are liable to be subjected. Further, the comparison hardly applies, inasmuch as in the case of the dwellings one closet only is required to each and the number of closets in the lodging houses is small as compared with the liberal

supply in the schools (provided in blocks and required by the code of the Board of Education). When it is remembered that the total number of square feet of floor is about 6,000, the great importance of having a substantial and durable type of fitting, pan, etc., in the first instance provided out of loan will be readily appreciated, especially when it is recollected that the cost of all subsequent repairs—thus reduced to a minimum—comes out of the rates of the year. The use of iron drains, instead of the abandoned, except where the drains pass through made up ground or under buildings.

As regards wood block flooring, we propose to effect a saving under this head by substituting in the classrooms flooring consisting of 6-in. concrete, thus limiting the use of wood block flooring to the halls and corridors only. It is also proposed to reduce somewhat the cost of the glazed bricks by providing these dado high only in the corridors with plastered walls above.

The playsheds will, without material disadvantage, be simplified in construction and reduced in cost by the use of iron columns, 200 ft. long, and the standard pattern of sashes and fittings, together with substitution of cords, pulleys, and quadrant stays for the present metal window gearing will be provided.

We do not advise that the specification should be altered in regard to the requirements for "picketed" stocks, the saving in cost being so trivial. The same applies also to the cisterns, in view of the material sanitary advantages gained as compared with the use of ordinary cisterns in lead or galvanized iron, to say nothing of the saving in labour in cleaning.

The instruction to obtain from warming engineers competitive schemes for providing systems of warming by low-pressure hot-water apparatus is already being followed in the case of the new schools in course of erection on the sites in Scnarb-street (Stepney), and Sellincourt-road (Wandsworth). It will then be possible to submit a further report with the present systems, and, should a saving result, the usual provision now included for warming can be reduced. We propose to look carefully into the matter, and to submit a further report thereon at a later date.

We have instructed the architect (Education) in all future cases to lay down in a report the cost of the estimated cost of all portions of the proposed buildings above the floors actually occupied for ordinary teaching purposes. We also propose to consider carefully the cost of the extra cost of the extra cost reduced by the omission of rooms for art classes, and ordinary drawing classrooms in the roof. By the omission of this story there will be a saving of about 10 per cent. on the total cost of a school, while by making reductions in the cost of carving and general architectural embellishments in all suitable cases, by excluding as far as possible the use of special articles, and by making the other reductions already alluded to, we hope to effect a further saving. It must, however, be borne in mind that while the cost of a school is reduced, the cost of the extra cost of the school, it is only arranged in those cases where the site is small and the cost of additional land is prohibitive, and to most extent the extra cost of building is the result of a saving in the expenditure on the site.

We have also decided to throw the tenders open to public competition, and, consequently, though there are manifest advantages in confining the competition to a large selected list of contractors who are acquainted with the special requirements of this class of work.

We think that the experience gained on many points while engaged in this investigation will result in a decrease in the future cost of erection of public elementary schools, without detracting from the necessarily high standard of quality and efficiency which the Council should maintain. We have had submitted to us plans of a typical school of 176 pupils, consisting of three elementary buildings to be erected on a perfectly level and large site to be selected, requiring no retaining walls or terracing, nor extra deep foundations, the boundaries being of oak fencing instead of a brick wall, and the specification providing for the reductions already agreed to by the Council and the further modifications suggested in this report. The boundaries being of oak fencing instead of a brick wall, and the specification providing for the reductions already agreed to by the Council and the further modifications suggested in this report. The boundaries being of oak fencing instead of a brick wall, and the specification providing for the reductions already agreed to by the Council and the further modifications suggested in this report.

Main school buildings complete, 13,664, equivalent to 11s. 12s. 4d. a place.

Main school buildings, including inclosing and draining site, etc., 17,834.

Total cost, including possible extras, lithography, furniture, supervision charges, etc., 19,659s., equivalent to 16s. 14s. 4d. a place.

The cost per foot cube is 6-14d.

We desire, in conclusion, strongly to represent to the Council that it is a very extravagant proceeding to plan schools for subsequent enlargement in growing neighbourhoods, instead of building the complete school at once, where it is known that the area of accommodation is limited. There is no doubt that in many cases the elevation of the school and the architectural features in connexion therewith have not been designed with so strict a regard to economy as to the pleasing and dignified appearance which has enabled a school to adorn the neighbourhood in which it has been placed. In this connexion the "Oliver" schools tend to be a notable exception, and here it appears to be a general impression that these could be of a considerably less costly description, approximating more closely to one of the standards in use in the erection of dwellings for the working class. We venture to point out that this impression is hardly borne out by facts, and that such a standard would scarcely suffice in view of the rough usage to which the school fittings are liable to be subjected. Further, the comparison hardly applies, inasmuch as in the case of the dwellings one closet only is required to each and the number of closets in the lodging houses is small as compared with the liberal

THE LETCHWORTH GARDEN CITY.—Mr. J. M. Dent, the publisher, has decided, it is stated, to remove his works, with over 200 employees and their families, from the City of London to the Garden City at Letchworth, and to erect new works communicating directly with the Great Northern Railway. About 110 "London unemployed" are at work at Letchworth excavating land for the new goods yard of Garden City. An area of 13 acres has been acquired by the Great Northern Railway Company for this purpose, and the levelling involves the removal of over 30,000 cubic yards of earth. The unemployed is now about 1s. per cubic yard for the work, and this pays about half the expense of keeping the men and their wives, and running the colony financed by the London Unemployed Fund.

Engineering Societies.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on Monday, the 11th inst., Mr. Maurice Wilson, President, in the chair, a paper was read on "Submarine Groyning" by Mr. Gerald Otley Case. The author said that erosion was not confined to the visible shore between high and low water marks, but took place to some extent also in considerable depths of water. He summarised the chief forces at work below low water mark tending to cause erosion as being (1) unbroken or true waves of oscillation; (2) waves during or after breaking; (3) tidal or other currents. He thought the greatest depth of appreciable wave disturbance was about 100 to 150 fathoms. The transporting and eroding power of waves decreased as the depth of water increased. Referring to current action, he stated that the velocity of tidal currents was not as a rule sufficient to enable them to erode coarse material, but that they transported material stirred into suspension by the waves. Currents due to the flow and ebb of the tide were oscillating currents. The conformation of the coast had a most important influence on the action of both waves and currents. He then dealt with the generally-accepted theory of deep sea erosion, which was that in many places erosion of the coast was caused by erosion going on in deep water, which, by undermining the foundation of the shore, caused the shore between high and low water mark to slide into the hollow thus created. That theory was a fallacy; the power of waves and currents to erode decreased as the depth of water increased, and little erosion was going on in deep water. On the contrary, as a whole, the oceans must be slowly filling up, owing to material eroded from the coast and brought down by rivers being gradually spread over the ocean floor. Referring to littoral drift, the author observed that material, in moving round the coast, was gradually worn away by attrition, the smaller particles being slowly carried seaward, fresh material eroded from the land keeping the supply fairly constant. He concluded that waves were the chief cause of littoral drift, and were aided by currents. Adequate protection could generally be obtained by the application of a properly-designed system of groyning, but he insisted on the importance of extending groynes below low water mark. He did not, however, think it necessary or advisable to extend them beyond a depth of about 5 ft. of water. It was most important to build groynes low at first, and raise them as accumulation took place, there being no advantages, but many disadvantages, in building them high in the first instance. After pointing out the disadvantages of using wood and exposed from submerged groynes, the author expressed the opinion that ferro-concrete was the material of the future for marine works. The merits of any system of groynes could not be judged by the accumulation brought about in a short time, but by their ability to hold the accumulated material for a considerable period, and by the cost incurred in maintenance.

Books.

The Slide-Rule: A Practical Manual. By CHARLES N. PICKWORTH. Tenth edition. (Manchester: Emmott & Co., Ltd.)

AMONG the various treatises published on the slide-rule, none is more popular than that written by Mr. Pickworth, a fact which is sufficiently proved by the frequent demand for fresh editions. In the present issue no noteworthy changes are to be found in the earlier portion of the work, although this has been carefully revised. It would be still further improved by the inclusion of a table setting out the various special marks, or constants, engraved on slide-rules by different makers, together with full explanations of their exact values and uses. Towards the end of the book more adequate description than formerly is made of rules provided with *log-log* scales, and several recent types of slide-rules are described and illustrated. We find no mention, however, of Col. Anderson's slide-rule, an instrument of great precision

clearly deserving notice. The block on p. 100 ought to be replaced by one better drawn and more correctly representing Fuller's calculating rule, which, by the way, is supplied by all instrument-makers and not solely by Mr. Stanley, as implied on p. 101. The section entitled "Slide-rules for Special Calculations" is one which could be amplified with advantage, as, apart from a few words relative to two varieties of calculating wheel, it makes reference to only one slide-rule among the various types now available for specific computations. Owing to successive additions, the category of slide-rules described in the last twenty pages of Mr. Pickworth's treatise has so overgrown the classification originally adopted as to suggest the desirability of entire rearrangement in the next edition, which we hope will be provided with an index as well as the table of contents. In making these hints we are merely accepting the invitation extended by the author, and do not for a moment wish it to be thought that we fail to appreciate the useful character of this treatise, or the successful efforts made by Mr. Pickworth to popularise the slide-rule in the office and workshop.

Practical Pattern-making. By F. W. BARROWS. (London: Crosby Lockwood & Son; 1906.)

IF we omit from consideration some American and one or two English papers, it may safely be said that the technical press of the world is conducted on serious lines, and is fairly free from the writings of misguided people who try to make science and art interesting by treating technical subjects in a way that is meant to be funny. Judging from his colloquial style and the statement that some of the subjects discussed in this treatise have appeared in the *American Machinist* and the *Pattern-Maker*, we assume Mr. Barrows to be either an American, or an Englishman who has lived for some time in the United States. His attempts to make the material in his book "as interesting as possible" are not conspicuously successful. References to "the sty for Farmer Jones' pig," "Johnny's picture of the cow," "the pattern-maker in the role of Sherlock Holmes," and various other irrelevant allusions, are more calculated to induce the reader to lay the book aside than the "dry reading" which Mr. Barrows looks upon as an objection to technical books as a class. We are glad to find that, as the author gets deeper into the subject, he gradually becomes interested, and, writing sensibly on work he evidently understands, becomes really interesting. The book contains much useful information on pattern-making in general, a detailed description of the materials and tools used by the pattern-maker, and a section devoted to typical patterns in wood and metal. As the examples selected and the general treatment appeal more particularly to mechanical engineers than to architects and builders, the treatise is less suitable for the bulk of our readers than others that could be named. The illustrations are all good, having been prepared exclusively from sectional and other drawings, and, except in places where the author tries to be "interesting," the language used has the merit of being plain, intelligible, and to the point.

National Engineering and Trade Lectures. Vol. II.: "British Progress in Pumps and Pumping Engines." By PHILIP R. BJÖRLING. Vol. III.: "British Progress in Gas Works' Plant and Machinery." By C. E. BRACKENBURY, A.M.Inst.C.E., M.Inst.Gas.E. London: Archibald Constable & Co., Ltd. 1905.

IN Vol. II. of this work Mr. Björling describes and illustrates several different kinds of pumps and pumping engines made by some of the best-known makers in Great Britain. While containing information which may be useful to Colonial and foreign buyers, this "lecture" has no technical interest, and, in our opinion, is of far less practical value than a well-assorted collection of trade catalogues.

Vol. III., written in a very different style, constitutes an intelligent and interesting review of the plant and machinery employed in gasworks. Commencing with machinery for the reception and handling of raw material, Mr. Brackenbury demonstrates the superior character of the coal and coke storing equipment made in this country and its greater diversity and adaptability than

Continental plant for the same purpose. He instances the unique constructional ability displayed by British engineers in the manufacture of stoking machinery, gas-holders, and practically all apparatus incidental to the production of coal and water gas. The concluding chapters on "Gas Appliances" and "By-Products" quite deserve perusal, and the book as a whole is a readable, instructive, and welcome addition to the literature of gas engineering.

Electro-Wiring, Diagrams, and Switchboards. By NEWTON HARRISON, E.E. (London: Crosby Lockwood & Son. 1906.)

THIS book is well printed, many of the diagrams are excellent, and it is notably free from misprints. The author discusses the question with a vigour which often takes the reader by surprise. In the introduction we are told that electric-wiring has now "assumed an importance in the building arts second to none," and, in the preface, that "the pages of this volume will prove of the utmost value to the student, wireman, or contractor." The book deals mainly with American practice, and so the sizes of the wires are given in B and S gauge. Where an English writer would say "earth," or "earthen," the author says "ground" or "grounded." On the other hand, where an American would say "cross," he uses the English "short-circuit." Although the reviewer has had considerable experience in testing three-wire circuits, he is not able to understand the working of the "ground detector" described on p. 211. In his opinion the indications of this detector would be entirely misleading. The descriptions and diagrams of alternating current systems are simple and clear. Young electricians will find some of their difficulties clearly explained, and will appreciate the diagrams explaining the various methods of wiring.

The Encyclopedia of Practical Engineering and Allied Trades. Edited by JOSEPH G. HORNER, A.M.I.Mech.E. Vol. III. London: Virtue & Co.

THIS volume commences with "Boiler Plate" and ends with "Civil Engineering," and, in accordance with the standard set by the compiler, is directed mainly to the instruction of practical men. Most of the articles and paragraphs refer to the various branches of mechanical work, and with the exception of one on Book-keeping—which cannot be considered an engineering subject, and is not discussed in a way helpful to anybody—they are well selected and judiciously treated. Among the articles more particularly interesting to our readers we may mention those entitled "Bore Holes," "Bridge," "Caisson," "Canals," "Carpentry," and "Cement." There is, however, a good deal of information scattered about the volume which may often be drawn upon with advantage in connexion with work performed under architectural specifications, and the present issue quite sustains the favourable opinion we have already expressed concerning the first two volumes of the encyclopedia.

Joiners' Machines and How to Work Them. By T. R. GROOM. (London: William Rider & Son, Ltd.)

IN this small volume the author deals chiefly with some of the machines commonly used in joinery and cabinet-making, his object being to give serviceable information to those engaged in such branches of work rather than to the experienced mill-owner or operative. The author writes from experience gained as a practical sawyer and machinist, and his book contains a good many useful hints as to the management of various simple types of wood-working machines.

Society of Engineers: Transactions for 1905. Edited by PERRY F. NURSEY, Secretary. (London: E. & F. N. Spon, Ltd. 1906.)

MOST of the papers printed in this volume of *Transactions* have already been noticed in our columns. The subjects discussed are of more than ordinary interest, a circumstance which may be responsible for the fact that two at least of the authors have read very similar papers before other engineering societies, or have availed themselves of other means of making known their views and experience. "The Transport Possibilities of

our Inland Navigable Waterways," by Mr. B. H. Thwaite; "The Parade Extension Works at Bridlington," by Mr. E. R. Matthews; "The Improvement of London Traffic," by Messrs. Meik and Beer; and "The Metallic Preservation and Ornamentation of Iron and Steel Surfaces," by Mr. S. Cowper-Coles, are the most noteworthy contributions in the volume, and their value is considerably increased by the numerous drawings and diagrams reproduced as illustrations.

BOOK RECEIVED.

ELECTRICITY IN HOUSES AND WORKSHOPS. By Sydney F. Walker. Fourth Edition. (Whittaker & Co. 5s.)

Fifty Years Ago.

FROM THE *Builder* OF JUNE 14, 1856.

INSUFFICIENT SCAFFOLDING: TARRANT v. WEBB.

In the Court of Common Pleas, at Westminster, on the 3rd inst., this case was tried. The defendant is a house decorator and painter, and in October last he was employed to do some work in the interior of the Carlton Clubhouse. For the purpose of performing his contract, a scaffold was erected (according to the case of the plaintiff) under the defendant's directions, in the hall of that building. The plaintiff, who was employed on the same work with several other men, mounted this scaffold on October 4 last: a portion of it gave way, and he was precipitated to the ground, and seriously injured, and he now sought to recover damages from the defendant, who, as he alleged, had built the scaffold in an unsafe and insufficient manner.

The defence was, that even if Mr. Webb had erected the scaffold, he was not liable for any accident which might happen to the plaintiff, who, if he saw that the structure was faulty, need not have gone on it.

The jury eventually found a verdict for the plaintiff—damages, 25*l.*

Illustrations.

SCULPTURE FROM THE PARIS SALON.

THE two groups of sculpture here illustrated were among the most prominent exhibits in the sculpture hall of the Paris Salon this year, and were referred to in our article on the Salon some weeks since.

The "Nouvelle Muse," by M. Guilloux, appears to represent the Muse of music, or he may merely mean to represent the modern spirit of poetry; it would lend itself to either interpretation. It will be observed how finely the two figures are grouped so as to make a pyramidal composition.

M. Peyre's "Offrande à Venus" sufficiently explains itself.

NEW CHAPEL FOR THE COMMUNITY OF THE RESURRECTION, MIRFIELD, YORKS.

ON the top of a commanding eminence, which on one side slopes away down into the valley below, the site offers great opportunities for effective treatment.

The chapel is to be built of the local stone, and a quarry exists in the grounds of the community. The external bands are formed by the employment of alternate ashlar and rubble work.

Internally the local stone will be used, also various other kinds, the roof being formed with stone ribs and coke breeze concrete coloured on the under face. The height to the apex of the vaulting is 64 ft., and to the top of the columns 50 ft. The columns which support the lantern tower are so arranged as to form a sort of baldachino over the high altar.

The screen is of marble and metal.

Two stairways on either side of the nave with two flights of twelve steps each lead on to the vestries' level, and a further flight of twelve steps leads to the crypt. This is a spacious, vaulted chamber about 18 ft. in height, 98 ft. in length, and an average width of 45 ft.

Over the walls of the crypt on the external face and leading round the lady chapel from each of the octagon chapels is an outside passage. The west end will be connected to the house on the one side and to the college on the other by a low cloister in crescent form. The architect is Mr. A. H. Skipworth.

SOME SAN FRANCISCO BUILDINGS BEFORE THE FIRE.

THE first of these four illustrations is of what may be called a tragic practical interest, for it forms an illustration of the danger of wooden buildings in a city liable to earthquakes and fires. It was the rapid conflagration of these wooden buildings which led the fire up to the higher-class residential quarter of the city, which might otherwise have escaped.

The effects of earthquake and fire on the City Hall and Leland Stanford University

gateway are shown in the subjoined reproductions from photographs taken after the fire. The Mint is the building previously mentioned in a letter in our columns, which withstood the earthquake without damage; but we cannot help thinking that there must have been some especial cause for this immunity other than the mere thickness and solidity of the walls.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Metropolitan Asylums Board was held on Saturday last week at the offices, Victoria-embankment.

Darveth Asylum.—The Asylums Committee submitted a report dealing with the proposal to construct new workshops and a fire-station at this Institution. The Local Government Board having asked for further information in regard to the fire-station, the Committee recommended that the report of the Engineer-in-Chief should be forwarded to that authority. The Committee's recommendation was agreed to. The total cost of the scheme is estimated at 3,500*l.*

East Cliff House.—The same Committee submitted a report on the proposal to erect a new building for the laundry staff at this Institution. The Works Committee were instructed to obtain tenders for the work. The cost is estimated at 690*l.*, but the Local Government Board have suggested that the work could be carried out for 500*l.*

Small Pox Hospitals.—On the recommendation of the Hospitals Committee the question of providing additional accommodation for cuttle at the Board's small-pox hospitals was referred to the Works Committee to be dealt with.

Bacteriological Laboratories.—The plans prepared by Messrs. T. W. Aldwinckle & Son for the provision of diphtheria antitoxin and bacteriological laboratories on the Board's property at Peckham Rye were adopted, and ordered to be forwarded to the Local Government Board.

WHITEFRIARGATE BRIDGE, HULL.—At a recent meeting of the Hull Corporation Works Committee the Whitefriargate Bridge Sub-Committee reported that the Mayor had seen Mr. Newell, with the City Engineer, with reference to the suggestion that a spare shaft should be provided for Whitefriargate Bridge, and that Mr. Newell stated that he could not advise the North-Eastern Railway Company to provide one. The City Engineer also informed the sub-committee that he had written to the engineer in charge of the Tower Bridge inquiring whether any spare main shaft for the bridge was provided, and that he had received a negative reply. In the opinion of the City Engineer it would be unreasonable to expect a spare shaft to be provided for the new Whitefriargate Bridge. The sub-committee thereupon resolved that in their opinion it was no part of the duty of the Corporation to provide a spare shaft for the Whitefriargate Bridge, and that there is no sufficient reason for asking the North-Eastern Railway Company to do so.



City Hall, San Francisco: After the Fire.



Arch, Leland Stanford University, San Francisco: After the Fire.



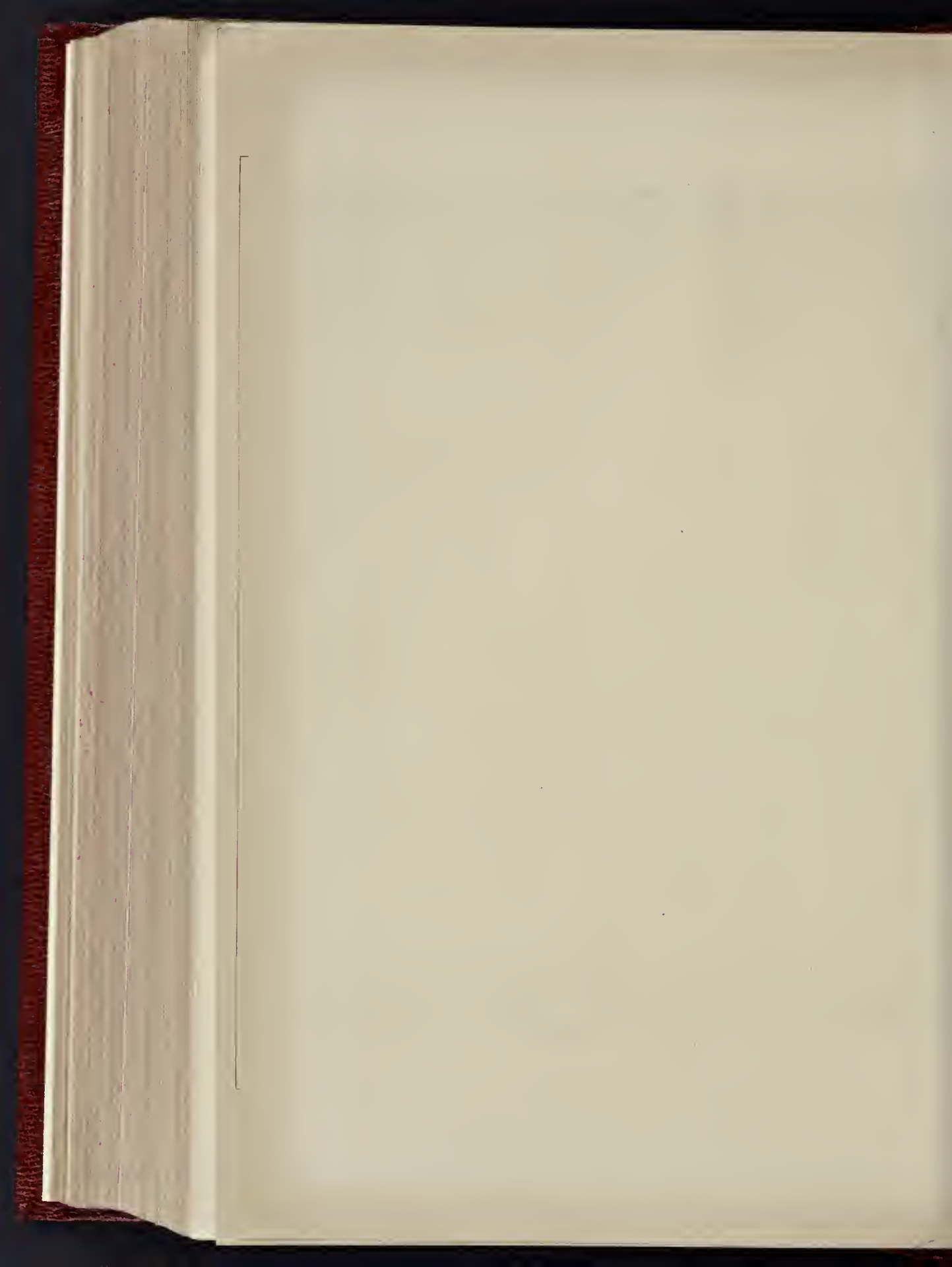


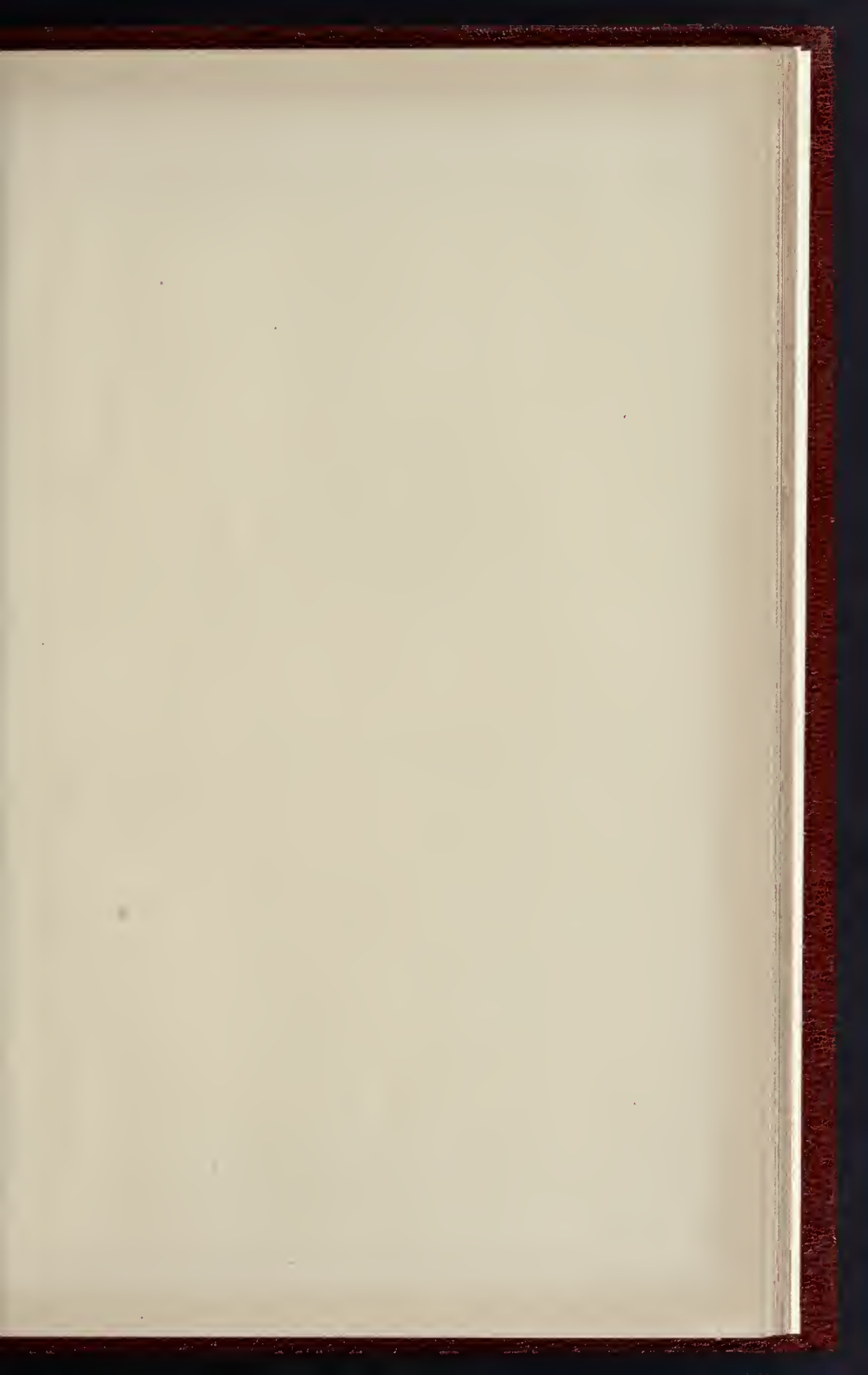
"LA NOUVELLE MUSE." BY M. GUILLOUX.



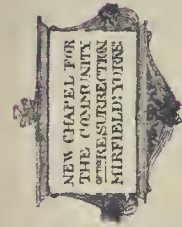
"OFFRANDE À VÉNUS." BY M. PEYRE.

MA PHOTO JAPANESE - C. L. 4 & 5 EAST HARDING STREET FETTER LANE EC





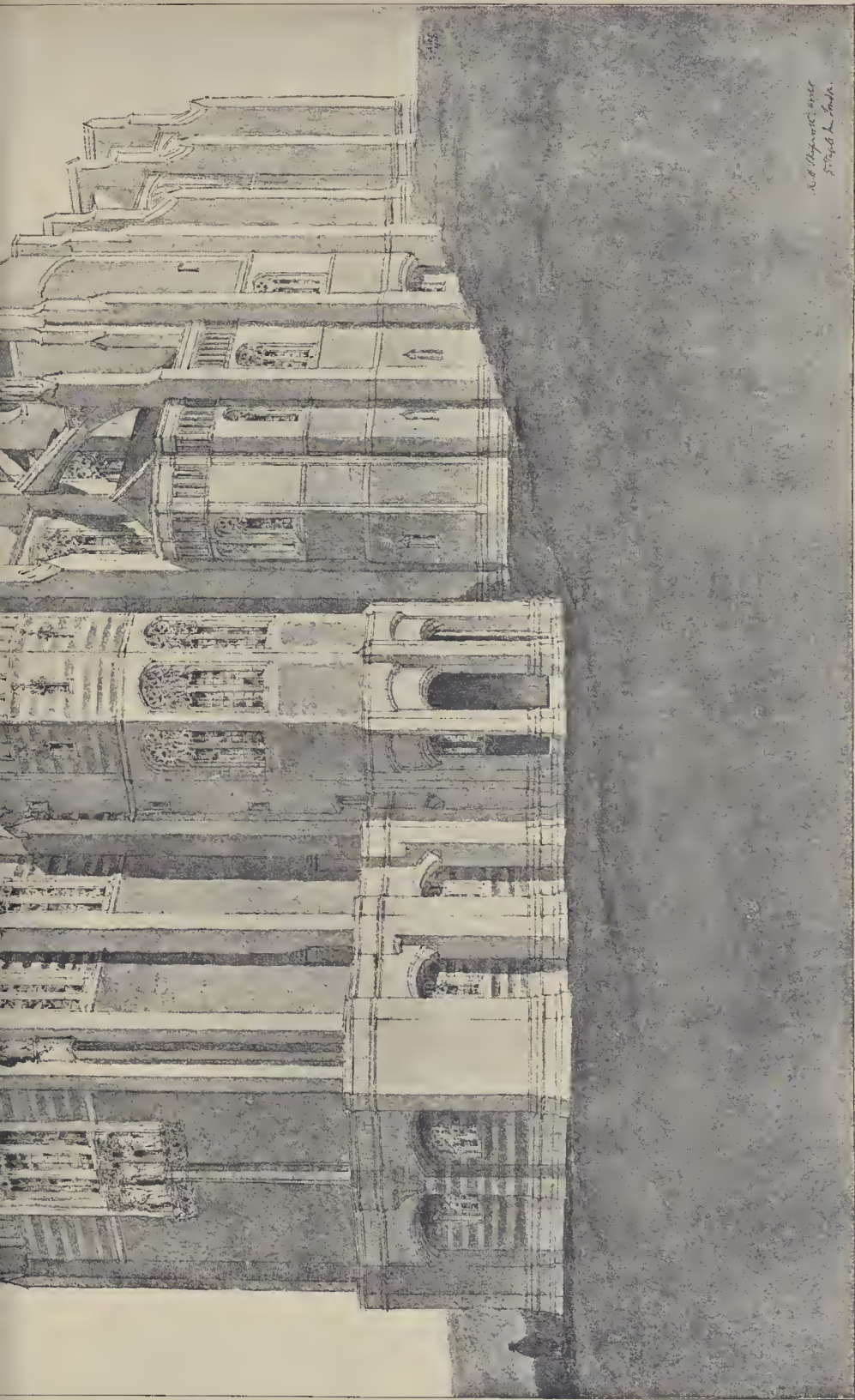
THE BUILDER, JUNE 16, 1906.



1) Chapel. 2) Plan of the proposed building. 3) Section of the proposed building.

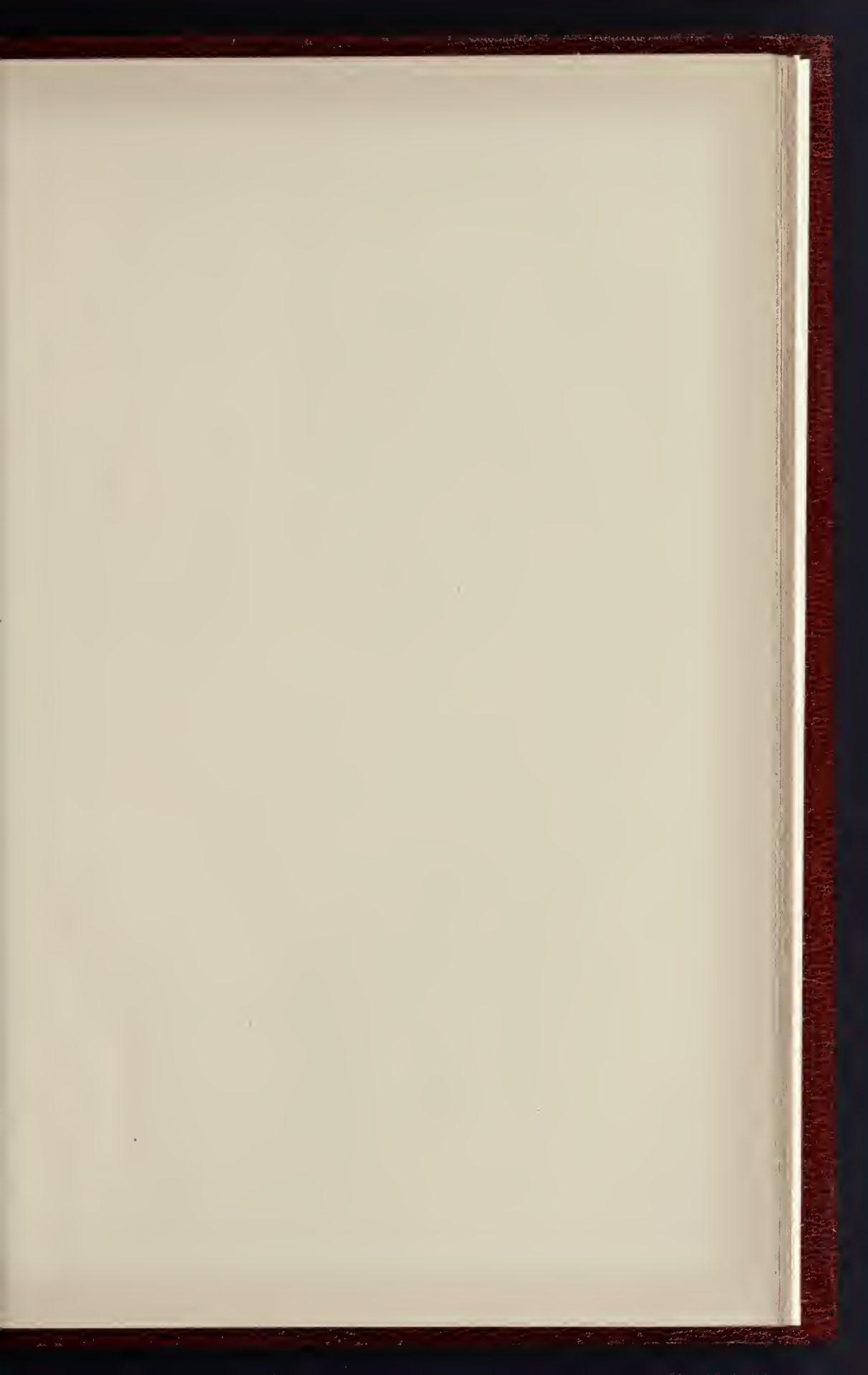
Architect: Mr. J. H. Stanger, York.





*W. H. Raymond's work
57 High St. N. York.*

INV. PHOTO - PRAGUE - C. L. I. 4. 6. 5 EAST IRRUNG STREET FETTER LANE E.C.



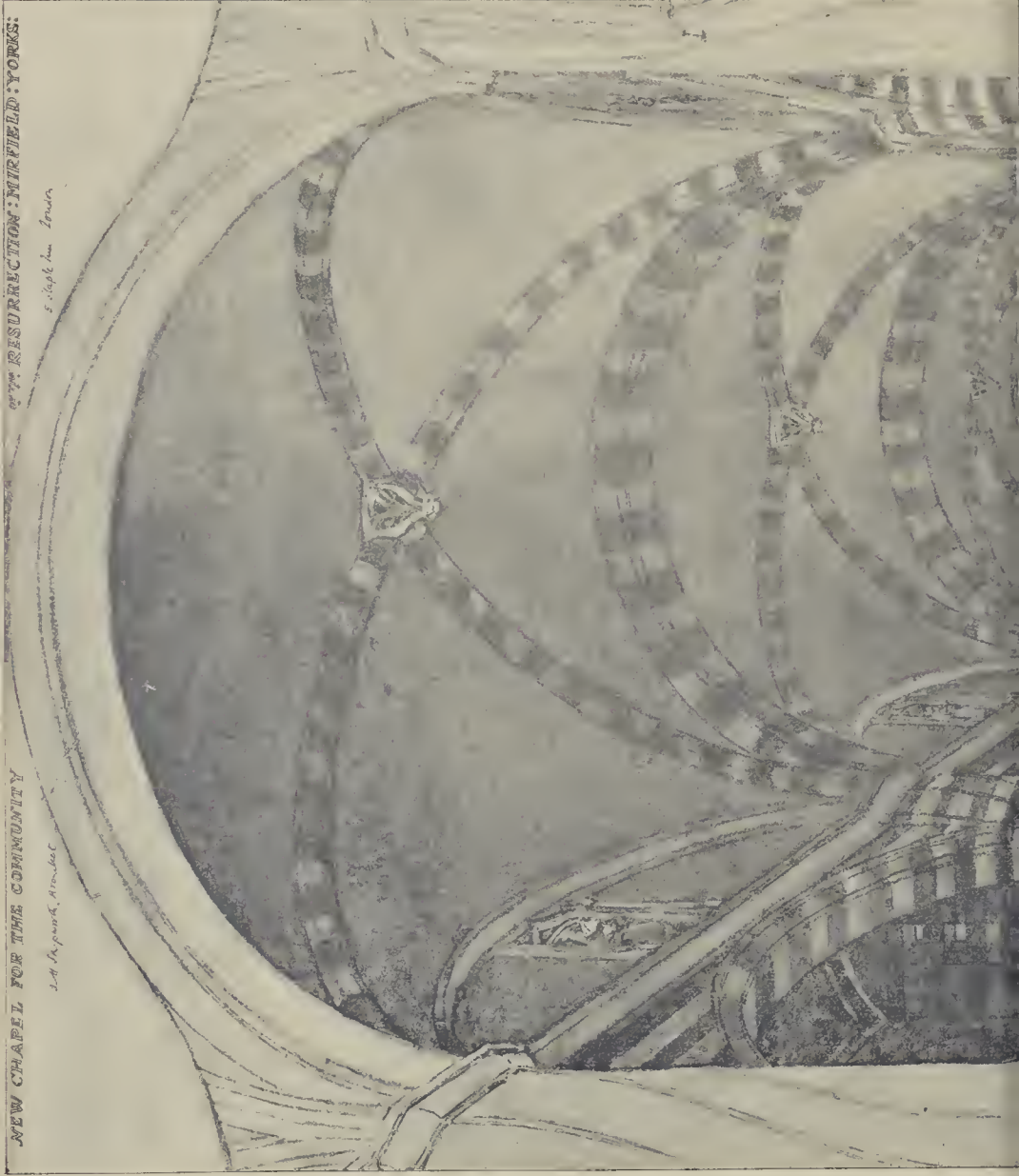
THE BUILDER, JUNE 16, 1906.

NEW CHAPEL FOR THE COMMUNITY

J. A. Simpson, Architect

ST. MARY'S RESURRECTION CHURCH, YORKS.

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260, 265, 270, 275, 280, 285, 290, 295, 300, 305, 310, 315, 320, 325, 330, 335, 340, 345, 350, 355, 360, 365, 370, 375, 380, 385, 390, 395, 400, 405, 410, 415, 420, 425, 430, 435, 440, 445, 450, 455, 460, 465, 470, 475, 480, 485, 490, 495, 500, 505, 510, 515, 520, 525, 530, 535, 540, 545, 550, 555, 560, 565, 570, 575, 580, 585, 590, 595, 600, 605, 610, 615, 620, 625, 630, 635, 640, 645, 650, 655, 660, 665, 670, 675, 680, 685, 690, 695, 700, 705, 710, 715, 720, 725, 730, 735, 740, 745, 750, 755, 760, 765, 770, 775, 780, 785, 790, 795, 800, 805, 810, 815, 820, 825, 830, 835, 840, 845, 850, 855, 860, 865, 870, 875, 880, 885, 890, 895, 900, 905, 910, 915, 920, 925, 930, 935, 940, 945, 950, 955, 960, 965, 970, 975, 980, 985, 990, 995, 1000



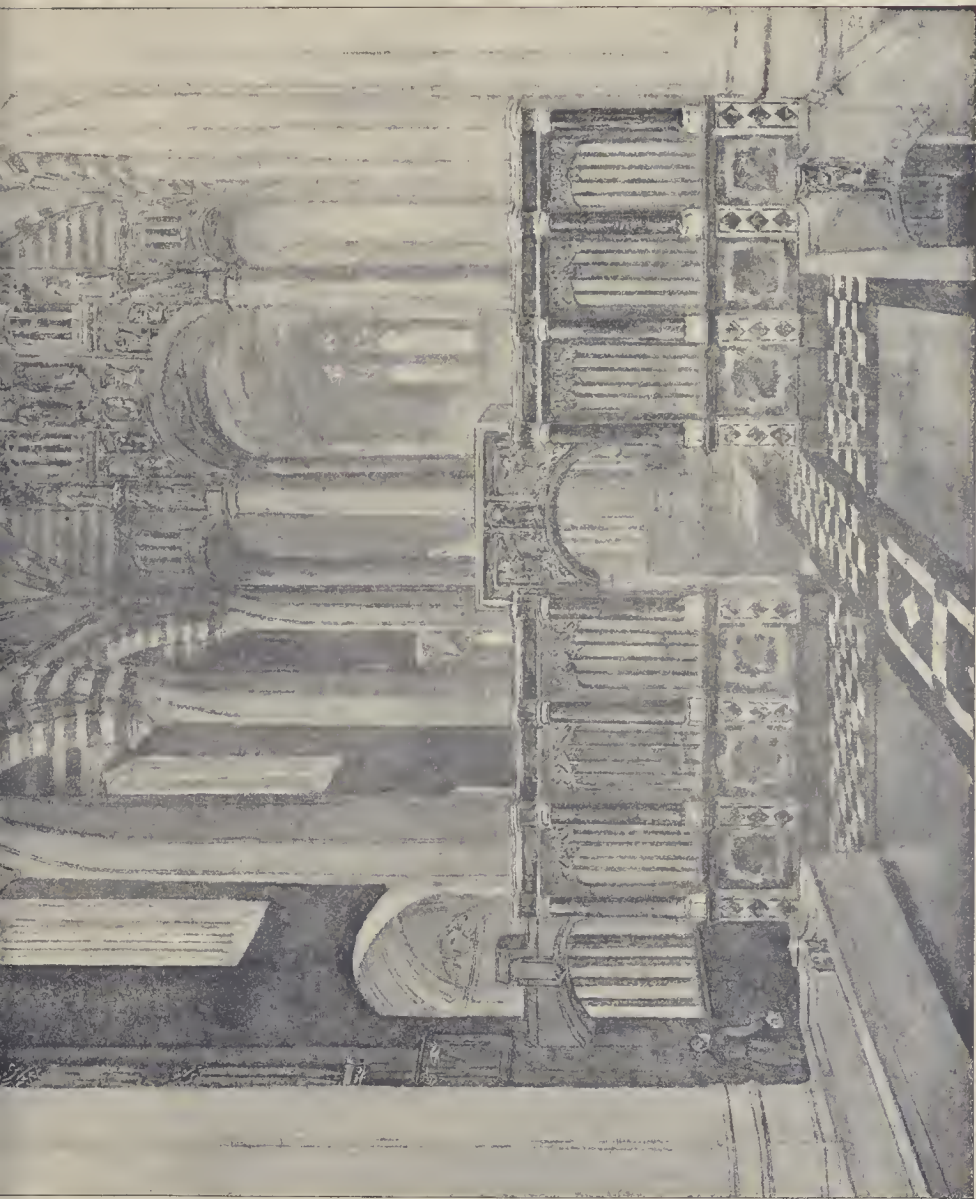
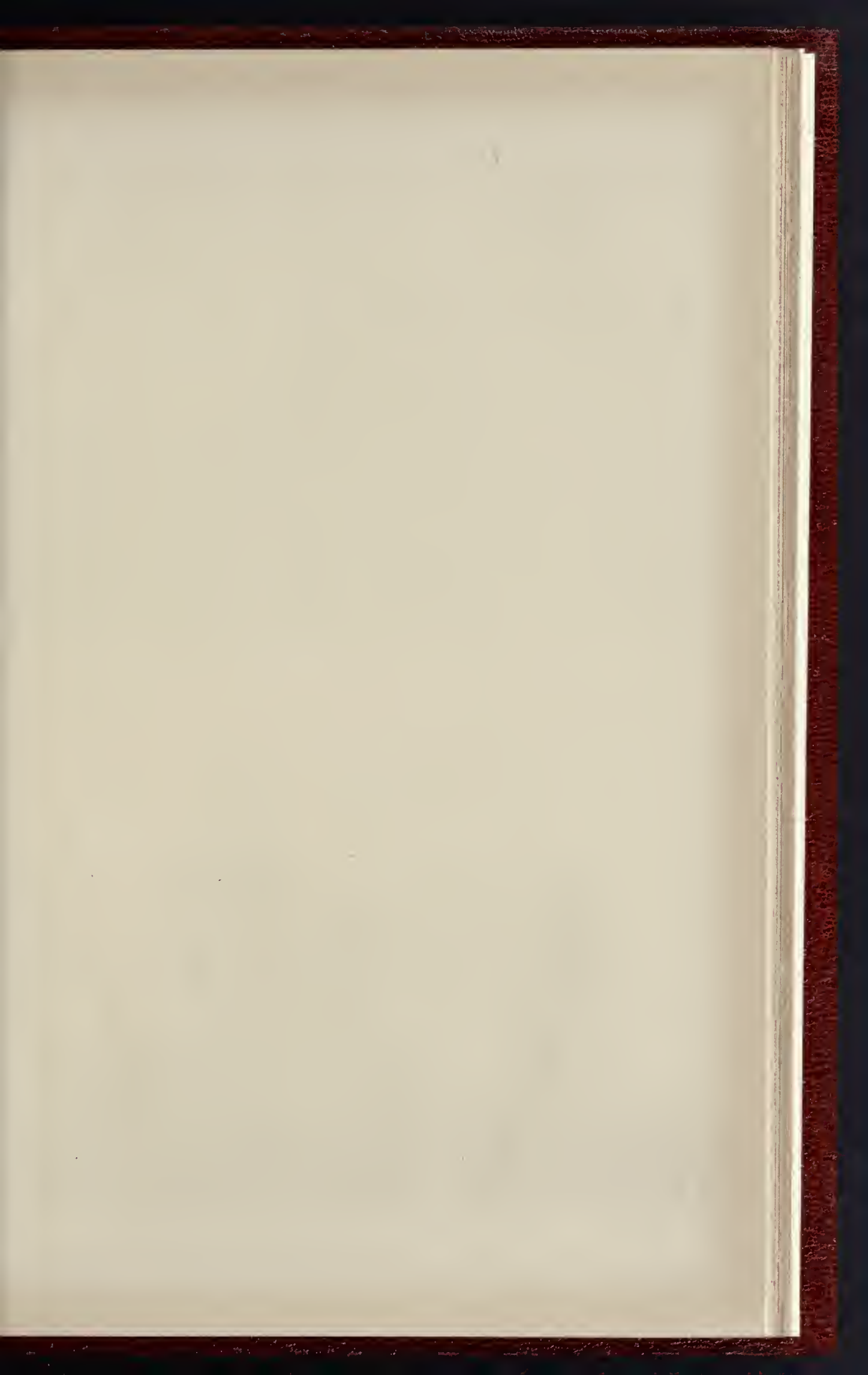


PLATE 1. THE INTERIOR OF THE GREAT HALL, WESTMINSTER ABBEY.

THIS QUALIFIED NAME IS LONG





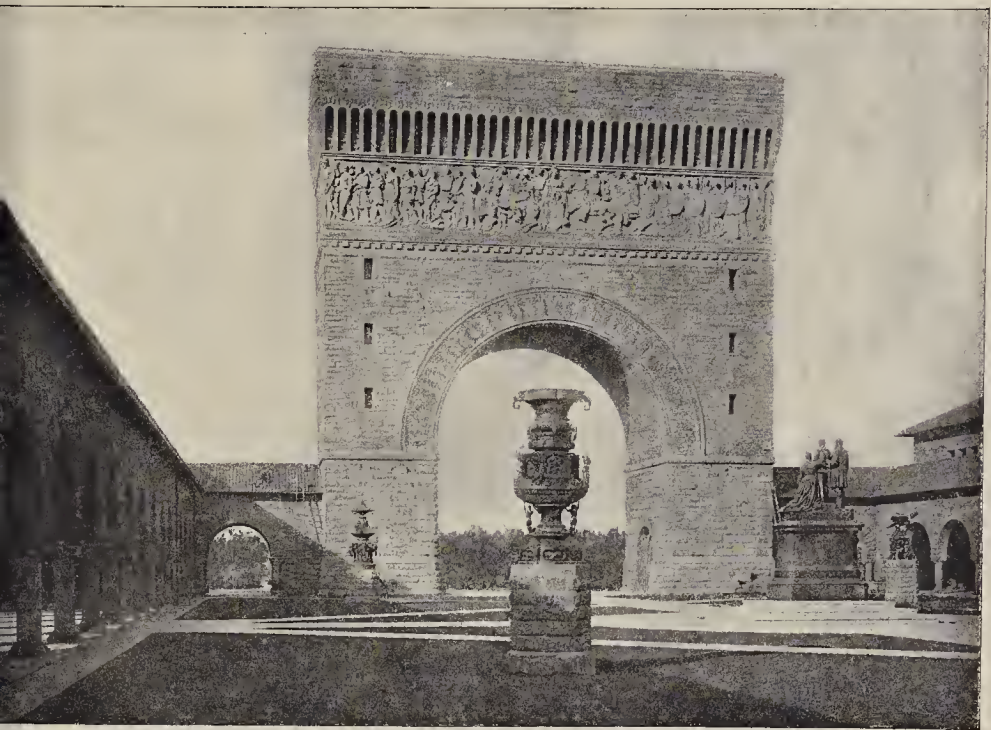
Tottering Wooden Shanties on the Nob Hill Grade, forming the Fuse which led the Fire up to the Mansions on the Summit.



City Hall, covering Five Acres. Cost £1,600,000.



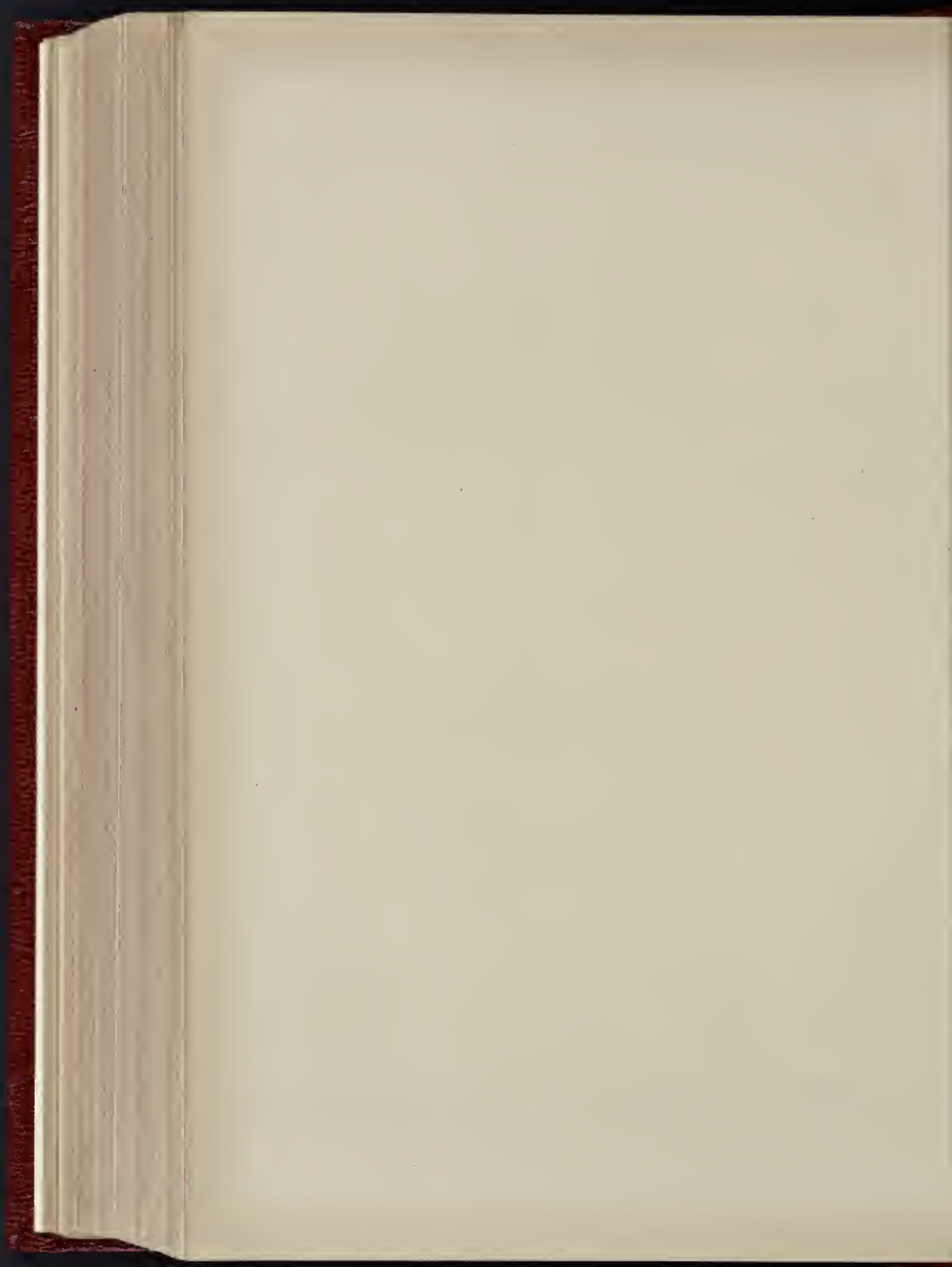
U. S. Mint. Massive Stone-built Building: Survived unscathed.



Colossal Arch: Entrance to Leland Stanford Jr. University. Now appearing like an Ancient Ruin

INK-PHOTO SPRAGUE & CO. LITH. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

GS BEFORE THE FIRE.



The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XXIII.
THE SLIDE-RULE IN TECHNICAL CALCULATIONS (continued).

SOME other modes of applying the slide rule to technical calculations still remain to be mentioned, and, as before, the reader is referred to the rule illustrated in Fig. 16.

Cubes.—To find the cube of any number by the slide-rule it is quite feasible to proceed by successive multiplications on one pair of scales, but a more expeditious method is to bring into play the automatic squaring process effected by the shorter graduations of scales A and B.

Rule (1).—To find the cube of any number from $\sqrt[3]{1}$ up to $\sqrt[3]{100}$ ($= 4.6415$) on D, set the left-hand index of C to the number on D, and opposite the given number on the left-hand half of scale B read the required cube on scale A.

To find the cube of any number from $\sqrt[3]{100}$ up to $\sqrt[3]{1000}$ ($= 10$) on D, set the right-hand index of C to the number on D, and opposite the given number on the left-hand half of scale B read the required cube on scale A.

The employment of the right-hand index is necessary for numbers above $\sqrt[3]{100}$, because the movement of the left-hand index beyond 4.6415 on D causes the numbers of scale B corresponding to the remaining values on scale D to pass beyond the limit of scale A. Therefore, as explained in Article XIX., we continue the process by using the right-hand index of scale C, regarding the values marked on the left-hand half of scale A as having been multiplied by 100, so that 1 represents 100, 2 represents 200, and so on.

In this way we are enabled to find the cubes of all numbers up to 10, and by considering the figures and marks on the scales to have been multiplied by positive and negative powers of 10 as required, all numbers, mixed numbers, and decimal fractions can be cubed. For the correct positions of multiples and sub-multiples of numbers on the upper scales, see tables XVII. and XVIII.

The number of digits to the left of the decimal place in the cube of any whole or mixed number is determined as stated below, where N = number of digits in the cube, and n = the number of digits in the given number.

- Rule (2).**—
- (a) For cubes read on L.H. half of A, slide projecting to the right hand: $N = 3n - 2$.
 - (b) For cubes read on R.H. half of A, slide projecting to the right hand: $N = 3n - 1$.
 - (c) For cubes read on L.H. half of A, slide projecting to the left hand: $N = 3n$.

The number of ciphers immediately to the right of the decimal point in the cube of any decimal fraction is determined as stated below, where C = the number of ciphers in the cube and c = the number of ciphers in the given decimal fraction.

- Rule (3).**—
- (a) For cubes read on L.H. half of A, slide projecting to the right hand: $C = 3c + 2$.
 - (b) For cubes read on R.H. half of A, slide projecting to the right hand: $C = 3c + 1$.
 - (c) For cubes read on L.H. half of A, slide projecting to the left hand: $C = 3c$.

Example (1). Find the cube of 21.
Set L.H. index of C to 21 on D, and over 21 on L.H. of B read 926 on the L.H. half of A. As the slide projects to the right the number of figures in the cube by Rule (2) a is $(3 \times 1) - 2 = 1$. Therefore, the cube is taken at 9.26, the exact value being 9.261.

Example (2). Find the cube of 39.6.
Set L.H. index of C to 39.6 on D, and over 39.6 on L.H. of B read 621 on the R.H. half of A. As the slide projects to the right the number of figures by Rule (2) b is $(3 \times 2) - 1 = 5$. Therefore, the cube is taken at 62.100, the exact value being 62.999-136.

Example (3). Find the cube of 8.2.
Set R.H. index of C to 8.2 on D, and over 8.2 on L.H. of B read 551 on the L.H. half of A. As the slide projects to the left the number of figures by Rule (2) c is $(3 \times 1) = 3$. Therefore, the cube is taken at 551, the exact value being 551.368.

Example (4). Find the cube of 0.082.

The required figures being the same as found in Example (3), we have only to settle the number of ciphers following the decimal point in accordance with Rule (3) c thus: $(3 \times 1) = 3$, and the cube is 0.006551.

Cube Root.—Two methods are available for finding cube roots by the aid of the slide-rule.

Rule (4).—Set the cursor to the given number on scale A, and move the slide to the right hand or the left hand, until the number found on the left-hand half of scale B under the cursor is equivalent to the number simultaneously found on scale D under the L.H. or R.H. index of scale C. The value thus concurrently ascertained represents the cube root, or the significant figures of the cube root, of the given number.

In applying this rule to numbers containing one, two, and three figures respectively, it is necessary to take the numbers on the appropriate parts of scale A, to move the slide in the proper direction, and always to use the left-hand half of scale B in conjunction with scale A. Thus:

- Take 1-figure numbers on L.H. of A, move slide to R.H.**
 " 2 " " R.H. " A, " to R.H.
 " 3 " " L.H. " A, " to L.H.
- Example (5).** Find the cube roots of (1)8, (2)80, and (3)800.
- (1) Set cursor to 8 on L.H. of A, move slide to R.H. and find $\sqrt[3]{8} = 2$.
 - (2) Set cursor to 8 on R.H. of A, move slide to R.H. and find $\sqrt[3]{80} = 4.3$.
 - (3) Set cursor to 8 on L.H. of A, move slide to L.H. and find $\sqrt[3]{800} = 9.28$.

In dealing with numbers containing more than three figures the numbers must be pointed off into groups of three as in evolution by arithmetic (see Article XI., page 325). Having done this, the number of figures in the first group indicates the part of scale A on which any given number is to be taken, and the direction in which the slide is to be moved.

Rule (5).—In any cube root there is one digit for each group of three figures into which the given number has been pointed off, and one digit for the first group, whether this includes one, two, or three figures.

In applying Rule (4) to decimal fractions having two, one, and no ciphers immediately after the decimal point, the procedure is as follows:—

Take 0-cipher fractions on L.H. of A, move slide to L.H.
 " 1-cipher " R.H. " A, " R.H.
 " 2-cipher " L.H. " A, " R.H.

- Example (6).** Find the cube roots of (1)0.008, (2)0.08, and (3)0.8. These numbers must be written as 0.008, 0.080, and 0.800.
- (1) Set cursor to 8 on L.H. of A, move slide to R.H. and find $\sqrt[3]{0.008} = 0.2$.
 - (2) Set cursor to 8 on R.H. of A, move slide to R.H. and find $\sqrt[3]{0.08} = 0.43$.
 - (3) Set cursor to 8 on L.H. of A, move slide to L.H. and find $\sqrt[3]{0.8} = 0.928$.

To deal with decimal fractions having more than two ciphers immediately after the decimal point, point off the fraction towards the right into groups of three figures, and add any ciphers necessary at the end of the last period, as in arithmetic (see Article XI., page 325). Then the position of the first significant figure in its group indicates which part of scale A must be used, and the direction in which the slide is to be moved.

Rule (6).—In the cube root of any decimal fraction there is one cipher immediately after the decimal point for every group consisting entirely of ciphers into which the given fraction has been pointed off.

Example (7). Find the cube roots of (1)0.0008 and (2)0.000008.

Pointing off the numbers and appending the necessary ciphers we have 0.000,800 and 0.000,000,080.

- (1) Set cursor to 8 on L.H. of A, move slide to L.H. and find $\sqrt[3]{0.0008} = 0.0008$.
- (2) Set cursor to 8 on R.H. of A, move slide to R.H. and find $\sqrt[3]{0.000008} = 0.000008$.

Cube roots can also be found by the use of the inverted slide and scale B, i.e., scale B inverted. When the operator has learned to read figures upside down with facility this method will be found more convenient than that discussed above.

Rule 7.—Set the left-hand or the right-hand index of the inverted slide to the given number on scale A, and look along scales B' and D for two coincident numbers. When found, these represent the required cube root or the

significant figures of the root of the given number.

As in the previously described method, it is necessary to take the given number on the proper part of scale A, to use the proper index of the slide, and always to use the right-hand half of scale B' (that is the left-hand half of scale B) in conjunction with scale D as follows:

Take 1-figure numbers on L.H. of A, use R.H. index.
 " 2 " " R.H. " A, " R.H. "
 " 3 " " L.H. " A, " L.H. "

The method of pointing off the digits of numbers whose cube roots are required, and the methods of determining the number of digits or ciphers in the cube roots found are the same as those already explained in Rules (4) to (6).

Example (8). Find the cube root of (1)6,000, (2)60,000, and (3)600,000.

- (1) Set R.H. index of slide to 6 on L.H. of A, and find 1817 on R.H. of B' coincident with 1817 on D. Then $18.17 = \sqrt[3]{6,000}$.
- (2) Set R.H. index of slide to 6 on R.H. of A, and find 391 on R.H. of B' coincident with 391 on D. Then $39.1 = \sqrt[3]{60,000}$.
- (3) Set L.H. index of slide to 6 on L.H. of A, and find 843 on R.H. of B' coincident with 843 on D. Then $84.3 = \sqrt[3]{600,000}$.

In applying Rule (7) to decimal fractions having two, one, or no ciphers immediately after the decimal point, the procedure is as follows:—

Take 0-cipher fractions on L.H. of A, use L.H. index.
 " 1-cipher " R.H. " A, " R.H. "
 " 2-cipher " L.H. " A, " R.H. "

The same procedure is also applicable, after a decimal fraction has been pointed off, to the group containing the first significant figure.

Example (9). Find the cube roots of (1)0.00006, (2)0.00036, and (3)0.0006.

- These numbers must be pointed off thus: 0.000,006, 0.000,036, and 0.000,600.
- (1) Set L.H. index of slide to 6 on L.H. of A, and find 1817 as before. Then $0.1817 = \sqrt[3]{0.00006}$.
 - (2) Set R.H. index of slide to 6 on R.H. of A, and find 391 as before. Then $0.391 = \sqrt[3]{0.00036}$.
 - (3) Set L.H. index of slide to 6 on L.H. of A, and find 843 as before. Then $0.843 = \sqrt[3]{0.0006}$.

Higher Powers and Roots.

Fourth Powers.—

Rule (8).—Set the right-hand or the left-hand index of scale C to the given number on scale D, and opposite the given number on scale C read the fourth power on scale A.

It should be observed that only one half of scale D can be used with the L.H. index of the slide, and that to use the other half the R.H. index must be employed.

Rule (9).—Let N = the number of digits in any fourth power, and n = the number of digits in the given number. Then calculate the number of digits as below:—

Power Read on	Index.	Number of Figures in Power.
L.H. half	L.H.	$N = 4n - 3$
R.H. "	L.H.	$N = 4n - 2$
L.H. "	R.H.	$N = 4n - 1$
R.H. "	R.H.	$N = 4n$

With suitable modification this rule is also applicable to decimal fractions.

Example (10). Find the fourth powers of (1)19, (2)21.15, (3)376.5, and (4)6.69.

- (1) Set the L.H. index of C to 19 on D, and over 19 on C read 2 on L.H. of A. The number of figures = $(4 \times 1) - 3 = 1$. $\therefore 19^4 = 130321$.
- (2) Set the L.H. index of C to 21.15 on D, and over 21.15 on C read 2 on R.H. of A. The number of figures = $(4 \times 2) - 2 = 6$. $\therefore 21.15^4 = 200,000$.
- (3) Set the R.H. index of C to 376.5 on D, and over 376.5 on C read 2 on L.H. of A. The number of figures = $(4 \times 3) - 1 = 11$. $\therefore 376.5^4 = 20,000,000$.
- (4) Set the R.H. index of C to 6.69 on D, and over 6.69 on C read 2 on R.H. of A. The number of figures = $(4 \times 1) = 4$. $\therefore 6.69^4 = 2,000$.

Fourth Roots.—Fourth roots may be extracted by a reversal of the process described above.

Rule (10).—Set the cursor to the given number on scale A, and move the slide to the right hand or the left hand until the number found under the cursor on scale C is equivalent to the number simultaneously found on scale D under the L.H. or R.H. index of scale C. The

value thus concurrently ascertained represents the fourth root, or the significant figures of the fourth root of the given number.

It is necessary to take the numbers at the proper part of scale A, and to use the proper index of the slide. When the given number has been pointed off into groups of four figures, the first group in the case of a whole number, and the group containing the first significant figure in the case of a decimal fraction, read in connexion with the subjoined table, indicates at once which half of scale A and which index of the slide are to be used.

Number taken on A. on C.		Index		Readings on A.	
L.H.	R.H.	1 to 10	10 to 100	Whole Numbers.	Decimal Fractions.
L.H.	R.H.	1 to 10	10 to 100	0.0001 to 0.0099	0.0001 to 0.0099
L.H.	R.H.	100 to 999	100 to 999	0.01 to 0.99	0.01 to 0.99
R.H.	R.H.	1000 to 9999	1000 to 9999	0.1 to 0.9	0.1 to 0.9

Rule (11).—The number of digits in the fourth root of any whole number corresponds with the number of groups obtained by pointing off the digits in fours, and the number of ciphers immediately after the decimal point in the fourth root of any decimal fraction corresponds with the number of groups, which, after pointing off, are seen to consist wholly of ciphers.

Example (11).—Find the fourth roots of (1) 835, (2) 83.5, (3) 835, (4) 8350.

(1) Set the cursor to 835 on L.H. of A, and using L.H. index of slide, find 17 on C under cursor and 17 on D below the index of C. Then, as the given number contains part of only one group of four digits, $1.7 = \sqrt[4]{835}$.

(2) Set cursor to 835 on R.H. half of A, and using L.H. index of slide, find 302 on C under cursor and 302 on D below the index of C. Then, as the given number contains part of only one group of four digits, $3.02 = \sqrt[4]{83.5}$.

(3) Set cursor to 835 on L.H. half of A, and using R.H. index of slide, find 5375 on C under cursor and 5375 on D below the index of C. Then, as the given number contains part of only one group of four digits, $5.375 = \sqrt[4]{835}$.

(4) Set cursor to 8350 on R.H. half of A, and using R.H. index of slide, find 956 on C under cursor, and 956 on scale D below the index of C. Then, as the given number contains only one group of four digits, $9.56 = \sqrt[4]{8350}$.

Example (12).—Find the fourth roots of (1) 0.000000835, (2) 0.0000835, (3) 0.0000835, and (4) 0.0000835.

These numbers must be pointed off thus: 0.0000008350, 0.00083500, 0.00008350, and 0.00083500.

(1) Find 17, as before. Then, as the given number contains one group entirely of ciphers, $0.017 = \sqrt[4]{0.000000835}$.

(2) Find 302, as before. Then, as the given number contains no group entirely of ciphers, $0.302 = \sqrt[4]{0.0000835}$.

(3) Find 5375, as before. Then, as the given number contains one group entirely of ciphers, $0.5375 = \sqrt[4]{0.000000835}$.

(4) Find 956, as before. Then, as the given number contains one group entirely of ciphers, $0.956 = \sqrt[4]{0.0000835}$.

By noticing exactly what happens when operating the slide rule in the foregoing calculations, the reader will find that after the proper position of any given number has been settled on scale A, the quickest way of finding the fourth root is to extract the square root of the square root as follows:

Rule (12).—Set the cursor to the given number on scale A, read the square root on scale D, set the index of B to the value of the square root on scale A and read the fourth root on scale D below the index of scale C.

WORKSHIP-STREET POLICE-COURT.—Under an order in Council the police-court in Workshop-street has been closed, and the business of the court is transferred to new buildings in Old-street, St. Luke's, which will serve for the locality by name of the Old-street Police-court. In Rocque's map of about 1755 the east end of the present Workshop-street appears as Hog-lane, where lived the actor, Gabriel Spencer, whom Ben Jonson killed in a duel in the fields at Hoxton.

Obituary.

MR. SCRIVENER.—The death, at his residence, The Cedars, Newcastle-under-Lyme, is announced of Mr. Edward Elvine Scrivener, in his sixty-eighth year. Mr. Scrivener was senior member of the firm of Messrs. R. Scrivener & Sons, of Howard-place, Hanley, architects, surveyors, and valuers. His partners were Mr. A. Scrivener and Mr. E. D. M. Scrivener; in May last the firm dissolved partnership in so far as regards Mr. E. D. M. Scrivener. Of the more principal architectural works carried out by Mr. Scrivener and his firm we may mention the enlargement of the schools at Atherstone; school buildings for Highley School Board, Salop; the new schools in Queen-street, Fenton, for the Stoke-upon-Trent Urban District School Board, for 660 boys and girls, 1897, and in 1902 more school buildings at Fenton; a mixed school for 470 children in Princes-road, and one for the deaf and dumb at Penkull, Staffs, the new church for St. Jude's parish, Hanley, for a congregation of 850 persons, at a cost, with the site, of some 10,000, in 1897-8; the Roman Catholic Church and schools for 20 children, Hall-street, Burnley, 1897-8; the laying-out of Fenton Park estate, and Dix's brewery, Hanley; new premises in Foundry-street, Hanley, for the proprietors of the *Staffordshire Sentinel*, comprising offices, a publishing-room, and a large printing press room to accommodate six electrically driven machines; and, in Lamb-street, premises for Messrs. Huntbach & Co., the restoration, six years ago, of the parish church of St. Lawrence, Anley, near Atherstone, in Warwickshire; the infirmary and sick wards at Deunstone College, Hanley, 1901; extension of mill works at Hanley, for Messrs. C. Leese & Sons; premises at Burnley, and enlargement of Dalehall Manufactory, Hanley, for Messrs. Keating & Co.; shops and warehouse in High-street, Stoke-upon-Trent, for Mr. J. H. Irwin, and, for Messrs. W. Kirkham & Sons, a slip-house and workshops, Stoke-upon-Trent; schools for 548 children at Tunstall; St. James's rectory-house, Longton, Staffs. (a very recent work of the firm); and schools in Shelton, Newbold, and in Leek, Leek classrooms, etc., at Harfield, for the School Board of Stoke-upon-Trent. Mr. Scrivener was architect to the School Board for Hanley and their successors, the Hanley Education Committee; in that capacity he and his firm made the plans and designs for many board schools, amongst them being those in Caudon-road, 1896; Great York-street; Northwood Schools; a junior mixed school; the New Grove Schools for 1,000 children; and, in 1905, the extensions of the Municipal Secondary School. Mr. Scrivener was valued to the Board of Guardians for Stoke-upon-Trent, and five years ago was appointed a Justice of the Peace for the borough of Hanley.

MR. W. PARRISON.—Mr. William Pattinson, head of the firm of Messrs. W. Pattinson & Sons, contractors, Ruskington, near Sleaford, has just died in his seventy-third year. He was the first chairman of the Ruskington Urban Council.

General Building News.

ST. AUGUSTINE'S CHURCH, DERBY.—A further advance towards the completion of this church has been made by the erection of a south aisle, which will provide about 200 additional sittings. The work has been carried out under the direction of Messrs. Naylor & Sale, architects, of Derby, who prepared the original design, and the builder was Mr. Henry Chattle.

CHURCH, GARRISTOWN, IRELAND.—The new church at Garristown has just been dedicated by his Grace the Archbishop of Dublin. The new church is built in the Gothic style. It consists of a nave 90 ft. by 30 ft., with a diagonal apse 20 ft. by 18 ft. The walls are built of local limestones from Mr. Mangan's quarries, lined on the inside with brick. The chancel dressings to windows, doors, plinths, buttresses, weatherings, etc., are from the Milverton quarries, Skerries. The chancel floor is laid in mosaic; the nave passages and floors of porches are tiled. The roof, which is of open timber construction, is panelled with pitch-pine. The chancel arch is supported on polished granite shafts with carved capitals and moulded bases. The edifice was erected by Mr. James M'Adory, builder, Dundalk, from the designs and under the superintendence of Mr. George L. O'Connor, Dublin. The statues in the niches at each side of the altar were presented by Mrs. Aungier. The gates of the altar rails were supplied by Messrs. McGloughlin.

CHRIST CHURCH, NORTHAMPTON.—The erection of this church has just been completed. The main structure is of local stone from Lady Robinson's Kingshorpe pits, but both east and west ends are temporarily built of brick. The floors under the seats are of wood blocks, and the passages are paved with quarries. The carving to the exterior and to fittings has been executed by Mr. S. L. Reynolds, Northampton. Mr. Robert G. Costford, Northampton, was the general contractor; the architect being Mr.

M. H. Holding, also of Northampton. The artificial lighting is by electricity, the installation having been carried out by Mr. W. C. Mansell, of Northampton. The heating is by means of hot water. The seating at present is for about 600 people, but to complete the scheme the chancel, chancel aisle, vestry, western tower, and western porches have to be added. The amount of the contract was 5,800.

WESLEYAN CHURCH, GATESHEAD.—On the 6th inst. the opening ceremony took place of the new Wesleyan Methodist church in Durham-road, Gateshead. The building is in the early Gothic style, and is surmounted by an octagonal turret, about 90 ft. in height. The church is seated for 671. The architect for the work is Mr. W. Stanley Ellison, of Liverpool; and Mr. Alexander Pringle, Gateshead, is the contractor. The stone has been supplied from Mr. Pringle's quarry at Beacon Lough, near Wreckenton.

WESLEYAN SCHOOLS, KETTERING.—The foundation-stones of the new Wesleyan Methodist Sunday Schools in Regent-street, Kettering, were formally laid on the 4th inst. The schools are being erected to plans prepared by Messrs. Gotch & Saunders, and the estimate for the building is 1,588, 10s., the contract having been secured by Messrs. E. & F. Henson, of Kettering.

BAPTIST SUNDAY SCHOOL, BROMLEY.—The picked stock of the new Sunday School, which is being erected on the land at the rear of the Bromley Baptist Church, were laid recently. The building is designed upon one floor only, and will have a main assembly-hall, 42 ft. 6 in. long and 34 ft. wide, with classrooms on all sides, being lighted from the clearstory rising above the flat roof over the classroom. The hall will have an average pitch of about 20 ft. On the east and west sides there will be small classrooms divided from one another by "Climax" folding partitions, which when required will be thrown back and increase the width of the hall to 50 ft. These rooms will be seven in number, each about 1 ft. square. On the northern side of the building a reading room has been provided for the secretary and librarian, a Bible classroom for seniors, the kitchen and the boys' lavatories. On the southern side is another seniors' classroom and the infants' classroom, also the lavatories for girls. The front elevation will be faced with red Kentish bricks, and all other elevations with picked stock. The stone dressings are to be of Bath stone from the Monks Park quarries. Welsh slates will be used in covering the main roof and lead on the flats. The whole of the joinery will be in pitch-pine. It is proposed to light the building with gas and warm it by a system of low-pressure heating, the plan of which has been designed by Mr. Percy Coad, Bromley, and the builder is Mr. T. D. Grady, also of Bromley.

NEW COUNCIL SCHOOL, PRESTON.—The cornerstone of the Roebuck-street School, Preston, was laid a short time since. The site of the school is nearly an acre in extent, and the school, which is of the central hall type, will be erected according to the designs of Mr. architect of Morecambe, whose plans were selected in competition. In addition to the ordinary elementary curriculum, provision will be made for training the boys in manual work and imparting a knowledge of cookery to the girls. Though not included in the original scheme, sanction may be sought for an additional grant of 500 £ for a caretaker's room, and it is proposed to utilise the caretaker's house, which will stand in one part of the playground, for training in housewifery. The two central halls, each 1,060 sq. ft. in dimensions, not only act as lungs to the apartments adjoining, but may be used for marching and drill during wet days or on any occasion when it is desired to group the scholars. The school will be divided into two departments—the infants and the mixed. In the latter there will be six rooms, five of which will accommodate 60 children each and one 50. For infants there are four classrooms, one to hold nearly 60 and three to accommodate 54, thus giving a total accommodation of 570. The cookery-room will have an area of 752 sq. ft., the manual instruction room 700, and the two teachers' rooms each 128 sq. ft. The contract was let to Mr. T. Cottam, Preston, for 6,350.

PUBLIC LIBRARIES IN ST. PANCRAS.—The Public Libraries Committee of St. Pancras Borough Council has provisionally arranged to purchase for 4,400 £ a site of 3,834 sq. ft. in Mableton-place for the purpose of erecting thereon the proposed second largest library in the borough. The principal façade of the new library is to be in a new road now being constructed by the Borough Council, situated between the Gray's Inn-road and the Tottenham Court-road districts. The Borough Engineer estimates that the cost of the Highgate district library will be 3,860.

SCHOOL, BALSAGRAY, GOVAN, GLASGOW.—Mr. James Caldwell, M.P., opened the Balsagray Public School on the 5th inst. The building consists of three stories, with a front to Dumbarton-road, and is built of Corncockle stone in the Roman classic style. There is accommodation for 1,415 scholars. In connexion with the school there is a swimming pond 75 ft. long by 30 ft.

broad, with dressing boxes and galleries on three sides. There is also a workshop for manual instruction, a cook's kitchen, and the usual author's house. The buildings are from designs by Messrs. Bruce & Hay, architects, Glasgow, and the cost is estimated at 29,000.

COUNCIL SCHOOLS, BIRMINGHAM.—The secondary and elementary schools erected by the Education Committee of the City Council in Guyton have just been opened. The area of the site, including playgrounds, etc., is 10,280 square yards and the length of the buildings is 450 ft. The schools are built of brinded Black Country bricks, with dressings of mottled Hollington stone. The roofs are of Hartall tiles, and the construction throughout is fire-resisting. The architects are Messrs. Buckland & Farmer. A feature of the building is the tower, which serves the double purpose of ornament and ventilation. The secondary school affords accommodation for 600 pupils, 300 boys and the same number of girls. The main teaching rooms for their use are on the ground floor, and the special rooms, chemical laboratories, gymnasium, and art rooms are upstairs. Two central halls are provided, each 74 ft. long and 32 ft. wide, one for the boys and the other for the girls. In the sixteen classrooms provision is made for teaching the boys wood and metal work, and the girls cookery and laundry work; while the pupils of both sexes will be instructed in chemistry and physics, and they will be allowed the use of the gymnasium. In the basement dining-rooms have been fitted up for the convenience of the scholars. The elementary school is distinct from the secondary, although it is part of the main block. Accommodation is provided for 600 children—400 in the mixed rooms, and 200 infants. There are two halls, one for the mixed children and the other for the infants, each 48 ft. long by 23 ft. wide, and twelve classrooms have been arranged. The heating of the building is by means of low-pressure steam, and the ventilation is on the exhaust principle, the foul air being extracted by two rotary fans driven by electric motors. The chemical laboratory works are situated in a similar manner, but on a separate system, and the inlets for fresh air are at the back of radiators. The total cost of the buildings, exclusive of the site, will be between 40,000, and 45,000.

POST OFFICE EXTENSIONS, CHELTENHAM.—The additions which have been made to the Cheltenham Post Office have now been completed. The new front has been executed in Bath and Portland stone, and is in harmony with the Grecian style of the rest of the building, with the difference that the details of the former are Doric and those of the latter Ionic. The public offices and sorting-rooms for the postmen are on the ground floor, and are 55 ft. in length. The remainder of the building is taken up by the sorting office and the telegraph messengers' room. On the first floor of the front building are placed the Postmaster's and Chief Clerk's offices, and the sorting-rooms for the postmen. The postmen's office occupies the whole of the first floor of the back building. The telegraph and telephone rooms are on the second floor of the front building, the remainder being occupied as retiring-rooms for the male and female clerks. In the basement accommodation is provided for the telegraph and postal and telegraph stores. Except in the Postmaster's and Chief Clerk's offices, which retain the fire-grate, the heating is by hot-water pipes. The general contractor was Mr. Colborne, of Swindon. The work has been carried out from the designs of Mr. John Rutherford, Architect of the Board of Works.

HOTEL, TURNBERRY, N.B.—A new hotel has been erected at Turnberry by the Glasgow and South-Western Railway Company, in connexion with the new line of railway which runs the entire length of the seaboard from Ayr to Girvan, and which will be officially known as the Maidens and Dunure Railway. The hotel adjoins the railway, and is connected with Turnberry Station by a covered way which leads through a conservatory to the entrance lounge. The building has been designed in the Georgian period of architecture, and has a frontage of 300 ft. The exterior walls are rough cast, coloured a light cream; the woodwork of the windows, verandah cornices, etc., have been relieved with pure white, while the roof is of red tiles. Altogether there are one hundred visitors' bedrooms. The entire building is lit by electric power, produced by a central station which provides two 30-horse-power engines, and electric lifts communicate with various floors. The building was designed by Mr. James Miller, Glasgow.

FREE LIBRARY, LITTLEHAMPTON.—The new Littlehampton Free Library has just been opened. The building is situated on the corner of Malvern-road and Fitzalan-road, and has its main front facing south-east, with an entrance from each road leading up to a central porch, from which the chief public rooms are directly approached through an arched corridor. The building contains a lending library 30 ft. by 20 ft., reference library 17 ft. by 17 ft., news and newspaper-room 33 ft. by 17 ft., on the ground floor, where also are the librarian's private room and workroom, which are entered from the lending library. The back portion contain a

holder-house and usual offices, while over the librarian's room and the workroom are two store-rooms. The rooms on the ground floor are divided by means of glazed lead light screens and doors, and the main portions of the building are heated by low-pressure hot-water apparatus, and radiators. Gas lighting is employed, incandescent burners being used. Pitch-pine has been employed for the roof, which is hoarded and covered with Staffordshire tiles, and the floor is composed of pitch-pine blocks. The building is designed in the Tudor style, plain red kiln Poling bricks being used, with stone bands, sills, millions, lintels, etc. The plans for the work were prepared by Mr. H. Howard, the Surveyor.

THE PALACE, CLACTON.—This building, which has just been opened, occupies a site of four acres, and has cost about 40,000. It is situated on the West Cliff, overlooking the sea. The architects were Messrs. Spencer & Tighe. The theatre, which is the main building, will seat 1,500 persons, and it contains a supper lounge and various alcoves. It is approached by an entrance-hall, which also gives access to a couple of terraces. In the grounds a bandstand is reared in a pool, and there are tea-houses in the Japanese, Indian, and Swiss styles. The structure is built entirely of steel and iron framing, and the whole of the work has been carried out by Messrs. D. Rowell & Co., of London, under the management of Mr. W. W. Pepper. The grounds have been laid out under the supervision of Mr. T. B. Harpham. The artistic continuation scenery is the work of Mr. B. Burris, the electric contracts have been carried out by Messrs. Mayfield & Co., of London, and the superintendent-general has been Mr. Gatfield.

CLUB PREMISES, WHITSBURY, HANTS.—The foundation-stone of a new clubroom has just been laid at Whitsbury. The architect is Mr. Fred Bath, of Salisbury, the builders being Messrs. Frederick Merrick & Son, of Glastonbury, Somerset.

FACTORY, HULL.—New works are being erected by the National Radiator Company on the north of Springhead-road, Hull. The architect is Mr. H. Heathcote, of Messrs. Charles Heathcote & Sons, London; Messrs. Arnold & Sons, Doncaster, are the general contractors; Messrs. Dorran, Long, & Co., Middlesbrough, the contractors for the steel work; Messrs. Bell & Co., Liverpool, for the erection of the steel work, Messrs. Hewitt & Sons the zinc roof; Messrs. Henry Hope & Sons, Birmingham, the windows; and Mr. F. Abbe is executing the plumbing work.

ISOLATION HOSPITAL, READING.—The opening of the new hospital for infectious diseases in Prospect Park, Reading, took place a short time ago. Mr. Charles Smith was the architect of the buildings. The general contractors were Messrs. Collier & Catley, and the engineering work has been carried out by Messrs. Barford & Perkins, of Peterborough. Mr. B. J. E. Webber acted as clerk of the works.

GENERAL POST OFFICE, EDINBURGH, EXTENSIONS.—A scheme of extension of the General Post Office, Edinburgh, is under consideration, and plans for the same, prepared by Mr. Oldrieve, of the Board of Works, have been sanctioned. Working drawings are now in course of preparation. The enlargement scheme is one of considerable magnitude, it being intended to build an extension eastward along the railway to Low Calton, and also to add an additional story to almost the whole of the present building. Nearly every department in the post office will have more accommodation assigned to it, and the administrative offices will be concentrated. It is also intended, for example, to bring into the enlarged building the engineering department and the office of the superintendent engineer of the district, now outside the building. In preparing the elevations, the architect of the Board of Works has kept prominently in view the preservation of the *ensemble* of the group of buildings at the east end of Princes-street, as viewed from the south. To this end the sky-line of the post office block, after extension, as seen from the bridge, will be broken up by three steps, so to speak, leading from the lowest elevation on the east to the highest on the west, to meet the line of the North British Station Hotel. The wall top of the new buildings will be at the present level, and the "steps" will be to the west. Photographs have been taken of the corner, and it is believed that the additional story on the post office to the west, when in combination with the new building in the manner indicated, will restore the architectural scale of the neighbourhood, which was somewhat thrown out of joint by the height of the North British Hotel. The cost of the extension will be over 50,000.

LIBRARY, KING'S HEATH, BIRMINGHAM.—On the 11th inst. the Carnegie Free Library, which has been erected at King's Heath, close to the railway station, was opened. The building, which has cost upwards of 3,000*l.* has been built to the design of Mr. A. G. Latham, of Birmingham. It has been carried out in the classic Renaissance style, and the whole of the front and a portion of the side facing the station have been carried out in white Hollington stone and the other frontages are of red brick with stone dressing. A bold entrance with vestibule, having

wrought-iron gates, is provided facing the main road. From thence swing doors lead to the reading and news-room, and the lending and reference departments. The reading-room has a circular, panelled ceiling, and, in addition to accommodation at the tables for forty-two readers, there is a recess with wall slopes and independent newspaper stands of fumed and polished oak providing for about a score of newspapers. In the centre of the building is the lending department, in which shelves are provided for 11,000 volumes. The borrowers' space, which forms the corridor to the reference room, is 11 ft. wide, and is furnished with a polished oak counter for service of books, and there is a seat for the use of persons waiting. The reference room is at the rear of the building, as far removed as possible from the noise of traffic, and is provided with shelves for over 4,000 volumes.

PROPOSED NEW GUILD HALL, PERTH.—Plans have been prepared by Mr. A. Granger Heiton, architect, Perth, for a new guild hall, which it is proposed to erect in High-street, Perth. The building will be of the XVIIth century style. On the ground floor there are to be one large double bay of wood blocks, while the ceiling will be of concrete fireproof. A low platform with panelled front is to be erected at the east end of the hall. If chairs are used accommodation will be provided for 160 persons, and twenty on the platform. Ventilation is provided by shafts led from the ceiling to the turret ventilator on the roof. A cloak-room, lavatory, and store are provided over the main staircase. The hall will cost about 2,250*l.*

Sanitary and Engineering News.

GLASGOW MAIN DRAINAGE SCHEME.—On the 4th inst. Lord Provost Bilsland out for the first of the works at Shieldhall which form the third and final section of the main-drainage scheme of Glasgow, which was inaugurated fourteen years ago. The whole of the works for taking the drainage of the north side of the city out of the River Clyde are already in operation, and when the works at Shieldhall are completed the drainage of the south side of the city will also be kept out of the river. The third section includes the whole municipal area of Glasgow on the south bank of the river, the burghs of Rutherglen, Pollokshaws, and Govan, as well as various residential and rural districts in the counties of Lanark and Renfrew. The extent of this section is 14 square miles. The works for the disposal of the sewage of this area were originally intended to be situated on the river bank at Braehead, about one mile eastward from Renfrew. It having recently been found that this position would be disadvantageous to the interests of the Clyde Navigation, it has been arranged to place the works at Shieldhall on the ground recently occupied as the timber depot. The daily volume of dry-weather sewage to be treated at Shieldhall will be 47,000,000 gallons, and the works have the advantage of river frontage, with every facility of water carriage for receiving and dispatching materials. Mr. A. B. McDonald is the City Engineer.

WIGTON WATER SCHEME.—On the 7th inst. Mr. H. P. Boulnois, Local Government Board Inspector, held an inquiry at the Council Chambers, Wigton, into an application by the Wigton Urban District Council for sanction to borrow 2,000*l.* for works of water supply, viz., the laying of a cast-iron main in the parishes of Bolton and Westward. Mr. J. W. Crookes (clerk) and Mr. Joseph Graham Carlisle (the Council's Water Engineer), appeared in support of the application, and there was no opposition.

BIRMINGHAM SEWAGE FARM.—Mr. R. H. Bicknell, Local Government Board Inspector, held an inquiry at the Birmingham Council House on the 11th inst., respecting the application by the Tame and Rea Drainage Board for sanction to borrow 40,500*l.* for the purpose of constructing four additional bacteria beds at Minworth Graves. Mr. J. D. Watson, the Engineer of the Board, pointed out that at the present time they were able to deal with about a quarter of the dry-weather flow by means of the beds already in existence. The new ones were to be constructed on the same principle, but the Board had gained knowledge from experience, which would lead to a lessening in the cost. The imperative necessity for more beds was shown by the fact that they had 450 persons per acre, which was abnormally high, as it was held that anything above 100 or 150 per acre was excessive. Mr. Watson added that with the additions proposed they would be able to deal with about half of the dry-weather flow. The land would be used for dealing with the remaining part of the sewage on irrigation lines.

SEA DEFENCES, HORNSÉE.—On the 6th inst. Mr. P. M. Crosthwaite, M.Inst.C.E., the Local Government Board Inspector, heard the application of the Urban Council, which has been made to the Local Government Board, for sanction to

borrow a sum of 12,500l. for works of sea defence, or, in other words, to repair the great damage done to the sea front by the recent spring tides, by the erection of a sea wall and groynes. Mr. W. T. Douglass, C.E., of London, the Council's Engineer, said his first report was in November, 1905, with a subsequent one in April of the present year, copies of which had been forwarded to the Local Government Board. The plans showed a sea wall from the north end of the Promenade-gardens to the New-road end with four groynes, but the Council had since decided to limit the length of the sea wall at the south end of the Gardens because of the expense attached. The plans presented embodied the scheme for which the loan was applied for, and included a sea wall with upper and lower decks and a groyne to the south, which was 745 ft. in length, with further ones of 550 ft., 430 ft., and 400 ft. respectively, making a total of 2,125 ft. The groynes were to be constructed 2 ft. 6 in. over the present beach line, and to have a crossing place provided for the Board of Trade rocket life-saving apparatus and the lifeboat. The scheme was estimated to cost 12,500l.

VENTILATION OF SEWERS.—Dr. Orme Duffield, the Medical Officer of Health for Kensington, in his annual report, just issued, goes at considerable detail into the question of the ventilation of sewers, a subject which, he states, has engaged the attention of the local sanitary authority at intervals for thirty-five years to his knowledge. Summing up, Dr. Duffield writes:—"Success has attended such efforts as the Kensington sanitary authority have made to cope with the nuisance from sewer emanations as by abolishing dead ends of sewers or by the ventilation of them; by the erection of pipe ventilators in substitution of offensive gratings at street level, and by the pan siphon trapping of offensive street gullies. Works of this sort carried out in the vicinity of Hurstway-street (in 1898) and in the Notting Dale 'special area'—which does not now possess a single entrapped gully or sewer grating at street level, sewer ventilation being effected by shafts—have proved effectual. I think it correct to say that wherever these means have been adopted, permanent good result, i.e., the prevention of nuisance, has been attained without detriment to the inhabitants of the locality. These means, applied with success locally, should be largely extended, and especially I would recommend an extension of the practice of abolishing dead ends of sewers (of which there are nearly 250 in the Royal Borough), or the effective ventilation of them when abolition would be either too costly or impracticable. This remedy, at a large increase in the number of pipe ventilators, so as to secure free circulation of air in the sewers, would, I believe, go a long way towards effecting the object in view, and thus put an end to the well-founded complaints which now recur during the hot weather every year, with painful regularity."

INTERCEPTING TRAPS.—The Works Committee of Hackney Borough Council reported on Monday having considered, in conjunction with the Public Health Committee, a letter from the London County Council with reference to a suggestion that by-law No. 5 of the series of by-laws (drainage etc.) made by the County Council under section 202 of the Metropolitan Management Act, 1855, should be repealed. It had been resolved by the Joint Committee to inform the London County Council that while the Hackney local authority does not consider that the use of intercepting traps affords perfect protection, their use generally is desirable until the public sewers are efficiently ventilated.

WATERWORKS EXTENSION, LEYLAND.—At Leyland Public Hall, on the 1st inst., a Local Government Board inquiry was held by Mr. A. A. G. Mays, M. Inst. C.E., into the application of the Council to borrow 945l. for the purpose of water supply and 225l. for the construction of a bridge over Mill Brook at Slaters-lane, Leyland. Mr. Wrennall, who is the engineer of the scheme, explained the plans and details.

Foreign.

FRANCE.—The jury of architecture of the Ecole des Beaux-Arts appointed to judge the work of the First Class in Architecture, have awarded a Première Médaille to M. Levard, pupil of M. Pascal. The subject of the competition was "La Grande Salle d'Une Bourgeoisie."—The Académie des Beaux-Arts has awarded to M. André Godard the prize founded by M. Deschamps, the object of which is stated to be "pour encourager de jeunes architectes se distinguant par leur aptitude artistique et par leurs bons sentiments envers leur famille"; so that art and domestic affection are to be jointly encouraged.—M. Rous has been appointed architect to the Administration of the Assistance Publique of Paris, in place of M. Lebrun, who has been superannuated.—The inauguration of the monument to Dumas fils, on the Place Malherbes, took place on Tuesday. It is the work of M. René St. Marcieux, and consists of a marble statue of Dumas, represented seated, in an attitude of

meditation, on a marble pedestal decorated with various female figures representing the principal heroines of his works, notably the "Dame aux Camélias."—The picture executed by M. Gervex and M. Poilpot. The picture by the first-named artist represents Louis XVI. and the celebrated agriculturist Parmentier on the plain of Sablonville: the subject of the other is the fête given by Murat in the Palais Borghese, at Neuilly, in honour of Napoleon and Josephine.—The official inauguration of the monument to Alfred de Musset, at Neuilly, is fixed for the 24th inst. The monument is the work of M. Granet, the sculptor.—The jury of the competition opened by the Conseil-Général of the Seine for the pictorial decoration of the Salle des Fêtes of the Mairie at Fresnes, has selected for execution the work of M. Endors, pupil of M. Cormon.—The municipality of Carasso have instituted a competition for a new asylum hospital ("hôpital-hospice"). The jury have selected for execution the plans by M. Bertrand, of Paris, awarding a second premium to M. Vasson, of Carasso, and a third to M. Carlier, of Montpellier.—The jury in the competition opened by the municipality of Carasso for a municipal theatre, have awarded the first prize to M. Legendre, "architecte diplômé"; the second to M. Tronchet, of Paris, and the third to M. Bourgeois, of Poissy.—M. Tronchet has just carried out in the Bois de Boulogne, at the Pré Catelan, a large restaurant, accompanied by buildings in the style of the Norman farm buildings, and intended for the use of villa and country houses.—The death is announced, at the age of eighty-two, of M. Pierre Joseph Dubel, architect "en retraite" to the Corporation of Paris, and a former pupil of Nicolle.

GERMANY.—The new bridge over the Elbe at Dresden is to be built from plans by Herr Wilhelm Kreis, and the work has commenced this autumn.—The new town hall at Kiel is to be built under the direction of Professor Billing, at a cost of about 3,100,000 francs.

AUSTRIA.—It has been decided to adopt the designs presented by Professor Karl König for the new Industrial House to be erected in Vienna; Professor König will also superintend the carrying out of the building.—Herr Ludwig Baudler, architect, died at Vienna in his sixty-sixth year on May 25.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The District Surveyor's office for the Western Division of the City of London has been removed to 22, Bride-lane, Fleet-street.—After the 24th inst. the offices of the QUANTITY SURVEYORS' Association will be removed from 17, Bedford-row, to Caxton House, Westminster, S.W.—Messrs. Lanchester & Rickards, architects, have removed their offices from 1, Vernon-place to 47, Bedford-square, W.C.

PROPOSED COTTAGE BATHS, BIRMINGHAM.—The Baths and Parks Committee, in their report to the City Council, state that, acting on the authority of the Council, they have inspected various properties in the Floodgate-street area with the view of acquiring some old buildings which might be converted into cottage baths. The committee have come to the conclusion that the better course will be to secure a piece of land and erect a new building thereon. They now submit for consideration an offer by the Rev. W. H. Clarriss, Vicar of St. Gabriel's, Pickford-street, to lease for a term of 999 years, at a ground rent of 27l. 10s., or 6d. per yard, a piece of land 1,100 sq. yds. in area, having a frontage of 17 yds. to Bordesley-street. The committee submit a plan of the land, with sketch plans of the buildings proposed. The cost of the buildings, with all necessary fittings adapting them for use as cottage baths, including boundary wall, leveling and asphaltting the site, is estimated at 2,000l., which the committee propose to defray from revenue account. The proposed buildings will cover about 100 sq. yds., and the remainder of the area will be utilised as a playground for the district. The committee recommend that they be authorised to lease the land, and to proceed with the erection of the buildings.

HOUSING OF THE WORKING-CLASSES.—Before the House of Commons Select Committee on the Housing of the Working Classes, Sir J. Dickson Poynder presiding, Mr. Noel T. Kershaw, Assistant Secretary of the Local Government Board, attributed the reluctance of local authorities compulsorily to acquire land for the erection of workmen's cottages to the fact that it was generally found that such action resulted in a loss to the rates. The cost of a cottage was, as a rule, 200l., and it was seldom possible to get a rent which would represent a fair return on the outlay. This contention, however, the knowledge that rates were rising, made the local authorities hesitate in embarking on an enterprise which was risky. Alderman Thompson, of Richmond, Surrey, Chairman of the National Housing Reform Council, said he had made a structural examination of nearly all the municipal

workmen's dwellings in this country and on the Continent. He produced a return showing that of 578 cottages, the cost of building averaged from 40l. to 70l. a room, and charging 2s. 6d. per week—which was the rule—for each room, expended the rents were greater than a workman could pay. Witness held the opinion emphatically that by standardising the parts of cottages the cost of production could be reduced to 30l., and in rural districts, where labour was cheap, to a figure even considerably lower. Witness lamented the apathy which was displayed with regard to local government, except on the part of men who had a financial interest. These men should at least be kept off the building committees of local authorities. In one town the Chairman of the Building Committee was a builder, and it was, therefore, given to him to pass his own plans. When witness last inquired into the matter every builder on the council was on the Building Committee. There was in a town, and in a country place the difficulties would be greater.

THE DECAY OF GLASGOW MUNICIPAL BUILDINGS.—Mr. Alexander Muir, in a Report to the Glasgow Corporation Municipal Buildings Committee regarding the restoration of the masonry work of the City Hall, which has been in repair since 1901, says his opinion is that the treatment has been quite successful, and his confidence in the Szechely stone liquid as being the best-known stone-preserving preparation is as strong as it ever was. In a building so large as the municipal buildings it is almost too much to expect that every stone will yield so well to the treatment, and in some places, in the cornice of John-street front seem to show decay since being treated. What the extent of this decay is it is difficult to say by examination from the street, as a considerable quantity of soot and dirt is lodging on this cornice, occasioned by the discharge of smoke from the stack of the cold storage building in George-square, which was in part blown direct on to the John-street front. He cannot say whether the discharge from this stack would have a bad effect on the stone forming the cornice; it certainly was not in its favour. John-street front was the first treated, and at the beginning of the work he had an idea that the cost of the work would be kept within as much as possible, consequently he did not cause some stones to be cut out and replaced by new ones, which he now realises has been a mistake. He thought at the time that re-hewing them and coating with the liquid would suffice. It was not long, however, until he realised that it was essential to cut out stones freely and replace them with new ones, and since then he has had this done. Looking over the whole building, he sees nothing even to suggest that the treatment is likely to prove anything but a thorough success.

A NEW MODEL VILLAGE, NEAR BOURNVILLE.—It has been decided at the Cotteridge, King's Norton, to establish a Co-operative Tenants' Society, upon co-partnership principles, for the provision of artisans' dwellings on "model village lines." Mr. George Cadbury, the founder of Bourneville, addressing the co-operative delegates, expressed his conviction that the physique of the nation could only be maintained by those who worked in factories during the day being able to get out to cottages with gardens in the evening. Municipalities had made a stupendous mistake in buying and pulling down slums, and he believed such cottages as he indicated could be provided if in future the municipalities confined themselves to buying up the land around our great towns and cities. If fifty years ago that had been done by Birmingham the city would to-day be surrounded by hundreds of Bournevilles instead of by suburbs miserable, dreary, and desolate. The Bourneville Trust had offered to a local Co-operative Tenants' Society 20 acres of land on lease at a rent of between 5 per cent. and 6 per cent., which he thought a municipality would be perfectly justified in doing. The lease would, after the Scotch fashion, be renewable at the end of ninety-nine years at a valuation, so that the house-owner did not lose his house at the expiry of the lease. The 20 acres offered by the Bourneville Trust has a frontage of 400 yards to Northfield-road and about 270 yds. to Woodlands Park-road, is in close proximity to King's Norton station, and within a quarter-hour's walk from the Pershore-road trams. The ground rent will be at the rate of 11l. 10s. per acre. The society, if formed, will have the option of taking up 5 acres only at a time, which will relieve them of a large amount of expenditure, which they would necessarily incur if the whole of the 20 acres were taken at one time. The number of houses must not exceed eleven per acre. The land will be let on a lease for ninety-nine years, at the end of which time the society would have the option of a further lease or leases at revised terms. For every 10 acres taken by the society, the Bourneville Village Trust grant a acre of land free of cost, so that for 20 acres leased, ground rent will have to be paid on only 18 acres, the remaining 2 acres to be used as permanent open spaces. Mr. George Cadbury has offered to erect an iron hall to be used for public purposes as soon as 100 houses are erected.

EDINBURGH OLD CITY WALL.—At a meeting of the Treasurer's Committee of the Edinburgh Town Council, held on the 7th inst., the question in dispute between the Town Council and the Governors of the Heriot's Hospital as to the ownership of the wall on the north side of the Hospital grounds was under consideration. A report on the question by the town clerk was before the Committee, in which it was shown that the wall in question is part of the old "Blodden wall, and was the property of the Corporation. On the other hand, the Heriot Governors, who desire to use the wall as part of the foundation of their new building for the art department of the school, contended that it was at least a mutual wall, seeing that it was rebuilt in 1888 at the joint expense of the city and the Trust. After discussion, the Committee agreed to recommend to the Council that the wall in question belongs to the Corporation. Further, however, that the magistrates and Council should without giving any conveyance of the ground, or the wall, to the Heriot Governors, allow the Governors to reconstruct the wall as desired; that no compensation or price should be asked, only that the Governors in all time coming should relieve the Corporation from the upkeep of the wall.

URKFIELD NEW BUILDING BY-LAWS.—Mr. E. Walter (Vice-Chairman) presided at the meeting of the Urkfield Rural District Council on the 11th inst. In connection with the carrying out of the Crowborough scheme, intimation was received from Messrs. John Taylor, Sons, and Santo Crisp, the Council's engineers, that they had arranged that their Resident Engineer, A.M. Hart, C.E., should be their resident engineer on the works. Mr. Hart then moved that the draft of the proposed new building by-laws, which had been before the Works Committee for a considerable time, should be submitted to the Local Government Board for their preliminary approval. The district, Major Thornton stated, had been split up into urban and rural areas for the purposes of applying the new by-laws, so that in future persons wishing to build in rural areas would not be tied and bound by the present most unsuitable by-laws, which would never have been passed but for the insistence of the Local Government Board, who thought they knew more about rural parishes than those who lived in them. Practically the only restrictions in future would be in regard to the sanitary arrangements. In the parts defined as urban, the by-laws would be to a certain extent more lenient than at present; where alterations were made they would be in favour of the owner.—The resolution was carried.

PROJECTING SHOP PROPERTIES.—At the St. Pancras Town Hall, on Monday evening, a meeting of property owners, convened by the local branch of the association for the amendment of the projecting shop clauses of the London Building Act, 1905, was held to protest against sections 10 and 12 of the London Building Acts Amendment Act, 1905. Sir W. J. Collins, M.P., presided. Mr. H. D. Wildcombe explained the working of the clauses, which, he said, were calculated to inflict considerable hardship upon property owners and occupiers. Mr. T. B. Westcott proposed a resolution to the effect that the meeting of owners and occupiers of projecting shop properties in the borough of St. Pancras, of which there are not less than 700, representing approximately some 1,400 owners and occupiers, views with alarm, and hereby records its emphatic protest against sections 10 and 12 of the London Building Acts Amendment Act, 1905, requiring the provision of concrete or other fire-resisting roofs to existing projecting shops and means of access to roofs. It also records its protest against sect. 10 as applied to lantern lights in existing projecting roofs, and appeals to the London County Council to take such immediate steps as may be necessary to repeal or amend the sections herein referred to, so far as they apply to existing buildings, having regard to their interference with the principle of security of contract and the arbitrary infliction of loss upon both owners and occupiers, not only by reason of the capital expenditure involved, but also the serious disturbance to peaceful possession and the infliction of damage upon all classes of trades carried on by the occupiers. Mr. Coleing seconded the resolution, which was supported by Mr. Balch. Sir W. J. Collins said the Act was framed with the intention of protecting life from fire, but the County Council had no desire to deal harshly, and he advised owners to take advantage of the exemption clause. Mr. H. C. Lea, M.P., said his sympathies were divided between the tenants and the owners, but he would follow the lead of the chairman. The resolution was carried, and a deputation appointed, which the chairman said he would introduce to the County Council.

SOUTHWOLD HARBOUR.—Proposals are made to form a company for the enlargement and deepening, at an estimated outlay of 50,000*l.*, of the harbour at the mouth of the River Blyth, Southwold, to render it available for the shipping employed in the local and Scottish fishing trade, and in the export trade to Germany and Russia.

PROPERTIES FOR SALE.—Lundy Island, in the mouth of the Bristol Channel, and distant about 14 miles north-west from Clovelly, is about

3 miles long by from one to half a mile broad, and is well-nigh inaccessible, except on the east side. There are ruins of an ancient chancel dedicated to St. Anne, and, near the south-eastern point, of the castle named after Morisco, the pirate, who there suffered death for conspiring against the life of King Henry III. Lord Saye and Sele held the castle for the King in the Civil War, and it was occupied a while by a French force *temp.* William III.—Ware Priory, Hertfordshire, embodying some remains of the religious house founded *temp.* Henry III., by Margaret, Countess of Leicester, as a cell to Ebrali in Normandy, and bestowed by Henry V. upon the Carthusians at Sheen.—Hudson House, near Ware, wherein are portions of the palace built by Henry VIII., which Queen Elizabeth gave to her kinsman, Henry Cary, Lord Hunsdon, whose monument in St. John the Baptist Chapel, Westminster Abbey, was erected by his son, and is the loftiest in the Abbey.—The estates, in three portions, of Lady Mox, extending over an aggregate of 20,000 acres in and near Wootton Bassett, Marlborough, and Dauntsey, North Wiltshire. The Downs estate, being the second portion, includes the West Woods, 700 acres in extent, and adjoins Savanake; the first portion comprises nearly all the town of Wootton Bassett, and the manor house of Vestern, at one time a Benedictine priory, and, it is said, the home of Anne Boleyn. The total rent-roll is computed at 22,660*l.* per annum, and facilities will be given to subsisting tenants of the farms to purchase their holdings.—Stoke Park, Stoke Poges, with a deer park of 300 acres, which once appertained to Windsor Forest, of which the ownership passed from Lord Mollines, *temp.* Edward III., to the Lords Hungerford, and from them to the Earls of Huntingdon (Hastings) (whose badge may be seen in the church), Lord Mansel, and, lastly, to Sir Edward Coke, to whom it was bought by William Penn, for whose descendant John Penn the house was re-built by James Wyatt, with colonnades after the Doric order on the north and south fronts; Repton laid out the park, with its ornamental waters. The old manor house is now a house of Gray's "Long Street" written when it belonged to Viscountess Cobham.—Milton Ernest Hall, near Oakley, Bedfordshire, having a frontage of 600 yards to the river Ouse; the house was built in 1858, after Butterfield's designs in the Gothic style.—High Walls, Gullane, co. Wick, Ireland, a fine Marlfield, well-fitted with all the conveniences, the work of which Mr. E. L. Lutyens was the architect.—The "Tower House," one of those built in Bedford Park, Chiswick, by Mr. R. Norman Shaw, R.A.; and Palace-court House, Palace-court, Bayswater, planned and designed by Mr. Leonard Stokes, with a facade of stone and red brick in the Flemish manner. Of the Willesden Paddocks, a freehold of 165 acres, at Dollis Hill, we may mention that they formed the last resting place for cattle when driven from the north to the market at West Smithfield; and of Ivy House, North End, Hampstead, that it was the house of the late Sir Cockerell, R.A., who modelled the frieze, in the library, from the reliefs, discovered in 1812, of the frieze of the Temple of Apollo.

GAS LIGHTING AT THE NEW VICTORIA STATION.—The new Victoria Station, when complete, will be lighted by 2,000 lamps, varying from 175 to 1,000 candle-power, and giving a total light of about 140,000 candle-power. Gas is supplied at a pressure of 50 in. from two Salco-Onslow compressors, each capable of delivering 5,500 cubic feet per hour, driven by gas engines, the plant being duplicated throughout, and the shafting so arranged that either engine can drive either or both compressors, in order to guard against the possibility of break-down. Two smaller compressors that can be run from the same shafting have been fixed for use when only a small number of lights are in use. The compressors are supplied through two 500-light dry meters (George Glover), inter-connected and by-passed, which are fed by a 6 in. main. The platforms are lighted by Sugg's "Chertsey" pattern lamps of 350 candle-power, except in the case of those on either side of the carriage drive, which are lighted by lamps of 500 candle-power. The lamps are placed one between each pair of columns carrying the roof, so that there is no shadow. The platforms are divided into sections by the Eccleston and Elizabeth Bridges, under which they pass, back-lights being chiefly used for lighting the portions under the bridges. The lamps lighting each of the platform sections are controlled by two taps (especially devised for the purpose by the Gas Light and Coke Company) placed at the end of the section, one tap controlling Nos. 1, 3, 5, etc., lamps, and the other Nos. 2, 4, 6, etc.; so that every alternate lamp can be lighted or extinguished in series from the control point. To enable this to be done, dual services have been run, with a third independent service for the by-pass supply. A special cup-and-ball joint is used for connecting the down-rod of each lamp to one of the two main supplies and to the by-pass service, the one cup-and-ball serving for the two connexions. Each lamp is connected to the down-rod supplying it by a cup-and-ball, so that the effects of vibration on the mantles are reduced to a minimum. A special mercerial seal is fitted to each down-rod to

prevent air getting into the pipes when the gas is shut off at the "distant control" tap. The down-rod is also fitted with taps to enable any lamp to be removed without shutting off the supply to the platform generally. Each section of the by-pass services is fitted with a governor regulating the pressure to 2 in. The by-passes are completely extinguished by the action of lighting the lamps. The station yard beyond the platforms is lighted by four "Bellevue" lamps (each 1,000 candle-power) on welded steel columns, two 25 ft. and two 30 ft. high, the lamps being worked by "distant control" taps, similar to those used on the platforms, placed at the base of the columns, to avoid the necessity of climbing the ladder to light or extinguish the lamps. The signals, both ground and post, are lighted by flat-flame gas burners, supplied from the high-pressure services through double-governors, to save the expense of running special low-pressure supplies. The services for the ground signals and the column lights in the yard have been laid in pitch in wood troughing. The scheme for the lighting of the station, as submitted to and approved by Mr. Charles L. Morgan, Engineer to the railway company, was prepared by the Gas Light and Coke Company; the work of installation was accordingly entrusted to them, and is being carried out by their contractors—Messrs. Sugg & Company—under the direction of the company's chief inspector, Mr. F. W. Goodenough.

THE LATE GALLERY.—Mr. D. S. McCall has been appointed Director of the Tate Gallery.

THE SLATE TRADE.—The mineral statistics for 1905 show a falling off in output of roofing slates of 32,000 tons from open quarries, and 18,000 tons from mines (or underground quarries), together 50,000 tons, about 10 per cent. of the total output. This, with the great falling off in the imports of foreign slates, is bringing down the quarry stocks rapidly.

Legal.

ACTION BY BUILDING OWNER AGAINST BURIAL BOARD.

THE case of Godden v. the Hythe Burial Board came before the Court of Appeal, consisting of Lord Justice Vaughan Williams, Koster, and Moulton, on the 12th inst., on the defendants' appeal from a decision of Mr. Justice Kekewich in the Chancery Division.

The short facts of the case were as follows:—The defendant Board in 1905 found it necessary to provide a new burial-ground, and had chosen a site, called a Vestry Meeting in April of that year, when a resolution was passed, authorising defendants to acquire the land in question, subject to their obtaining the consent of the adjoining owners, if necessary. At this time there was only one house within 100 yds. of the proposed site, and the owner and occupier of such house consented in writing to the use of the land as a burial-ground. The plaintiff owned 7½ acres of land adjoining the proposed new burial-ground, which he meant to develop for building purposes, and in April, 1905, he commenced to build two dwelling-houses on his land, and when the defendants completed their purchase of the land the walls of the plaintiff's houses were some 5 ft., or 6 ft., in height. On April 27, 1905, defendants carried out a burial within 80 yds. of the site of the plaintiff's house and between April and August they caused three other burials to take place, but all of these were outside the 100 yds. limit. In October, 1905, the plaintiff commenced to build two more dwelling-houses, which had been completed. In March last the defendants caused another burial to take place, within about 80 yds. of the first two dwelling-houses erected by the plaintiff. Plaintiff then commenced proceedings to restrain defendants from using any part of their new burial-ground for any burial within a distance of 100 yds. from the plaintiff's houses, in alleged contravention of sect. 9 of the Burial Act, 1855, which provides that no ground not already used as or appropriated for a cemetery shall be used for burials within the distance of 100 yds. from any dwelling-house without the consent of the owner and occupier. The case put forward by the defendants was that, as the ground had been used by them before the erection of any dwelling-house by the plaintiff, the latter could not now complain. Mr. Justice Kekewich, however, held that the plaintiff was entitled to an interim injunction in the terms of the notice of motion, he seeing no reason why the plaintiff should not be protected because he had not a dwelling-house at the date of the acquisition of the cemetery. Hence the present appeal of the defendants.

At the conclusion of the arguments of counsel, the lordship dismissed the appeal with costs, holding that the construction put by Mr. Justice Kekewich on sect. 9 of the Act of 1855 was the correct one.

Mr. Cripps, K.C., Mr. P. O. Lawrence, K.C., and Mr. Gatey appeared for the appellants; and Mr. Levitt, K.C., and Mr. P. Wheeler for the respondent.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xvi.; Auction Sales, xxviii. Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

Contracts.

BUILDING.

JUNE 15.—Gulval.—WORK AT SCHOOL.—Cornwall Education Committee invite tenders for work at Gulval, Trythall Council school, including the erection of lavatory, etc. Plans, etc., at the school, or at the office of Mr. Sampson Hill, Architect to the Committee, Green-lane, Redruth. Forms may be had from the architect, or at the school. Sealed endorsed tenders to be sent to Mr. F. R. Pascoe, Secretary, Education Office, Truro, signed, on or before June 16.

JUNE 16.—Kehelland.—SCHOOL-HOUSE.—The Cornwall Education Committee invite tenders for additions to master's house, Kehelland Council school. Plans, etc., may be seen at the school, or at the office of Mr. Sampson Hill, Architect to the Committee, Green-lane, Redruth. Forms may be had from the architect, or at the school. Sealed endorsed tenders to be sent to Mr. F. R. Pascoe, Secretary, Education Office, Truro, on or before June 16.

JUNE 16.—Pannal.—RESIDENCE.—The separate trades required for the erection of a villa residence at Pannal, for Mr. G. E. Dixon. Tenders to be lodged not later than noon, June 16. Mr. John E. Stocks, architect, Greek-street-chambers, Park-row, Leeds.

JUNE 16.26.—Wakefield.—ASYLUM BUILDINGS.—The Committee of the Stortches Hall Asylum invite tenders for the erection of the second portion of the main institution. Plans may be seen, and bills of quantities obtained, on application to the offices of the County Architect, Mr. J. Vickers-Edwards, County Hall, Wakefield, from June 12 to June 16. A deposit of 3l. 3s. is required. Cheques, etc., to be made payable to and forwarded to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be delivered at the offices of the County Architect not later than 9 o'clock a.m. on June 26.

JUNE 18.—Almondsbury.—HOUSES.—The erection of three dwelling-houses, at Duntirk, Almondsbury. Plans may be seen, and bills of quantities obtained, at offices of Mr. J. Berry, architect and surveyor, 3, Market-place, Huddersfield. Tenders, free of charge, to be forwarded to Mr. J. T. Prentiss, Baxton-road, Huddersfield, not later than 3 p.m. on June 18.

JUNE 18.—Alverstoke.—SHED.—Alverstoke Guardians invite tenders for pulling down and rebuilding a small shed, etc., at the Workhouse, Park-road, Alverstoke. Plan and specification may be inspected, and further particulars obtained, at the office of Mr. H. A. F. Smith, architect, Star-chambers, Gosport. Sealed tenders, marked "Shed," to be sent to Mr. F. B. Bulmer, Clerk to the Guardians, Guardians' Offices, High-street, Gosport, by noon on June 19.

JUNE 18.—Woodbridge.—MASONIC HALL.—A Masonic hall, New-street, Woodbridge. Plans and specification at office of Mr. Henry J. Wright, architect and surveyor, 4, Museum-street, Ipswich, between the hours of 10 a.m. and 5 p.m., Saturday 10 to 1, when quantities can be obtained upon the deposit of a cheque for 2l. 2s. Tenders, sealed and endorsed, to be delivered to Mr. George Booth, inn, Church-street, Woodbridge, not later than 5 o'clock p.m. on June 18.

JUNE 19.—Egg Buckland.—CHAPEL.—Plymouth Corporation invite tenders for the erection and completion of a chapel at the New Cemetery, Egg Buckland, in accordance with the plans, drawings, and specifications, which can be seen, and forms of tender and bills of quantities obtained, on receipt of a deposit of 2l. in cash. Sealed tenders, accompanied by the fully priced out-bills of quantities, are to be deposited at offices of Mr. James Paton, Borough Engineer and Surveyor, Municipal Offices, Plymouth, not later than 5 p.m. on June 19.

JUNE 19.—Penrynhol.—HOUSES.—Nineteen dwelling-houses at Penrynhol, for the trustees of the Penrynhol Building Club. Plans and specifications may be seen at the Works Inn, Penrynhol, near Caerphilly. Tenders to be sent to the Secretary, Mr. E. Brisson, auctioneer, 29, Cardiff-road, Caerphilly, on or before June 19. Mr. G. L. Walkins, architect, Rectory-road, Caerphilly.

JUNE 20.—Abergavenny.—ALTERATIONS TO SCHOOLS.—The Managers of the Abergavenny Group of Council schools invite tenders for additions and alterations to the Park-street and 1st Victoria-street Council schools, Abergavenny. Plans and specifications may be inspected at the office of Mr. F. Baker Gabb, Clerk to the Managers, to whom separate tenders are to be sent, endorsed, "Tender for Park-street Additions" and "Tender for Victoria-street Additions" respectively on or before June 20.

JUNE 20.—Clontarf.—CHURCH.—Rebuilding of the new Methodist church and schools, Clontarf, according to the drawings and specifications prepared by Messrs. W. M. Mitchell & Sons, architects, 10, St. Stephen's-green, Dublin, N., where they can be seen. Bills of quantities can be obtained from the surveyors, Messrs. Mumby & O'Rourke, 15, College-

green, on payment of a deposit of 2l. 2s. Tenders to be sent in to the architects on or before June 20.

JUNE 20.—Dublin.—COLLEGE BROCK.—Now, centre block and other work in connection with the Dominican College, Eccles-street. Bills of quantities may be obtained from Messrs. Mumby and O'Rourke, surveyors, 15, College-green, on lodgment of 2s. Tenders, marked "Dominican College," to be received at office of Mr. J. P. Wrenn, M.R.I.A.I., architect, 189, Great Brunswick-street, Dublin, not later than June 20.

JUNE 20.—Lymington.—WORKS TO HOUSE.—The Lym U.D.C. invite tenders for an additional building to the gas manager's house. Specification and plan may be seen by appointment on application to the Gas Manager, Mr. W. L. Donahoe, Gasworks, Lymington, from whom all particulars may be obtained. Sealed tenders to be delivered not later than June 20, addressed to Mr. W. Mullard, Clerk to the Council, Gas Offices, Lymington, and endorsed "Tender for Building."

JUNE 20.—New Fryston.—SIGNAL CABIN.—The Directors of the North-Eastern Railway Company invite tenders for the erection of a signal cabin at Fryston South, situate near New Fryston village, midway between Castleford and Burton Salmon. Plans, specification, quantities, and indenture may be seen at the office of the Company's Engineer, Mr. W. J. Cadworth, at offices, Lymington, and form of tender may be obtained on personal application. Sealed tenders, marked "Tender for Signal Cabin at Fryston South," to be sent to the Engineer, Mr. W. J. Cadworth, at York, not later than June 20.

JUNE 21.—Ashburton.—SCHOOL ALTERATIONS.—Devon County Education Authority (Education Committee) invite tenders for alterations and additions to the Ashburton Council school. Bills of quantities and forms of tender can be obtained in due course upon payment of 1l. 1s. Applications must be sent to the architect, 1, Richmond-road, Exeter, not later than June 21.

JUNE 21.—Barry.—CHURCH.—Building a new church at Barry for the Rev. H. H. Stewart. The plans and specification can be seen, and quantities obtained, at office of Mr. E. M. Bruce Vaughan, F.R.I.B.A., 21, Dumfries-place, Cardiff. A deposit of 2l. 2s. must be made. The tenders are to be sent to architect, not later than June 21.

JUNE 21.—Caerphilly.—COTTAGES.—The erection of forty cottages at Caerphilly for the Castle Building Co. Plans and specification can be seen at offices of Messrs. A. O. Evans, William & Evans, architects, Pontypridd. Sealed, endorsed tenders to reach architects on or before June 21.

JUNE 21.—Carnarvon.—SCHOOLROOM.—The erection of new schoolroom, etc., attached to Engedi C.M. Church, Carnarvon. Plans and specification may be seen at office of Mr. Rowland Lloyd Jones, architect, Carnarvon, and Pwllheli. Sealed tenders, endorsed "Tender for New Schoolroom," to be sent to Mr. J. T. Jones, Breidden, Llanwrthwl, Carnarvon, not later than 6 p.m., June 21.

JUNE 21.—Darlington.—SCHOOL.—Darlington Education Authority invite tenders for the erection of a manual instruction school at Corporation-road; also, for alterations and additions to the Gurney Pease schools, Albert Hill. Plans and specification may be seen, and bill of quantities and form of tender obtained at the office of Mr. George Winter, Borough Surveyor and Waterworks Engineer, Town Hall, on depositing a cheque for 2l. 2s. Tenders, endorsed "Schools," must be sent to Mr. Hy. G. Stevenson, Town Clerk, not later than noon on June 21.

JUNE 21.—Port Tennant, Swansea.—CHURCH.—Building a new church at Port Tennant, Swansea, for the Rev. W. Evans. Plans and specification can be seen, and quantities obtained, at office of Mr. E. M. Bruce Vaughan, F.R.I.B.A., 21, Dumfries-place, Cardiff. A deposit of 2l. 2s. must be made. The tenders are to be sent to architect not later than June 21.

JUNE 21.—Shipley.—VICARAGE HOUSE.—Various works required in the erection of a vicarage house for the parish of St. Paul, Shipley. Plans may be seen, and bills of quantities obtained, at offices of Messrs. T. H. & F. Healey, architects, 42, Tyrryl-street, Bradford, from June 14 to June 21, on which latter day tenders are to be delivered.

JUNE 21.—Trelawny.—SCHOOL WORKS.—Rhonda U.D.C. invite tenders for the alteration and conversion of the old Trelawny schools into a school for girls and infants. Plans and specification may be seen, and bills of quantities obtained, at the office of the Architect, Mr. Jacob Rees, Hillside Cottage, Pentre, on deposit of 2l. 2s. Tenders must be made out upon the form of the Council, a copy of which may be had from the architect. Sealed tenders, endorsed "Tender for Trelawny Schools," accompanied by the priced quantities, must reach Mr. T. W. Berry, Director of Education, Council Offices, Pentre, Rhonda, not later than June 21.

JUNE 22.—Belfast.—SCHOOLS.—The Committee of Parkgate Presbyterian Church invite tenders for the erection of stable buildings. Plans and specifications can be seen at the office of Messrs. Parkgate and civil engineers, Scottish Provident-buildings, Belfast. Sealed tenders, addressed to the Rev. W. J. M. Kinney, A.M., to be lodged with architects on or before June 22.

JUNE 22.—Longwood.—DWELLING-HOUSES.—Erection of four dwelling-houses, at Lovergate, Longwood. Plans may be seen, and quantities obtained, at offices of Messrs. Lunn & Kay, architects and Surveyors, Millsbridge and Huddersfield, from June 14 to June 22, on which latter date sealed and endorsed tenders must be delivered at Millsbridge not later than 5.30 p.m., free of charge.

JUNE 22.—Salsbury.—OPERATION WARD.—Alterations to the operation ward of the infirmary, the plans and specifications of which can be seen at the offices of the architects, Messrs. John Harding & Son, 38, High-street, Salisbury. Tenders to be delivered to Mr. S. Buchanan Smith, Secretary, Crown-chambers, Salisbury, before 4 p.m. on June 22.

JUNE 22.—Yelverton.—CHAPEL.—New Bible Christian Chapel at Yelverton, Devon. Plans and specification may be seen with Mr. W. W. Hooper, Heathfield, Yelverton, and at the offices of the architect, Mr. W. J. Rees, 3, Dumfries-place, Cardiff, from whom bills of quantities may be obtained. Tenders to be sent to Mr. Hooper on or before June 22.

JUNE 23.—Birkenhead.—POST-MORTEM ROOM.—The Corporation of Birkenhead invite tenders for the erection and completion of a post-mortem room, Livingstone-street. Plans, specification, and particulars can be seen, and bills of quantities and form of tender obtained on application at the office of Mr. Charles Brownridge, M.Inst.C.E., Borough Engineer and Surveyor, upon a deposit of the sum of 10s. Tenders, upon the printed form supplied, sealed, and endorsed "Tender for Post-mortem Room," to be sent in to Mr. Alfred Gill, Town Clerk, Town Hall, Birkenhead, not later than 12 o'clock noon on June 23.

JUNE 23.—Good Easter.—COTTAGES.—A pair of labourers' cottages at Good Easter, Essex. Plans and specification can be seen at office of Mr. Frank Whitmore, architect and surveyor, 73, Duke-street, Chelmsford. Tenders to be delivered to architect, not later than 10 a.m., June 23, endorsed "Tender for Cottages at Good Easter."

JUNE 25.—Barnsley.—SCHOOLS.—Barnsley Education Committee invite tenders in the whole or separate trades for the erection of three elementary schools, to accommodate 360, 300, and 350 scholars respectively, on a site in Racecommon-road, Barnsley. Applications, together with a deposit of 2l. 2s., to be made to architect, Mr. Ernest W. Dyson, 14, Market-hill, Barnsley, not later than Monday, June 25.

JUNE 25.—Llanbadach.—HOUSES.—Thirty-one houses at Llanbadach for the Llanbadach Building Club. Plans and specification can be seen at office of Mr. John H. Phillips, F.R.I.B.A., architect, "Five-chambers, Windsor-place, Cardiff," and sealed tenders are to be delivered on June 25.

JUNE 25.—Redruth.—HOSPITAL AMPLIATIONS.—The Committee of the West Cornwall Miners' and Women's Hospital invite tenders for the erection and completion of proposed building, comprising an operating theatre, with adjoining rooms and corridors, according to plans and specifications, which may be seen by appointment at the office of Mr. Sampson Hill, architect, Green-lane, Redruth. Sealed tenders, endorsed "Hospital Operating Theatre," to be sent to Mr. C. Tweedy, Hon. Secretary, Capital and Counties Bank, Redruth, not later than 10 o'clock on June 25.

JUNE 25.—Tylorstown.—CONVERTING PREMISES INTO SHOPS.—Extending and converting premises in Tylorstown into two shops for Mr. A. I. Lobbe, outfitter, Fast-road, Tylorstown. Plans and specification can be seen at offices of Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd. Sealed, endorsed tenders to be sent to Mr. Lobbe on or before June 25.

JUNE 25.—Usworth.—CHAPEL EXTENSION.—Extensions to High Usworth Wesleyan Chapel, and for decoration of the interior. Plans and specifications at the office of the architect, Mr. J. Walton Taylor, F.R.I.B.A., 81, John-street, Newcastle. Sealed tenders, properly endorsed, are to be delivered to Rev. Theodore Rishon, 31, Regent-terrace, Gateshead, not later than 10 o'clock, June 25.

JUNE 26.—Aber-Bargoed.—HOUSES.—Erection of thirty houses at Aber-Bargoed for the Ty-Fry Building Club. Plans, specification, and form of contract can be seen, and form of tender obtained at the office of Mr. D. J. Thomas, architect, High-street, Blackwood, Mon.; or at the Ivy Bush Hotel, Pengam, not later than 12 o'clock noon on June 26.

JUNE 26.—Kelly Bray.—SHOP AND HOUSE.—For the erection of a shop and dwelling-house at Kelly Bray, for Mrs. Wearing. Plans, specification, etc., may be seen at the office of Mr. Lawrence Scudlery, architect and surveyor, Callington. Tenders to be delivered at the architect's office on or before June 26.

JUNE 26.—Stanleytown.—HOUSES.—For the erection of three houses and vestry at Stanleytown, Rhonda Valley, for the trustees of the Welsh Calvinistic Methodist Chapel, Pontygwaith. Plans and specification may be seen with Mr. William Williams, grocer, Cash Stores, Pontygwaith, to whom

sealed and endorsed tenders are to be delivered before 5 p.m. of June 26. Mr. W. D. Morgan, architect, Victoria-street, London, E.C. 1.

* **JUNE 25.—Wrexham.**—**EMBALEMENT OF POST OFFICE.**—Tenders are invited for the enlargement of the head post office at Wrexham. Drawings, specification, copy of conditions, and form of contract, to be sent on application to the Postmaster, between 10 a.m. and 5 p.m. Bills of quantities and forms of contract may be obtained, on deposit of 1l. 1s. at the undermentioned address. Tenders, endorsed "Tenders for Enlargement of Head Post Office, Wrexham," to be delivered to the Secretary, H.M. Office of Works, Storey's-gate, S.W., before 12 noon, June 26.

* **JUNE 25.—Port Talbot.**—**HOUSES.**—The Port Talbot Building Club invite tenders for the erection of thirty-five houses at Port Talbot. Plans and specifications may be seen at offices of Mr. R. O. Clarke, C.E., Station-street, Port Talbot. Sealed tenders are to be addressed to Chairman of the Club, Grand Hotel, Port Talbot, not later than June 27.

* **JUNE 25.—Cardiff.**—**FOG SIGNAL HOUSE.**—The Trinity House Corporation invite tenders for the erection of a fog signal house, dwelling, etc., on Flathead Island. The plans may be inspected at the offices of Messrs. Gifford & Trinity House, E.C., or on application to the Officer-in-Charge, Trinity Store, Cardiff. Applicants, when receiving a form of tender and bills of quantities and specifications, must deposit 1l. 1s. in the hands of Messrs. Corderoy, Selby, & Corderoy, 21, Queen Anne's-gate, S.W., they may obtain the drawings and quantities at Messrs. Gifford & Trinity House, E.C. Signal House, etc., Flathead, to Mr. A. Owen, Secretary, Trinity House, E.C., on or before June 28.

* **JUNE 25.**—**REGISTRY FOR SHIPPING AND SEAMEN.**—Tenders are invited for the registry of shipping and seamen—adaptation for the Commissioners H.M. Office of Works, Storey's-gate, S.W., copy of conditions, and form of contract, may be seen on application to Mr. J. B. Westcott, M.V.O., at the Office of Works, Storey's-gate, S.W., or at the offices of Messrs. Gifford & Trinity House, E.C., Oxford-chambers, Kidderminster, on payment of 1l. 1s. Tenders, sealed and endorsed, "Registry for Shipping and Seamen—Adaptation," to be delivered to the Secretary, H.M. Office of Works, Storey's-gate, S.W., before 12 o'clock noon, June 28.

* **JUNE 25.—Highley.**—**SCHOOL.**—Additions.—School C.C. Elementary Education Authority invite tenders for the erection of certain additions at Highley Council school. Plans and specifications may be seen, and bills of quantities and forms of contract, obtained at the offices of Messrs. Gifford & Trinity House, E.C., Oxford-chambers, Kidderminster, on payment of 1l. 1s. Tenders, sealed and endorsed, "Highley School, School," to be delivered to the Secretary, H.M. Office of Works, Storey's-gate, S.W., not later than 12 o'clock noon on June 29.

* **JUNE 30.—Barnmouth.**—**POLICE STATION.**—McGee & Co. Standing Joint Police Committee invite tenders for the erection of a public elementary school at Barnmouth. Plans and specifications and further particulars to be obtained from Mr. E. Vaughan, C.E., County Surveyor, Arthog, Denbighshire. Tenders, sealed and endorsed "Police Station," to be sent to the Chief Constable's Office, Dolobellay, on or before June 30.

* **JUNE 30.—Cooksbridge.**—**SCHOOL.**—East Sussex Local Education Authority invite tenders for the erection of a public elementary school at Cooksbridge, Hammersley. Plans, specifications, and conditions of contract may be seen, and bills of quantities and forms of contract, obtained at the offices of Messrs. Gifford & Trinity House, E.C., Oxford-chambers, Kidderminster, on payment of 1l. 1s. Tenders, sealed and endorsed, "Cooksbridge School," to be delivered to the Secretary, H.M. Office of Works, Storey's-gate, S.W., before 12 o'clock noon on June 30.

* **JUNE 30.—Preston.**—**SCHOOL.**—Preston Corporation invite tenders for the erection of a secondary school for girls in Moor Park-avenue, Preston. Plans and specifications and bills of quantities and forms of contract may be seen, and bills of quantities and forms of contract, obtained at the offices of Messrs. Gifford & Trinity House, E.C., Oxford-chambers, Kidderminster, on payment of 1l. 1s. Tenders, sealed and endorsed "Tender for New School," to be addressed and delivered to the Secretary, at the office of Mr. Hall, Lanes, not later than 12 o'clock noon on June 30.

* **JUNE 30.—Luton.**—**SCHOOL.**—Tenders are invited for the erection of new secondary school at Luton for the Bedfordshire C.C. Drawings, specifications, and form of contract may be inspected at Messrs. Spaulding and Spaulding, architects, 15, Queen-street, Chislehurst, E.C., between 11 a.m. and 4 p.m., except Saturday and Sunday. Names and addresses to be sent to the architects, as above, on or before June 19, with a deposit of 1l. 1s. Tenders, addressed to Mr. W. W. Marks, Shire Hall, Bedford, and endorsed "Tender for New Secondary School," to be delivered before 5 o'clock on June 27.

* **JUNE 30.—Cardiff.**—**OFFICES, ETC.**—Tenders are invited for the erection of new offices, stores, etc., at the headquarters of the Cardiff and Vale Great Eastern Railway. Plans and specifications may be seen, and forms of tender and bills of quantities obtained of the engineer, Newport, or at Messrs. Gifford & Trinity House, E.C., Oxford-chambers, Kidderminster, on payment of 1l. 1s. Tenders for Cardiff, to be delivered to Mr. G. G. Mills, Paddington Station, on or before July 3.

* **JUNE 4.—Paddington.**—**REVENUE WARFS, ETC.**—The Guardians of the Board of Paddington invite tenders for receiving wards and porter's lodge at their workhouse in the Woodfield-road, W., pursuant to plans and specification new work at the offices of Mr. W. F. Marks, Shire Hall, Bedford, and at Victoria-street, S.W., between 10 a.m. and 5 p.m. Warrington, on or before July 4. Also for the erection of a new workhouse at Victoria-street, S.W., between 10 a.m. and 5 p.m. Warrington, on or before July 4. Also for the erection of a new workhouse at Victoria-street, S.W., between 10 a.m. and 5 p.m. Warrington, on or before July 4. Also for the erection of a new workhouse at Victoria-street, S.W., between 10 a.m. and 5 p.m. Warrington, on or before July 4. Also for the erection of a new workhouse at Victoria-street, S.W., between 10 a.m. and 5 p.m. Warrington, on or before July 4.

* **Borough of Croydon Education Committee** invite tenders for the erection of a school for 1,200 children

in Davidson-road, Croydon. In accordance with drawings prepared by Mr. H. Carter Pezga, Architect, Thornton Heath. Bills of quantities and forms of contract can be obtained at the Education Office, Katharine-street, Croydon, on payment of 1l. 1s. Applications should reach the Clerk to the Committee not later than June 20, and tenders must be delivered before noon, July 10.

* **NO. 10.—CARDIFF.**—**POST-OFFICE BUILDING.**—For the following works for Messrs. Wm. Hancock & Co. Ltd., brewers and wine merchants, Newport and Cardiff: (1) Pulling down and rebuilding the new building of the Prince of Wales Inn, at Pontypridd; (2) alterations and repairs to the Three Saffrons Inn, at Pontypridd; (3) repairs to Green Dragon Hotel, at Chepstow. Plans and specifications may be seen, and bills of quantities obtained, at the offices of Messrs. Sawdell & Hayward, architects and surveyors, Steam Packet-chambers, Dock-street, Newport, Mon., or on after June 15.

* **NO DATE.—CARDIFF.**—**KITCHEN, ETC.—SUNDAY WORKS.**—Including new drainage scheme and rebuilding of kitchen, offices, etc., at Mr. Nutcher's, Holywood-road, Cardiff. For particulars apply to Messrs. Gifford & Trinity House, E.C., Oxford-chambers, Kidderminster, on payment of 1l. 1s.

* **NO DATE.—HORBY.**—**HOUSES.**—Erection of thirty-eight houses and shop at Horbury, near Doncaster. Plans and specifications may be seen at Messrs. Gifford & Trinity House, E.C., Oxford-chambers, Kidderminster, on payment of 1l. 1s.

* **NO DATE.—LEADS.**—**ALTERATIONS TO PREMISES.**—The separate trades in connexion with the alteration of existing premises into houses and shops, and the erection of three new houses and shops, and three lock-up shops at Beeston-road, Leeds. For particulars apply to Messrs. Gifford & Trinity House, E.C., Oxford-chambers, Kidderminster, on payment of 1l. 1s.

* **NO DATE.—NEWCASTLE-ON-TYNE.**—**WAREHOUSE.**—For the erection of warehouse for Messrs. Gifford & Trinity House, E.C., Oxford-chambers, Kidderminster, on payment of 1l. 1s.

* **NO DATE.—PAINTON.**—**HOUSE.**—Erection of a house at Painton, near Doncaster. Plans and specifications may be seen at Messrs. Gifford & Trinity House, E.C., Oxford-chambers, Kidderminster, on payment of 1l. 1s.

* **NO DATE.—SOUTH HETTON.**—**FLATS.**—Two flats. Plans and specifications may be seen at Screeno's Arms, South Hetton.

* **NO DATE.—YORK.**—**NEW FACTORY.**—Tenders are invited for the erection of a new factory about 250 ft. by 80 ft. by 20 ft., together with corridor and bridge, floors, foundations, staircases, and staircase, and reinforcement concrete, for Messrs. Kountze & Co., Ltd., 10, Abchurch-lane, London, E.C. 4. Bills of quantities and forms of tender obtained, at the architect's office, The Cocoa Works, York, on deposit of 3l. 5s.

ENGINEERING, IRON, AND STEEL.

* **JUNE 18.—Belfast.**—**PORTABLE RAILWAY.**—Belfast Railway and Castlereagh Joint Board invite tenders for the supply and delivery of about 2,500 lin. yds. of new or secondhand portable railway, with sidings, turnouts, and six tip waggon. Form of tender and specifications may be obtained on application to the City Surveyor, Town Hall, Belfast. Tenders, endorsed "Portable Railway," to be lodged with Mr. R. Meyer, Clerk to the Board, Town Hall, Belfast, not later than 12 noon on June 18.

* **JUNE 18.—Chorley.**—**CLINKER ELEVATOR.**—Chorley Corporation invite tenders for supply of a clinker elevator and rotary screen, with all requisite destructor works, according to plan and specification, which may be seen, and any further information obtained, on application to Mr. W. Cunliffe, Nuisance Inspector, Back-street, Chorley. Tenders, endorsed "Elevator," to be sent to Mr. Jno. Mills, Town Clerk, Town Hall, Chorley, before noon on June 18.

* **JUNE 18.—Glasgow.**—**RENEWAL OF UNDERBRIDGES.**—The Directors of the Caledonian Railway Company invite tenders for the works to be executed in the construction and renewal of the underbrides of 19 miles 34 chains, 34 miles 45 chains, 38 miles 30 chains, 42 miles 50 chains, 52 miles 67 chains, and 62 miles 10 chains, and 68 chains north of Carlisle on main line. Drawings may be seen at the office of the Company's District Engineer, Princes-street, Edinburgh, where copies of the specification and schedule may be obtained on payment of 2l. 2s. Sealed tenders, endorsed "Tender for Steel Work Required in the Renewal of Underbrides," on the Southern and Eastern District," to be lodged with Mr. J. Blackburn, Secretary, Caledonian Railway Company's Office, 302, Buchanan-street, Glasgow, on or before June 18.

* **JUNE 18.—Salterhebble.**—**CONCRETE AND STEEL COVERING.**—Hallifax Improvement Committee invite tenders for the construction of a concrete and steel covering to a conduit at Salterhebble. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. James Lord, Municipal Engineer, Borough Engineer, Town Hall, Halifax. Tenders, endorsed "Covering Conduit," must be sent to Mr. Keightley Walton, Town Clerk, on or before June 18.

* **JUNE 18.—Warrington.**—**CAS-TIRON TANK.**—The Electricity Committee invite tenders for the supply and delivery of various piping. Specification, and form of tender, may be obtained from the Electrical Engineer, Warrington, on payment of a deposit of 2l. 2s. Tenders to be sent in, addressed "The Electricity Committee, Stoke-upon-Trent," not later than June 18.

* **JUNE 18.—Warrington.**—**CAS-TIRON TANK.**—Warrington Sanitary Works Committee invite tenders for the supply of a circular cast-iron tank, 7 ft. diameter, 10 ft. long, on payment of 1l. 1s. Tenders, in securely fastened envelopes, endorsed "Tender for Cast-iron Tank," and addressed "The Chairman, Sanitary Works Committee, Town Hall, Warrington," to be delivered not later than June 18.

* **JUNE 18.—Dublin.**—**TIDAL FLAP VALVES.**—Dublin Improvements Committee invite tenders for the supply, delivery, and erection of tidal flap valves in the City of Dublin. The drawings, specifications, and form of tender may be inspected at the office

of the City Engineer, City Hall, Dublin; and at the office of the Consulting Engineer, Mr. George Chatterton, 1, Inst.C.E., 6, The Sanctuary, Westminster, between the hours of 10 a.m. and 5 p.m., daily. Saturdays excepted, on payment of a sum of 2s. (crossed cheques only will be received in payment). Tenders, sealed, and endorsed on the envelope "Tender for Tidal Flap Valves, County Dub.," must be addressed to the Chairman of the Improvements Committee, City Hall, Dublin, and delivered in this office before 12 o'clock noon on June 19. Each tender must be submitted the names of two sureties who will be prepared to execute a joint and several bond for the due performance of the contract, in a sum of one-fifth of the contract price.

* **JUNE 15.—London.**—**DARK SPACES, ETC.**—The Secretary of State for India in Council is prepared to receive tenders from such persons as may be willing to supply (1) 150 ft. deck spans, (2) bearing plates, (3) spikes. The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office by 2 o'clock p.m. on June 19.

* **JUNE 19.—Manchester.**—**TROLLEY WIRES.**—Manchester Tramways Committee invite tenders for the supply of hard-drawn copper trolley wires. Specifications and forms of tender may be obtained on application to Mr. J. M. Kroy, General Manager, Warrington Department, 55, Piccadilly, Manchester. Tenders are to be addressed to the Chairman of the Tramways Committee, 55, Piccadilly, Manchester, endorsed "Tender for Trolley Wires," and must be received not later than 10 a.m. on June 19.

* **JUNE 19.—Ripon.**—**GAS HOLDER.**—Ripon Gas Committee invite tenders for the reconstruction of a gas-holder gas holder. Drawings and specifications and all particulars can be obtained on application to the Engineer and Manager, at his offices, Gas-works, Ripon. Tenders to be sent to Mr. M. Kirkley, Town Clerk, Town Hall, Ripon, on or before June 19.

* **JUNE 19.—Wellingborough.**—**GAS ENGINE.**—Wellingborough U.D.C. invite tenders for the provision, delivery, and installation of a gas engine, with pumping station at Hildrick, near Wellingborough, of a gas engine and suction gas plant for driving two existing vertical tribo-ran pumps capable of delivering 10,000 gallons per hour against a head of 140 ft. Particulars and plans can be obtained, and specifications seen, on application to the Council's Surveyor and Water Engineer, Mr. Percy C. Dormer, A.M.Inst.C.E., at his office in Park-road, Wellingborough, on payment of 2l. 2s. Tenders, sealed, and endorsed "Tender for Machinery," must be delivered at the office of Mr. J. T. Barker, Clerk of the Council, 29, Church-street, Wellingborough, by 12 o'clock noon on June 19.

* **JUNE 19.—Willesborough.**—**BRIDGE.**—Kent C.C. invite tenders for reconstruction of Willesborough Bridge, near Ashford. Plan and specification can be seen, and bills of quantities and tender forms obtained, between the hours of 10 a.m. and 5 p.m., on deposit of 2l. Sealed tenders, endorsed "Willesborough Bridge," are to be delivered to Mr. E. W. Rickett, County Architect, Maidstone, not later than 5 p.m. on June 19.

* **JUNE 20.—Brynaman.**—**ELECTRIC STREET LIGHTING.**—Brynaman and District Electric Supply Company Ltd. invite tenders for electric street lighting extensions, etc., from Brynaman to Gwaenysgerbyr and Cwmgwrsg. Plans may be seen at the office of the Chairman, Mr. W. J. Williams, Annarwyn House, Brynaman. Specifications and forms of tender may be had from the Secretary, Mr. Evan W. Evans, Cwmgwrsg-road, Brynaman; or from the Chairman, as above, on payment of a deposit of 1l. 1s. Sealed tenders, endorsed "Lighting Extension," to be in the hands of Mr. Evan W. Evans, Secretary, Cwmgwrsg-road, Upper Brynaman, R.S.O., on or before June 20.

* **JUNE 20.—Chorley.**—**PIPES.**—Chorley Corporation invite tenders for the supply and delivery, at the Chorley Railway Station, of 1,500 yds. of 4-in. diameter, and 250 yds. of 6-in. diameter, cast-iron main pipes. Specification and form of tender can be obtained from Mr. J. W. Allitt, Gas Engineer, Chorley. Tenders, endorsed "Cast-iron Pipes," to be sent to Mr. Jno. Mills, Town Clerk, Town Hall, Chorley, not later than noon on June 20.

* **JUNE 21.—Llwynypïa.**—**BRIDGE.**—Rhondda U.D.C. invite tenders for the construction of a bridge to carry a proposed new road over the Rhondda Park River at Llwynypïa. The clear span of the bridge will be 52 ft., width of roadway 40 ft., height above water level 37 ft. The work will be let on two separate contracts. Contract for excavation, concrete, and masonry. Plans may be inspected on application at offices of Mr. W. J. Jones, Engineer and Surveyor, Public Offices, Pentre, Rhondda, and quantities and form of tender obtained on payment of a deposit of 1l. 1s. Tenders, endorsed "Llwynypïa Bridge, Contract for Masonry, etc.," and addressed to the Chairman of the Council, must be delivered on or before June 21.

* **JUNE 25.—Chesham.**—**STANDPIPE.**—Chesham U.D.C. invite tenders for the erection of a 6-in. cast-iron standpipe complete, with foundations, valves, and fittings, adjoining their high-level reservoir at Hyvings Hill, within the limits of the Parish of Chesham. Plans, sections, and specification may be seen upon application to Mr. Percy C. Dormer, Waterworks Engineer and Surveyor, Public Offices, Chesham. Tenders, endorsed "Stand Pipe," to be delivered to Mr. Dormer on or before June 23 at 10 a.m.

* **JUNE 25.—Osselt.**—**STANDPIPE.**—Osselt Water Committee invite tenders for erection of standpipe 30 ft. high, 6-in. pipes, and meter, at their Service Reservoir, Chiswell-lane, Osselt. Specifications and quantities may be obtained on application to Mr. E. W. Rickett, County Architect, Maidstone, not later than 5 p.m. on June 19.

* **JUNE 26.—London.**—**CHAINS, SPRINGS, ETC.**—The Southern Railway Company, Ltd., are prepared to receive tenders for—(1) 200 tons of chains; (2) 9,736 spiral and volute springs; (3) 20 tons copper nuts, as per specifications and drawings, which may be seen at the office of the Company. The charge for each specification and drawing which will not be returned. Tenders must be sent

in addressed to the Secretary, marked "Tender for Safety Chains, or, as the case may be, not later than June 26. Mr. Edw. Z. Thornton, Secretary, 46, Queen Anne's-gate, S.W.

JUNE 25.—London.—PIPES.—The Metropolitan Water Board invite tenders for the supply and delivery of about 950 tons of 42 in. and other cast-iron pipes and castings. Forms of tender and contract, with specification, may be obtained, and the drawings inspected, upon application to the engineer, at the Firs, Southern-road, Fortis Green, East Finchley, N., between the hours of 10 and 4 (except on Saturdays). Tenders, enclosed in sealed envelopes, addressed to the Chief of the Board, Metropolitan Water Board, Savoy-court, Strand, W.C., and endorsed "Tender for Pipes and Castings—Staines Reservoirs Communication Works, Contract No. 25," must be delivered at the Offices of the Board not later than 10 a.m. on June 26.

JUNE 27.—Erdington.—OVERHEAD ELECTRICAL EQUIPMENT.—Edington U.D.C. Tramways Committee invite tenders for the electrical equipment, on the overhead trolley system, of tramway No. 1 in their district (2 miles 2 furlongs 9-30 chains route length), including poles and overhead line equipment. Contractors desiring to submit tenders for the work should forward their names and addresses to one or other of the joint engineers, Mr. Robert Green, of 37, Waterloo-street, Birmingham, and Mr. H. H. Humphries, Engineer to the Council, Council House, The Park, Erdington, together with a deposit of 5s. 5s. Sealed tenders, endorsed "Tramways Equipments," to be delivered to Mr. Herbert Green, H. Humphries, Engineer to the Council, Council House, Erdington, Birmingham, before noon on June 27.

JUNE 27.—Aylesbury.—BRIDGES.—Aylesbury U.D.C. invite tenders for the design and construction of 12 brick bridges and the construction of two new steel girder bridges (over the Grand Junction Canal and Mill Stream), retaining walls, and the kerbing, channelling, metalwork, etc., of the roadway between the two bridges. The drawings may be seen, and copies of the bill of quantities, specification, and form of tender obtained, on application to Mr. W. H. Taylor, Engineer and Surveyor to the Council, Town Hall, Aylesbury, on payment of 3s. 3s. Sealed tenders, which must be on the form supplied, and should be endorsed "Bridges, Bridges, and addresses," to Mr. Percy A. Wright, Clerk to the Council, Town Hall, Aylesbury, to be sent in not later than 4 p.m. on July 2.

JUNE 2.—Belfast.—MOTOR-CAR STATION.—Great Northern Railway Company (Ireland) Directors invite tenders for an extension of the motor-car shed at their Belfast terminus. Parties wishing to tender may see the drawings and specification at the office of Mr. W. H. Mills, Engineer-in-Chief, Amiens-street, Dublin, or copies of them at the office of the District Engineer, Belfast, and can obtain at the said offices lithographed copies of the drawing, specification, and form of tender on payment of 10s. (not returnable) per set. Tenders, made out on the forms supplied by the Company, and endorsed "Tender for Motor-car Shed," should be delivered to Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin, not later than 10 a.m. on July 2.

JUNE 2.—Epsom.—LONDONDOV WATER SUPPLY.—Epsom R.D.C. invite tenders for supplying about 244 yds. of 3 in. cast-iron water-pipes and the excavation of trenches, the carting and laying of the pipes, and the fixing of hydrants, etc. Specification of the works can be seen by appointment at the office of Mr. F. A. Pringle, the Surveyor to the Council, Waterloo-road, Epsom. Tenders, upon prescribed forms (to be obtained on application), must be delivered at office of Mr. W. O. Rander, Clerk to the Council, "Lonsdale," Epsom, not later than 6 o'clock p.m. of July 2, addressed to the Chairman of the Epsom U.D.C., "Lonsdale, Epsom."

JUNE 2.—Stirling.—BRIDGE.—The Directors of the Caledonian Railway Company invite tenders for the works to be executed in the removal of the existing bridge carrying the Company's main lines over the River Forth at Stirling, and in construction of a new bridge on the site thereof. The works comprise the construction of foundations, earth retaining walls, and of masonry, and the supply, delivery, and erection of about 500 tons of wrought steel-work. Drawings may be seen at the office of the Company's Engineer, Buchanan-street, Glasgow, where copies of the specification and schedule may be obtained on payment of 2s. An assistant engineer will attend at Stirling Station on June 16, at 10.45 a.m., to accompany contractors over and point out the site of the works. Sealed tenders, endorsed "Tender for Reconstruction of Bridge over River Forth at Stirling," to be lodged with Mr. J. Blackburn, Secretary, Caledonian Railway Company's Offices, 302, Buchanan-street, Glasgow, on or before July 2.

JUNE 2.—Weylesley.—BRIDGES.—The County Highways Committee of C. of Middlesex invite tenders for demolishing the old bridge (to foundation level) crossing the Grand Junction Canal at Weylesley, West Drayton, Middlesex, and for erecting a new structure of 40 ft. span in brick, stone, and steel in its place, in accordance with plans and specification, which may be seen at office of Mr. H. J. Wakelam, County Engineer, Middlesex Guildhall, Westminster, during office hours. Bills of quantities, with forms of tender, may also be obtained on payment of 5s. Tenders, endorsed "Colham Bridge, Weylesley," must be delivered in sealed envelopes to Sir Richard Nicholson, Middlesex Guildhall, Westminster, S.W., on or before July 2.

JUNE 4.—Buntingford.—WATERWORKS.—Buntingford U.D.C. invite tenders for the construction of new waterworks, including the providing and laying of cast-iron pipes, construction of reservoir and engine-house, and the provision of pumping machinery, at Buntingford. Drawings may be seen, and copies of the specification, bill of quantities, and form of tender obtained, at the office of the engineer, Mr. John Chadwick, F.R.S., Bletchley, Bucks, upon payment of a deposit of 3s. Sealed tenders, on the prescribed forms, endorsed "Tender for Waterworks," must be received at office of Mr. J. Hall, Buntingford, Clerk to the Council, the Board Chamber, Union Workhouse, not later than 12 o'clock noon on July 4.

JUNE 6.—Wallasey.—REFUSE DESTROYER.—The Wallasey U.D.C. invite tenders for an extension of

refuse destructor (not buildings), the specification of which, and further particulars, may be obtained on application to Mr. W. H. Travers, Engineer and Surveyor, Public Offices, Egremont, Cheshire. A charge of 3s. will be made. Tenders, enclosed in sealed envelopes, to be addressed to Mr. H. W. Cook, Clerk and Solicitor, Public Offices, Egremont, Cheshire, to be forwarded per post not later than July 6.

JUNE 9.—Egremont.—TENNANT-PALLANAY WATER SCHEME.—Tennant-Pallanay U.D.C. invite tenders for the laying and jointing of about 17,110 lin. yds. of 9-in., about 1,120 lin. yds. of 6-in., and about 3,850 lin. yds. of 4-in. British Brass Manufacturers' pipes, including haulage of pipes from various railway stations, together with the erection of a meter-house, and the provision of all necessary sluice, air, and other valves, washouts, meters, chambers, and incidental works, including the crossing of the tidal river Teign, about one-fourth of a mile in width. Plans may be seen, and copies of the general conditions, specification, bills of quantities, and form of tender obtained, on application at office of Mr. Chas. F. Gettings, engineer, Town Hall, Teignmouth, on the form supplied, addressed to Mr. A. Percival Dell, Clerk to the Council, Town Hall, Trignmouth, Devon, and endorsed "Tennant-Pallanay Water Scheme, Contract No. 2," not later than July 9.

JUNE 9.—New Zealand.—TUNNEL.—Alternative tenders will be received at the office of the High Commissioner for New Zealand, Westminster-buildings, 15, Victoria-street, London, S.W., for the construction of a tunnel, about 5 miles 25 chains in length, at Arthur's Pass, through the dividing range between Canterbury and Westland, on the route of the New Zealand Mainland Railway. Tenders are to be addressed to the High Commissioner for New Zealand, 15, Victoria-street, Westminster, S.W., and marked on the outside "Tender for Arthur's Pass Tunnel—5 miles 25 chains length." Tenders will be received up till noon of July 9. Specifications, conditions, tender forms, and other information may be obtained on application to the High Commissioner upon payment of a deposit of 10s.

NO DATE.—Belfast.—HOST.—An estimate for electing a host in the warehouse of Mr. J. N. Richardson, Sons & Bell, Ltd., Belfast, and application to be made on the premises, where the present host can be seen.

NO DATE.—Lancaster.—HEATING.—The Visiting Committee of the County Asylum, Lancaster, invite tenders for reconstructing and improving the steam heating arrangements and hot-water service of the asylum. Further information may be obtained on application to the Medical Superintendent, Mr. J. T. Cheetum, Clerk and Steward.

NO DATE.—Wigton.—WATER MAINS.—The Wigton U.D.C. invite tenders for providing and laying about 3,760 lin. yds. of 6-in. diameter cast-iron piping, with valves, etc., complete, according to plans, sections, and specifications prepared by the Engineer, Mr. Joseph Graham, Bankers, Bank-street, Carlisle. Plans and specifications may be seen at the engineer's office, and bill of quantities obtained, on payment of 1s. 1s.

MISCELLANEOUS.

JUNE 18.—Barnstaple.—DESKS, ETC.—Barnstaple Education Committee invite tenders for the supply of desks, cupboards, chairs, etc., for the new schools. Particulars can be obtained from the Secretary, Mr. G. W. F. Brown, The Square, Barnstaple, to whom tenders should be delivered on or before June 18.

JUNE 18.—Chelmsford.—OAK FENCING.—The Town Council of Chelmsford invite tenders for supplying and fixing, at their new reservoir at Long Slumps, 70 yds. of oak fencing, 6 ft. high, and for 200 yds. of unclimbable wrought-iron fencing, 4 ft. 6 in. high, the specification of which may be seen at the office of the Borough Surveyor, Mr. Culbert Brown, 16, London-road, Chelmsford. Tenders, sealed, and endorsed outside "Fencing for Reservoir," to be sent to Mr. H. Thos. Burt, Clerk to the Council, London-road, Chelmsford, not later than noon on June 18.

JUNE 18.—Chorley.—ELECTRIC LIGHT INSTALLATION.—Chorley Corporation invite tenders for the erection of an electric light installation at their Refuse Destructor works, Slump-lane, Chorley. Specification may be obtained on application to Mr. Oswin Hanson, Electrical Engineer, Albert-square, Fleetwood, on payment of 1s. 1s. Tenders, endorsed "Electric Light," to be sent to Mr. Jno. Mills, Town Clerk, Town Hall, Chorley, before noon on June 18.

JUNE 18.—Guildford.—CARBINE.—Guildford R.D.C. invite tenders for carting materials on the various roads in the district. Forms of tender and other information may be obtained of the Surveyor of the Council, Mr. J. Ansley, at the Council's Offices, Commercial-road, Guildford. Sealed tenders, endorsed "Tender for Carting," must be sent to Mr. W. S. V. Curllene, Clerk, R.D.C. Offices, Commercial-road, Guildford, before noon on June 18.

JUNE 18.—Ilford.—FURNITURE.—Ilford U.D.C. Education Committee invite tenders for the supply and delivery of 189 dual desks and other furniture at various schools in the district, and for altering 129 infants' desks at the "Christ-road" school. Bill of quantities, form of tender, and other particulars, can be obtained at the offices of the architect, Mr. C. Dawson, School B, Elmfield, Brook-road, Ilford. Tenders, in sealed envelopes, endorsed on outside "Tender for Furniture," to be delivered to Mr. W. S. T. Tord, Secretary to the Education Committee, Elmfield-road, Ilford, not later than 3 p.m. on June 18.

JUNE 18.—Swindon.—ASPHALTING PLAYGROUNDS.—Swindon Corporation invite tenders for asphaltting the playgrounds of seven schools in Swindon, and forms of tender may be had, and further information obtained, from Mr. W. Seaton, Secretary to the Education Committee, Education Office, Town Hall, Swindon, to whom sealed tenders, endorsed "Asphalting Playgrounds," must be sent before noon on June 18.

JUNE 19.—Chorley.—FINE HOSE.—Chorley Corporation invite tenders for supply of 500 yds. of canvas

fire hose, 2½ in. diameter. Further particulars may be obtained from Mr. William Canliffe, Fire Brigade Superintendent, Chorley, Chorley. Tenders, enclosed in sealed envelopes, to be addressed to Mr. H. W. Cook, Clerk and Solicitor, Public Offices, Egremont, Cheshire, to be forwarded per post not later than July 6.

JUNE 19.—Manchester.—MOTORS, ETC.—Manchester Electricity Committee invite tenders for the supply of the following during the twelve months ending June 30, 1907: (a) Direct current motors; (b) direct current motor starters; (c) amper-hour and watt-hour meters; (d) service cables; (e) fuse-boxes; (f) bitumen; (g) box compound; (h) insulators and forms of tender may be obtained on application to Mr. C. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester. Sealed tenders, addressed to the Chairman of the Committee, Electricity Department, Town Hall, Manchester, must be delivered at the Town Hall not later than noon on June 19.

JUNE 21.—Belfast.—FURNITURE, ETC.—Belfast Library and Technical Instruction Committee invite tenders for the following, for the new Municipal Technical Institute, viz.: (a) Furniture and fittings for the School of Art; (b) main switch-board; (c) machines and appliances for bleaching and dyeing section; (d) woodwork in the Library and Dining Room; (e) specifications and drawings relating to the above can be obtained at the Central Technical Institute, College-square North, between 11 a.m. and 5 p.m. For specifications, drawings, and drawing for (e), respectively, a charge of 5s. is made, the particulars for (d) and (e) will be supplied without charge. Payments are not returnable. Sealed tenders, addressed to the Chairman of the Committee, Technical Instruction Committee, must be delivered at the Town Hall, Belfast, not later than 11 a.m. on June 21. Each tender to be forwarded in separate cover, suitably marked.

JUNE 21.—West Ham.—COAL AND COKE.—The County Borough of West Ham invite tenders for supply of coal and coke to their pumping station, West Ham, and for the year ending June 30, 1907. Forms of tender may be obtained on application to Mr. C. E. Speakman, Clerk to the Council, 152, Hospital-street, Nantwich. Further information may be obtained from Mr. John Mills, Town Clerk, Town Hall, Chorley, on payment of 1s. 1s. Tenders, endorsed "School Furniture," to be sent to Town Clerk on or before June 25.

JUNE 25.—Chorley.—CARBINE.—Nantwich R.D.C. invite tenders for the carting of road material and other team work in connexion with the maintenance and repair of the highways under jurisdiction for the year ending June 30, 1907. Forms of tender may be obtained on application to Mr. C. E. Speakman, Clerk to the Council, 152, Hospital-street, Nantwich. Further information may be obtained from Mr. John Mills, Town Clerk, Town Hall, Chorley, on payment of 1s. 1s. Tenders, endorsed "School Furniture," to be sent to Town Clerk on or before June 25.

JUNE 25.—Chorley.—CARBINE.—The Cartage of steam coal from the railway goods station to the works at Hineskey. Forms of tender, and all particulars, can be obtained from the City Engineer, Oxford, to whom sealed tenders are to be delivered on or before June 25.

JUNE 26.—East Sussex.—STEAM ROILER.—East Sussex C.C. invite tenders for the hiring of steam rollers and scarifiers for use on the roads, during the year ending March 31, 1907. Particulars and form of tender can be obtained on application to Mr. F. J. Wood, Assistant C.E., County Surveyor, County Surveyors' Office, Lewes, Sussex. "Tender for Steam Rolling," to be addressed and delivered to Mr. Wood on or before June 26.

JUNE 26.—Great Yarmouth.—CARTRAGE, ETC.—Great Yarmouth Corporation invite tenders for the supply of harness, men, harness, carts, and tonks for the general cartage and haulage work of the Town Council of Great Yarmouth, for a period of three years. Specifications and forms of tender can be obtained at office of Mr. J. Wm. Cockrill, Borough Surveyor, Town Hall, Great Yarmouth. Tenders, upon the form and in the envelope supplied, are to be delivered at the office of the Town Clerk, Hall Quay, before noon on June 26.

JUNE 26.—Leyton.—PULLING DOWN, ETC.—Leyton District Council invite tenders for the pulling down of Knott's Green House, Leyton, E., and clearing the site. Specification, conditions, and form of tender may be obtained on written application on or before June 29, to Mr. William James, A.R.P.A., 2, Colchester-street, Fenchurch-street, E.C., the Committee's Architect. Sealed tenders, in special endorsed envelopes supplied with the forms, must be delivered at the meeting of the Council, to be held on or before June 29, at 4 o'clock a.m.

JUNE 29.—Southampton.—LITHOGRAPHIC STONES.—The Director-General, Ordnance Survey, is prepared to receive applications from any firm which is willing to tender for the supply of lithographic stones. Applications for forms of tender and specification should be made to the Officer in Charge of Stores, Ordnance Survey Office, Southampton. All tenders must be submitted before noon on June 29.

JUNE 30.—Rotherham.—CABLE AND METERS.—Rotherham Corporation invite tenders for the supply and delivery of cable and meters, according to the following requirements: for the supply of (covered) cable of various sizes; electricity meters of sizes for maximum currents of 2½, 5, 10, 25, and 40 amperes. The supply pressure is 220 and 450 volts continuous current. Further particulars may be obtained upon application to the Borough Electrical Engineer, Tenders, endorsed "Tenders for Cable and Meters," to be sent to Mr. W. J. Board, Town Clerk, Town Hall, Rotherham, not later than June 30.

JULY 31.—Ipswich.—MTRS.—East Suffolk County Education Committee invite tenders for the supply

of 300 iron and 200 fibro mats. Form of tender and conditions of contract (to be returned not later than July 31) may be obtained from Mr. W. E. Watkins, Secretary, White House, Tower Churchyard, Ipswich.

JUNE 17.—LANCASTER.—HEATING.—The Visiting Committee of the Conolly Lunatic Asylum, Lancaster, invite tenders for reconstructing and improving the steam heating arrangements and hot-water service (existing service in Verney Road, Rochdale New-road, viz.:—(a) New 12-in. pipe sewer with manholes, gullies, etc.; (b) paving, kerbing, channelling, and making-up roads. Specifications and forms of tender may be obtained from Mr. William Ostley, Borough Engineer, and tenders must be delivered to the Town Hall, Peckham-road, S.E., for (a) on or before June 19, not later than 5.30 p.m., and addressed to the Public Health Committee; and for (b) on or before June 18, not later than 6.30 p.m., addressed to the Works and General Purposes Committee.

JUNE 18.—LYME REGIS.—EXCAVATING, ETC.—Messrs. Mitchell, Toms & Co., Ltd., invite tenders for excavating, filling, and making-up roads, in the Lyne Regis. The drawings may be inspected, and bill of quantities obtained, on application at the office of the architect, Mr. Arthur W. Youmans, 14, E.B. Orchard, between the hours of 9 a.m. and 6 p.m. Sealed tenders, on forms supplied, endorsed "Excavating," to be sent to the Secretary, Messrs. Mitchell, Toms & Co., Ltd., not later than 10 a.m. on June 18.

JUNE 18.—LYONSALL.—DRAINAGE.—Lyonsall Parish Council invite tenders for drainage work, specifications as to material quantities, etc., can be seen at Mr. J. Ratcliffe's, Lyonsall Nursery. Tenders to be sent in, not later than June 18, to Mr. J. Ratcliffe, Clerk, Lyonsall Nursery.

JUNE 18.—PLYMOUTH.—ROADS.—Plymouth Corporation invite tenders for making-up and completing the following streets and lanes:—Buckhampton, Bute-road, between the hours of 9 a.m. and 6 p.m. Sealed tenders, on forms supplied, endorsed "Excavating," to be sent to the Secretary, Messrs. Mitchell, Toms & Co., Ltd., not later than 10 a.m. on June 18.

JUNE 18.—LYONSALL.—DRAINAGE.—Lyonsall Parish Council invite tenders for drainage work, specifications as to material quantities, etc., can be seen at Mr. J. Ratcliffe's, Lyonsall Nursery. Tenders to be sent in, not later than June 18, to Mr. J. Ratcliffe, Clerk, Lyonsall Nursery.

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JUNE 19.—DURHAM.—TAR PAVING.—Durham County Education Authority invite tenders for all tar paving required to be done at schools in the administrative area of the county. Particulars may be obtained at the office of Mr. W. Rushworth, A.R.I.B.A., Architect, County Education Office, Durham, where sealed, endorsed tenders must be delivered only later than June 19.

JUNE 21.—TYNEMOUTH.—PIPE SEWER.—Tynemouth U.D.C. invite tenders for providing and laying of about 400 line yds. 18-in. pipe sewer near Hurley Station, with manholes, etc. Plans may be seen at the office of Mr. A. S. Dinning, 21, Elbow-road, in Hartley, Tynemouth. Tenders to be sent to Mr. A. Whitehorn, solicitor, 60, Saville-street, North Shields, Clerk to the Council, not later than June 22.

JUNE 22.—LEVENSHULME.—STREET WORKS.—Levenshulme U.D.C. invite tenders for sewerage, drainage, paving, kerbing, flagging, channelling, and completing the following streets and passages in the Council's district:—Carril-groze East extension, Mount-street extension, Derby-street extension, Lonsdale-road, Hawthorn-road, passage rear of Clifford-road, etc. Plans, specifications, and bills of quantities may be obtained from the Council's Surveyor, Mr. James Jesson, 5, St. James's, Tynemouth. Sealed tenders, on payment of 2s. 2d., to be sent to the Council, on or before June 22.

JUNE 22.—SOUTHGATE.—STREET IMPROVEMENTS.—Southgate U.D.C. invite tenders for the execution of certain works of asphaltting, tar paving, kerbing, and channelling of several streets in the Council's district, of a total length of about 2,000 yds. Plans may be seen on application in the Council's Surveyor, Mr. C. G. Lawson, C.E., from whom copies of the specification and forms of tender may be obtained, on depositing 2s. in cash. Tenders, endorsed "Roadways," must reach Mr. W. M. Ellener, Clerk to the Council, Council Offices, Palmer's-green, N., not later than June 22.

JUNE 23.—MIDLEBROUGH.—SEWERAGE EXTENSION.—The Corporation of Midleborough invite tenders for the construction of about 670 line yds. of 15-in. pipe sewer in Ayresome Green-lane, etc., together with manholes, 12-in. diameter, ventilating shafts, also for subsoil drainage, laying-out, and constructing tar-asphalt walks, etc., in connection with the New Cemetery extension. Plans and specifications may be seen, and quantities obtained, at the office of Mr. Frank Baker, C.E., F.S.S., Borough Engineer, Municipal Buildings, Middlesbrough, on payment of 1s. 15d. Sealed tenders, endorsed "Sewerage," must be delivered at the office of the Town Clerk, Mr. Alfred Sockell, Municipal Buildings, Middlesbrough, not later than 10 a.m. on June 23.

JUNE 25.—MORRISTOWN.—SEWERAGE.—Plymouth U.D.C. invite tenders for the construction of tumbling-lays, manholes, flushing tanks, and about 250 line yds. of 15-in. pipe sewer, varying from 6 in. to 12 in. in diameter. The 12-in. sewer is about 200 line yds. long, and will be in tunnel. Plans and specifications may be examined on bills of quantities obtained, on and after June 15, from Mr. Edgar J. Evans, A.M.I.C.E., Surveyor, Council Offices, Penarth. Sealed tenders, endorsed "Sewerage," must be delivered to the Council, not later than June 25.

JUNE 26.—WEST HAM.—ROAD-MAKING.—The County Borough of West Ham invite tenders for making-up various streets, etc. Plans may be seen, and specifications, form of tender, etc., obtained of Mr. John G. Morley, Borough Engineer, Down Hall, West Ham, E., on payment of 1s. Tenders, endorsed "Tender for Private Street Works," to be sent to Mr. Hillery, Town Clerk, Town Hall, West Ham, E., before 4 p.m. on June 26.

JUNE 27.—DARTFORD.—TAR PAVING, ETC.—The Metropolitan Asylums Board invite tenders for the paving, tar-paving and making-up at Dartford Asylum, Dartford, Kent, and repairing and renovating certain roads at Joyce Green Small-pox Hospital, Dartford, Kent, in accordance with drawings and specification prepared by Mr. W. T. Halse, Engineer-in-Chief. Drawings, specification, conditions of contract, and form of tender, must be applied for at the office of the Board, Embankment, E.C. 4, on or after June 18, and can then be obtained on payment of 1s. Tenders, addressed as noted on the forms, must be delivered at the office of the Board before 10 a.m. on June 27.

JUNE 27.—EDINBURGH.—DRAINAGE.—The Governors of Trinity Hospital, Edinburgh, invite tenders for the several works required in the execution of proposed clean water drains at Trinity Hospital, Blinksburg Drainage. Schedule of quantities and form of tender may be obtained on application at Messrs. Buchanan, Paton & Co., who will also exhibit the general conditions, etc. Tenders must be sent to Mr. Thomas Hunter, W.S., Town Clerk, Edinburgh, not later than 10 a.m. on June 27.

JUNE 29.—WALTHAMSTOW.—UNDERGROUND CONVEYANCE.—Tenders are invited for the construction of underground conveyance adjoining the Public Baths, High-street, in accordance with plans and specifications, to be inspected at office of the Council's Engineer, on and after June 19. Forms of tender may be obtained on deposit of 3s. 5s. Tenders, addressed to Mr. C. Sydney Watson, Town Hall, Walthamstow, and endorsed "Tender for Underground Conveyance," to be delivered not later than 5 o'clock, June 29.

JUNE 2.—CLONTAR.—SEWERAGE WORKS.—The Improvements Committee of the Corporation of Dublin invite tenders for the construction of about fourteen miles of pipe sewers, etc. The drawings, specification, bills of quantities, and forms of tender may be inspected at the office of the City Engineer, Mr. J. Hill Dublin, and at the office of the Consulting Engineer, Mr. George Chatterton, M.I.C.E., 6, The Sanctuary, Westminster, between the hours of 10 a.m. and 5 p.m. daily, Saturdays excepted, and a limited number of copies of the said documents may be obtained at the offices aforesaid on payment of the sum of 5s. Crossed cheques only to be used on the envelope. Tenders for Clontarf Sewerage, must be addressed to the Chairman of the Improvements Committee, City Hall, Dublin, and delivered not later than 12 o'clock, noon, on July 2.

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JUNE 9.—TAVISTOCK.—SEWERAGE WORKS.—Tavistock U.D.C. invite tenders for works of sewerage and sewage disposal, including the providing and laying of stoneware and cast-iron sewers, and the construction of sedimentation tanks, manholes, etc. Drawings may be inspected at the office of the Engineer, Mr. John Chalwick, F.G.S., Blechington, Tavistock, on payment of a deposit of 3s. 3s. Sealed tenders, on forms endorsed "Tender for Sewerage Works," must be received at office of Mr. W. W. Matthews, Clerk to the Council, Council Offices, Tavistock, not later than 12 o'clock, noon, on July 9.

NO DATE.—IRLINGTONBOROUGH.—WINNING.—Northamptonshire C.C. invite tenders for the widening of the approach to Irlingtonborough, in the name of Mrs. J. M. Gervis, County Surveyor, County Hall, Northampton.

NO DATE.—LEITCHWOOD.—ROADS.—Construction of a tunnel at Leitchwood for the First Grand Cut, Leitchwood, Herk. Apply, enclosing 1s. 1s. 6d., specification and bill of quantities, at the Estate Office, Leitchwood.

and specifications, form of tender, etc., obtained of Mr. John G. Morley, Borough Engineer, Down Hall, West Ham, E., on payment of 1s. Tenders, endorsed "Tender for Private Street Works," to be sent to Mr. Hillery, Town Clerk, Town Hall, West Ham, E., before 4 p.m. on June 26.

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STONE, MATERIALS, AND STORES.

JUNE 19.—ROMFORD.—GRANITE SPALLS.—Romford Charobans invite tenders for the supply of 100 tons of blue Guernsey granite spalls, to be delivered at the Workhouse, Romford. Tenders must reach Mr. William Smith, Clerk, North-street, London, not later than June 18, and the stone must be delivered within one month after notice of acceptance of the order.

JUNE 20.—ENFIELD.—GRAVEL.—The U.D.C. of Enfield invite tenders for the supply of 750 tons (more or less) of coarse screened Hertfordshire or other approved gravel, delivered free, in such quantities and at such times prior to March 31, 1907, as may be ordered by the Council's Surveyor at the below-named railway stations in the following quantities (more or less): viz.:—200 tons at New Barnet Station, G.N.R.; 350 tons at Hadley Wood Station, G.N.R.; 200 tons at Redbair Bar Station, G.N.R.; 100 tons (the stone supplied only) to be sent to Mr. T. W. Scott, Clerk to the Council, Public Offices, Enfield, endorsed "Tender for Gravel," not later than 10 a.m. on June 20.

JUNE 20.—ORMSKIRK.—GOODS AND REPAIRS.—The Guardians of the Ormskirik Union invite tenders for the supply of the undermentioned quantities of materials for the Workhouse and Industrial Schools, until July 24, 1907:—(1) Repairs—plumber, glazier, gas-fitter, plasterer, paper-hanger, painter; (2) iron-work; (3) brickwork; (4) joinery work. Forms of tenders, which will state the approximate quantities required, the nature of the work to be done, and the quality and sorts of the materials to be used, may be obtained on application at the office of Mr. Alfred Dickinson, Clerk to the Guardians, Ormskirik. Tenders must be at office of Clerk on or before June 20.

JUNE 20.—REICHMOND.—PORTLAND CEMENT.—The Joint Committee of Management of the Richmond District Asylum invite tenders for the supply of about 700 tons of Portland cement, delivered free, in such quantities as may be ordered, to the Richmond Asylum, Gracechurch, Dublin, and Donabate Station, on the Great Northern Railway, for

ROADS, SANITARY, AND WATER WORKS.

JUNE 16.—DEVONPORT.—LEVELLING, PAVING, ETC.—Devonport Corporation invite tenders for levelling, paving, and completing the following lanes, viz.:—(1) Lane between Devonport and Wellington avenues; contract 67, lane rear of Nos. 40 to 56, Wilton-street (part of). Plans, specification, and

ROADS, SANITARY, AND WATER WORKS.

conditions may be seen, and forms of tender and bills of quantities obtained, at the Surveyor's Office, Municipal Offices, 29, Ker-street, Devonport, on payment of 1s. 1s. for each set of quantities. Separate sealed tenders, addressed to Mr. John F. Burns, Borough Surveyor, Municipal Offices, must be delivered on or before 12 noon on June 26.

JUNE 18.—CAMBERVELL.—ROAD WORKS.—Camberwell Borough Council invite tenders for the following works:—(a) New 12-in. pipe sewer with manholes, gullies, etc.; (b) paving, kerbing, channelling, and making-up roads. Specifications and forms of tender may be obtained from Mr. William Ostley, Borough Engineer, and tenders must be delivered to the Town Hall, Peckham-road, S.E., for (a) on or before June 19, not later than 5.30 p.m., and addressed to the Public Health Committee; and for (b) on or before June 18, not later than 6.30 p.m., addressed to the Works and General Purposes Committee.

JUNE 18.—LYME REGIS.—EXCAVATING, ETC.—Messrs. Mitchell, Toms & Co., Ltd., invite tenders for excavating, filling, and making-up roads, in the Lyne Regis. The drawings may be inspected, and bill of quantities obtained, on application at the office of the architect, Mr. Arthur W. Youmans, 14, E.B. Orchard, between the hours of 9 a.m. and 6 p.m. Sealed tenders, on forms supplied, endorsed "Excavating," to be sent to the Secretary, Messrs. Mitchell, Toms & Co., Ltd., not later than 10 a.m. on June 18.

JUNE 18.—LYONSALL.—DRAINAGE.—Lyonsall Parish Council invite tenders for drainage work, specifications as to material quantities, etc., can be seen at Mr. J. Ratcliffe's, Lyonsall Nursery. Tenders to be sent in, not later than June 18, to Mr. J. Ratcliffe, Clerk, Lyonsall Nursery.

the Portrane Auxiliary. Copies of the specification can be obtained at the Asylum Offices, Grange-gorman, Dublin. Sealed tenders to be sent to Mr. W. J. Murphy, Chief Clerk, Offices, Grange-gorman, Dublin, not later than June 20.

JUNE 21.—Warrington.—STORES.—Warrington Gas Committee invite tenders for the undermentioned goods. Full particulars can be obtained on application to Mr. W. S. Haddock, Gas Engineer, Warrington. Sealed endorsed tenders to be sent in not later than June 21. (1) Bags; (2) bolts and nuts; (3) brass and copper tubing; (4) brass fittings; (5) builders' ironmongery; (6) cast-iron pipes and connections; (7) cement; (8) castings; (9) clothing; (10) copper street lamps; (11) cookers; (12) common paving and other bricks; (13) firebricks, fireclay, and retorts; (14) flexible tube; (15) glass; (16) iron and steel; (17) lead and compo pipe; (18) lime; (19) oils, paint, etc.; (20) printing and stationery; (21) rails, crossings, fastenings, etc.; (22) red and white lead; (23) sets; (24) timber; (25) wet and dry gas meters; (26) wrought-iron tubes and fittings; (27) coal, slack, or nuts (30,000 tons); (28) canal (5,000 tons); (29) benzol (7,000 gallons); (30) taps, valves, etc.

JUNE 22.—Cleckheaton.—ANIMAL CONTRACTS.—Cleckheaton U.D.C. invites tenders for the following for the year ending June 30, 1907: No. 2, granite; No. 7, dress, circular kerbs, and sets; No. 12, cartage of coal from railway station to the gas works. Forms of tender, conditions, and full particulars may be had on application at the office of Mr. John H. L. Parker, Clerk to the Council, Town Hall, Cleckheaton. Sealed tenders, marked "Tender for —," to be delivered not later than 4 o'clock p.m. on June 22.

JUNE 23.—Bedwelty.—LIMESTONE.—The U.D.C. of Bedwelty invite tenders for the supply and delivery of limestone broken to pass through a 2 1/2-in. ring, also limestone screenings, to be delivered, carriage paid, during the months of December, 1906, and January, 1907, at such rate as shall be required by the surveyor, as follows: the quantities being more or less—150 tons of limestone to Whitehorse Station, B. and M. Railway; 50 tons of screenings to Whitehorse Station, B. and M. Railway; 150 tons of limestone to Aberargoed Station, B. and M. Railway; 250 tons of limestone to Pengam Station, B. and M. Railway; 50 tons of screenings to Pengam Station, B. and M. Railway; 350 tons of limestone to Blackwood Station, L. and N.W. Railway; 30 tons of screenings to Blackwood Station, L. and N.W. Railway; 100 tons of limestone to Argoed Station, L. and N.W. Railway; 20 tons of screenings to Argoed Station, L. and N.W. Railway. Sealed tenders, giving price per ton, and endorsed "Tenders for Limestone," to be sent to Mr. T. J. Thomas, Clerk, Barged, on or before June 23. Samples to be sent, carriage paid, addressed to Mr. J. H. Lewis, Assoc. M.Inst.C.E., Council Offices, New Tredegar, Cardiff.

JUNE 23.—Newcastle-on-Tyne.—MATERIALS.—The Guardians of the Poor of the Newcastle-on-Tyne Union request prices for the following classes of material, which may be required for the work-house during the ensuing twelve months, viz.:—Sanitary pipes, etc.; builders' hardware, timber, etc.; slates, etc.; sheet lead and piping; and engineers' fittings, pipes, etc. Forms will be supplied by Mr. James Atkinson, Clerk to the Guardians, Union Offices, Pilgrim-street, Newcastle-on-Tyne. Schedules of prices will be received at office of clerk up to 12 o'clock at noon on June 23.

JUNE 25.—Leeds.—ARTICLES.—The Gas Committee of the Leeds Corporation invite tenders for supply of the following articles, for twelve months from

date of order—About 25 tons best merchant iron, at per ton; about 2 tons best charcoal annealed double tinned iron, at per cwt; about 10 tons wrought iron bars, at per cwt; about 10 cwt. steel, at per lb.; about 150 gross washers, of various sizes, at per gross; about 5 cwt. wrought nails, at per cwt.; about 10 cwt. rivets, at per cwt.; about 10 cwt. iron pipe hooks, of various sizes, at per cwt.; about 6 tons bolts and nuts, of various sizes; about 15 cwt. iron rivets, at per stone; about 100 boxes tin plates, as per term of tender; about 40 cwt. pure tin ingots, at per lb.; about 90 gross screws, of various sizes, for wood and iron (discount off price list to be stated); about 4 dozen No. 2 square ballast shovels, at per dozen; about 4 dozen No. 7 square coal shovels, at per dozen; about 60 dozen cast steel charging shovels, at per dozen; about 4 dozen cast steel forks, at per dozen; about 3 dozen spades, at per dozen; about 2 dozen sheet shafts, at per dozen; about 6 dozen pick shafts, at per dozen; about 40 dozen hammer shafts, at per dozen; about 2 dozen hammer heads, of various sizes, at per lb.; about 12 dozen rake heads, at per cwt.; about 8 gross files, of various sizes, and re-cutting files (discount off price list to be stated); 72 dozen galvanised iron buckets, at per dozen; about 20 dozen weed brooms, eachaving, at per dozen; about 100 dozen brushes, of various descriptions (net price); indiarubber cords (net price); wood spurs, 3 in. to 2 1/2 in.; about 25 tons best pig iron, at per ton; about 80 cwt. virgin sheet lead, at per ton; about 100 tons lead tube, at per ton; about 5 tons roofing white lead, Walker Parker's; about 15 cwt. genuine red lead; about 5 cwt. red oxide paste, at per cwt.; about 14 cwt. black ash, about 30 gal. best pale copal varnish; about 2 gal. cast iron paint; about 20 gal. black oil, at per gallon; about 80 gal. pure linseed oil; about 1,500 gal. engine oil, at per gallon; about 2,000 gal. gas engine oil; about 300 gal. common oil, at per gallon; about 40 gal. pure boiled linseed oil, at per gallon; about 100 gal. white lead; about 7 tons tarred hemp top gaskin, at per cwt.; about 20 tons Portland cement, at per ton. All articles to be delivered at the stores, Meadow-lands, or at the gas-works, at the price tendered. Samples of the various articles may be seen at the stores office, Meadow-lands, and tenders to be obtained on application to Mr. K. H. Towseley, General Manager, Gas Offices, Leeds. Endorsed tenders, addressed to the Town Clerk, Town Hall, Leeds, to be delivered not later than June 25.

JUNE 25.—Bromley.—ROAD MATERIALS.—Bromley Town Council invite tenders for the supply of the following road materials—3,725 cubic yds. of broken stone, 4 in. Gurnsey's granite, Leicestershire granite, Charbonat quartzite, Penle, Elvan, or Bussat; 250 cubic yds. of broken surface or pit flints; 175 yds. of broken surface or pit flints; 625 cubic yds. of broken surface or pit flints; 740 cubic yds. of broken surface or pit flints; 200 cubic yds. of broken surface of pit flints. Samples of each description tendered for must accompany the tender. Tenders must be made in printed form, to be obtained at the office of the Borough Engineer, Municipal Offices, Bromley, and must be delivered, addressed to Mr. Fred H. Norman, Town Clerk, Municipal Offices, Bromley, and endorsed "Tender for Road Materials," not later than 3 o'clock p.m. on June 25.

JUNE 26.—Keywood.—STORES.—Heywood and Middleton Water Board invite tenders for the supply of stores and materials, including timber, picks, spades, iron steel, oil, wash-water, Portland

cement, lia lime, coal, brass taps and fittings, iron pipes, lead service pipes, sluice valves, fire-pump casings, valve casings, and other stores, for a period of twelve months ending June 30, 1907. Specification, form of tender, and all other information may be obtained on application to Mr. James Diggle, C.E., Water Engineer, Water Board Offices, Heywood. Sealed tenders, endorsed as specified, to be sent in to Messrs. G. G. Bouchier & F. Entwistle, Clerks to the Board, Heywood, not later than June 26.

JUNE 27.—Barnet.—GRAVEL, GRAVEL, and HOOG.—The Barnet U.D.C. invite tenders for 600 tons and upwards of 2 1/2 in. broken granite, 500 tons of gravel, and about 450 tons of Hoogin. The certified crushing strain to be stated, and no form of tender supplied. Tenders, sealed and endorsed "Gravel," "Gravel," or "Hoogin," to Mr. H. W. Poole, Clerk to the U.D.C., 40, High-street, Barnet, on or before June 27.

JUNE 27.—RAMSGATE.—PORTLAND CEMENT.—Rams-gate Corporation invite tenders for the supply of Portland cement from July 1, 1906, to June 30, 1907, inclusive. The contractor may estimate that the quantity required will not be less than 100 tons, and probably not more than 150 tons. Specification, form of tender, and full particulars may be obtained on application to the Borough Engineer, Albion House, Ramsgate, between the hours of 10 a.m. and 4 p.m. Sealed tenders, endorsed "Tender for Cement," are to be addressed to the Chairman of the Works Committee, and delivered under cover to the Borough Engineer, Albion House, Ramsgate, on or before noon on June 27.

JUNE 27.—RAMSGATE.—STONEWARE PIPES.—Rams-gate Corporation invite tenders for the supply and delivery of glazed stoneware pipes, junctions, etc., for the ensuing twelve months. Forms of tender and full particulars can be obtained on application to Mr. F. G. Taylor, Borough Engineer's Office, Albion House, Ramsgate. Tenders, endorsed "Tender for Pipes, etc.," addressed to the Chairman of the Works Committee, are to be delivered at the Borough Engineer's Office, Albion House, before noon on June 27.

JUNE 30.—Rotherham.—STORES.—Rotherham Tramways Department invite tenders for the supply of the following stores and materials required by the Tramways Department during the twelve months ending August 31, 1907.—Oils and greases; tools, hardware, brake blocks; cast-iron brake blocks; paints and varnishes; brass castings; waste cleaning rags; nuts, bolts, and screws; incandescent lamps; river sand, etc. Forms of tender, specification, and further particulars can be obtained upon application to the tramways Manager, Tram Depot, Rotherham. Tenders, endorsed "Tramways Stores," to be sent to Mr. W. J. Board, Town Clerk, Town Hall, Rotherham, not later than June 30.

JUNE 6.—Brighton.—GRANITE SPALLS.—Brighton Corporation invite tenders from such persons as may be willing to enter into a contract for the supply of 1,000 tons of granite spalls. The specification and form of tender may be obtained on application at the office of the Borough Surveyor, from Depon, Brighton. Sealed tenders, addressed to Mr. Hugo Talbot, Town Clerk, Town Hall, Brighton, and endorsed "Tender for Granite Spalls," must be left at the Town Hall before 10 o'clock in the forenoon on July 6.

NO DATE.—Dublin.—ROAD MATERIALS.—Dublin Daving Committee require supplies of broken Whinstone, Fresh-water rubble, and Fresh-water sand. Full particulars regarding price and specification can be obtained on application at the office of the City Engineer, City Hall, Dublin, during office hours.

Public Appointment.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, Applications to be in. Row 1: TEMPORARY ASSISTANT, Cheshunt U.D.C., Not stated, June 1.

Auction Sales.

Table with 4 columns: Nature and Place of Sale, By whom Offered, Date of Sale. Multiple rows listing various real estate and goods auctions, such as 'CONTRACTOR'S PLANT, PLYMOUTH', 'FREEHOLD BUILDING LAND, NEW SOUTHGATE', etc.

Patents of the Week.

APPLICATIONS PUBLISHED.* 9,909 of 1905.—J. BEWICK: Kitchen Ranges. This relates to means for adjusting and supporting a rising and falling grate for a kitchen range, and consists of a loose top bar with pivoted front... * All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

part, this latter having extensions forming pawls, and said top bar carrying the grate front and being at each end formed with a groove, plates by which the top bar and grate front are guided and lugs by which and by the extensions the top bar and front grate are supported at various elevations. 10,255 of 1905.—C. WILSON and W. W. SEER: Water Heater for Baths and the like. This relates to a water heater for baths and the like, and consists of a hollow sheet iron vessel

in the form of a Wellington boot which is put in the bath with the narrow or leg part projecting above the surface of the water, the narrow or leg part being open at the top. A suitable gas burner is placed inside the sheet iron vessel which will heat it and the water will thus be heated externally. 10,449 of 1905.—J. H. BRINDLE and S. BONSOR: Appliance Applicable for use as a Fire Lighter or Stove. This relates to a fire lighter or appliance with a chamber or channel—to contain a non-combustible

wick and oil or spirit—between two walls and a central passage to admit air to the centre of the flame, and consists in constructing a number of projections upon the edges of the walls or partitions between which air is admitted and the flame allowed to spread.

12,321 of 1905.—E. GOOLD: Heating Apparatus for Domestic or Warming Purposes.

This relates to a heating apparatus for domestic or warming purposes especially such as are arranged in separate systems either by a tank or coil within an outer tank, the boiler with circulating pipes and the tank or coil forming the primary system for giving up its heat to the water in the secondary or service system, and has for its object the minimising of the deposit of solids in the boiler. According to this invention both systems are supplied in the first instance from the same cistern. The water in the primary system for heating is used in continual circulation and therefore after it has deposited the solids it originally contained no further deposit can take place, as the make up water for replacing that which may be evaporated is taken from the upper part of the secondary or service tank which has already deposited its solids.

13,797 of 1905.—A. MIETZ: Steps or Stairs.

This relates to the construction of steps or stairs from a composition, and consists in fitting at the front of the step a detachable and replaceable facing strip of metal extending the whole length of the step and forming the nose thereof, said strip being secured or carried upon a supporting plate or upon metal brackets or blocks resting upon the top or foundation of the step, the said composition being run over the whole surface of the step and extending to the top of the said facing strip.

17,229 of 1905.—E. PRICE: Chimney Cowl.

This consists of a chimney cowl for the prevention of down draught constructed with notched side plates or wings and a loose shield carried by the wings having side extensions resting on the bottom of the notches which form a fulcrum allowing the shield to turn to either side and close either side of the cowl.

18,006 of 1905.—R. P. WILSON and A. G. MARSHALL: Ventilating Fans, Blowers, and the like.

This relates to a fan or blower, so constructed and mounted that its rotation, a gyroscopic precessional movement, occurs, whereby the stream of air delivered automatically varies its direction as the fan or blower rotates.

19,297 of 1905.—A. E. BISHOP: Glass Plates or Tiles, and Means for Attaching the Same to Walls, Ceilings, and Other Structures.

This relates to means for attaching plates or tiles to walls, ceilings, and other structures, and consists in the use in combination and application to the back of said glass plates, tiles, or the like, of a mixture of seven parts of finest ground calcined magnesite, four parts of concentrated sodium silicate solution, three parts pure precipitated silica, and three parts of manganese dioxide. These materials are mixed until a tacky or elastic substance is produced, and then applied to the back of the tile, and while the coating is soft, pottery chips or some such material is sprinkled over the coating, and is pressed into the coating thus forming a key by which the tile can be fixed either with the same mixture that provides the coating or with cements.

20,475 of 1905.—C. JOYNER & Co., LTD., and E. ISCHLEY: Gas Brackets or Fittings.

This relates to gas brackets or fittings, and consists essentially in the employment of a cut-off plug secured to carry the burner, this plug being located in an upwardly expanded sealing in the front or end connexion piece and of means for rotating the said plug.

26,382 of 1905.—W. SELTNER: Jiggers for Separating and Grading materials.

This relates to a jigger having fixed screens and is characterised by the separation or grading being simultaneously effected on two or more screens arranged one above the other in the same chamber of the jigger.

214 of 1906.—C. H. RICHARDSON and C. HUNTER: Window Sash Suspenders.

This relates to a window sash suspender and consists of a metal casting shaped and cast in one piece and having a hole in its top end for the passage of the sash cord, and a parting bend with a recess to enable the cord to be secured to the sash stile from the face of the sash without removing the sash or beads from the window frame.

10,230 of 1905.—W. T. BUCHLEY: Drains or like Conduits for Arresting the Passage of Solid Matter in Suspension.

This relates to drains or like conduits, and consists in the provision of an internal chamber provided with a flat or conical outlet in said base provided with louvred openings, an upstanding flange arranged in the interior of the chamber having perforated or louvred openings, a second flange at the base or lower bottom having depending flanges to form a water seal an open topped receptacle adapted to fit into or onto or to rest upon

the flange and having louvred openings in its sides level with or arranged at different heights to each other and a grid or cover at the top of the receptacle with or without a fixed flange extending below it all.

13,491 of 1905.—H. J. HASKINS: Machinery or Apparatus for Scoring, Cutting, Polishing, and Finishing Sanitary Clay Pipes.

This relates to a valve for finishing clay pipes in which the pipe sockets are when the pipes are in the drum open to access, thereby enabling a scoring tool to be introduced for scoring the interior of the sockets or enabling a cutter or tool to be introduced.

17,465 of 1905.—T. E. DEVONSHIRE and H. STEPHENS: Pipes more especially intended for use for Conducting Water, or other Fluid under Pressure.

This relates to pipes used for adjusting water or other fluid under pressure, and consists of a tube made of perforated metal and of such a form that in cross section it presents a series of dovetails, corrugations or equivalent formations. These may be formed in any suitable way such as by rolling or pressing in thin metal sheet and forming this into the required tube. The cement, mortar, concrete, or the like when moulded inside and outside the metal tube so formed is retained or keyed owing to the formation of the said tube and there is no need to embed any metal rods or rings or expanded metal or the like in the cement, mortar, concrete, and the like within the said metal tube and owing to the longitudinal strength of the said tube when formed there is no necessity to use longitudinal rods embedded in the cement or the like outside the said metal tube, laterally or circumferentially disposed metal rings or spiral metal windings being sufficient to resist the pressure.

16,086 of 1915.—H. J. YATES and D. R. McNEILL: Radiator and like Heating Appliances.

This relates to radiators and like heating appliances, and consists in the combination with a radiator plates or air deflector of a rotatable and resilient clamping device adapted to be inserted and secured in position from the front of the baffle plate.

5,955 of 1905.—H. KLEE: Method of Manufacturing Artificial Stone Plates or Fibrous Materials and Hydraulic Binding Substances.

This relates to a method of manufacturing plates from fibrous material and hydraulic binding substances in which a paper, cardboard, or like machine is employed and is characterised by the hydraulic binding substance being supplied to the fibrous material by means of a suitable device, while the fibrous material is still on the perforated drum or on the longitudinal sieve or band of the machine.

9,179 of 1906.—C. SCHMIDT: Boiler Furnaces for Heating Apparatus and the like.

This relates to a boiler composed of elements having a feed shaft furnace and consists of an arrangement of louvre-like bars between the boiler elements on the sides of the feed shaft, which bars form one side of inwardly leading passages into which the gases of combustion may enter laterally at various heights.

22,624 of 1905.—A. ABZCO: Combined Hinges and Fastenings for Doors.

This relates to a combined hinge and fastening for doors, and consists of a door, opening to right or left, and provided with a cross bar which connects the right and left side rods or hinge pins together, the distinguishing feature being that the cross bar is moved by levers which are so connected with door latches that after the proper side rod has been drawn back the latch can be moved by the upper lever without the cross bar being further influenced.

SOME RECENT SALES OF PROPERTY:

Table listing property sales including Estate Exchange Regent, May 31, By Haslam & Son (at Reading), Reading, Berks.—Various enclosures, 62 a. 2 r. 6 p., £3,245; 2 cottages and 7 a. 2 r. 3 p., £1,440; 2 cottages and 6 a. 1 r., 230; June 2, By Elworthy & Son (at Wisbech), Upwell, Cambs.—The Well Fen Farm, 439 a. 2 r. 37 p., £11,000; June 6, By Drexdale, Nere & Co., Stamford Hill—57, Cranwiche Rd., ut. 84 yrs., gr. 7 1/2 lbs., yr. 4d., 455; Clapton—25, Norfolk rd., ut. 74 yrs., gr. 0l., yr. 34d., 350; By Rodd & Slipper, Peckham—28, Camden-gr., l., ct. 40l., 530; By Rosworth & Stevens, Caledonian road—Byron Rd., "Bryan Mews" (coach-houses), ut. 37 1/2 yrs., gr. 6l., ct. 31l., 210; By Wyer, Adams, & Glover, Lee—Grove-pk., "Olovelly," and 1 1/2 acres, l., p., 2,970; June 7, By G. F. Harrington, Beckenham—Stanley-av., two building sites, 0 a. 3 r. 10 p., 480; Geverby-av., two building sites, 0 a. 2 n. 25 p., 525.

Table listing various property sales and building contracts. Includes entries for By W. F. LAING, By Godfrey C. Lambere, By Stimson & Sons, By T. B. Westaoot, By Stanley Parkes & Brown, By Weston, Bull, & Cooper, and various building contracts with details of land area and terms.

MEETINGS.

Table listing meetings for Friday and Saturday, June 16 and 17, 1906. Includes Northern Architectural Association, Builders' Foremen and Clerks of Works' Institution, and Northern Architectural Association—Students' Sketching Club excursion.

PRICES CURRENT OF MATERIALS.

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

Table listing prices current of materials. Columns include material names (Hard Stocks, Rough Stocks, Picked Stocks, etc.), quantities, and prices per 1000 or per unit. Includes sub-sections for GLAZED BRICKS and various types of bricks and headers.

BRICKS, &c. (continued).

Table listing various types of bricks and their prices, including glazed bricks, Thames and Pitt Sand, and Portland Cement.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

STONE.

Table listing various types of stone and their prices, including Bath Stone, Portland Stone, and Ancaster in blocks.

Table listing various types of stone and their prices, including York Stone, Scapplied random blocks, and Hopton Wood (Hard Bed).

Table listing various types of stone and their prices, including Hopton Wood (Hard Bed) in blocks, slates, and tiles.

Table listing various types of stone and their prices, including slates and tiles.

Table listing various types of stone and their prices, including tiles.

Table listing various types of stone and their prices, including wood.

WOOD (continued).

Table listing various types of wood and their prices, including building wood, battens, and deals.

Table listing various types of wood and their prices, including joiners' wood.

Table listing various types of wood and their prices, including white sea and yellow deals.

Table listing various types of wood and their prices, including kauri pine and teak.

Table listing various types of wood and their prices, including teak and American whitewood planks.

Table listing various types of wood and their prices, including joists, girders, and sheet iron.

Table listing various types of wood and their prices, including sheet iron.

METALS (continued).

Table listing various types of metals and their prices, including iron, galvanized corrugated sheets, and steel sheets.

Table listing various types of metals and their prices, including lead, zinc, and copper.

Table listing various types of metals and their prices, including English sheet glass in crates of stock sizes.

Table listing various types of metals and their prices, including English rolled plate in crates of stock sizes.

Table listing various types of metals and their prices, including oils and varnishes.

Table listing various types of metals and their prices, including varnishes.

Table listing various types of metals and their prices, including varnishes.

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

TERMS OF SUBSCRIPTION.

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TENDERS.

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

* Denotes accepted. † Denotes provisionally accepted.

ABERDEEN.—For constructing a pipe sewer, etc., in Richmond-hill-road, for the Town Council, Mr. William Dyack, Borough Surveyor, 413, Union-street, Aberdeen:—
Gald & Walker, Richmond-street . . . £51 13 10

ALFORD (Lincs).—For erecting a house, for the Urban District Council:—
C. R. Seymour, Alford £185

ALDEBROT.—For street works, York-road, and St. George's-road, for the Urban District Council. Mr. F. C. Tread, Surveyor to the Council. Quantities by Surveyor:—
St. George's-road York-road
W. Norris, Upper Hale, near Farnham, Surrey, £745 10 6 . . . £148 10 0

AMERSHAM (Bucks).—For the erection of a shop and premises, Station-road, for Mr. J. T. Covey, for Mr. E. T. Gilder, architect, 100A, High-street Watford:—
G. Darlington, £1,100 0 0 C. H. Hunt & Son £701 0 0
H. J. Wright . . . 985 0 0 A. E. & C. Saw* . . . 692 10 0
B. Stone & Son . . . 813 0 0

ASHBY (Lincolnshire).—For erecting a new Wesleyan Church, Mr. W. H. Bottrick, architect, 28, Wells-street, Scarborough:—
A. & H. Woods £4,005 0 0 S.R. & T. Kelsey, Good & Son . . . 3,302 8 3 Gault £3,793 0 0
Scarborough . . . 3,890 0 0

BOLTON-LE-SANDS (Lancaster).—For constructing a 6-in. iron and cast-iron pipe sewer, for the Lancaster Rural District Council. Mr. W. Dixon, Surveyor, 5, Dalton-square, Lancaster:—
A. Long, Bolton-le-Sands, near Canforth £100 12 6

BISHBY.—For erecting new elementary school and new centre, London-road, for the Education Committee of Hertfordshire County Council, Mr. Urban A. Smith, County Surveyor, Hatfield:—
J. Willmott & Co. £13,483 0 0 C. Hightman 11,449 3 8
L. & M. Patrick . . . 11,312 3 0
Wilkinson . . . 13,300 0 0 H. P. Foster 11,027 0 0
Bros. 11,020 0 0
W. Bailey & Co. 12,890 1 1 Oak Building Co. 10,809 0 0
L. & W. H. P. Kettering Co-operative Builders, Ltd., 10,467 1 0
Parsons . . . 12,272 0 0 Ld. 10,467 1 0
A. W. Nash 12,171 9 2 T. Culbert 10,410 3 6
W. S. Shephard & Co. 11,745 0 0 G. Henson & Son, Mill-lane-road, 10,348 11 1
W. H. Hyde 11,679 0 0 land-road, 10,348 11 1
C. Mickin . . . 11,585 0 0 Wellington-hill* . . . 10,348 11 1
G. & F. Waterman . . . 11,544 0 0 Hooper & Co. 9,939 3 11
Cotton & Co. 11,475 0 0 Lotts

COLCHESTER.—For erecting the East Ward Council school, Greenstead-road, for the Education Committee, Messrs. Goodley & Cressall, architects, Victoria-chamber, Colchester:—
Spencer, Santo, & Co. £10,400 0 0 Young & Son . . . 49,267 0 0
R. Besant . . . 9,184 17 0
Coulson & Lotts 10,180 0 0 Rywell & Son . . . 8,998 0 0
Oak Building Co. 8,700 0 0 C. Roper 8,700 0 0
C. Co. 9,973 0 0 Dalson & Son . . . 8,679 0 0
J. M. 8,479 0 0 F. W. Col- 8,400 0 0
W. Chambers . . . 9,439 0 0 clister* 8,600 0 0
H. W. Gladwell 4,374 0 0 Clark & Sons . . . 8,297 0 0
H. E. Ambrose 8,295 0 0

CONVOY (Ireland).—For erecting four dwellings-houses for Mr. S. Asho. Mr. J. McIntyre, architect, Rath-kenny:—
A. Neely £484 0 0 J. Johnston . . . 2550 0 0
Synth Bros . . . 616 10 0 K. Brady 544 0 0
S. Donnell . . . 615 0 0 G. Kelly, Con-
W. Pitt 610 0 0 voy* 525 0 0
J. M. Grath . . . 551 0 0

CRAWLEY.—For the construction of about 7,784 yds. of earthenware pipe sewers, ranging from 7 in. to 15 in., with the necessary tanks, pumping station, valves and pumps, percolating filters, and the laying-out of a sewage irrigation area and other works, in the parishes of Crawley and Hove, Sussex, for Horsham Rural District Council. Mr. S. R. Lowcock, engineer:—
Edwards & Co., Granville House, Arundel-street, Strand* £10,750 3 5

CROYDON.—For the erection of small first-floor additions to the workshops at the Workhouse, Queen's-road, for the Guardians. Mr. H. Berney, architect, 104, Green-street, Croydon:—
E. P. Bull & Co., Stratimere-road, Croydon* £269

CRAWLEY.—For Crawley and Hove sewerage and sewage disposal works, for the Horsham Rural District Council. Mr. Sidney R. Lowcock, M.Inst.C.E., Engineer for the works, Westminster:—
J. H. Macdonald £15,511 4 0
Smith & Co. 13,832 17 2
J. T. Binn 13,656 15 0
P. W. Tripp 13,451 0 0
F. Gibson & Co. 13,377 10 0
D. Potter 13,505 0 0
A. N. Coles 13,522 5 0
J. Jackson 13,407 15 0
R. G. Brooker & Co. 13,420 0 0
G. Napier & Sons 13,384 19 10
J. A. Ewart 13,216 14 0
Rowland Bros 13,210 0 0
Johnson & Langley 13,141 0 0
B. Wilkinson 13,139 0 0
G. Bell & Sons 12,891 0 0
R. Cooke & Sons, Council Education, 12,818 0 0
R. Hes, Ltd. 12,659 0 0
W. Pearce 12,581 5 0
R. Kingston 12,542 0 0
Hooper, Neary, & Co. 12,484 11 3
Petlick Bros 12,210 0 0
G. G. Rayner 11,999 3 2
Hewson & Sons 11,924 10 0
W. Smith 11,907 3 4
R. H. B. Neal 11,707 0 0
W. L. Wallis & Co. 11,500 0 0
H. Barrow 11,348 0 0
Edwards & Co., Strand, W.C. 10,750 3 5
[Engineer's estimate, £11,611 ds. 2d.]

EAST BARNET.—For additions and alterations to the Margaret-road County Council School, for the Metropolitan Board of Works, Metropolitan Commis- sioner, Mr. Urban A. Smith, County Surveyor, Hatfield:—
Coulson & Lotts £2,186 0 0
W. M. Batcher 2,123 3 4
Patman, Fotheringham & Co. 2,073 0 0
J. & M. Patrick 2,055 0 0
J. Willmott & Sons 2,042 17 11
A. F. and A. Sons 2,042 17 0
L. & W. H. Patman 1,907 0 0
Mattock & Parsons 1,971 0 0
J. Stewart 1,958 0 0
J. Evans 1,862 0 0
W. H. Hyde 1,845 10 0
W. F. Harris & Co. 1,877 0 0
E. & G. Foster 1,842 0 0
Williamsons 1,841 0 0
H. Flint 1,833 0 0
Kettering Co-operative Builders, Ltd., Kettering* 1,714 11 2

EAST GRINSTEAD.—For laying pumping main and sewers, for the Urban District Council. Mr. W. E. Woolham, Engineer and Surveyor, Council Offices, East Grinstead:—
Collingwood & Co. £2,800 Johnson £597
Collingwood & Co. 755 Reads & Sons 568
L. Waters & Sons 749 G. Wells 517
E. & G. Hies 727 G. G. Rayner, Croy- 500
G. Bell & Sons 689 don

EAST GRINSTEAD.—For building engine-house, for the Urban District Council. Mr. W. E. Woolham, Engineer and Surveyor, Council Offices, East Grinstead:—
E. & G. Hies £693 G. Wells £490
E. & G. Hies 576 Reads & Sons, Bridge-
L. Waters & Sons 408 street, Westminster 456

EAST GRINSTEAD.—For 1,400 yds. of 6-in. cast-iron socket pipes, for the Urban District Council. Mr. W. E. Woolham, Engineer and Surveyor, Council House, London-road, East Grinstead:—
J. Every £8 7 6 J. & B. Ritchie £5 7 6
Narrow & Co. 5 8 0 Austen 5 7 0
Weeks & Co. 5 2 6 Baines* 5 7 0
Cochrane & Co. 6 0 0 Case & Barnes 5 6 6
A. B. Clink 5 10 0 Hollowell Iron Co., 5 5 0
A. & G. B. Clink 5 10 0 Hollowell Iron Co., 5 5 0
Ltd. 5 15 0 and Iron Co. 5 3 0
Birtley Iron Co. 5 11 6 Stavely Coal and Iron Co. 5 2 6
Stanton Iron Co. 5 11 2 Iron Co. near
Cochrane & Co. 5 7 6 Chertefeld

EAST GRINSTEAD.—For supplying and erecting duplicate gas-engines and pumps, for the Urban District Council, Mr. W. M. Woolham, Engineer and Surveyor, Council Offices, East Grinstead:—
G. R. Mather, £1,400 0 0 Rice Bros, Ltd. £575 7 6
A. C. Potter & Co. 744 0 0 National Gas Co. 698 0 0
Pratichitt Bros. 698 0 0 Engine Co. 565 0 0
Tangley, Ltd. 643 0 0 Rice Bros. 533 12 6
R. Proctor 633 0 0 Weeks 514 0 0
Lea, Howell, & Co. 633 0 0 Cressley Bros. 500 0 0
C. Co. 633 0 0 Ltd. 500 0 0
H a y v a r d , Ltd., 511 6 0 Campbell Gas Engine Co. 500 0 0
T. L. Co. 501 13 0 Halifax* 495 0 0
E. Bird & Co. 583 0 0

EVESHAM.—For erecting a mill factory, for Messrs. T. W. Beach & Sons. Mr. F. Foster, architect, Masonic-buildings, Coventry:—
A. H. Haywood £9,384 0 0 R. Bowen £3,890 0 0
W. J. Blodgett 9,130 0 0 J. Darse 8,350 0 0
G. J. Colborne 8,999 0 0 Cliff & Co. 8,314 0 0
R. H. Dyle 8,912 0 0 Eaply & Co., Ltd. 8,200 0 0
T. Rowland Ltd. 8,801 0 0 W. Lussman & Co. 8,100 0 0
G. Hains & Son 8,792 0 0 Co. 8,100 0 0
W. Jones 8,745 0 0 R. P. Githers 7,900 0 0
T. Bailey 8,700 0 0 W. H. Gibbs 7,878 0 0
J. Farnell 8,690 0 0 E. Harris, Coventry 8,475 0 1
E. E. White 8,475 0 1 try* 7,852 0 0

GREAT MISSENDEN (Bucks).—For the erection of an artists' studio "The Brow," for Mr. Julian Phillips, Mr. J. Bruce Merson, architect, 76, High-road, Kilburn, N.W.:—
F. G. Rust £512 0 0 G. Parsons, Great-Aldridge & Son 492 0 0 wood* £440 0 0
G. Darlington 472 0 0 H. J. Wright 365 10 0

GRIMSBY.—For erecting new hall, Garibaldi-street, for the Ancient Order of Foresters. Mr. H. Heap, architect, 10, St. George's-chamber, Grimsby:—
W. Kuson* £1,123

HARROGATE.—For private street works required in a portion of Lancaster Park-road, for the Corporation. Mr. F. Bagnall, Borough Engineer and Surveyor, Harrogate:—
E. Long, 7, Forest-avenue, Starbeck, Harrogate* £468 5 7

HEBBURN.—For excavating a living farm and 400 rods of sewage, Whitnash-pavine, etc., in Hedgely-road, etc., for the Urban District Council. Mr. H. Waterson, Surveyor, Council Offices, Argyle-street, Hebburn:—
A. Walker & Son, Ltd. T. Callaghan £2,273 16 6
Glen & Co. 2,285 8 6 T. Paterson 2,235 14 6
S. & M. 2,577 17 7 J. Wardlaw 2,234 7 0
G. Thornton & Co. 2,188 5 3
Co. 2,495 17 6 J. Hatfield & W. Kennedy 2,339 10 0 Co., Park-land* 2,150 7 3
J. R. Squires 2,355 15 3 Lane-Sumner-land* 2,150 7 3
H. Ellison 2,328 11 0

[Surveyor's estimate, £2,235 14s. 6d.]

HESTON.—For main road paving, for the Heston and Isleworth Urban District Council. Mr. P. G. Parkman, Engineer and Surveyor, Council House, Hounslow, W.:—
A. Walker & Son, Ltd. £11 12 2
G. Winpoy & Co. 3 472 13 9
T. Adams 3 425 10 0
S. Gibbons 3 350 11 0
G. R. Mann 3 336 12 6
M. Thacker & Co. 3 335 1 3
W. Griffiths & Co. 3 327 1 11
P. Langley & Johnson 3 293 4 4
W. Neave & Son 3 280 0 0
Patent Victoria Stone Co., Ltd. 3 276 8 5
T. Price & Son 3 273 17 0
T. Watson, Joint Commis- sioner* 3 271 5 2
K. Rogers & Co. 3 253 8 11
T. Chapman 3 238 2 3
E. & E. Hies 3 192 4 9
J. Mosley & Co., Ltd., West- minster* 3 167 0 0
S. Atkins & Co. 3 325 8 3
* Error in tender.

HORWICH.—For sludge pressing and other plant required at sewage disposal works, for the Urban District Council. Mr. H. H. Hinnell, engineer, 41, Corporation-street, Manchester:—
Ashon, Frost, & Co. £1,495 0 0
Manlove, Allott, & Co., Ltd. 1,467 10 0
Whitehead & Poole 1,168 7 7
J. Wolstenholme & Son 1,108 0 0
Goddard, Massey, & Warner, Notting- ham* 1,125 10 0

LIANBERIS.—For rebuilding and altering building, for Mr. William Williams, Fitz-coch, Llanberis. Mr. Lowlyan Lloyd Jones, architect and surveyor, Tower-buildings, Carnarvon:—
O. Morris £335 0 0 T. P. Roberts & Jones Bros. 188 0 0
H. J. Roberts 239 0 0 H. Jones, Ltd. 188 2 2
J. Jones & Son 230 0 0 beris* 188 12 0

LONDON.—For the internal painting, etc., at the infirmary, Brook-street, for Lambeth Guardians:—
A. E. Vleor & Co. £510 0 0 Cracknell & Co. £248 0 0
W. Hussey 508 10 0 R. J. Richards, Greenwich Mills* 331 15 0
han 505 10 0 Rice & Son 313 0 0
Wright & Co. 502 10 0 A. H. Tans 298 10 0
W. Dennison 439 0 0 E. Mills 279 0 0
P. Barr 484 0 0 Koshy & Co. 279 0 0
F. Warburton/Son 445 0 0 H. Kent, 31, J. J. Richards 373 10 0 B. C. A. on-road 359 0 0
S. Penn 359 0 0 H. H. Harrison 359 0 0
H. Bragg & Sons 331 2 8 S.E.* 274 0 0

LONDON.—For cleaning and painting works at the Northern Convalescent Fever Hospital, Winchmore Hill, N., for the Metropolitan Asylum Board. Mr. W. T. Hatch, Engineer-in-Chief:—
E. Mills, engineer £2,475 14 0
M. McCarthy £1,500 0 0
W. W. Harris & P. M. Dudley 2,007 0 0 Co., Ltd. 1,500 0 0
W. W. Dudley 1,903 5 0 E. Proctor & Son 1,325 0 0
S. & L. Luns 1,530 0 0 R. Wood 1,480 0 0
W. J. Simms & Sons 1,728 0 0 Co., 40, Tur-
W. Hussey 1,545 17 0 Lime-house, E.* 1,500 0 0

LONDON.—For hot-water heating apparatus in the Lower Administration Block at South Western Hospital, Lander-road, Stockwell, S.W., for the Metropolitan Asylum Board. Mr. W. T. Hatch, Engineer-in-Chief:—
R. J. Ward Co. £225 0 0
Taylor & Fraser 218 0 0
J. Keith & Blackman Co., Ltd. 215 0 0
J. Weeks & Co., Ltd. 210 0 0
H. C. Davis & Co., Ltd. 209 0 0
R. Dawson & Co., Ltd. 197 0 0
P. H. Burroughes & Sons 197 0 0
P. H. Allen & Sons, Ltd. 192 10 0
Death & Willwood 182 0 0
Barnes, Griffiths, & Co., Ltd. 180 0 0
Bollon, Fane, & Co. 177 0 0
Mathews & Yates, Ltd. 175 0 0
J. Gray 175 0 0
W. G. Gannon & Sons, Ltd. 165 0 0
South Eastern Engineering Co. 150 0 0
J. & F. May 150 0 0
M. Duffield & Sons, Ltd. 150 0 0
R. Harding & Son 155 0 0
G. Hopkins & Sons 154 6 6
Brighton Foundry & Engineering Co., Ltd. 149 0 0
T. Potter & Sons, Ltd. 137 10 0
W. Freer 125 0 0
T. T. Wright & Sons, Ltd. 125 0 0
R. J. Cassi & Co., Ltd. 122 0 0
G. & E. Bradley 113 0 0
Cannon & Hedford, Sloughbury Works, Sloughbury-road, Peckham* 112 0 0

LONDON.—For the erection of four cottages at Ordnance-road, East Greenwich, for Mrs. S. R. Cowell. Mr. Alfred Roberts, architect, Greenwich, S.E.:—
Thomas & Edges £1,587 0 0 S. J. Howie £1,194 0 0
P. & T. Thorne 1,487 10 0 Groves, Stock-
P. D. Long 1,309 well-street, Green-
W. Martin 1,216 well* 1,150

LONDON.—For the erection of residence, "Moulmain," in the Grove, Church End, Finchley, N., for Mr. E. J. Bailey, Messrs. Bennett & Richardson, architects, 2, The Broadway, Finchley.—
 Jackson £800
 C. W. Scott 800

LONDON.—For the erection of residence, "Westfield," in Hendon-avenue, Finchley, N., for Mr. J. B. West, Messrs. Bennett & Richardson, architects, 2, The Broadway, Finchley, N. Quantities by the architects:—
 W. Tont £2,262
 Nicholls & Son 2,250
 Ford & Walton Ltd. 2,935
 Godron & Sen 2,243
 Matlock Bros. 2,193
 C. W. Scott 2,166

LONDON.—For the first section of exterior restorations of the west and south facades of St. Stephen's Church, Elthorne-road, Upper Holloway. Mr. G. Carter, architect, 513, Holloway-road, N.
 E. Tomkins, 12, St. John's road, N. £300

LONDON.—For alterations to No. 494, Hornsey-road, for Mr. Charley. Mr. G. Carter, architect, 513, Holloway-road, N.:—
 Rowe £161 0
 G. Cox, Holloway-road £148 15

LUDLOW.—For the execution of drainage works at the Workhouse, for the Guardians. Mr. B. Weale, architect, East Hamlet, Ludlow:—
 T. Speake, Church Stretton £497

LUDLOW.—For the extension of the infirmary at the Union Workhouse, for the Guardians. Mr. B. Weale, architect, East Hamlet, Ludlow:—
 T. Speake, Church Stretton £530

MORRISTON.—For "Libanus" new schoolroom, Mr. C. S. Thomas, architect and surveyor, Wind-street, Swansea:—
 J. & D. Jones £1,310 0 0
 T. Richards .. 1,280 0 0
 D. Jenkins .. 1,258 10 0
 Evers 1,250 0 0
 Bennett Bros. 1,250 0 0
 Lloyd Bros. .. 1,243 10 0
 J. & F. Weaver 1,225 0 0
 Williams & Mort 1,220 0 0

ST. ALBANS.—For additions and alterations to the Priory Park County Council School, for the Education Committee of Hertfordshire County Council. Mr. Urban A. Smith, County Surveyor, Historical:—
 Bailey & Sons £1,533 5 11
 G. E. Wallis .. 1,499 0 0
 E. Donham .. 1,428 6 6
 J. Willmott & Sons 1,404 11 10
 C. Miskin & Sons 1,393 0 0
 H. Flint 1,366 0 0
 J. & W. Drake 1,340 0 0

ST. ALBANS.—For additions and alterations to the Garden Field's County Council School, for Hertfordshire County Council. Mr. U. A. Smith, County Surveyor, Hatfield:—
 W. Payne £2,497 8 4
 F. J. Bailey .. 2,495 0 0
 W. Stanley 2,481 0 6
 Gibson & Co. 2,354 0 0
 W. Irwin 2,297 0 0
 H. A. William-son 2,234 13 5
 Miskin & Sons 2,190 0 1

ST. BRISWOLD (Cornwall).—For trenching and laying 6-in. diameter cast-iron and stoneware pipes from Stannou to near Wenford Bridge, for the Directors of the North Cornwall China Clay Company, Ltd. Mr. T. H. Andrew, engineer, Market-hill, St. Austell:—
 White & Alder £5,125 0 0
 man 4,612 0 1
 Runnalls & Son 2,806 0 0
 Woodman & Son 2,780 0 0
 C. E. Carden .. 2,773 16

SHELLINGTON (Beds).—For erecting a chapel, for Primitive Methodist Church Committee. Mr. J. Shillock, architect, Hitchin:—
 M. Foster & Co. 2,575 0 1
 A. C. Bland 474 0 0
 J. S. Lauder 456 0 0
 D. G. G. G. & Brewer 495 0 0
 Young & Co. 415 15

SNODLAND.—For building a mortuary at the cemetery, for the Parish Council. Mr. Charles Souter, jr., architect:—
 A. G. Caudler £204
 G. Gates 145
 J. A. Davison 143
 E. G. Brown 142

SURBITON.—For private street works at Ravenscar-road and Crane's-drive, for the Urban District Council. Mr. H. T. Mather, Surveyor, District Council Offices, Surbiton:—
 G. Napier & Sons £2,188 0 0
 Jura 1,840 0 0
 T. Free & Sons 1,835 0 0
 S. Atkins 1,829 0 0

SWINDON.—For making additions to the Whale Inn, for Messrs. Wadley & Co. Messrs. Drew & Sons, architects, Regent-circus, Swindon:—
 S. Osborne £730 0 0
 P. Chick 725 0 0
 H. & C. Spackman 678 0 0

TOTNES.—For the construction of sewerage works, for the Urban District Council. Mr. C. E. Ware, engineer, 18, Bedford-circus, Exeter:—
 W. C. Shaddock £12,713 13 4
 G. Pollard & Co. 11,763 16 10
 T. Shaddock 11,693 0 0
 J. Shaddock 11,506 13 6
 A. N. Coles 9,871 16 11
 E. R. Lester 9,732 0 0
 Matcham & Co., Ltd. 9,498 0 0
 R. H. B. Neal, Ltd. 9,251 0 0
 E. Pike 9,222 0 0
 Petrick Bros. 9,209 0 0
 R. E. Narracott 8,417 6 8
 Woodman & Son 8,290 0 0
 Stephens & Sons, Ltd. 7,733 0 0
 E. Harris, Cyst Hydron, Exeter* 7,625 0 0

TREDEGAR (Mon.).—For erecting a house and shop at Tredegar Junction:—
 H. Rees, Blackwood* £585

WESTERHOPE.—For erecting a new Council school at Westerhope, near Newcastle-on-Tyne, for Northumberland County Council Education Committee. Mr. H. Topham Forrest, Architect to the Education Committee, Quantities by Messrs. J. P. Allen & Partners, Newcastle-on-Tyne:—
 S. Easton, L.L.L., Newcastle-on-Tyne* .. £4,100

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 H. A. Jones £280 3 6
 Davies Bros. .. 253 0 0
 [All of Wrexham.]

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VOL. XC.—No. 3307.

JUNE 23, 1906.

ILLUSTRATIONS.

National Provincial Bank, Great Yarmouth.....	Mr. Arthur S. Hewitt, A.R.I.B.A., Architect.
Premiated Designs for the Peace Palace at the Hague:—	
First Premiated Design.....	By M. Cordonnier.
Second Premiated Design.....	By M. Marcel.
Third Premiated Design.....	By Herr F. Wendt.
Fourth Premiated Design.....	By Herr O. Wagner.
Fifth Premiated Design.....	By Messrs. Greenley & Olin.
Sixth Premiated Design.....	By Herr F. Schwecten.

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The Peace Palace Designs at the Hague.—II.



HAVING noticed in our last issue the six premiated designs for the Peace Palace, it seems only right to give a little space to some of the best of those which

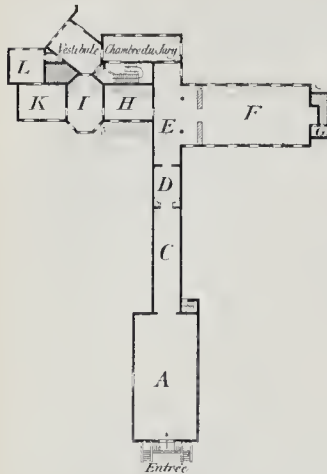
have received no imprimatur from the Jury; and it may also be entertaining to say a word on some of the more extraordinary and eccentric architectural fancies which are illustrated. Taken altogether, the collection forms indeed rather an amusing architectural comedy, illustrating the various ways in which it is possible to regard a programme of this kind. Several competitors seem to have thought there could be nothing so suitable and emblematic as to construct a model of the globe on the top of the building. Thus the author of No. 47, in Gallery B, has got an immense representation of the earth, with all the countries duly drawn out on it—all that can be visible in one hemisphere at least, and a crowd of bronze figures of men and horses at the base, as if crushed or about to be crushed under the monstrous globe which takes the place of a dome. No. 18, in Room A, is a truly wonderful specimen of the modern German mystical architecture, looking as if it came out of the world before the Flood; the author, however, is so little afraid of ridicule that he has

taken the trouble to attend and place his card on it—"Walter Solbach, Elberfeld." * If we could publish Herr Solbach's perspective view, it would afford an interesting example of what the modern German architect of the mystical school is capable; but it will very likely appear in due time in the *Berliner Architekturwelt*, where we have before come across similar nightmare visions. The plan, it may be added, is as preposterous as the architectural treatment. In Room H, No. 142, with the ambitious motto "Athene—Roma—La Haye," illustrates this by an enormous pagoda in terraces, like an idea for the tower of Babel, the whole practical part of the plan being sacrificed to the base of this wonderful erection. The puzzle about it is, what was the connexion in the author's mind between his motto and his design? It would be interesting to know from what quarter of the world came No. 157, with the motto "Skibo"; a building with green roofs, drawn on rough grocery paper, and with a blue pond in front. On the table in Room E a great deal of amusement may be found; here have been placed, flat, some of the designs which were apparently thought too absurd to hang up. One of them, a triangle on plan, rises into three great brick towers one on each face, pyramidal in line, and holding between them at the top an enormous crystal globe, how made and supported is not apparent. Another on the table looks

like a scene for some romantic opera—say "Die Zauberflöte." But, as Bacon says, "enough of these toys."

On the right side of Room A, No. 195 ("Adrinastéphe") is a noteworthy conception of the exuberant French type of detail, showing in a bird's-eye view a pyramidal composition with three pavilions grouped around a centre one rising above them; there is nothing especially to recommend it in plan, but it has the merit of unity of architectural conception. Also, on the same side of the room, No. 144 ("Vogue la Galère") shows a noteworthy scheme, the Court block a Greek cross on plan with a large dome in the centre; the dome buttressed by the square masses of building has a fine effect. The Library department is joined on to this on the plan of an inverted T; the plan, however, does not fulfil the requirements. On the left side of the same room No. 10 ("Cedant arua toga") is an orthodox classic design shown in a fine set of drawings, but correct rather than impressive. No. 29 ("Palladio"), on the same wall, occupies an immense amount of ground with his garden courts, but it is a fine dignified design, laid out on the principle of having a dominant block running up the axis of the plan, rising above the rest, and marked by a portico and pediment in front; the plan is well arranged though spaced rather widely; in the large open court on part of the central axis rises an immense Corinthian column carrying a globe on the top. This employment of a column as a central feature is a suitable way of advertising,

* All the other designs except the six premiated ones were anonymous at the time of our visit. If there are any names on them now, they have been appended since.



Plan of Exhibition Galleries.

as it were, the position of the Palace; we find it employed again in No. 72 ("Templum Pacis") on the screen at the top of the room, which we think we recognise as that of Mr. A. W. S. Cross. This is a very fine architectural conception, one of the best in the collection in fact; the two departments are placed vertically on the site in two parallel symmetrical blocks, recessed in the centre; into these recesses a square colonnaded court is worked between the two blocks of building, with a great column in the centre of the square; on the outer side of each block there is a similar recess in the plan with a colonnade, forming a kind of echo to the colonnaded court between. This, with its front porticos, works out, as might be expected, into a very fine composition in perspective, but we cannot see that the plan would work very well, the two departments are too much separated; and as a matter of architectural expression it does not seem right to treat the two departments side by side as of equal value; the Court department is the more important one, and therefore should naturally appear as the front block, with the Library block in the rear. On the lower or entrance wall of Room A, to left of the entrance, is a very nice low-proportioned classic design of which we omitted to note the number, but which is in excellent taste, and is very well suited (evidently intentionally so) to the architectural *genius loci*; far more so than the first pre-niated design, for the Hague is a city of quiet and not of florid architecture. Among the designs on the cross screens No. 60 ("Paix du Monde") impresses one as a production of native Dutch talent; a brick tower and lofty green-slated roofs, and a general suggestion about it of being a new Casino for Scheveningen. We may pass over two or three which look well at first sight but will not bear investigation. One or two remind one usefully how an otherwise good design may be rendered effete by a bad crowning feature. No. 143 ("Honneur et Patrie"), for instance, is a most ambitious classic design lost by the employment of a large glass dome, a feature fatal to monumental

architecture; and No. 112 is a very good piece of rusticated masonry design spoiled by a glazed cupola in a still worse form—square on plan with convex hipped angles; we should have thought this was "made in Germany" but for the motto, "Fluctuat nec Mergitur," the armorial motto of the City of Paris. No. 134 ("Sol"), quite obviously French, is a very clever design perfectly unpractical in the plan, in which everything is sacrificed to a great three-aisled vestibule running across the front; the very clever perspective sketch shows an architecturally one-storied front with three great entrances with segmental frontons, flanked by a columned order, each entrance approached by a large flight of steps convex on plan; there is great spirit and style about this sketch, though perhaps it suggests a royal hunting pavilion rather than a Palace of Peace.

On the left hand side of Room C are one or two fine designs. No. 100 ("Pax Humanitati"), a French (?) classic design, shows a very well arranged plan, in which the Library department is separated from the Court by a garden, the corridors of communication enclosing the garden right and left, the centres of these communication corridors developing into vestibules for the entrances from the Park at each side of the site. The corridor plan is unbroken all round, the rooms well arranged and the architectural design dignified. No. 82 ("Pax Vobiscum") is also a rather fine design, differing from most in showing a large hall running not across but vertically up the axis of the plan, ending in the large court, which ends in an apse projecting from the further margin of the plan. The principal stairs rise in flights to right and left outside the door of the large court, too far from the main entrance of the building; one would have to traverse the whole length of the hall before arriving at the staircase. The central hall divides the two departments, the Court section (except the large court) on the left, the Library section on the right, but both sides are treated the same in the symmetrical elevation; an obvious aesthetic mistake. No. 147 ("L'Homme"), on the left side of the centre screen in Room C, is one of the Utopian architectural dreams which this competition has evoked; though a building that no one would think of carrying out, it is not without power as an abstract architectural conception. The style is a kind of mixture of Persian and Egyptian suggestions; the main feature is an immense octagonal tower built with a considerable entasis and ending in a small dome; internally the treatment of this tower reminds one of Blake. Above the arches and pendentives is a band of massive sculptured wreaths enclosing shields; above this a band of colossal figures of angels between columns, and then the lofty tower interior with long narrow slits of windows, and a domed ceiling. What becomes of the great space between the inner and outer dome is wisely left a blank. But it is a rather remarkable architectural dream, and the plan is a great deal better than one generally finds in a Utopian design of this kind. The perspective view, one must admit, suggests rather

a funeral monument to Peace than a palace for her entertainment.

In the right hand recess in Room E No. 140 ("Ecco") is worth note, a scholarly and severe classic design with a sensible plan. In Room L No. 103 ("L'Ange de la Paix") is also worth something; the plan shows a very clever combination of practical arrangement with possibilities of interior architectural effect; the access to the two courts is very cleverly managed so that the entrances to them from the vestibule appear symmetrical, without any "dodging" being employed to produce different-sized courts internally. The architectural treatment is a light and graceful Renaissance, but the cupola, of high proportions and pleasing in outline, is unfortunately only a glass affair, detracting from the effect of an otherwise good design.

Among the number of drawings in the large room marked F there are only two or three that are worth particular notice. No. 55 ("Red Dragon") shows a very nice elevation, but rather too suggestive of almshouses or an agricultural college. The author of No. 215 ("Arx Pacis") has had the idea of producing a Peace Palace in a kind of rural cottage style—white stone walls and mullioned windows, a roof garden with trees on the top, and climbing plants all over the walls. The idea is pretty and idyllic, but the plan is childish. No. 39 ("Pax") is a design of much merit; the plan is in this shape, the centre block containing a vestibule and a large square hall with a low stone dome over it; the left-hand block is the Court section and the right-hand the Library section; in front of the centre block is a tetrastyle portico, and a strong cornice is carried all round the building. In perspective these three blocks group exceedingly well, though in the elevation the detail looks rather naive; of course, in this as in one or two other cases mentioned, the symmetrical treatment of the Court and the Library sections is a mistake. No. 81 ("Ædes Pacis") has a good plan, except that the bookstore has an entrance only at one end, which does not facilitate despatch in procuring books for readers. The grey-toned perspective, showing a front with a centre recessed behind a colonnade of coupled Ionic columns, and a low dome behind, has a good effect of dignity and repose. The design is probably French.

The upstairs rooms contain mostly a collection of curiosities. No. 75 ("S. P. Q. R.") is not without architectural merit; the loftier portion of the building is arranged in four great square blocks coming to the centre of each face, and connected by lower buildings in the angle spaces; the bigger blocks are crowned with sculpture. Unfortunately the lower portions are roofed with visible glass roofs, which gives the whole the appearance of an exhibition building. Among these designs in the upstairs rooms, mostly curiosities, the Jury, or whoever was concerned in the hanging, have placed that by Mr. Hare, No. 117 ("Red Cross"). So much for their judgment and attention to their task. After looking through the best of the other plans, we should hardly

hesitate to say that Mr. Hare's, in point of arrangement and concentration, and symmetry of interior effect, is actually the best plan that has been submitted, and has a completeness about it which we find in no other plan; while in architectural treatment it takes its place among the best. But it is a compact and rather small plan, very economical of space, and exhibited therefore in drawings which are smaller than many others and more quiet in style of execution, and the fact that it has been passed over in the awards and almost overlooked in the hanging is one among other indications that the Jury have simply given their attention to the largest and most showy sets of drawings, and that they have fallen into the very pitfall which professional adjudicators are supposed to be warranted to elude—viz., that of mistaking drawing for design. It has been a badly-judged competition. As we are giving the illustrations of the premiated designs this week, we have printed under the head of "Illustrations" the remarks on each design in the Jurors' Report; only those who have examined the drawings themselves can fully appreciate how vague and weak these remarks are, and how completely they fail to discriminate the real points in each design.

Whether the mere exhibition of the designs, to those who already know the town, is worth a visit, may be a question; but those of our professional readers who may not before have visited S'Gravenhage (as it is properly called) would find it worth while to make this an opportunity at once of looking over the designs for the Peace Palace and making the acquaintance of a small city which has a peculiar attraction of its own. Architecturally the Hague has not very much to show; there is the well-known Grootte Kerke, with its hexagonal brick tower and traecried stone spire; and there is the bold and picturesque ancient Hall of The Knights in the courtyard of the Binnenhof; that is all that is of the first interest, and the street architecture is of little interest *per se*. The charm of the Hague is in the combination of water and trees with streets; the continual vistas of canals, often lined by avenues of trees; the large open lake of the Vyver at the centre of the town, with the exterior walls of the Binnenhof rising straight out of the water; while a five minutes' walk from the Vieux Doelen hotel—a hotel with a history of two centuries behind it, and looking out on the Tournooiveld, the ancient tilting field, now a tree-planted square—takes one across the canal at the eastern boundary of the town into a tract of woodland large enough to furnish an afternoon's walk. Take the electric tram from the Tournooiveld to Scheveningen, and as soon as the tram is clear of the town it is running nearly the whole way under an avenue of trees. As for Scheveningen, however, it is a riot of casinos and kurhaus's, each one more vulgar and blatant in style than the last; it is like the Paris exhibition taken down to the seaside, only that the buildings are much worse. It is only a good way from the watering-place establishment that painters find the picturesque craft and the rather uncouth figures which are familiar to us in a

hundred exhibitions under the title "On the Beach at Scheveningen." The celebrated picture-gallery in the Mauritshuis at the Hague is also rather a disenchancement. It contains no doubt two very famous pictures, Rembrandt's "Tulp and his Pupils" and Paul Potter's "The Young Bull" (an over-rated work by an over-rated painter); one or two good Metzus, two admirable Gerard Dowz, and one or two good Jan Steens; but the main body of the collection consists of second-rate Dutch pictures; and we do not know any form of entertainment more depressing to the mind than second-rate Dutch pictures. The best thing in the Mauritshuis next to Rembrandt's "Tulp" is the carved stair balustrade. But there is another art-gallery, known apparently to few, the Mesdag Museum, in an out-of-the-way street in the north-west quarter of the town. This was founded by Herr Mesdag, the well-known marine painter, and dowered with his private collection. It is admirably arranged in three stories of rooms, and contains a number of interesting pictures of the modern French and Dutch schools, besides a considerable amount of bric-à-brac and other artistic curiosities. It is one of the best minor art-museums we have seen anywhere, and no visitor to the Hague should miss it.

NOTES.

The Workmen's Compensation Bill. THE so-called Government measure to amend the Workmen's Compensation Acts will soon be hardly recognisable by its originators. Already the Government have been compelled to give way on two points—viz., the limit they inserted in the Bill to exempt small employers by exempting those employing not more than five workmen, and the date from which compensation is to commence; but now they have been further over-ruled in Committee. Owing to pressure the Home Secretary introduced a clause which would include shop assistants, provided the salary paid did not exceed 200*l.* and the employer did not employ less than three shop assistants. The "followers" of the Government, not satisfied with this concession, moved amendments raising the limit of salary to 250*l.* and removing the limitation based on the number employed. The Home Secretary acceded to the first amendment, but stood out against the second, but the Government was defeated on a division, and an adjournment had to be asked for to allow the Government to consider the position. Some members even pressed for the Compensation Acts being extended to soldiers on active service, but we only allude to this to prove the rashness exhibited in Committee in relation to this question of compensation. The fact that all compensation is a charge eventually on the consumer is entirely lost sight of by these ardent reformers, but is one which will make itself severely felt by the industrious industrial classes. The principle of compulsory insurance has also been introduced in Committee and carried against the Government, a clause having been introduced enabling

a Secretary of State to make rules in any industry compelling employers to insure their workmen in any mutual trade insurance scheme confined to that industry.

The Charing Cross Trade, issued Friday last week, Major Pringle discusses

In a Report to the Board of Trade, in a Report to the Board of Trade, issued Friday last week, Major Pringle discusses at length various theories which have been put forward to account for the failure of a portion of Charing Cross station roof in December last. It is satisfactory to find that he sweeps away all suggestions to the effect that the accident may have been due to reduction of strength by corrosion or by fatigue of the metal to excessive wind pressure, to disturbance of the foundations by tunnelling or other causes, or to the absence of buttresses on the west wall of the station. Major Pringle confirms the view that the fall of the roof was brought about by the breaking of the tie-rod in the principal nearest to the wind screen, the fracture having occurred at a defective weld where a flaw, commencing in the heart of the bar, had gradually extended outwards. The facts stated in our article of December 23 last as to the state of the broken bar were so fully corroborated by the evidence given at the Coroner's inquest and at the Board of Trade inquiry, that no other conclusion was possible as to the actual cause of failure. Major Pringle finds further that the weight of the temporary staging was the immediate cause, but as the stress in the total sectional area of the bar did not exceed 513 tons per square inch, no reason existed for anticipating danger. In our "Note" of January 13 last we said, "The most important lesson to be drawn directly from the accident is that a roof like this ought not to depend for safety upon a single tie-rod." That warning is repeated in the present Report, where the particular lessons to be learned from the accident are said to be (1) that in old iron roofs where welded bars have been used there is danger of concealed flaws; (2) that unless main tension members in such roofs be duplicated or strengthened there is possible risk of failure; and (3) that where such risk of failure exists the supporting walls should be strengthened, if not already of adequate strength to resist the thrust caused by failure of the roof ties. In some respects the interest of the Report is diminished by its tardy appearance, but to those who desire a complete record of the facts for study and future reference the document is well worth having.

The Panama Canal. A RECENT vote of the Senate Committee on Inter-oceanic Canals in favour of the

level scheme for Panama has considerably raised the hopes of those who believe that this is far superior to the lock canal project. On the other hand, a telegram received last Saturday from Washington announces that the House of Representatives agreed by a majority of seventy-four votes to the adoption of the lock type of canal. It remains to be seen whether this decision will be confirmed by the Senate. A letter by Mr. W. H. Hunter, printed in the *Engineering Record*, contains a strong statement of

the grave dangers that may attend the operation of the six large locks proposed in the high-level plan. The writer describes the results of five accidents to lock gates on the Manchester Ship Canal between 1895 and 1906, and points out that if similar mishaps were to take place on the Panama Canal there would be no escape from serious disasters. The three locks proposed at Gatun are characterised as presenting "one of the most striking examples of rash and hazardous experiments in the construction of public works ever seriously suggested to the Government of a great nation." Other portions of the proposed works come in for almost equally emphatic condemnation, and as Mr. Hunter's conclusions were generally in agreement with those of the majority of the Board of Consulting Engineers, it is really difficult to understand the preference entertained in some quarters for the high-level canal.

THE case of Godden v. Hythe Burial Board (reported in the *Builder*, June 16), recently decided in the Court of Appeal, has raised a very important point under the Burial Amendment Act, 1855. The Burial Board, having to increase the burial accommodation, resolved to acquire certain land for this object, and with the consent of the Local Government Board entered into negotiations for this purpose. At that time there was only one house within 100 yds. of the site, and the consent of the owner and occupier had been obtained, as the Act requires. The plaintiff in the action owned $7\frac{1}{2}$ acres of land, which he used as a market garden, but intended to develop as a building estate, and on April 17, 1905, he commenced two houses. The purchase by the Board was completed on April 26, and on April 27 a burial took place within 80 yds. of the plaintiff's houses, which were in the course of construction. The plaintiff subsequently erected other houses, but on March 24, 1906, a burial took place within 80 yds. of the houses first erected, and the plaintiff then took action against the Board. Sect. 9 of the Burial Amendment Act, 1855, provides that "no ground not already used as, or appropriated for, a cemetery shall be used for burials within the distance of 100 yds. from any dwelling-house." And the Court of Appeal with great reluctance have been compelled to construe the word "already" as indicating the time when the Act became law, and hence the plaintiff succeeded in his action restraining the Board from burying within 100 yds. of his houses. The Court pointed out the serious result of their decision, which amounts to this, that a margin of 100 yds. must be left round every burial ground acquired since the Act. This is clearly a case which calls for remedial legislation, the wording of the Act being amended so as to indicate the time when the land is acquired.

THE Right to Photographs of Buildings. IN these days photographs of buildings are used for so many purposes that any light which is thrown by legal decisions on the right to reproduce them is important. The case of *Stackemann v.*

Paton, which is reported in the current number of the "Law Reports," is, therefore, worth notice. The right in question depends on the words of the Fine Arts Copyright Act, 1862. The gist of the first section is that the author of every photograph shall have the sole right of reproduction unless the negative shall be sold "or shall be made or executed for any other person for a good or valuable consideration." In the case in question a photographer had taken photographs on his own initiative of a school, the proprietor allowing him to enter to visit rooms, and, as the phrase is, giving him every facility by means of groups of the pupils, and, so forth. It is unnecessary to go into the details as to the way in which the dispute as to the reproduction of these photographs arose; it is sufficient to quote a sentence from the judgment of Lord Justice Farwell:—"There is," he said, "a perfectly good consideration given by the owners of these establishments to the photographers by allowing them to come on to the premises and to take photographs." In other words the permission to come on the premises is equivalent to a payment, and therefore under such circumstances the owner of the house has the right to reproduce the photographs, and to prevent their reproduction by the photographer, unless the latter has by writing expressly reserved the right of reproduction.

PROFESSOR McADIE, of the United States Weather Bureau, has written an interesting article on "Atmospheric Electricity and Trees" in the *New York Electrical World*. He discusses first the use of trees in connexion with wireless telegraphy. It is found that they can be used for the "antenna" of the receiver or transmitter. Trees which have a small amount of leaf surface give poor results, and dead trees act practically like insulators. The variations of the resistance of a large eucalyptus-tree were recorded. They show that rapid changes occur every morning and evening. This is probably due to the disturbing effects produced by sunlight on the electrical condition of the atmosphere. It is suggested that a sunshine recorder might be constructed on this principle. The photographs shown of trees struck by lightning are most interesting. The oak is the most frequently struck, and the beech is seldom if ever struck. When dead trees are struck they are splintered at the top exactly in the same way as flagstaves or the masts of ships. Living trees, however, are sometimes splintered at points on the trunk, above and below which there is little trace of the discharge, but generally there is merely a deep groove made on the trunk. Attention is called to the excellent "earth" made by the roots of trees. In many places in America the end of the lightning-conductor is connected with a large nail driven into the trunk of a tree, and this is found to be more satisfactory than connecting it with an earth plate in the ordinary manner. Records are to be made of the differences of electrical pressure between the tops and the roots of trees during thunderstorms, and this field of research appears to be very promising.

A REPORT, presented to the Rapid Transit Board, explains the conditions which led to the subsidence during construction of the tunnel now being driven under the East River, New York. It appears that no trouble arose until the shield had passed below the river bed, when water was encountered in considerable quantities, and the shield commenced to sink. We learn from the report that this effect was due to the action of the contractor, who, instead of maintaining an adequate air-pressure, preferred pumping as an alternative means of keeping the shield free from water. The result was that in flowing beneath the shield the water washed away the underlying sand in quantities sufficient to form a cavity, into which the forward end of the tunnel subsided. Heavy bending moments were developed, and the resulting strains had the effect of cracking numerous plates of the lining, besides disturbing the gradients for a total length of 2,500 ft. The broken plates are now being replaced, and the gradients corrected by reconstruction of the permanent way. It is stated that the settlement was "immediately detected" by the Rapid Transit engineers, but this is hard to believe, except on the assumption that some 2,500 ft. of tunnelling were performed in the space of a few hours. "Subsequently detected" would be a better phrase. No explanation is given as to why the contractor was allowed to follow his own foolish devices without interference from the responsible engineers. The occurrence does not seem to be a particularly good advertisement for American methods of supervising the execution of important engineering works.

SEEING that steel-framed buildings are becoming general in London and elsewhere in Great Britain, it is well that a clear distinction should be drawn between the three essentially different methods in which steel is applied to construction. The first method, now happily falling into disfavour, is that in which columns and girders are more or less loosely built into brickwork without proper or adequate inter-connexion, and serving purely local purposes, would not be able to stand without the support afforded by the walls. Steelwork of this kind is so bad that it does not deserve a name, and we may therefore pass on to the second method. This may conveniently be termed "skeleton" construction; it consists in the establishment of a steel framework properly and rigidly connected throughout, the object of the skeleton being essentially to carry the floors, and sometimes other details, of a building, while the walls are self-supporting. The new Waring building in Oxford-street is a good example of skeleton construction. The third method, or "cage" construction, embodies the idea of a complete and well-connected framework of steel capable of carrying not only the floors, but the walls, roof, and every other part of a building, all loads being transmitted to the ground through columns at predetermined points. The Ritz Hotel, in Piccadilly, is a genuine cage building, although the stipulations of the existing Building Act made it

necessary for the architect to adopt brick and stone masonry of just the same thickness as if the walls had been required to support their own weight and that of the entire structure and its contents.

DR. COPEMAN'S Report to the Local Government Board on the causes of an epidemic of enteric fever at Fulbourn Asylum.

of enteric fever at Fulbourn Asylum states that at the time of the outbreak the sewage was disposed of by broad irrigation (after a preliminary straining) on land adjoining the asylum. The water supply for the asylum is obtained from a well sunk in the chalk about 60 ft. deep, near the centre of the block of buildings. The water-supply for the town of Cambridge and for the village of Fulbourn is obtained from other wells and springs about one mile from the asylum. The underground water in the neighbourhood is held up in "what is practically an immense basin," and the surface-soil above the chalk is of a loamy nature with a thickness of from 1 ft. to 1 ft. As long ago as October, 1902, the Local Government Board directed the attention of the Town Council of Cambridge "to the danger that exists of possible pollution to the asylum wells and those of the Cambridge Waterworks Company, by the discharge of untreated sewage from the asylum direct on to land having a chalk subsoil and in close proximity to the water supplies." At a later date the asylum authorities were warned, but they declined to "admit the danger," and took no steps to escape it. The Lnuacy Acts require all plans for the "erection, restoration and enlargement of buildings" to be approved by a Secretary of State, but by a curious and unfortunate omission nothing is said about drains, and the Visiting Committee took advantage of the omission and carried out the work on their own lines, and consequently on their own responsibility. Dr. Copeman's tests with fluorescin showed clearly that colouring matter (and therefore in all probability sewage), applied to the irrigation-area, found its way to the underground water and to the springs and wells supplied therefrom, and his conclusion is that "it is not possible to deny the potentiality of danger from this cause [*i.e.*, sewage pollution], through the medium of the water supply." We agree with him, and incidentally may point out the danger of the soak-away cesspools which are so common in many districts having a chalk subsoil; wells more than a mile away may be polluted with the sewage from these convenient but insanitary filth-pits.

Whitton Park, Hounslow.

THE Metropolitan Public Gardens Association have taken steps to advance the acquisition of this finely-timbered estate, extending over 45 acres, at a cost of 15,000*l.*, the sum for which it is stated the vendors are willing to sell the land, conditionally upon its preservation as a public park. The Twickenham District Council have offered to contribute 3,500*l.* towards the purchase money. The freehold property, of 115 acres, was offered for sale, in parcels, for building purposes, twelve years ago; the mansion and pleasure grounds were subsequently

rented by the Whitton Park Club. The grounds were laid out over some cornfields and the waste on the verge of Hounslow Heath by Archibald, third Duke of Argyll. The Duke built the house and laid out the property, making fishponds, a bowling-green, an orange-walk, and so on, and (a rarer thing at that time in this country) planting a large variety of foreign trees and shrubs, with cedar, fir, larch and pine trees—some of the cedars, including the avenue about quarter-mile long; he raised from seeds in 1724-6. He also built a tower for his astronomical observations, and a conservatory for a choice collection of exotics. After the Duke's death, *s.p.*, in 1761, the estate passed through several hands; it was ultimately bought by a Mr. Gostling, who sub-divided it, taking the conservatory for his own residence and selling the house with the greater portion of the grounds to Sir William Chambers. Chambers made some alterations of the house, and occupied it as his country-seat during many years. He built in the grounds a temple of *Æsculapius*, in honour of the Rev. Dr. Willis after the King's recovery, in 1789, together with "ruins," a "Roman bath," etc., somewhat after the mode he adopted at Kew; he restored the observatory, and, *teste the Gentleman's Magazine*, 1812, set up in the garden portions of the screen from the chapel in Denmark (Somerset) House, Strand. In the grounds was Cibber's marble group, afterwards taken to Stowe, of a Highland piper and his dog, commemorating an incident, related by De Foe, of the Great Plague. A bas-relief of Zeus overthrowing the Titans was carved by Dere for the tympanum of the pediment of the principal façade. After Chambers' death the two properties were acquired and again united by Mr. George Gostling.

The New English Art Club.

THE Club are holding their thirty-sixth exhibition at galleries in Dering-yard, off 67A, New Bond-street. It is of no use, of course, expecting to see here pictures in the sense in which one ordinarily understands the word; one must be content to take it as a gallery of experiments in painting, dealing with part of the elements of a scene or subject; the colour without the form, as in the late Mr. Brabazon's shapeless colour-blot of buildings; or colour and form without atmosphere, as in Mr. A. Rothenstein's side elevations of "The Linen Markers" (62), a very interesting composition nevertheless. The desire of some of the members seems to be especially never to let us forget that this is *paint*—paint laid on thickly in the shape of something or some one, but not for a moment to descend to anything so low as simulating life. Professor Brown has rather fallen from the true ideal in two studies of nature effects, "Misty Morning on the Thames" (61) and "Richmond, Yorkshire" (71), an effect of storm; these have something of the force and reality of nature. We are glad to see Miss Alice Fanner at her best again in her really bright and breezy picture "Old Mill at Montreuil" (64). Mrs. McEvoy, in "The Sonata" (7), gives a good study of a very plain girl looking over some music; there is certainly character

in this; and Mr. Tonks's "The Crystal Gazers" (58) is an interesting and very cleverly-drawn figure composition. Beauty of course is sedulously avoided in this gallery as if it were the accursed thing; the point is to find the element of art in low and repulsive subjects—see "Noctes Ambrosianæ" (123), a study of a vulgar audience in the gallery of a music-hall; or if there is possible beauty in the subject, to evade it, as in Mr. von Glehn's so-called "Decorative Panel" (99), in which a nearly colourless nude figure sprawls in the most ungainly and undecorative of attitudes. As a type of the higher ambitions of the Club we may call attention to the crooked sketch of some old buildings at Honfleur (22) by a well-known art-critic who finds the Royal Academy not good enough for him.

The Dowdeswell Gallery.

At the Dowdeswell Gallery there is a second exhibition of water-colours of garden scenes by Miss Beatrice Parsons, whose first exhibition there we noticed some time ago. The collection is entitled "Old Gardens in England and Algiers." We thought Miss Parsons's first exhibition admirable; this second one is even more so. For delicacy, finish, and truth in the painting of garden scenes and flowers it would hardly be possible to surpass these water-colours; we know of nothing of the same kind in contemporary art to equal them. It is hardly worth while to particularise or to select, for all are equally beautiful; the artist has made for herself a first and incontestable place for subjects of this class.

The Baillie Gallery.

At the Baillie Gallery there is a collection of paintings by Mr. Montague Smythe, mainly of Chinese and Japanese scenes and figures; many of them only slight sketches, but all showing his well-known ability. The paintings by a young artist, Mr. Philpot, recently a student at the Slade school, are full of talent and promise, though they are rather studies than pictures; and it is a mistake to tack the name of "Ganymede" to a prosaic nude study of a very ordinary-looking youth; a kind of mistake, however, which older and more experienced painters frequently make. The work of most value in a pictorial sense is the small picture entitled "The Bath of Venus," which is both original and pleasing in composition. The paintings by Mr. Louis A. Sargent, rather mystical in character, show imaginative feeling; the group entitled "Titans," and a landscape "The Hour before Dawn," have a good deal of poetry in them; and there is a powerful design illustrating Blake's "Tiger" poem, which would have been more effective however if the whole tiger had been shown, instead of his head and tail being cut off by the frame.

Old Wimbledon.

AN interesting exhibition has been on view last week at the building at Wimbledon called "The Art College" (though we understand it is no longer put to the use which that name would imply), consisting in part of a loan exhibition of various objects of artistic and

archeological interest lent by residents in the neighbourhood, and in part of a special section illustrating, by old engravings and by water-colours, different features of Old Wimbledon, most of which have now disappeared. The exhibition was got up by the exertions of Mr. Richardson Evans, the Hon. Secretary of the Society for Checking the Misuse of Advertisements, with the co-operation of the members of the local "John Evelyn Club." There was a great deal of interest in the illustrations, some of the old engravings showing buildings which had long since passed away and been forgotten, though their sites can be identified. At the same time there was exhibited in the ground floor rooms the work of Wimbledon Arts and Industries. The Loan Exhibition, especially the Old Wimbledon section, was of so much interest that it is to be regretted that it could not have been kept open longer.

ARCHITECTURE AT THE ROYAL ACADEMY.—III.

The church architecture exhibited this year is neither large in quantity nor particularly striking in quality when compared with the secular work shown, and the annual decline which has shown itself during the last few years in exhibits of this class is thus maintained. Presumably fewer churches are being built, or else architects of ability devote themselves less and less to ecclesiastical work.

In the present exhibition, too, the dividing line is again strongly marked between what one may properly call archeological Gothic and the new Gothic built of arrangements and features by no means traditional. Naturally it is to the latter class that one looks for the least commonplace designs; but even as regards these one must, before attempting criticism, set a different standard and get into quite another atmosphere, so far apart have secular and church work drifted nowadays.

First on the list comes Mr. C. H. M. Mileham's "Design for a Church at Epsom" (1,394), shown by a thin-looking water-colour drawing. This is a quite traditional Norman church with a fine square tower rather on the lines of that at Tewkesbury. The plan is of a church with nave and aisles, the aisles and the crossing under the tower vaulted. The tower piers are curiously planned with arches facing the nave, transepts, and chancel, in three receding planes which are carried down to the floor. Mr. Mileham also has another scheme, presumably for the same church (1,493), which is certainly not so good, and is disappointing as coming from him.

Mr. Frank Freeman's church at Failsforth (1,433), and Messrs. Oliver, Leeson, & Wood's "Proposed Church at Swalwell" (1,455), are both Gothic revival churches of not much interest; the latter has a long row of simple square-headed clearstory windows to the nave, a common and pleasing feature in north-country Gothic, but a little spoilt in this case by a too heavy hood moulding jumping up and down over each opening. Otherwise this is a quiet and meritorious design.

"Baptist Church at Farnworth" (1,471), by Mr. A. J. Hope, is a heavy Renaissance building made up of scraps of "municipal" detail which we suppose must be considered equally applicable to a Baptist meeting-house.

In an entirely different class are the two drawings (1,465 and 1,488) setting out Mr. A. H. Skipworth's "New Chapel at Mirfield for the Community of the Resurrection," interior and exterior views of which are shown by water-colours of a somewhat unrealistic character. The chapel is situated on a steep hillside which falls in an easterly direction, allowing a spacious and well-lighted crypt to be formed under the chancel; access to this crypt is obtained down two flights of steps leading directly out of the nave, with an open well-hole. Possibly there may be some special reason for an arrangement such as this, though one cannot help feeling that, if a direct approach to the crypt from the church was necessary, a scheme like that at

Torcello could have been devised to give a better architectural effect and take up less floor space. Otherwise the interior would no doubt be impressive, but the inexplicable twisting of the fluted polygonal piers must produce a very uneasy effect, while the method of springing the main arched off corbels attached to the twisted portion of the piers, instead of off some kind of cap in the usual way, looks most unstable.

Close by are hung two drawings (1,496 and 1,497) of Mr. G. H. Fellowes Pryne's "New Church of St. Mary, at Jobannesburg"; neither of these drawings is very interesting; so far as the architecture is concerned, perhaps it may be above the level of Jobannesburg, though it is to be regretted that what will evidently be looked upon there as a representative example of English Gothic should fall short of the present English standard.

Mr. Temple Moore has two exhibits, one a quiet and correct little early-Decorated church at Wellhall, in Kent (1,502), but inadequately drawn, and with no plan. Also a large interior view of "All Saints' Church, Tooting Graveney" (1,511), an uninspiring piece of work shown by a commonplace brown-ink and wash drawing, and again no plan. Apparently the interior is faced with yellow brick and stone bands, a combination of materials which is, as a rule, singularly ineffective when applied to this arid kind of Gothic. Altogether this important church is scarcely worthy of Mr. Temple Moore.

"Three Chapels" (1,503) is a large frame with several interior and exterior views, cleverly executed in water-colour, of village chapels in countries as far apart as Italy and Ireland. They are all well "localised," and the painted ceilings and decoration look dainty and well thought out. These are by Sir C. N. Nicholson, as is the important "Steeple, leaded" (1,505), which we illustrated and described in a former issue, and which, therefore, requires no further comment.

Mr. Ernest Newton shows a wash drawing of the "New Spire and Upper Part of Tower, St. George's, Bickley," which has also appeared in a former issue. It is certainly a successful attempt to work down to the level of the existing modern church behind it.

A very large drawing of a "High Bay of the Choir, Liverpool Cathedral," exhibited by Mr. G. G. Scott (1,513), is interesting as showing the detail to a large scale. On the whole it is a splendid piece of building, turned into somewhat unconvincing Gothic by the correct but rather lifeless tracery of the windows.

Sir Charles Nicholson has another drawing, in water-colour, and not quite up to his usual standard, of the exterior of the "New Parish Church at Epsom" (1,515); no plan is given. There is a curious mixture of styles in this design; the chancel, with its rude wall arced and early character generally, is by far the most satisfactory portion, but it is difficult to reconcile it with the rest; the tower is made to look clumsy by the unnecessarily heavy buttressing of the belfry stage.

"Proposed Church, New Somerby, Grantham" (1,517), by Mr. B. H. Tarrant, is a pleasing little interior showing a low church ceiled with a flat segmental paneled roof giving a feeling of breadth. The absence of chancel arch and the general open effect is reminiscent of west-country churches, but the screen would have been better had it run across the aisles as well as the nave. The iron screen itself is unsatisfactory; cusped tracery never looks well in this material.

Mr. C. E. Bateman's "Hill Church, Sutton Coldfield" (1,518), is a good, simple suburban church, rather over-chequered perhaps, but otherwise restrained; the plan is ingeniously arranged so as to throw the space under the tower into use for seating accommodation.

"St. Chad, Longsdon" (1,532) is a pen drawing by Mr. G. C. Horsley, executed in a manner which assuredly cannot do justice to any merits the building may have; some of the fittings look as if they might be interesting.

Mr. H. C. Corlette's design for "A Modern Church" (1,534), which might just as well have been labelled "A Study for a Byzantine Church," is, nevertheless, very interesting, and shown in a good water-colour drawing

in which the foreground and the chancel are extremely well put in. The plan is in three compartments, each of which is domed, the domes springing from four large square piers which are placed so close to the outside wall as only to allow space for a passage aisle. The interior is impressive, and would probably be more so if the whole scheme had been a little less stumpy. Altogether this is an admirable study.

In some respects the most notable church design in the exhibition, though it is not very well hung, is Mr. G. Gilbert Scott's "Design for a New Church at Bourne-mouth" (1,549). In the absence of a plan it is not easy to gather exactly what the scheme is intended to be; the west end, which is good in scale and very quiet, has high-stepped parapets masking the sloping lines of both the aisle and nave roofs. The nave is very low in comparison with the high transept beyond, and the scheme seems to be another development of the idea embodied in the corresponding part of Liverpool Cathedral. Part of a tower appears in the drawing, but it is of far less convincing design than the fine west front already mentioned.

Messrs. Rogers, Bone, & Coles show a design for a wooden chancel screen (1,558), in which the stout upright members, set rather closely together, certainly produce a definite architectural effect, which is very pleasing.

Mr. Ponting's two village churches (1,595 and 1,596) in the old manner are quite quiet and English in effect. Mr. Spooner shows a drawing (1,572) of a lofty church interior, in which a more modern spirit and a greater effort at impressiveness are shown.

On Mr. T. G. Jackson's two designs we have commented in a former article.

PROPOSED NATIONAL COLLECTION OF DRAWINGS OF ARCHITECTURE.

The following letter has been issued by the Committee formed by Mr. R. Phené Spiers to assist him in organising a national collection of drawings of architecture:—

"DEAR SIR,—Owing to the lack of any organised scheme for the collection of architectural drawings, numerous sets of measured drawings of old buildings forming in themselves valuable historical records, have been lost or destroyed, and many others are practically inaccessible to students. Magnificent work has been done during the last fifty years by young architects and others, in making accurate drawings of old buildings, both at home and abroad, and as many of these buildings have since been destroyed or materially altered, these drawings in some cases form the only record of their original design and arrangement.

It has long been felt that drawings of this nature should be carefully collected and housed for future reference, and the Committee charged with arranging a testimonial to Mr. Phené Spiers last year hoped to have been able to initiate such a scheme as part of the testimonial. This was found to be impracticable, but Mr. Spiers has since come forward and, of his own free will, put aside the money balance of the testimonial as the nucleus of a fund for dealing with the matter, and he has invited a small Committee to assist him in organising and arranging a scheme.

As it is felt that such a collection should be as freely accessible as possible to everyone, the authorities of the Victoria and Albert Museum at South Kensington were approached to ascertain if they would be willing to take over and house such a collection in their library under reasonable conditions. We are pleased to say that arrangements have now been completed whereby the collection will be deposited in the Art Library at South Kensington, and any contributors of drawings will be recognised as donors conjointly with Mr. Spiers' Committee, and will be entitled to the donors' privileges of the Museum. While the drawings will be accessible to students for purposes of study, and can be copied under this head, they will not be available for publication by other than the author during his lifetime, without his permission.

The Committee feel sure that architects who possess such drawings only require to be made aware of the existence of a definite scheme for collecting and adequately housing the same in order to present their drawings

to the collection. In most cases such drawings, having served their original purpose, are rolled up and never looked at, being ultimately either lost, destroyed, or forgotten.

The collection will not be confined to drawings of old work, but will include within its scope the following—Records of important public buildings and of works by eminent architects down to the end of the XIXth century; photographs of buildings which no longer exist, or which have been materially altered; and sketch-books of deceased architects of repute.

We venture to hope that you will signify your approval of the scheme by contributing any such suitable material as you possess and by informing us of the existence of similar material in other hands, as well as by using your influence to secure the same for the collection.

We will arrange, if required, for the collection of drawings, etc."

The letter is signed on behalf of the Committee by Professor W. R. Lethaby and Mr. Robt. Weir Schultz.

STUDENTS' DRAWINGS AT THE ARCHITECTURAL ASSOCIATION.

At the Association's premises in Tuffen-street, Westminster, the walls of the central hall and the entire suite of lecture rooms on the first floor are hung with a very large collection of students' drawings, representing the work done for the annual prizes and in the studio.

One cannot but ask oneself in the presence of such a large show what it all means, and if the work exhibits the best kind of promise both in the individual and in the system. But from the nature of the case the part of the work that is really criticisable—that done for the prizes—eludes such questioning. With the exception of the Travelling Studentship the competitions can only by chance be governed by the system of training in vogue at the Architectural Association. The men who compete need not necessarily be day school and studio men, so that we are face to face with an exhibition that defies systematic criticism. The Travelling Studentship is, indeed, somewhat of an exception, though not so much as appears at first sight. By an innovation introduced some years ago this competition was brought into touch with the educational work of the Association, and the prize was awarded for the best three sets done in the Advanced Class of Design, plus a certain number of sketches and measured drawings. Excellent as the Design Classes are in themselves, however, they cannot be said to represent a system of training. The visiting list is made up of men well known in the profession, who give up part of their valuable time to giving much invaluable advice to the student. Results, in such circumstances, must be more accidental than systematic. To come to another matter, it may be questioned if the Association has improved its studentship by bringing in the element of design. Since the innovation the standard of sketching and measuring work submitted has inevitably declined. By offering the prize for draughtsmanship alone, as aforesaid, work of a high quality could be obtained. Now, the appearance of the drawings submitted, for the most part, suggests that they are done in the least possible time.

We might throw out the suggestion that the Studentship, as regards its design work, should no longer attempt to enter into competition with that excellent and popular prize, the Architectural Association silver medal for design, and, by limiting its field, maintain the high standard of its earlier years.

The winner of the Studentship, Mr. A. Winter Rose, appears on the whole to be the strongest competitor. Most successful of his design work is, perhaps, the "Entrance Lodge and Gates to a Public Park." In the "Wayside Inn" perspective he leaves colour for pen and ink, with a result that shows promise. The 3-in. scale drawing to this subject is not improved by the spiritless, not to say meaningless, pencil shadows. The perspective of his third design, the "Specimen House at Kew," is a highly-coloured, rather hot drawing of a design which soars out of "Garden Renaissance" into

very modern Byzantine. The design is otherwise well thought out, particularly as to detail. Two pleasant, but not remarkable, colour sketches of bits at Queens' College, Cambridge, are also submitted, and as measured drawings, three staircases of the Senate House at Cambridge—the small scales in ink-line and the details in pencil and wash; but we fear that Mr. Rose has not always done his best with the draughtsmanship, in the fluting of the columns in the small-scale drawing, for example. Some of the drawings in this winning set are marred by particularly objectionable printing. When will students learn that there is a scale and a fitness in accessories which the strongest drawings cannot ignore?

One can fairly say for Mr. E. Brantwood Muff, who is awarded second prize, that his work is not tainted with the desire of doing everything in the least possible time, which is too apparent in much of the work submitted by the winner. In his draughtsmanship he is not hurried, neither is he exactly laboured, but perhaps he just misses the real living yet careful workmanship, which is the best of all. His drawings of Bolton Abbey seem to suffer from lack of interest on the part of the worker, and one of the scale drawings is obviously unfinished. Yet the impression, confirmed by the Street of Almshouses at Bursall, is a pleasant one, on seeing drawings that for the most part are done cleanly and carefully. Mr. Muff's strong exhibit is unquestionably his design for a village church, which is up to the best traditions of the Class of Design. With another strong design exhibit he would score handsomely. But his oak staircase is not so convincing.

Though not yet of full Studentship calibre, there is much in the work of the third competitor, Mr. W. A. Hodges, that is excellent and full of promise. In his pencil sketches of St. George's, Hanover-square, and the Cloisters at Worcester, he really tries to draw as carefully as he can, a method of getting to work not by any means too common nowadays. His design for Public Park Gates also shows capital feeling for dignity, though the plan of the house is unduly sacrificed. The "Wayside Inn" is also a very fair design, and the "Grammar School"—which avoids meaningless eccentricity—is commonplace more from inexperience than method.

The drawings executed in the two Classes of Design—Elementary and Advanced—and exhibited in a separate room—vary much in excellence, and on the whole, perhaps, are not quite so strong as we have seen them in former years. In the Elementary Class Mr. George L. Alexander's "Three Cottages" should be mentioned, as well as the lot generally showing shop-fronts; and in the Advanced Class the designs for a "Wayside Inn" by Mr. P. M. Stratton and another student, who draws on tracing-paper, but does not sign his name; the charming "Tudor Chimney-piece," by Mr. Stratton, as well as the "Public Park Gates," by Mr. Alan Binning.

The competition for the Architectural Association medal and 10L 10s., unlike the Studentship, does not suffer from lack of competitors. "Heron" (Mr. T. W. Watkins) is unquestionably first in the design for a "Village Library." He exhibits a well-coloured and well-drawn set with a good plan and workmanlike elevations. He is not happy, however, in the arches on each side of the central bay of the first floor in his front elevation. Other creditable sets are submitted by "Nil Desperandum," "Mansard," and "Sacred Beetle." "Mercian" makes an attempt at a condensed plan, but he gets scrappy in his elevations. "Lion" is quite the weakest of the six. It cannot be said that it is a strong year for the Architectural Association medal.

The Banister Fletcher Bursary for Measured Drawings goes to Mr. Cecil Pinsent for a set showing the Mansion House, an interesting piece of work well worth measuring. This set is on the whole the best piece of measured work in the exhibition. Mr. P. Hulbert Keys shows the Stationers' Hall, but, though the thick line he has adopted is perhaps allowable for this class of work, his drawings have not the merit of Mr. Pinsent's.

We cannot understand the Architectural Union Company's Prize, also for measured

drawing, being awarded at all. Only one set seems to have been submitted, representing Pallant House, Chichester, under the motto "Dodo." The house is of the comparatively tame order that has quietness and sobriety as its chief merit—with an occasional piquant smack in the details, as in the dodos carved in stone which adorn the front gate-piers—requiring more than common care in the draughtsmanship. The drawings submitted, however, are poor and commonplace to a degree, and deserve no prize of any kind.

It is with greater pleasure that one turns to the Saxon Snell Prize of value 50l. offered every three years for the best set-design fully worked out in all practical details, including a specification. Two designs are submitted, and that by Mr. Vincent Hooper (Motto "A") is deservedly successful. He is certainly to be congratulated not only on the thorough working out of his subject ("A Home for Aged Soldiers"), but on the very neat way he has condensed his matter on to four small stainers. His elevations are not unpleasing, though somewhat heavy, and his plans are excellent. A taking, if rather slipshod, design is also submitted by "Suspect," which Effer worked out might have gained more recognition. He would do well to study the winner's up-to-dateness in practical matters, such as the disposition of lavatories.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A SCOTTISH district meeting of the members of the Association of Municipal and County Engineers was held at Berwick-on-Tweed on Friday and Saturday, June 15 and 16. The members assembled at the Town Hall, where they were received and welcomed by the Mayor (Mr. Ralph Thomson, J.P.).

The business meeting was held in the Museum. Mr. F. C. Holmes (Govan) presided, in the unavailing absence of the President (Mr. A. E. Collins, of Norwich), supported by J. Bryce (Partick), Honorary District Secretary, W. F. Curry (Pretoria, South Africa), J. Lee (Paisley), T. Nisbet (Glasgow), and others.

Mr. J. Bryce made a report of the work of the Committee which is engaged in preparing by-laws under the Borough Police Act (Scotland), 1903. The draft Report was complete, and when revised they intended to submit it to the Town Clerks' Association before they went to the Secretary for Scotland.

The Chairman said the Report was satisfactory, as it must be patent to all of them that the preparation of these by-laws involved a good deal of time and trouble.

Mr. J. Bryce, of Partick, was then unanimously re-elected Honorary Secretary for Scotland.

Municipal Works, Berwick-upon-Tweed.

Mr. R. Dickinson, Borough Surveyor, read a paper on the "Municipal Works in Berwick-upon-Tweed." He said that, while the poor rate was levied uniformly over the whole borough, the sanitary rates varied in Berwick, Tweedmouth, and Spittal. Each part of the borough defrayed the cost of its own services. Tweedmouth had neither water or sewage, and, consequently, was not rated for such, while Spittal rate included sewerage expenses but not water, this being paid to the owners of the waterworks. This charge, which varied, might be taken at ls. 6d. in the 1l., so that the total rates in Spittal amounted to over 8s. in the 1l., as against 5s. 6d. in Berwick. Establishment charges, which included salaries, hospital expenses, buildings, etc., could not be debited to each place according to the service rendered, and were divided in proportion to the rateable values.

The authority had been content to levy out of current rates for permanent improvements, rather than borrow for such purposes, and, consequently, no important improvement schemes were in progress. For years Berwick levied 6d. to 8d. in the 1l. for renewing streets, and when the small rate-producing power of each division of the borough was considered, very little could be done even with very high rates. Four causes seemed to explain the hitherto deep-rooted objection to the principle of borrowing, viz. the reckless mismanagement of the old Guild, which ruled down to 1835, the misapplication of the

principle "pay as you go," the idea that hallowing was expensive, and the comparative isolation of Berwick from other large and progressive centres.

At the last meeting, however, the Berwick rate estimate was reduced 3d. in the lb. by striking out two items of permanent improvement, the required sum being ordered to be borrowed. This action might be taken as an indication that a more progressive spirit was beginning to prevail.

The rare old relic of Berwick Bridge was entirely under the jurisdiction of the Corporation, into whose keeping it was handed by Charles II., together with a perpetual annuity of 100l. per annum for its maintenance.

Built during the years 1611-1624, the bridge was carried on fourteen piers of substantial proportions. The arches were formed of two rings of freestone of a total thickness of 3 ft. 2 in. It was 1,000 ft. long, and the carriage-way was 13 ft. 3 in. between the kerbs, with narrow paths on each side. The foundations and arches were sound, but the piers and cut-waters were not in a satisfactory condition.

The action of the river had had the effect of washing out the joints of the cut-waters, while surface water penetrating downwards between the rubble-paving of the old paths and defective channelling had completely disintegrated the lime-concrete with which they had been formed. The Corporation had in view a thorough repair, and instructed Messrs. Read & Waring, of Westminster, to examine and report. The estimated cost of putting the whole bridge into good order was 5,450l. As this work, however, included taking down and rebuilding the cut-waters and part of the piers, the question developed into one of widening the bridge.

Owing to the increase of heavier and speedier traffic, the narrowness of the bridge had become a serious matter, for while a traction engine was crossing all other traffic must be stopped. When it was remembered that this was the main route between England and Scotland, carrying a constant stream of motors, the Corporation did well to raise the question of widening. The engineers were consequently instructed to prepare a scheme.

Their proposal was to take down the piers and cut-waters to the level of the brandeths and rebuild on the same position, reusing the best of the existing old weathered stone for external work, the solid interior to be of Portland cement concrete. When the piers were carried to the necessary heights it was proposed to spring new arches on both sides, this part of the work to be executed in ferro-concrete but faced with old stones; while the existing parapets, which were 13 in. thick, of sound ashlar, would be carefully taken down, and, after being reduced 3 in. in thickness, would be again used. As arranged, the alterations would increase the carriage-way to 19 ft., with a 5-ft. path on each side, and, as the present structure carried both gas and water main, provision was made under the paths for this purpose. The estimated cost was 16,000l. The scheme was designed to avoid destroying the unique character of the bridge, and in this respect it had received a very hearty approval. As soon as the proposed widening was publicly discussed the interest in the bridge, from an antiquarian standpoint, became evident. But, putting that aside, the multiplicity of interests involved was a serious difficulty to overcome.

The bridge was essentially an Imperial one, having been built and maintained out of the National Exchequer; the Corporation was not liable to widen, being simply custodians for the Government; the sanitary authority, though under obligation to provide highway accommodation within the borough, had never had any control over this structure; while the County Council of Northumberland was also involved, as this bridge formed the only highway through this part of the county. Negotiations had been opened with the County Council and also with H.M. Treasury, where they remain for the present.

Only the Berwick division of the borough had a public water supply. Originally this was provided by the Corporation, or Guild, from certain springs on the freemen's estate, and was conveyed to various public "pans" by means of wooden pipes. In addition, almost every property had a private well.

In 1855 the then local Board of Health constructed a storage reservoir of 6½ million gallons capacity on a piece of moorland at New East Farm, about two and a half miles north of the town, at a level of 440 O.D. This supply served the purpose until 1870, when the land and springs at the existing Tower Works at Tweedmouth, were purchased. These springs yielded 250,000 gallons of water, which flowed daily into the river, over the bottom of what had been a freestone quarry. A reservoir was constructed on the quarry bottom, with three open-jointed sides into the bank from which the springs issued. At a lower level a second reservoir was built, which received its supply from the higher reservoir. From the low reservoir the water was pumped to the original Castle Terrace reservoir. For this scheme Messrs Leslie & Reid, of Edinburgh, were the engineers.

This new supply was used in conjunction with the older new East Farm supply, and, on the lowest estimate, formed a daily supply of over 320,000 gallons for a population of 8,000, or 40 gallons per head, and still the demand grew apace.

Before 1890, when the writer was appointed, the supply became totally inadequate, and for some years it was impossible to maintain a constant supply during summer months. So far as water supply was concerned, there was practically no control, no regulations, no meters, no trade charge, no inspection of waste, no required strength of fittings, no application for supplies; in fact, the supply was in the hands of plumbers. To cope with such chaos single-handed was impossible, and the author agitated for a special committee charged solely with water business.

After much opposition a Water Committee was appointed. With a strong man at its head and grasping the situation the Committee soon justified its existence. A Deacon waste-water meter was procured, which told tales that forced the appointment of an inspector. Regulations became imperative; the Waterworks Clauses Acts were put in force, and slowly but surely the Committee gained ground, and past anxieties began to disappear. The old New East Farm supply, in consequence of the gradual cultivation of the watershed, had become of doubtful purity and, owing to the prevention of waste, the Committee were able in time to abandon this supply altogether. A new pump was provided, capable of delivering 28,000 gallons per hour, instead of the original pump, which was only equal to half that duty, and, in order to further reduce waste and destruction of fittings, the town was divided into two districts by utilising a small reservoir as a pressure-reducing tank, so that on no part of the mains does the pressure exceed an equivalent to a head of 100 ft.

Charges of trade supplies, which had long been threatened, did not begin to operate till two years ago. This was vigorously opposed within the authority, as well as without, but there could be no going back. It became a choice between the abolition of meters and an additional supply, and the authority accepted the proper alternative. A charge of 1s. per 1,000 gallons was ordered, and this was shortly afterwards reduced to 8d. per 1,000 gallons. The revenue derived from this source was only about 350l. per annum, partly because no minimum charge had been made for metered supplies. In many cases where supplies were metered the amount paid for water was less than the meter rent. The meter used was Kent's "Standard," and its adoption had been fully justified by experience.

Berwick now rejoiced in a water supply of over 50 gallons per head, well distributed, and provided with 120 hydrants, but with the serious drawback that it did not reach the highest part of the town containing some of the best residences. This district had its own supply, but without "head," and consequently would be at a disadvantage in case of fire.

The supply to Tweedmouth was derived from two sources—a private company and public wells.

After prolonged investigation, the author became satisfied that probabilities were greatly in favour of additional water being found on the ground of the Berwick Waterworks, but, as boring involved considerable risk from two sources, he advised, as a

preliminary, that the advice of an engineer, experienced in work of this nature, should first be obtained. The dangers feared were the possibility of interfering with the existing springs and of sea-water being drawn into the bore-hole in consequence of its close proximity to the tidal waters of the river.

The matter was referred to Messrs. Read & Waring, who were engaged in carrying out a similar scheme in Lancashire, and, after careful inquiry on the ground, they confirmed the opinion already given, and recommended that a trial bore-hole be made to determine the depth of the water-bearing stratum in the first instance, and thereafter to proceed with well-sinking as might be found necessary.

An air-compressor plant was employed for the test. The water was discharged over a weir 12 in. in length, and on the thirteenth and fourteenth days the flow remained steady at a depth of 2 7-16 in., being equal to 175,000 gallons per twenty-four hours. As the surface of the bore-hole was only 10 ft. above high water, samples of water from it were taken at both states of the tide, and the analysis proved it to be in every way satisfactory. The quantity obtained from so small a bore exceeded the most sanguine expectations, while the existing supply had not been affected in the slightest degree.

The result was deemed so satisfactory that the engineers were instructed to prepare a scheme for the supply of the whole borough. The scheme was to combine the existing supply and that from the bore-hole, and, instead of pumping the water to Berwick, to pump it to a reservoir to be constructed in Tweedmouth, where a site could be obtained about 100 ft. higher than the Castle Terrace reservoir, which would provide "head" to gravitate the supply to any part of the borough.

The present pumping main was to be extended and utilised for delivering water from the new reservoir to the existing Castle Terrace reservoir for the supply of Berwick. As the new reservoir was intended to contain three days' supply for the whole borough, and the Castle Terrace reservoir could only hold one day's supply for Berwick alone, Berwick would be safeguarded against the existing risk of the supply being cut off in case of a machinery breakdown. Separate pipes would convey water to Tweedmouth and Spittal, where it would be properly distributed, and this would have provided in one establishment a thoroughly compact and efficient water supply for the whole borough. The authority's instructions were fully complied with, and the estimated cost of the work was 20,000l. In January last, at a meeting of eighteen out of twenty-four members, eight voted for and nine voted against the scheme, and one declined to vote. The position to-day was that, on the recommendation of the Spittal representatives, the authority had decided, subject to the approval of the Local Government Board, to purchase, for the use of Spittal alone, the Spittal Waterworks and the farm on which they were situated at a cost of 8,000l. Tweedmouth remained as before, in urgent need of a supply, with no prospect of its acquisition. Berwick was considering a proposal to provide a pump to raise water from the Castle Terrace reservoir for the supply of Castle Terrace.

Mr. Lee (Paisley) expressed surprise at the decision of Berwick to carry out all street improvements from revenue. The borrowing of money for the carrying out of permanent street improvements was quite a legitimate charge to put upon the rates. He could hardly imagine how it was possible to have a satisfactory administration of the water supply with three different authorities controlling it.

Mr. Wilson (Helensburgh) was also of opinion that there should be one water supply for the whole of the borough and a uniform charge for the water.

Mr. Curry (Pretoria, South Africa) told a story of a Kent meter which failed to register, though they knew water was going into the house in large quantities, and on examination it was found that the workmen had put the supply-pipe on the exhaust, and consequently the meter was not working.

Mr. Goudie (Stirling) considered that three different water supplies must cause a good

deal of trouble to the engineer, and could not in any way be satisfactory.

Mr. J. Bryce (Partick) said it was surprising to find a town with a Corporation one thousand years old which had so old-fashioned a system of rating, with parts of the borough like independent colonies, evidently more or less rebellious, and desiring to be rated according to their own peculiar ideas and views of things.

The Chairman thought if the differential rating could be got rid of many of the difficulties as to water supply and sewerage could be remedied.

Mr. Dickinson having replied, he was heartily thanked for his paper.

Mr. A. H. Goudie (Stirling) presented a paper on the plan and register of streets, as provided for in the Burgh Police (Scotland) Act, 1903. The Act imposes a duty on Town Councils to provide a plan and register of streets, in which certain information has to be given as described in the section.

Mr. Nisbet (Glasgow) said they had prepared a register in Glasgow under a Local Act, with the result that there were now 5,000 or 6,000 actions entered against him as registrar.

The members were entertained to lunch at the King's Arms Hotel, and the afternoon was occupied with a drive to places of interest in the district, including the Waterworks pumping-station and the old bridge.

On Saturday morning Captain Norman, R.N., gave some particulars of the Elizabethan fortifications and walls of Berwick.

EXPERIMENTAL SCIENCE AND THE BUILDING TRADES.

At the London County Council School of Building, Brixton, on Monday, Mr. Alan E. Munby delivered his second lecture on "Experimental Science and what it has done for the Building Trades." Having given a brief summary of the chief points touched upon in the first lecture, Mr. Munby said that all gases had great power of expansion on heat, and, that being so, they would expect considerable expansion if they raised the carbonic dioxide to a moderate temperature, the conclusion being that hot carbonic gas was lighter than cold air. This explained why bad gases rose to the top of a room and were extracted by different systems of ventilation. There were some systems of ventilation which extracted the bad gases from the bottom of the room, but he felt that they were wrong. Dealing next with the principles of combustion, the lecturer said that combustion was nothing more than oxidation. This oxidation might proceed slowly or rapidly. In the case of the rusting of a piece of iron oxidation took place slowly. Burning was simply a form of oxidation, and in all chemical action we get heat. Even in the rusting of iron the iron gets hot, although it was not noticed. The action was so slow that it was impossible to measure the rise of temperature, but if rapid oxidation went on it was very noticeable, and in some cases caused the bodies to take fire. Heaps of oil-rags, for instance, caught fire from spontaneous combustion, as it was called, and they had explosions in coal mines which was due to the rapid oxidation of the coal dust, and occasionally the same thing took place in flour mills. The rate of oxidation was influenced by the size of the particles which were oxidised. If they had an evenly-divided substance, which got plenty of air, the rate of oxidation was very rapid. In the present day attempts were made to protect our buildings from fire, and to leave them in such a state that they were not likely to be burned, and it was very necessary to know something about the principles upon which fire-proof construction was based. Combustion or burning might be described as the chemical action taking place with the evolution of heat and light at the same time, and if they wanted to prevent fire they must remove one of the conditions necessary for combustion. The conditions on which fire took place were:—(1) Something which will burn, (2) something in which it will burn, and (3) sufficient heat to raise the substance up to a point at which it will take fire, which will depend upon what the substance is. Everything required a certain degree of temperature at which it would take fire, and this

was a matter of great importance in the consideration of the choice of materials which would resist fire. If they could get the air away from a substance it would not burn, but the idea in fire-proof construction was to get rid of one of the conditions necessary for burning. Thus they might have a combustible material, but prevent air getting to it; and that idea was carried out in solid-joisted floors, in solid treads for staircases, in teak floors, etc. The use of hard woods, as against soft woods, was based on the same principle, as the hard woods were comparatively non-porous. Proceeding to deal with the question of the physical properties of bodies to show how science could assist building-work in showing how those engaged could by its help better understand the materials with which they were brought in contact, the lecturer touched first on the question of cohesion, and said that, with regard to building materials, cohesion lay at the root of most of them. It was the cohesion of the particles of the bodies of cement, mortar, and other materials which render them so valuable. Matter, to begin with, was not perfectly continuous. Although solids appeared to be perfectly homogeneous, yet they consisted of very minute particles which had inter-spaces between them. Even a thing like a piece of lead consisted of minute particles with spaces between them. These spaces were so minute that it was not possible for them to see between them, but their existence had been established on theoretical grounds which he could not touch upon that night. The small particles were called molecules, and they were minute rings, which had circular sections. They had a certain amount of motion, which was limited in solid bodies, and the amount of motion depended on conditions other than what the substance was. First, however, it was evident that they had this quality of cohesion; there was a certain force which held them together. When these molecules got hot their motion became much more active. With one exception, all bodies expanded on heating. They saw that in the case of steel used in building, and with the use of long lengths of steel it was a thing which had to be reckoned with. It was an ordinary thing to put a 30-ft. girder over a shop front, and the expansion might easily be $\frac{1}{4}$ in. between winter and summer, and, therefore, if the girder was fixed at both ends in the wall serious damage might result from the expansion, and so such things were only fixed at one end. In the case of the Forth Bridge, which was built of steel girders, the bridge was 1 yd. longer in summer than in winter. Then the way in which the molecules behaved was of importance, as on that depended to a large extent the weathering power of the substance. They might have substances of the same chemical composition, and might think they would behave in the same way, but if they used them they would find that one weathered a great deal better than the other. It might be asked if that was so, what was the use of the chemist? but the answer was, that the work of the chemist must be used in conjunction with other sciences. By means of a number of lantern slides Mr. Munby explained how the structure of materials was affected by crystallisation, and showed the difference between crystallised and uncrystallised things. Although they might have the same chemical composition, physical tests, he said, were quite as important. Chalk and marble, for instance, were of the same chemical composition, and the difference between them was due almost entirely to structure. In marble they got an enormous amount of interlocking, but in chalk they had a number of rounded grains, and the power to resist abrasion was not nearly so great. At the same time, he did not want it to be supposed that crystallisation in all cases was advantageous as regards the structure of the bodies, and they had an illustration of that in timber. Then, with regard to the power of bodies to conduct sound, the lecturer pointed out that if solids were homogeneous they were always good conductors of sound, and he demonstrated how sound would travel along a length of good timber. In good timber there was a continuous structure, but in decayed timber that was destroyed. In the case of cement and mortar, they could test it by seeing how it behaved when broken up and when mixed with water, because the ingredients of which

it was composed will settle according to their density, and they could then get a separation which would allow of a certain amount of examination. Mr. Munby concluded his lecture by showing how the water test with mortar could be made.

Mr. H. W. Richards (Principal of the School), in proposing a vote of thanks to the lecturer, said it was gratifying to see the lectures so well attended, and he regarded it as evidence that those present realised that they had to use their brains in their work. He hoped the time would come when those engaged in the building trade would feel generally that there was something more than A B C to learn. The cleverest men rose to the top, and the time would come when the students would realise the value of such lectures.

THE CARPENTERS' COMPANY.

At an examination in carpentry and joinery, held at the Carpenters' Hall on June 6 and 9, silver medals were awarded to the following candidates:—Ernest Kerridge and Geo. Arnall; bronze medals were awarded to P. J. Luxton, T. B. Davis, E. E. Hunt, and C. H. Hancock (equal); first-class certificates to J. F. Dowsett, H. E. Gibbs, Wm. A. Harvey, Robt. F. Ewin, B. Holmes, G. S. Haines, W. Breffit, Jas. Sinclair, and E. Dymock; second class certificates to T. A. Gilbert, Arthur R. Cope, A. McMillan, H. B. Sander, A. Crews, E. G. Hampshire, B. E. Smith, P. Woodward, W. F. Bulgin, W. S. Syson, N. Walls, W. A. Carter, W. G. Udall, F. J. Layzell, J. L. Thomas (equal), C. Burle, Geo. Mould, J. H. Crawford, H. J. Borrett, F. Barsby, H. C. Tweed, W. Bosworth, A. McSwan, F. Garner, A. Stevenson, H. Merryfield, E. J. Beesley, J. W. Isard, H. Forl, J. W. Aitchison, W. Emerson, Hy. Pitkin (equal), W. P. Downer, and F. J. Parr.

The number of candidates entering for the examination this year was a record one, there being no less than sixty-seven entries, nearly half of these coming from the provinces, including candidates from Ireland, Scotland, and all parts of England, thus showing that the value of the Carpenters' Company's certificate is becoming every year more widely known.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS.

III.—IGHTHAM MOTE AND FAIRLAWN, TONBRIDGE.

The third summer visit was held on Saturday, June 16, at Ightham Mote, Kent. The somewhat large party was driven from Sevenoaks through the enchanting scenery which makes this county justly famous, and, with the exception of some late showers, the excursion was an unqualified success. The house is one of the leading English historical establishments, and, to the architect, is particularly attractive in that it possesses features of all the great building periods from the XIVth century.

The first impression is one of intense interest, which is maintained upon closer investigation; but the charm begins to wane when the hand of the restorer of the Victorian era discloses itself. It is in this latter aspect alone that any disappointment is felt.

To those of our readers who are interested in the subject we refer the series of sketches, together with the detailed, historical description, which appeared in the *Builder* of July 15, 1905, and we now confine our remarks to a few general references. The situation is in a valley, and the surrounding gardens, most fitting of their kind, are set in a scene of great natural beauty. The main buildings are grouped around a quadrangle, and are themselves enclosed by a moat fed by springs and running water in the valley. A forecourt on the western side has ancient timber-framed stable buildings and high brick walls facing the gatehouse tower, entrance, and bridge. The principal apartment is the great hall, a curiously proportioned chamber, with a height of 37½ ft. in relation to a length of 30 ft. A window and other features show that a great establishment was in existence in the XIVth century. An adjoining object of interest is an excellent stone-vaulted chapel, supposed to be the crypt of an ancient chapel.

now transformed into less dignified apartments.

On the upper floor are several important rooms. The second, or Tudor, chapel has a charming interior, with an oak-ribbed vaulted roof, a pleasing arrangement of oak seats, a pulpit with canopy and linen-fold panelling throughout, all of the best work of the period. The withdrawing-room is also of great interest, apart from disclosing the incessant nature of the successive changes from which Ightham Mote has emerged. Windows are both early and late in date. The large Jacobean fireplace at the south end is of splendid design and workmanship, and is schemed with an ornate frieze of the same date, which is continued around the walls.

The house is unique among the remains of the great domestic works of the Middle Ages, and, while possessing the usual accommodation, everything is treated upon a much smaller scale than is generally found in kindred buildings.

Not the least noticeable of the numerous characteristics is the great variety in the building materials used in the structure.

The occasion under notice was extended by a visit to Fairlawn, a neighbouring mansion, of uncertain date, which has recently undergone a process of enlargement. The house virtually belongs to the later Renaissance Period, and is well stocked with valuable pictures and objets d'art. The chief interest is found in the dining-room, a lofty apartment of most satisfying proportions, panelled throughout and richly carved in the manner of Grinling Gibbons. A tour was made of the gardens, which occupy a hilly site, and give rise to a long series of terraced parts, while fine views of the surrounding country are thus obtained.

Architectural Societies.

GLASGOW ARCHITECTURAL ASSOCIATION.—The annual business meeting of the Glasgow Architectural Association was held in the Rooms, 187, Pitt-street. The President, Mr. James Lochhead, A.R.I.B.A., occupied the chair. Reports were read by the Secretary, Treasurer, and Librarian, which showed the working of the past session to have been very satisfactory. The membership has increased by twenty-three during the session, and four gentlemen were nominated for election. Office-bearers for the ensuing session were appointed, with the following results:—Mr. Lochhead was re-elected President. As Vice-presidents, Mr. James McKissack and Mr. Alex. Wingate were re-elected. The Hon. Secretaries, Mr. Stephen Adam, jun., and Mr. Alan G. McNaughtan, were again appointed. Mr. E. D. Smith was re-elected Hon. Librarian, and the new Council consists of Messrs. Whitelaw, Blain, Davie, Dewar, Malcolm, Baxter, and Wyllie.

Archaeological Societies.

EAST HERTS ARCHAEOLOGICAL SOCIETY.—The East Herts Archaeological Society visited Ware and the Thunthridge district recently in connexion with their first excursion this year. The contingent from Hertford started at 9 o'clock and met the other members of the party at Ware Parish Church. The Vicar (the Rev. Canon Appleton) had compiled a paper on the church, but in his necessary absence it was read by the Curate (the Rev. H. M. Rose). Mr. R. T. Andrews informally supplemented the paper with a few notes he had brought with him. A few yards back along the High-street brought the party to the premises occupied by Mr. R. W. Harradence. Remains of ancient buildings had been discovered at the rear of Mr. Harradence's establishment, and were at first believed to be those of an alien Benedictine Priory. Mr. H. P. Pollard had ransacked the records, and obtained copious information concerning this priory, but a few days ago the real site was found to be at Dr. Boyd's house. Several of the party climbed up to the lofts over the stables, and found the traces of blocked-up windows, doorways, and posts; and Mr. Pollard, at the close of his paper, suggested that it may have been the site of a guild. The excursionists then drove to Wadesmill, and arrived at "Chelings"

and "Rennesley Gardens." Here is a moated mound surmounted by trees; the plantation designated "Gardens" is probably the site of the manor-house. The party having assembled on the mound, Mr. G. Aylott read a paper on the subject. The archaeologists then proceeded to Thunthridge Old Church, of which only the tower (decorated) remains. The building ceased to be used for Divine worship about fifty years ago, and the present church superseded the old one, which is at a considerable distance from the village. Part of the building material was used in the erection of Sacombe Church. The fabric was Norman and Early English, and the features of interest comprise a Norman doorway (mutilated) and a curious ornament inserted in the tower wall. The Vicar (the Rev. P. R. Allnut) read a paper in which he discussed the derivation of "Thunthridge." The church was dedicated to St. Mary and All Saints, and consisted of a nave and chancel, separated by a Saxon arch. The embattled tower at the west end was surmounted by a tall spire. The registers date back to 1556. A few yards outside the churchyard stands a curious object, namely, a tall chimney-stack. This is a vestige of a Tudor building, the history of which was told by Mr. W. B. Gerish. The Manor of Thunthridge seems to have been from very early times subordinate to that of Ware. Chauncy traces its various possessors from the time of Edward III., which include members of the Disney, Hamsterly, and Pery families, until it came to the Gardiners (*temp.* Henry VII.), several of whose tombs are still in evidence in the long-neglected churchyard. Thunthridge Bury is stated to have been erected in the reign of Henry VIII., possibly by Henry, the first of the Gardiners. After four generations had in turn possessed the estate, we find it in possession of Edward Gardiner, a contemporary of Sir Henry Chauncy, who refers to him more particularly. The estate continued to be held by the Gardiners, although they had ceased to live at the Bury, until January, 1811, when John Gardiner sold it to Mr. Daniel Giles, who shortly afterwards sold it in lots to be taken down. The last occupants of the old mansion were the Hollingsworths. A writer in the *Gentleman's Magazine* for 1871, who signs himself "P.," gives an interesting description of the house. The fine avenue of elm-trees which formed the carriage-drive to the mansion parallel to the River Rib still exists. The brick wall, about 8 ft. high, which separates the churchyard from the old park still remains fairly perfect, and about 25 yds. distant is a stack of chimneys, the sole remaining fragment of Thunthridge Bury. The stack in question rises to a height of about 45 ft., and is 11 ft. 8 in. wide at the base and 4 ft. 3 in. in depth. It is supported in the centre of the south side by a massive brick buttress, 22 in. thick, which rises almost to the top. Many conjectures have been made as to the reason for thus carefully preserving this relic of the ancient house (which was especially reserved from destruction at the time the rest of the house was sold for its materials), the local tradition being that the rent-charge of 2l. per annum upon the Thunthridge estate would lapse if the sole remnant of the house were allowed to collapse. The correct explanation is, however, that Thunthridge Bury possessed a pew in Thunthridge Church, and when the old house was pulled down, Mr. David Giles left the chimney in order to preserve the right to his seat in the church. The theory that a house is in existence while the chimney-stack stands is not confined to Hertfordshire. Proceeding to Youngsbury, the party inspected the bath-house, and then wended their way to the excavated tumulus. Here Mr. H. C. Andrews read a paper, by Mr. E. E. Squires, principally extracted from Sir John Evans's article in *Archæologia* descriptive of the opening of this barrow in 1899, together with some remarks on another one close by. Mr. Andrews also read a paper, which had been compiled by Mr. F. C. Puller, on the Roman villa at Youngsbury. In the shrubbery at Youngsbury, he said, about 300 yds. W.N.W. of the tumuli, stood a Roman villa. The site of this was opened in 1890. Foundations were discovered, chiefly composed of flints embedded in mortar. The only brickwork that was unearthed was a circular pit about 2 ft. in

diameter and 2 ft. 6 in. deep. It was suggested that this might be part of some kind of heating apparatus. Several tesserae were found, but no trace of the tessellated pavement which is known to have existed, to some extent intact, about 1750. A few oyster shells and a bone pin were found, but very little else. The excavations were afterwards filled in. In 1903, while some levelling was being carried out on the lawn, a rubbish heap was discovered about 75 yds. south-west of the villa. Its area was about 20 ft. by 10 ft., and thickness 9 in. to 12 in.; depth below surface of ground about 15 in. Throughout its extent the ground was blackened by wood ashes. A large number of broken fragments of pottery were found, chiefly of rough brown or black ware of many shapes and sizes; there were also a fair number of buff-coloured and reddish fragments, and a few pieces of glazed red Samian ware. Two other smaller patches containing pottery were found near by, each about 4 ft. diameter. Five hundred yards south of the villa on the north bank of the river is a bath-house containing a small swimming-bath, fed from below by a strong spring. The bath is 10 ft. long, 6 ft. 7 in. wide, and 5 ft. deep. The overlow level 4 ft. 7 in. above the bottom of the bath. It is entered by a flight of six steps outside the bath itself and at one end of it. So far as can be seen, all the work is of comparatively modern date. It is possible, however, that the present bath owes its being to a previously existing Roman bath, and that it is copied from, or even built upon, remains of a Roman structure. The following reasons give some support to this proposition:—(1) the proximity of the villa; (2) the building of a bath on such a spot would be quite in accordance with Roman customs; (3) the shape of the bath is similar to baths of known Roman origin; (4) from the bath-house a path leads some distance up the hill, pointing nearly in the direction of the villa; the line of the path produced passes 20 ft. east of the rubbish heap and 100 ft. west of the discovered foundations of the villa. On the other hand, it is believed that before the present house at Youngsbury was built another house existed more or less in prolongation of the line of the path. It is equally or more probable, therefore, that the path was made long after Roman times. Supposing it to be of Roman origin, it is impossible to say in what state it remained between its abandonment by the Romans and the building of the present structure, but possibly its excellence as a spring caused it to be always maintained in some degree of preservation. At the conclusion of the papers Mr. H. C. Andrews proposed a vote of thanks to Mr. Giles Puller and Miss Puller, who had welcomed the Society and afforded them facilities to visit the features of interest. Before leaving Youngsbury the fragments of pottery, etc., which had been unearthed, were inspected in the house. The party then drove to Standon Lordship. A Tudor mansion was erected here in 1545 for Sir Ralph Sadler, but only a small portion survives in the existing house. The history of the house and its owners was related by the Rev. Edwin Burton, D.D., Vice-President of St. Edmund's College. The excursionists then returned homewards.—[Compiled from the *Hertfordshire Mercury*.]

EAST RIDING ANTIQUARIAN SOCIETY.—The members of the East Riding Antiquarian Society held their first summer excursion on the 13th inst. The place of visitation was Easington, the members proceeding by the morning train from Paragon Station, duly arriving at Withernsea a few minutes before eleven o'clock. Here waggons were brought into requisition for the continuance of the journey. The party proceeded to their rendezvous *via* Holmpton, when they were met by the Rev. E. Maule Cole, F.G.S., who acted as conductor. An inspection was made of the encroachments of the sea between Ten Chain-lane end at Easington and the Kinsea Beacon, where the results of the recent inundations were clearly manifest by the barren and wasted appearance of the land, which had been previously promising fields of corn and meadow. The evils of land drains for wearing away the cliff were shown, and the long trenches washed away by the water drip. At the Beacon the Rev. E. Maule Cole gave a short lecture on the

formation of boulder clay, which is here of a very shaly nature. It is apparently the base of the lower purple clay, the true basement clay having sunk beneath the sea level a short distance south of the Beacon. The formation of the clay was dealt with, and an excellent illustration of the wear during the glacial period was discovered on the surface of a small boulder. A return was made to Easington, where the church was inspected. An old detached piscina was viewed with interest in the church, it being possibly the only one of its kind in the district. The date of this interesting relic was estimated at about 1120, during the period when the chances of the old pre-Reformation churches were composed of wood or mud. The visit to the old church was made doubly interesting by the fact that the north aisle was undergoing restoration. This portion of the building shows great antiquity, having been rebuilt about 1190. A curious discovery had been made, being the use of old stone coffin lids, which had been utilised for the tops of the windows, the floriated crosses being distinctly discernible. A very fine Norman door was viewed at the north side. The party also visited the old Tythe Barn. This building, which is of the aisle type, is about the last of its kind, the date of its erection being put down as 1272. The thatching is in a bad state of repair, and the members passed a resolution asking the authorities to restore this part of the place, for the preservation of such an interesting relic. Easington is one of those villages which appear full of things in which an antiquary takes a delight. Old coins are found here, as well as fragments of Roman pottery, some of which were inspected. Mr. G. Alles, of Withernsea, exhibited a fine specimen of a mediæval signet-ring and an excellent drawing of the Sotteleur tomb slab at Welwick. A good example of the Hylton lustre and transfer pottery was procured in the village. The party proceeded on to Welwick, where the church, which has been recently restored, received the chief share of inspection. The shrine was an object of interest, and a discussion as to whether it had occupied another building arose, this beautiful piece of work being placed in a somewhat outlandish position for a permanency. The pulpit, which had been restored, was inspected. This piece of church furniture is dated 1618. The old screen, which is also being restored, has not yet been placed in the church. An old Bylawman's minute-book of Welwick, Weeton, and Plowland was also scrutinised. It dates from 1651 to 1764, and contains reference to Pensthorpe and Northerne, two of the lost towns of the Humber. The party next proceeded to Patrington, where afternoon tea was served. Subsequently a visit was paid to the fine old rural cathedral of Holderness (St. Patrick's), when its many objects of interest were surveyed. The members returned to the city by the 5.57 train from Patrington.—*Eastern Morning News*.

Competitions.

LIBRARY, HOVE.—A decision has been arrived at concerning plans for the Hove Library. The first competition among architects was abortive. Mr. John Belcher, A.R.A., as assessor, has reported on the ten sealed designs submitted in the second competition, for premiums of 50*l.*, 30*l.*, and 20*l.* He reports that many of them present excellent features, and that all show evidence of having been carefully thought out. After a careful study of their respective merits he places first No. 10A, and believes it will be found to be a most convenient and workable plan. No. 9A, placed second, "possesses many merits, and has also a good plan and elevation." No. 5A is placed third. On the envelopes being opened, it was found that the first three were: (1) Messrs. Percy Robinson & W. Alban Jones, 53, Albion-street, Leeds; (2) Messrs. A. J. Hardwick & Sydney E. Castle, Kingston-on-Thames; (3) Mr. Lionel U. Grace, 30, John-street, Bedford-row, London. The Library Committee have considered the designs, and, agreeing with the decision of the assessor, recommend the Council to approve his award, and that the design No. 10A, placed first, be selected as the design for the building to be erected.

HOSPITAL, STONE.—At a recent meeting of

the Stone Joint Hospital Board, the Acting-Clerk, Mr. W. W. Wynne, read correspondence which he had had with the Local Government Board and the Royal Institute of British Architects on the subject of the appointment of an assessor to consider the plans of the proposed new hospital, and reported that the President of the Institute had nominated Mr. W. A. Pite, of London, as the assessor.

Books.

British Canals: Is Their Resuscitation Practicable? By EDWIN A. PRATT. (London: John Murray, 1906).

Now beginning to end this is a most interesting book, which, although coming from the pen of a writer who appears to be strongly biased in favour of railway as opposed to canal traffic, is by no means an unwelcome contribution on a subject now occupying the attention of a Royal Commission and of the commercial and industrial classes throughout the country. We need not here dwell upon the historical aspects of the canal problem, nor deal at length upon the gradual decline of canal traffic in the face of railway competition. It is admittedly a fact, as the author says, that the canals constructed in the XVIIIth century "played a most important rôle in developing the trade, industries, and commerce of our country," although rates were excessively high, and the railway system was welcomed by traders "as a means of relieving them from what had become the intolerable monopoly of the canals and waterways." At the beginning canals and railways alike were designed to serve purely local purposes, and through traffic was scarcely contemplated. After a time the railway companies began to amalgamate and to co-operate one with another until a general system became available for the whole country. Canal proprietors, on the contrary, made practically no attempt to link up their waterways, and, after a period of rate-cutting, entered upon that down-grade which led to the condition of things known to everyone in the present day. Mr. Pratt vigorously contests the theory that the decline of our canals is due to their having been "captured" and "strangled" by the railway companies, and cites various statements in support of the opinion that, instead of being anxious to kill off moribund competitors, the railway companies were practically driven into the purchase and control of canals against their own will. This is a point upon which there is some difference of opinion, but, in any event, the fact, as stated by the author, is that by the middle of last century "about one-third of the existing canals had been either voluntarily acquired by or forced upon the railway companies." Mr. Pratt does not believe that railway ownership and control has been in any way prejudicial to the British canal system, and he devotes two entire chapters to an account of the efforts made by railway companies for the maintenance of their canals and the encouragement of canal traffic. The author omits to mention the fact that while through tolls are readily arranged by independent canals there is considerable difficulty in obtaining the same facilities upon canals owned by railway companies. That is not the way to encourage traffic. The elaborate defence of railways which occupies nearly one-half of the book does not bear upon the problem of to-day, for however well individual canal sections may be managed they cannot be expected to pay as isolated units. In succeeding chapters the author seeks to show that, even if the canals of the country were revived on a modern basis, no great use would be made of them under existing conditions of trade, and that, owing to difficulties connected with differences of level, water supply, and finance, any general resuscitation is altogether impracticable. In his book Mr. Pratt does not lead up to these conclusions by any judicial weighing of *pros* and *cons*. His method is the far less troublesome one of starting with ready-made conclusions and of supporting them by the selection of corroborative opinions from various sources. We are quite prepared to admit that the questions of levels and water supply constitute serious problems so far as concerns some existing canal routes, which

may possibly have to be abandoned or left in their present condition. But nothing said in this book should discourage further inquiry into the whole subject, and we believe that a judicious scheme for reviving the most important routes along canals and rivers, with new connexions as may be found necessary, should be attended with financial success. It would be quite another matter to attempt the general resuscitation of all the old canals without making allowance for altered conditions, and we may be sure that nothing so foolish will be recommended by the Royal Commission. The author, with iconoclastic zeal, would sweep away canals altogether, and recommends as an alternative to proposals which he regards "as more or less quixotic," the further encouragement of the railway system by the relaxation of Parliamentary regulations, the reduction of local rates payable by railway undertakings, and the co-operation of traders and agriculturists in such a way as to avoid the disadvantages of unremunerative "light loading." Although evidently written in the interest of the railway companies, the book is well worth reading, partly because of the interesting matter it contains, and partly for the reason that in some respects it may act as a corrective to the over-sanguine representations and arguments put forward by some canal enthusiasts, who look only at the question from their own standpoint, and are insufficiently acquainted with the difficulties that have to be faced.

Concrete Block Manufacture: Processes and Machines. By HARMON HOWARD RICE. (New York: John Wiley & Sons; London: Chapman & Hall, Ltd., 1906.)

NO INDUSTRY in modern times has developed with greater rapidity than that represented by the manufacture of concrete blocks for building purposes. In the United States solid and hollow concrete blocks have taken a place among recognised materials of construction, being regularly produced by numerous manufacturers and obtainable in the open market just as readily as ordinary bricks. Up to the present they have scarcely established a footing in our own country, but as machinery is now obtainable for their production in all requisite forms, it is probable that concrete-block building will soon become a feature of British architecture. The subject is one that may well be commended to the attention of architects, whose guiding influence may be usefully directed to the avoidance of those defects which characterised the early stages of the industry in America where, as Mr. Rice says, there was "a lack of recognition on the part of block-makers and machine manufacturers of those principles of symmetry and decorative fitness which can alone result in a building beautiful to one trained to judge of beauty from the viewpoint of the architect." In another respect, architects have an opportunity of performing useful service, for, at the very commencement of the new industry, they can insist upon the adoption of suitable mixtures of concrete, the proper manipulation and testing of blocks during manufacture, and the establishment of standard and generally consistent sizes of blocks for ordinary purposes. These points all receive judicious treatment in Mr. Rice's book, wherein several chapters are devoted to the preparation and use of concrete, and others deal with matters connected with the manufacture and testing of blocks, causes of failure, and the cost of production. In different parts of the book some useful hints will be found as to the best means of securing pleasing tints and surfaces for facing blocks. In respect of colour, the author is quite right in deprecating the employment of pigments which are always liable to fade in process of time, and, if used in sufficient quantity to produce the desired colour and to prevent fading, have the effect of weakening the concrete. The regulation of tint by the careful selection of aggregate is the only unfailing method of obtaining concrete of fixed colour, and of avoiding that plaster-like appearance characterising artificially-coloured material. Two of the most useful chapters in the book are those containing the specification drawn up by the City of Philadelphia for testing hollow concrete blocks, and a review of the building regulations, applying to the same material, adopted by the municipal authorities of Philadelphia, Denver, Minneapolis, and Newark.

A short chapter on "Architecture" deals with the possibility of architectural effect in concrete-block buildings in a very sensible manner. It is pointed out that makers who have put forth what they call ornamental concrete blocks have not realised that such things are not to be used all over a wall, but as an emphasis in certain suitable positions, and that the mere assemblage of blocks with a definitely-marked jointing is an important element in the effect of a wall surface. "In this connexion nothing is more valuable than a careful study of some of the structures of the Italian Renaissance; and the accentuation of mortar-joints in some of the block-stone rustications of that period is of especial interest to the progressive block-maker of to-day." This is good sense and shows a true perception of the problem. We do not see why very good architecture should not be built from concrete blocks, with a type of decoration (where required) suitable for cast detail; though we will not say that we would accept it willingly as a substitute for stone.

A Précis of the English Law Affecting Landlord and Tenant. By LAWRENCE DUCKWORTH, Barrister-at-Law. Second edition, revised and enlarged. (London: Effingham Wilson; 1906.)

THE fact that the first edition of this little handbook was only issued in 1904, and that a second edition has been found necessary in two years, proves that it has been appreciated, and that it meets a felt want. The work has been brought well up to date, and, in the limits of its 148 pages, contains much information most useful to the layman without attempting too great detail, and the author has wisely devoted a further thirty-two pages to what he has justly called "an exhaustive index," which much adds to the value of the book. The statement at the foot of page 108 as to the rights of owners of ancient lights appears to us hardly sufficiently modified by the reference in a note to the decision of the House of Lords in *Colls v. Home and Colonial Stores*, and therefore to be slightly misleading, but this subject of easements is purely incidental to the subject treated of in this volume, which answers the description given it on the title-page, "A précis" of the law affecting landlord and tenant, clearly expressed.

Electricity in Homes and Workshops. By S. F. WALKER, M.I.E.E. Fourth Edition. (London: Whitaker & Co. 1906.)

THE author states in his preface that the book is written for the practical man—that is, "the man who, in some form or other, has to get his living by the aid of electricity." He discusses electric bells, telephonic apparatus, electric lighting, heating, and power transmission. The book is a great improvement on the earlier editions, and contains much that will be helpful to those desiring a practical knowledge of the subject. The first chapter, however, which is headed "A Glossary of Terms," is unsatisfactory. The definitions are not rigorous; there are also several errors and misprints.

Practical Painters' Work. Edited by PAUL N. HASLACK. (Cassell & Co.)

THIS is, as its name implies, mainly a work of practical information as to painters' tools and pigments, and is in that sense a useful little book. The chapter on colour combination may be useful in its two diagrams showing in an outer circle the series of colours and in the effects respectively of mixing them with white, or mixing them with their complementary colour; this will be an aid to beginners as to what to expect in mixing; but the directions for producing harmonious colour effects are not very convincing; and in fact rules and recipes on this point are of no use; the treatment of colour is a natural or acquired artistic perception, not a science.

BOOKS RECEIVED.

REASON IN ARCHITECTURE: Lectures delivered at the Royal Academy of Arts in the year 1906. By T. G. JACKSON, R.A., F.S.A. (John Murray. 10s. 6d.)

ELECTRIC WIRING: A primer for the use of Wiremen and Students. By W. C. CLINTON, B.Sc. (John Murray. 2s.)

Trade Catalogues.

MESSRS. DORMAN, LONG, & CO., of Middlesbrough, send us their newly-published "Pocket Companion," containing useful data and tables pertaining to the use of steel manufactured at their works. The "Companion" takes the form of a neatly-bound volume of 267 pages, and is in every way superior to the handbook formerly issued by the same firm, and which was once the best commercial guide of its kind in Great Britain. During recent years, however, several firms in the steel trade have brought out excellently-arranged books giving useful information relative to structural steel, with the usual stimulating results. The manufacturing establishments of Messrs. Dorman, Long, & Co. now include the Britannia Steel Works and Rolling Mills, the Clarence Steel Works and Rolling Mills (for many years associated with the name of the late Sir Lothian Bell), the Cleveland Wire Works, and the Ayrton Sheet Rolling Mills, all situated in the vicinity of Port Clarence, Middlesbrough. The object of the pocket-book is to furnish a complete account of the various forms in which iron and steel are produced at the works mentioned, and to present technical information in accordance with the best modern practice. We observe with satisfaction that the British Standard Rolled Sections have been adopted by the company, and that, as far as possible, the details of constructional work have been standardised with the object of facilitating deliveries and insuring economy. There is so much interesting matter in the new handbook that we cannot possibly refer to it in detail, and must be content with a general mention of the chief sections into which the work is divided. After a complete catalogue of rolled structural steel sections, the dimensions and properties of simple and compound beams are tabulated, similar treatment being adopted in the case of stanchions and struts, concerning which the data now given are very complete, and for this reason far more satisfactory than the somewhat meagre references in the previous handbook. Then follow details and illustrations of bases, caps, and joints for stanchions and of standard beam connexions. A series of notes on roofs, with diagrams of trusses and typical connexions, and some notes on troughing and its application to bridge design complete the first portion of the book. In the succeeding sections there are detailed particulars of corrugated, curved, and plain steel and iron sheets and fittings of different kinds, of steel wire for fencing, cables, and electrical work, and of the different qualities of steel produced in ingots and other forms at the Clarence Works. Finally we have about seventy pages of general information, formulae, and tables, constituting a really serviceable collection of useful data. The book is provided with a comprehensive index, and will be found of much assistance to architects and those engaged in structural engineering.

We have received from the General Electric Company, of Queen Victoria-street, slips announcing an advance in the price of nearly all electrical supplies. They also send us a list of electric-light fittings and fixtures which, as they are not illustrated in their present catalogue, they are offering for sale at greatly reduced prices. In their "General Progress" sheet for June they show a "security" lamp-guard. There are many cases where it is desirable that no unauthorised person should be able to remove a lamp from its holder. This simple and ingenious appliance effects this object perfectly, and as there is no cap to obstruct the light it ought to prove useful. Improvements have been made in the well-known "link" branch switch. It is now supplied with a roller movement, and its action is therefore more rapid and decided.

Mr. C. D. Monninger sends us his 1906 illustrated catalogue of wood-working machinery and tools. Band-sawing machines and appliances for brazing, setting, and sharpening band saws are described in considerable detail, and the enumeration of other useful auxiliaries occupies nearly half the book. The latter portion contains particulars of circular-saw benches, log-saws, and moulding, mortising, boring, dovetailing, fluting, planing, and sundry machines particularly

adapted to the requirements of cabinet-makers and joiners. Attention should be given to the excellent selection of hand-guards for sawing, planing, and moulding machines illustrated in this catalogue.

We have received from the Caron Company a leaflet containing illustrations and prices of seven varieties of their "Radiant" and "Esto" firegrates. The firelump hacks are of the "Teale" shape, and economisers or frets and adjustable canopies of ordinary types are provided in front of the grates. The two special features are the shape of the bottom gratings and the adjustable trivets. The bottom gratings are concave from front to back, the back being some inches higher than the front, and the trivets are pivoted so that they can be turned up to form front bars or placed horizontally to form front hobs. Ornamentation is carried to excess, particularly in the trivets, but, from a practical point of view the grates will probably be successful. In the "Esto" fire the trivets are omitted.

Mr. F. Wallis Stoddart (Bristol) has sent us some leaflets showing his "New Pattern" distributor for sewage filters, the improvement consisting in the method of fixing the distributors to the sewage channels in order to secure more accurate adjustment.

Bishop's Safety Tread Company manufacture a tread which is applicable to new and old stairs, and which has much to recommend it. The wearing surface is of Limmer Rock asphalt, and this is compressed in a metal frame to which a re-enforcement of expanded metal is attached. The treads are made at the company's works to any size, and can be easily and quickly fixed.

Messrs. John Harper & Co. (Willenhall) have sent us a copy of their new catalogue of ironmongery, including window and door furniture, cistern and gutter brackets, hat and coat seats, etc. It is interesting to note that the dimensions are given in inches and millimetres, and the weights in pounds and kilogrammes. Another catalogue from the same firm shows their "Domestic Hardware Novelties," but it is impossible to speak highly of the quality of the designs.

We have received from Mr. John Jones a copy of his new catalogue of cast-iron drainage fittings, which includes illustrations and prices of some excellent intercepting and other traps, inspection-chamber bottoms (each in one casting), inspection chambers with airtight covers, channel-bends, gullies and rain-water shoes, drain-pipes and soil-pipes, penstocks, manhole covers, air inlets, etc. The catalogue contains 100 pages, and is fully illustrated, and provided with a good index. Altogether it is one of the most useful catalogues of cast-iron drainage fittings which we have received, and cannot fail to be appreciated by architects and sanitary engineers.

Messrs. Morrison, Ingram, & Co. (Swadlincote and Manchester) have sent us a sample and description of their new "Densitas" ware as used for water-closets, sinks, and other sanitary fittings. It is a hard, cream-coloured ware of great strength, and is supplied either cane-glazed or white-enamelled.

Correspondence.

STEYNING CHURCH.

SIR,—Allow me to correct an error in the article on Steyning Church. The arms on the tablet are those of Michell or Michael (a chevron between three escallops), an old Sussex family. Jonas Michael was a "Clerk," i.e. clergyman, and was Vicar of Steyning at the period named (A.D. 1613)—*vide* the old Churchwarden's Book.

W. POWELL BREACH
(Member of Council Sussex A.S.)

WESLEYAN CHAPEL, EYAM.—A new Wesleyan chapel is in course of erection at Eyam. It is being built throughout of Ribley wood stone, and will provide seating accommodation for 180 worshippers. Mr. H. White is the builder, and Mr. Frank W. Chapman the architect of the work. FACTORY, HULL.—Under the heading "General Building News," page 681 of our issue of June 16, under the sub-heading "Factory, Hull," a short description is given of the National Radiator Company's new works, where it is mentioned that the zinc work is being carried out by Messrs. Hewitt & Sons. We understand that the contractors for the zinc work are Messrs. Ewart & Son, Ltd., of London. The mistake was not ours.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XXIV.

THE SLIDE-RULE IN TECHNICAL CALCULATIONS (concluded).

BEFORE leaving Invention and Evolution, it may be useful to point out the manner in which the slide-rule is employed for raising numbers to any required power, and for extracting any required root.

Various Powers and Roots.—For raising numbers to powers and for extracting roots other than those hitherto considered, it is usually necessary to employ the logarithmic method described in Article XIV., pp. 411-12.

As the slide-rule is furnished with a scale by the aid of which the mantissa of the logarithm of any number can be instantaneously obtained, it can be used as a substitute for a table of logarithms.

Rule (1).—To find any given power or root of a number, set the L.H. index of scale C to the given number on scale D; turn over the rule and read the required mantissa above the lower index mark in the right-hand slot at the back of the rule. Prefix the characteristic mentally, set the L.H. index of the slide to the complete logarithm on scale D, multiply or divide it by the index of the given power or root. Then, turning over the rule, bring the mantissa of the product or quotient to the lower index in the slot, and read the result on scale D below the index of scale C. When the decimal point has been adjusted as demanded by the characteristic of the logarithm the value is that of the required power or root.

This explanation takes far longer to read than the operation to perform, as will be found by the following examples.

Example (1): Find the value of $3 \cdot 274^{17}$.
Set L.H. index of C to 3274 on D, read \log = 515 on back of slide. As the complete \log $3 \cdot 274 = 0 \cdot 515$, set L.H. index of C to 515 on D, bring cursor to 17 on C, and read 875 on D. Bring 875 on \log scale at back of slide to the index mark, and read 75 on D below the index of C. As the *char* is still 0 the required power = 75, the value calculated by Tables XIV. and XV. being 7508.

Example (2): Find the value of $\sqrt[3]{1179}$.
Set L.H. index of C to 1179 on D, read at back of slide \log 1179 = 072. As complete \log 1179 = 3 072, set 5 on C to 3072 on D, and read quotient 6148 (= 06148) on D below R.H. index of C. Bring 6148 on \log scale at back of slide to the index mark, and read 412 on D below L.H. index of C. As the *char* of the quotient was 0, the required root = 412, the value by Tables XIV. and XV. being 4114.

Trigonometrical Functions.
We have next to consider the practical application of the trigonometrical scales at the back of the slide. The graduation of these scales has already been described and illustrated in Article XX., and the uses of the scales are stated below.

Sines of Angles.
Rule (2).—To find the value of any natural sine. Withdraw the slide, replace it in the groove so that scale S is coincident with scale A, and over the given angle on S read the value on the sine on A. If found on the left-hand half of the scale, the first significant figure is in the *hundredths* place, and if on the right-hand half in the *tenths* place.

Example (3): Find the values of (1) $\sin 0^\circ 40'$, (2) $\sin 5^\circ 45'$, (3) $\sin 14^\circ 10'$, (4) $\sin 30^\circ 0'$.
Results: (1) 0 0116, (2) 0 10, (3) 0 245, (4) 0 5.

Rule (3).—To find the value of any natural sine. Using the scales in normal position, set the given angle on scale S to the upper index mark on the R.H. slot at the back of the rule, and read the value of the sine on scale B under the right-hand index of scale A. If found on the left-hand half of scale B, the first significant figure is in the *tenths* place, and if on the right-hand half in the *hundredths* place.

Example (4): Find the values of (1) $\sin 1^\circ$, (2) $\sin 2^\circ 50'$, and (3) $40^\circ 20'$.
Results: (1) 0 01745, (2) 0 0495, (3) 0 65.

Owing to the progressive decrease in the length of the graduations towards the end

of scale S, the accuracy of results decreases very much as the values of the angles increase. Consequently it is often desirable, and sometimes necessary, to perform the workings nearer the beginnings of the scales.

For this purpose the required sine is calculated in accordance with the equation:—

$$\sin \theta = 1 - 2 \sin^2 \left(\frac{90 - \theta}{2} \right)$$

Example (5): Find the value of $\sin 80^\circ$.
Using scale S as in Rule (1) we read on scale A, $\sin \left(\frac{90 - 80}{2} \right) = \sin 5^\circ = 0 \cdot 08742$ and find, by scales D and A, $0 \cdot 03742^2 = 0 \cdot 00762$. Then $1 - (0 \cdot 00762 \times 2) = 0 \cdot 98476$. Using scale S as in Rule (2), we find $\sin 5^\circ = 0 \cdot 08742$ on scale A and, without moving the slide, read on scale B, $0 \cdot 08742^2 = 0 \cdot 00762$. Then $1 - (0 \cdot 00762 \times 2) = 0 \cdot 98476$, as before.

The constants ρ and ρ'' on scales C and D (Fig. 16) are used for finding the values of the sines of small angles expressed in minutes and seconds, respectively, as follows:—

Place the constant on one scale opposite the figure representing the number of degrees in the given angle on the other scale of the pair to be used, and read the value of the sine opposite the index of the scale on which the constant is marked.

Example (6): Find the value of $\sin 0^\circ 5'$.
Set ρ on C opposite 5 on D and read 0 001454 below L.H. index of C.

Example (7): Find the value of $\sin 0^\circ 0' 5''$.
Set ρ' on C opposite 5 on D and read 0 0000212 below L.H. index of C, or bring 5 on C opposite ρ'' on D and read 0 0000242 above L.H. index of D.

Rule (4).—To multiply the sines of angles turn over the slide so that scale S is next to scale A, and proceed as in ordinary multiplication.

The following are rules for determining the number of digits to the left (or ciphers to the right) of the decimal point in the product. Let P = number of digits in the product, and n the number of digits in the multiplier. Then

- (a) $P = n - 2$ when the product is found to R.H. of multiplier and in the same half of scale A.
- (b) $P = n - 1$ when the product is found to R.H. of multiplier, but in the other half of scale A.
- (c) $P = n - 1$ when the product is found to L.H. of multiplier, but in the other half of scale A.
- (d) $P = n$ when the product is found to L.H. of multiplier, and in the same scale.

Example (8): Multiply (1) $5 \cdot 2^2$ by 2, (2) $5 \cdot 20^2$ by 2.

(1) Set L.H. index of S to 2 on L.H. of A and over 2 on S read 0 0693 on L.H. of A.
(2) Set L.H. index of S to 2 on L.H. of A and over 20 on S read 0 634 on R.H. of A.

Rule (5).—To divide numbers by the sines of angles, turn over the slide so that scale S is next to scale A, and proceed as in ordinary division.

The following are rules for determining the number of digits in the quotient. Let Q = number of digits to the left (or of ciphers to the right) of the decimal point in the quotient, and n the number of digits in the dividend.

- (a) $Q = n + 2$ when the quotient is found to the L.H. of the dividend, and in the same half of scale A.
- (b) $Q = n + 1$ when the quotient is found to the L.H. of the dividend, but in the other half of scale A.
- (c) $Q = n + 1$ when the quotient is found to the R.H. of the dividend, but in the other half of scale A.
- (d) $Q = n$ when the quotient is found to the R.H. of the dividend, and in the same half of scale A.

Example (9): Divide (1) 3 by $\sin 2^\circ$, (2) 60 by $\sin 20^\circ$.

(1) Set 2 on S to 6 on L.H. of A and over L.H. index of S read 172 0 on L.H. of A.
(2) Set 20 on S to 6 on R.H. of A and over L.H. index of S read 175 0 on L.H. of A.

Rule (6).—To divide the sines of angles by numbers, place the slide so that scale S coincides with scale A. Set the figure representing the number of degrees in the given angle on S opposite to the divisor on A, and

read the quotient on scale B below the index-mark at the back of the rule. If the slide projects to the left-hand, read the square root of the quotient on D, and square this on the front of the rule.

As a general rule more accurate results can be found on S below the R.H. or L.H. index of A, noting the values as obtained, and converting them to numerical equivalents by closing up the rule and reading as in Rule (2).

The number of digits in the quotient can easily be obtained by noting the decimal values of sines as stated in Rule (2).

Example (10): Divide $\sin 4^\circ$ by 20.
Set 4 on S to 2 on R.H. of A, turn over rule and read 0 0693 on B; or read $20^\circ 30'$ below R.H. index of A, close up slide and read $\sin 20^\circ 30' = 0 \cdot 0035$ on A.

Cosines of Angles.
When scale S has been placed in the rule so that it coincides with scale A, the cosine of any angle can be read by taking its complement on scale S in accordance with the relation $\cos \theta = \sin (90 - \theta)$.

The first significant figure of every value read on scale A is in the *hundredths* place if on the L.H. half, and in the *tenths* place if on the R.H. half.

Example (11): Find the value of $\cos 40^\circ$.
 $\cos 40^\circ = \sin (90 - 40) = \sin 50^\circ = 0 \cdot 766$.

Example (12): Find the value of $\cos 4^\circ$.
 $\cos 4^\circ = \sin (90 - 4) = \sin 86^\circ$ and as there is no graduation for this on scale S we proceed in accordance with the equation

$$\sin 0 = 1 - 2 \sin^2 \left(\frac{90 - \theta}{2} \right)$$

$$\cos 4^\circ = 1 - 2 \sin^2 \left(\frac{90 - 80}{2} \right)$$

Scale S gives $\sin \frac{90 - 86}{2} = \sin 2^\circ = 0 \cdot 0348$.

Scales D and A give $0 \cdot 0348^2 = 0 \cdot 00121$.
Then $1 - (0 \cdot 00121 \times 2) = 0 \cdot 9976$.

Tangents of Angles.
Rule (7).—To find the value of any natural tangent from $5^\circ 43'$ (approximately) to 45° .

Withdraw the slide and replace it in the groove so that scale T is coincident with scale D, and over the given angle on T read the value of the tangent on D. The values of the tangents so determined range from 0 1 to 1.

Example (13): Find the values of (1) $\tan 7^\circ 20'$, (2) $\tan 14^\circ 45'$, (3) $29^\circ 30'$, (4) $38^\circ 50'$.
Results: (1) 0 1257, (2) 0 2633, (3) 0 566, (4) 0 805.

Rule (8).—To find the value of any natural tangent from $5^\circ 43'$ (approximately) to 45° .

Using the scales in normal position, set the given angle on scale T to the index-mark on the left-hand slot at the back of the rule, and read the value on scale C over the left-hand index of scale D.

Example (14): Find the values of (1) $\tan 11^\circ 20'$, (2) $25^\circ 10'$, (3) $40^\circ 50'$.
Results: (1) 0 2, (2) 0 47, (3) 0 864.

Rule (9).—To find the value of any natural tangent from 45° to 90° . Withdraw the slide, replace it in the groove so that scale T is coincident with scale D; set (9) - 8) on scale T to the right-hand index of scale D and read the value of $\tan \theta$ below the left-hand index of scale T on D. The first turn of every result ascertain θ is to be taken as an integer.

Example (15): Find the value of $\tan 50^\circ$.
Set $90 - 50 = 40$ on T to R.H. index of D and read 1 192 on D below L.H. index of T.

The tangents of angles less than $5^\circ 43'$ differ very little in value from the sines of the same angles. Hence, for approximate calculations, scale S may be used in conjunction with scale A.

Rule (10).—To find the approximate value of any natural tangent less than $5^\circ 43'$, use scale S, placed next to scale A, and find values on scale A, taking a liberal reading for the last figure.

Example (16): Find the approximate values of (1) $\tan 4^\circ$, (2) $\tan 3^\circ$, (3) $\tan 1^\circ$.
Results by slide-rule: (1) 0 0699, (2) 0 0524, (3) 0 01744.

Values from Tables: (1) 0 0699268, (2) 0 0524078, (3) 0 0174551.

For the reason stated above, the constants ρ and ρ' on scales C and D can be used to find approximate values for the tangents of small angles expressed in minutes and seconds respectively. The procedure is the

same as that illustrated in Examples (6) to (9).

Cotangents of Angles.

Rule (11).—To find the value of any natural cotangent from 5° to 45° (approximately) to 45° , place scale T in the rule so that it is next to scale D, set the given angle on T to the right-hand index of D, and read the cotangent on D below the left-hand index of T. The first figure of every result so ascertained is to be taken as an integer.

Example (17): Find the value of $\cot 38^{\circ} 40'$. Set $38^{\circ} 40'$ on T to R.H. index of D and read 1.23 on D below the L.H. index of T.

Rule (12).—To find the value of any natural cotangent from 45° to $84^{\circ} 17'$ (approximately), place scale T so that it coincides with scale D, and read results on D opposite the complement of the given angles. All values so ascertained are decimal fractions.

Example (18): Find the value of $\cot 53^{\circ}$. The complement of 53° is $(90 - 53) = 37^{\circ}$, below which on T we find 0.733 on D.

Secants of Angles.

Rule (13).—To find the value of any natural secant, place scale S in the rule so that it is next to scale A, set the complement of the given angle on S to the right-hand index of A, and read the value over the left-hand index of S. The first figure of every result found on the left-hand half of scale A is to be taken as an integer, the first two figures of every result found on the right-hand half of scale A are to be taken as integers.

Example (19): Find the values of $\sec 60^{\circ}$. Set $(90 - 60) = 30^{\circ}$ on S to R.H. index of A and read 2 on L.H. half of A over L.H. index of S.

Cosecants of Angles.

Rule (13).—To find the value of any natural cosecant, place scale S in the rule so that it is next to scale A, set the given angle on S to the right-hand index of A, and read the value on A over the left-hand index of S. The first figure of every result found on the left-hand half of scale A is to be taken as an integer, the first two figures of every result found on the right-hand half of scale A are to be taken as integers.

Example (20): Find the values of $\csc 60^{\circ}$. Set 60° on S to R.H. index of A and read 1.15 on L.H. half of A over L.H. index of S.

All the foregoing rules and examples refer to the type of slide-rule illustrated in Fig. 16. In the case of instruments where the arrangement of the scales is different in minor details, some modifications of procedure are necessary, but such variations are so simple that no explanation is necessary.

LONDON FEVER HOSPITAL, LIVERPOOL-ROAD, N.

THE alterations which have just been completed are the first instalment of an entire recasting of the original hospital, as built from the plans of the late Mr. Charles Fowler in 1848.

The main wards, which still exist untouched on the female side, were double wards, that is to say—there were four rows of beds between the opposite windows, an arrangement which though much superior to most hospital work of the period, is now universally condemned. The sanitary offices were of the most meagre description—there was no proper disconnection from the wards, and there were no proper bath-rooms.

Some years ago a scheme was devised for rebuilding the whole hospital on modern lines, and part of the work has been carried out by the erection of a nurses' home, a diphtheria block, and a boiler-house, laundry, etc. The difficulty of getting funds and the necessity of doing something without further delay determined the committee to abandon the larger scheme and do what is possible to improve the existing buildings.

Half of the double ward has been removed, leaving a single ward for sixteen beds.

The windows have been carried up as near the ceiling as possible, without interfering with the existing arches, and have been brought nearer to the floor, thus giving better light and ventilation. A new ceiling has been put in below the old beams, which gives a level ceiling without any projections, and at the same time leaves less unventilated space above the heads of the windows. New Teale grates have been put in place of the old fireplaces, and the ward has been refloored with teak. New sanitary offices, properly disconnected, with a fixed bath and a place for a bath on wheels and all requisite fittings, have been erected, and the cross wards which run at right angles to the main ward have been rebuilt a story higher than at present.

These cross wards have their own sanitary offices and a balcony on the south and west sides is carried round at the levels of both floors, with access from each ward.

The upper floor over the main ward has been refloored, the lighting and ventilation improved, and a ward scullery with proper offices attached. The private wards in the front have been largely improved by lowering the ceilings and raising the windows, a bath-room has been formed between the two rooms, the floors have been relaid with teak, and new fireplaces inserted. A properly disconnected sanitary block has been built for these wards. The floors of all the ward kitchens and the sanitary blocks have been laid with terrazo, a jointless composition which has lately been introduced to this country. The walls are lined with white opalite tiles.

The next piece of work which is now being taken in hand is the erection of a block, partly one story, partly two stories, which will provide a new nurses' dining-room, servants' hall, stores, and rooms for ten servants. When this is completed the reconstruction of the female side will be taken in hand, and when finished the old wing, which was built to cope with an epidemic of fever in the metropolis, will be removed, and a block erected to provide accommodation for measles and German measles, and possibly additional isolation rooms.

The building work has been carried out by Messrs. Howell Williams, Ltd., the plumbing work by Messrs. Dent & Hellyer, the fireproof floors by Messrs. Mark Fawcett & Co., and the steam and hot water work by Messrs. Slater & Co. The grates by the Teale Fireplace Company, and the terrazo floors by Messrs. Bergthel & Young. The architects were Messrs. Keith D. Young and Henry Hall, of Bloomsbury, London, W.C.

Fifty Years Ago.

FROM THE *Builder* OF JUNE 21, 1856.

BRITISH SCULPTORS.

THE vote of 17,500l. agreed to by the Commune in committee of supply, for the Scutari monument, designed and executed by Euron Marochetti, and now on its way to the East, has excited much adverse comment. The Sculptors' Institute, as our readers may have observed, has addressed a memorial to Sir Benjamin Hall on the state of sculptural art in England, in which, guarding themselves against any imputation of illiberal jealousy, they deprecate the unmerited neglect into which native talent seems to have fallen, and submit that public competitions, before a committee so constituted as to give confidence both to artists and to the public, ought to be instituted, so that foreign artists might at least be made to enter into fair competition with those of England, the models of every competitor being publicly exhibited before selection by the committee. The memorial is signed by all the principal sculptors of this country. More than one eminent sculptor has stated that the sum paid for the Scutari monument, which certainly betrays no great stretch of genius, is exorbitant.

Illustrations.

NATIONAL PROVINCIAL BANK OF ENGLAND, GREAT YARMOUTH.

THIS building has been erected on the site of the old bank, and occupies a commanding position on the Hall Quay. It is faced with Ketton stone; the plinth, entrance, and columns to windows are of red Aberdeen granite.

The office, which is 20 ft. 9 in. in height, has a panelled teak dado 8 ft. high, above which the walls are divided into panels by Devonshire marble pilasters. The floors are of teak and marble mosaic, and the ceiling is moulded and decorated in panels. The accompanying plan shows the accommodation on the ground floor. In the basement is a heating chamber, and on the first floor rooms for the caretaker and store for old books.

The architect is Mr. Arthur S. Hewitt, of Great Yarmouth.

The illustration is from a photograph by Mr. F. H. Sayers, of Great Yarmouth.

THE PREMIATED DESIGNS FOR THE PEACE PALACE AT THE HAGUE.

We give this week illustrations of the perspective views of the six designs for the proposed Peace Palace which have been awarded premiums by the jury.

On the architectural character and plans of

these designs we have already commented. We give below the brief comments on each in the Jurors' Report; comments which, as observed in our first article in this issue, seem singularly vague and inconclusive, but represent all that we can gather as to the reasons for the awards and for the order of merit in which the designs are placed:

Design No. 25.

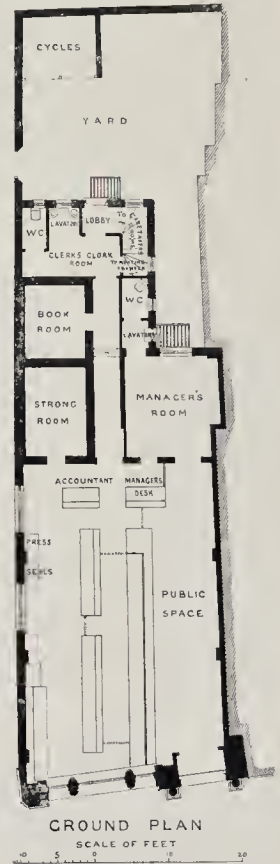
This design is an attractive one. Its author has considered that, inasmuch as the Hague has been chosen as the permanent seat of the Court of Arbitration, the building should in style follow the local traditions of XVIIIth century architecture. These considerations have finally prevailed with the majority of the jury.

This design somewhat emphasises the distinction between the Library and the Court of Arbitration, which is indicated by the programme, connecting them only by a corridor. But it has failed to give a sufficient unity of character to the two different portions of the structure.

Design No. 194.

In this design it is only the plan that has at all commended itself. Its general arrangement is very good, and is eminently that of a building standing in a park; the large rooms are well lighted by side windows, and in the rear part of the library rooms are admirably disposed around a garden, forming a kind of cloister.

But both in the plan and in the elevation the



National Provincial Bank, Great Yarmouth.

lines of the composition noticeably depart from the noble simplicity which should characterise a building devoted to the serious and dignified purposes of the Peace Palace, without at the same time evincing any special originality of treatment.

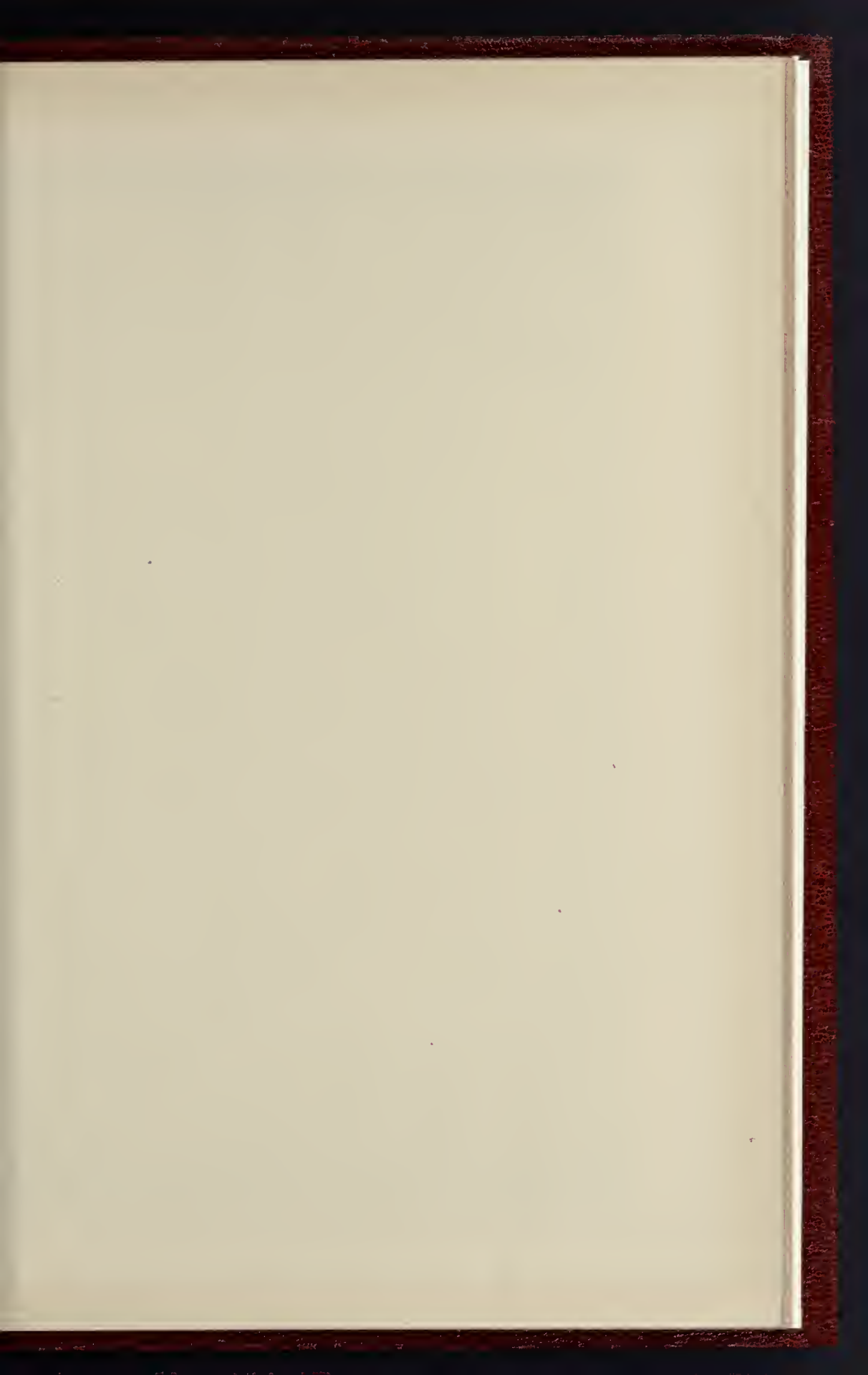
Design No. 132.

This design meets the requirements of the programme in a simple and straightforward way, though an undesirable amount of space is given to vestibules and corridors.

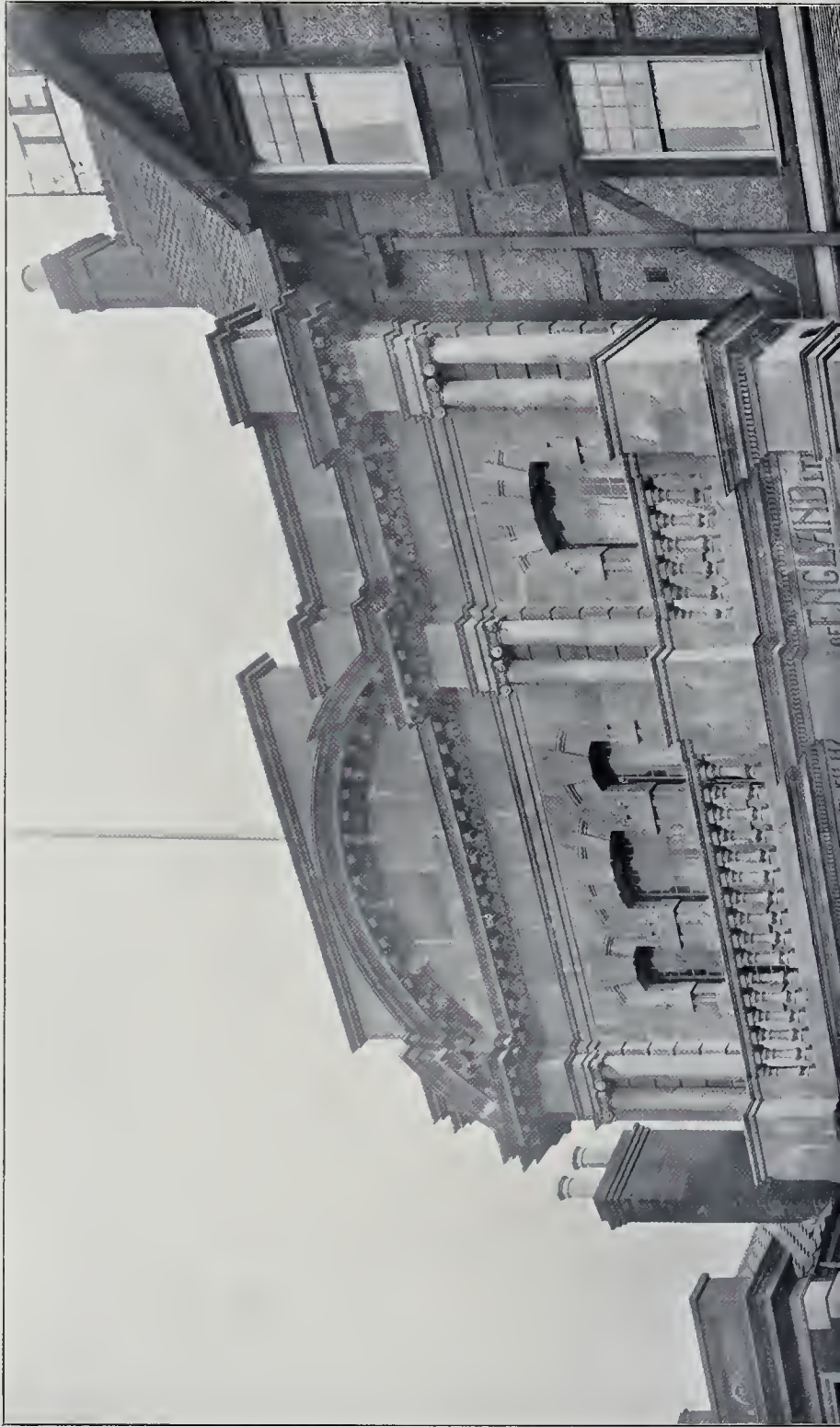
The exterior, though it exhibits a suitable dignity of character, is somewhat stiff and monotonous.

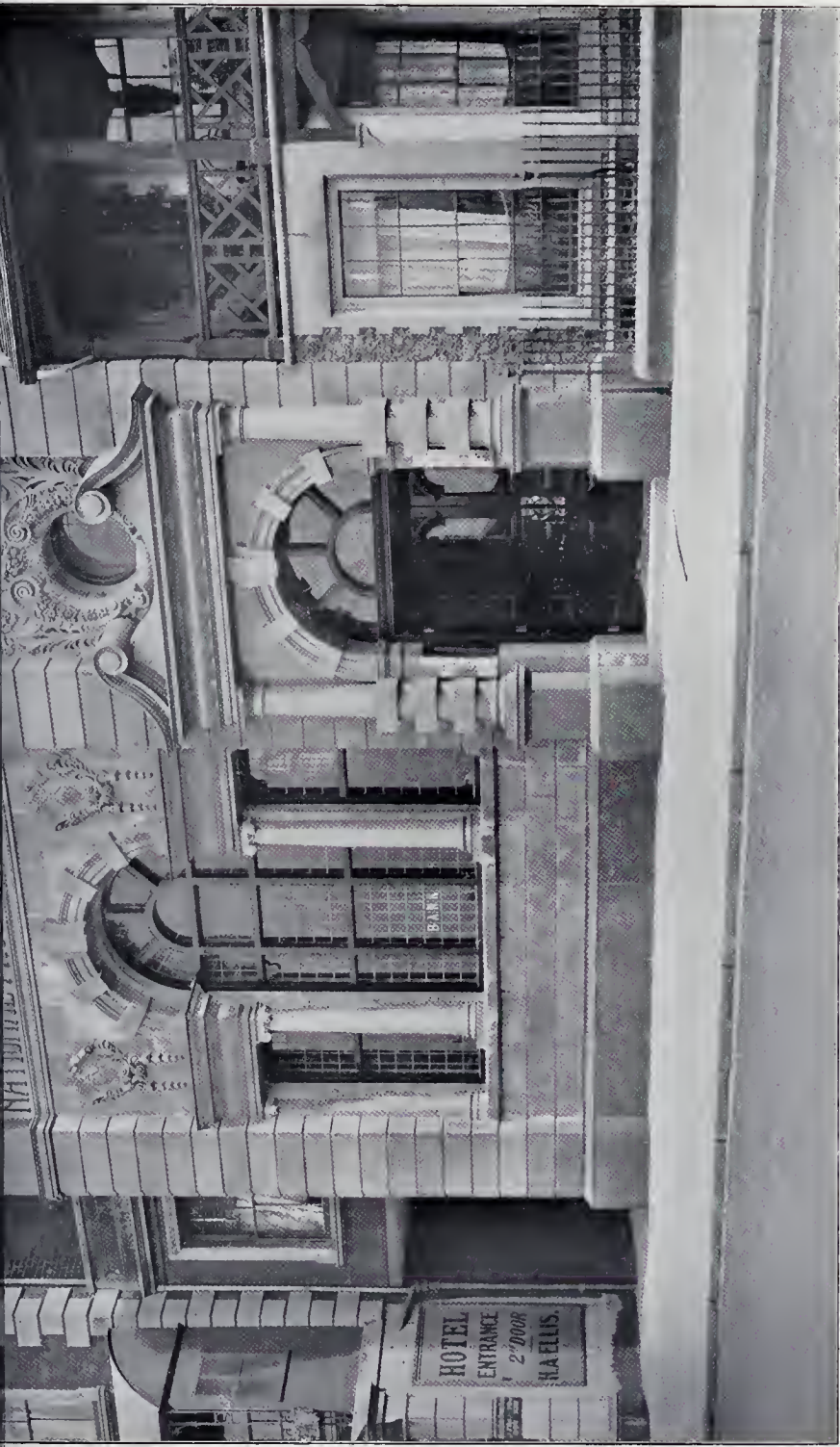
Design No. 17.

In the written memorandum which accompanies this design the author explains that a Palace of Peace, being something new, seems to him to require novel methods of artistic treatment.



THE BUILDER, JUNE 23, 1906.





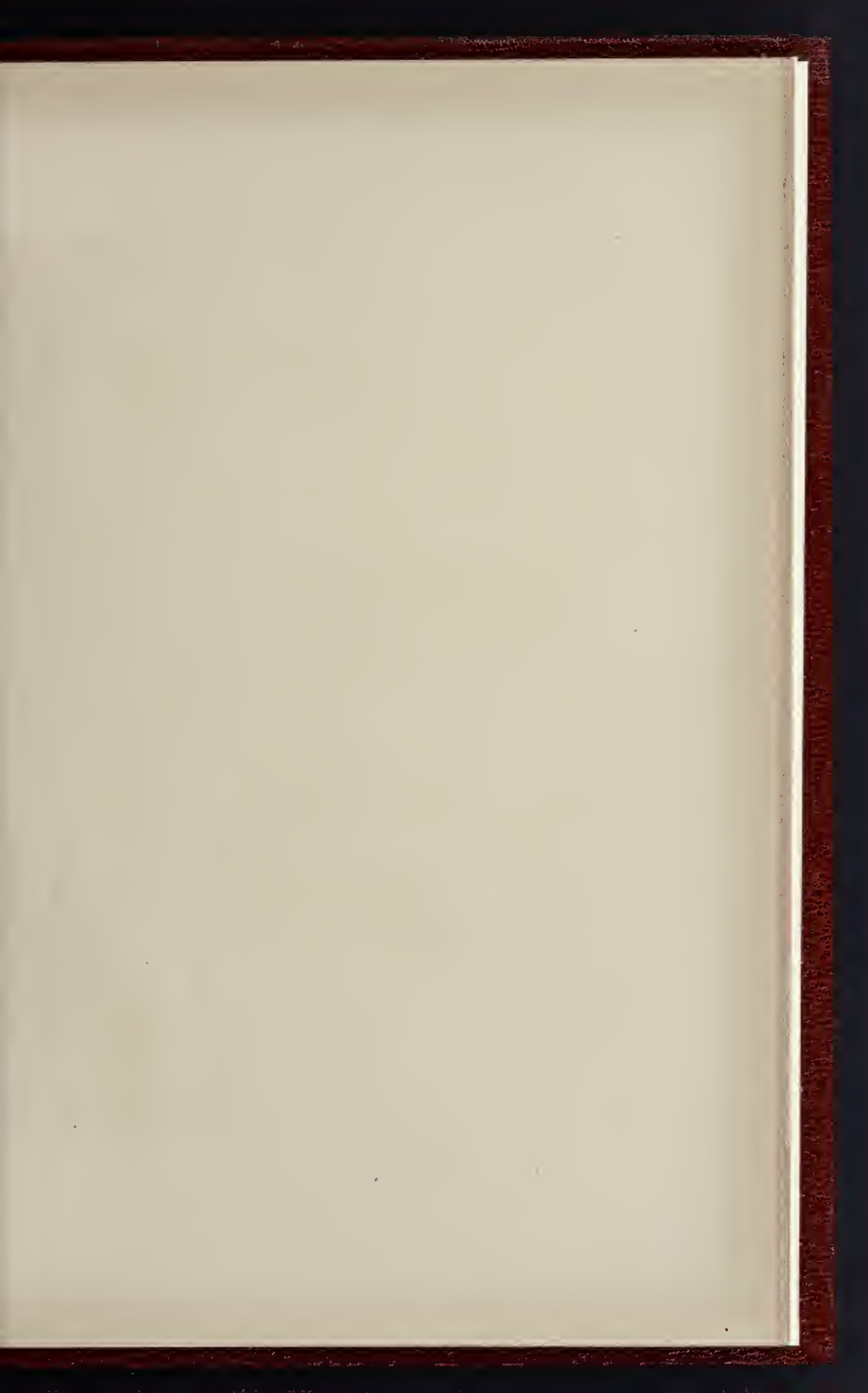
Sprague & Co., Ltd., Printers, 4, 5, 6, Fleet Street, E.C.

NATIONAL PROVINCIAL BANK, GREAT YARMOUTH.—MR. ARTHUR S. HEWITT, A.R.I.B.A., ARCHITECT.

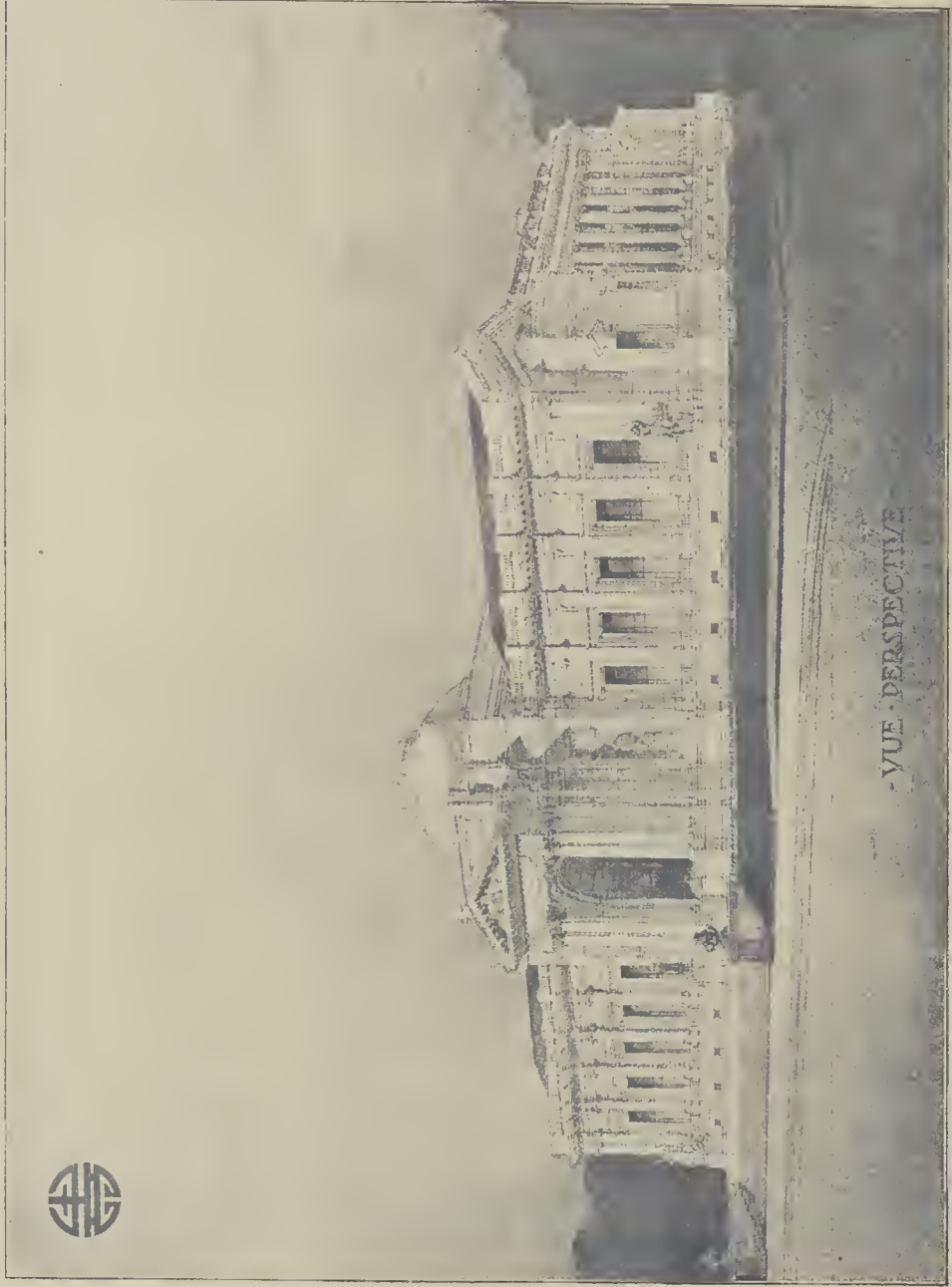


THE BUILDER. JUNE 23, 1906.

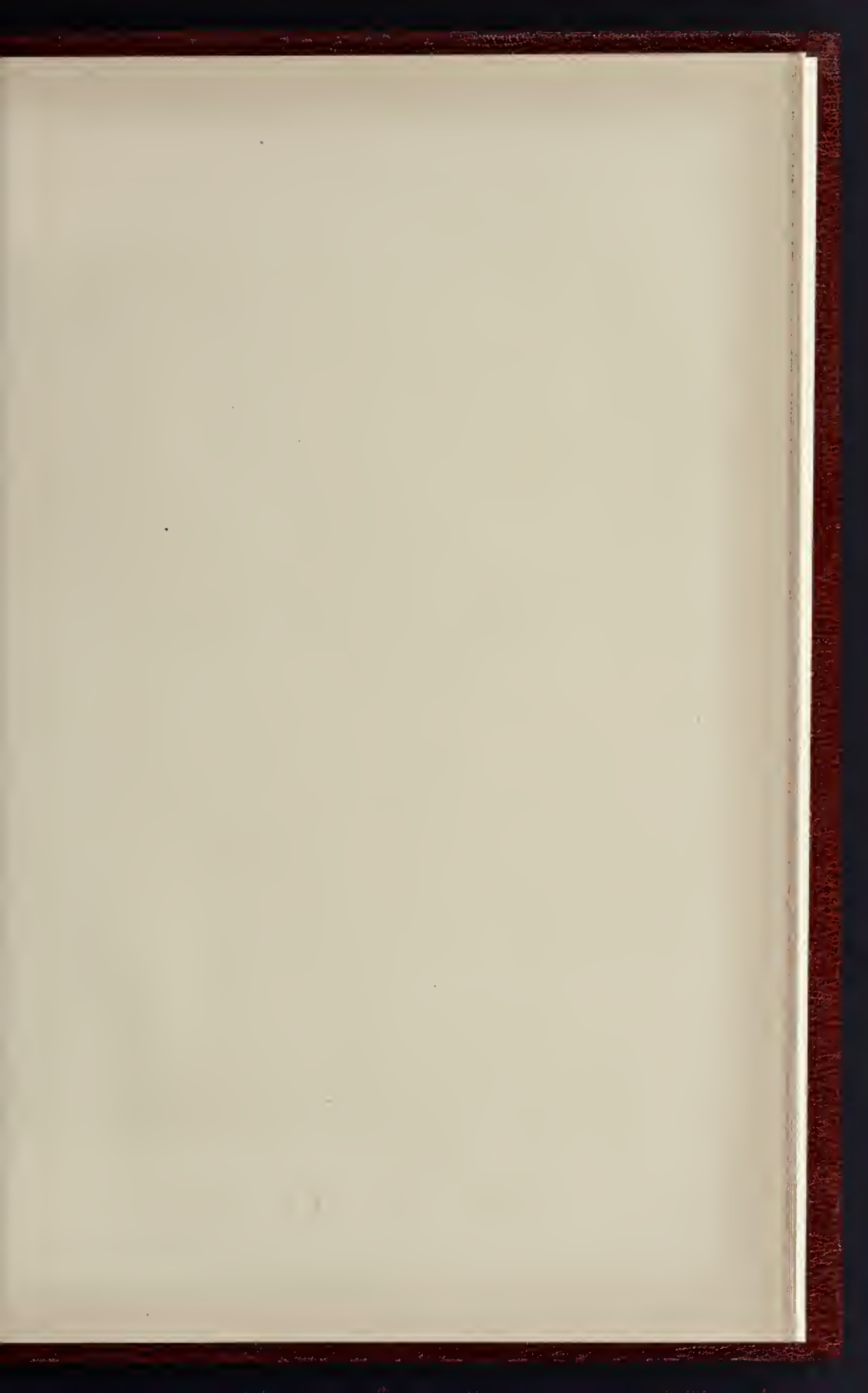




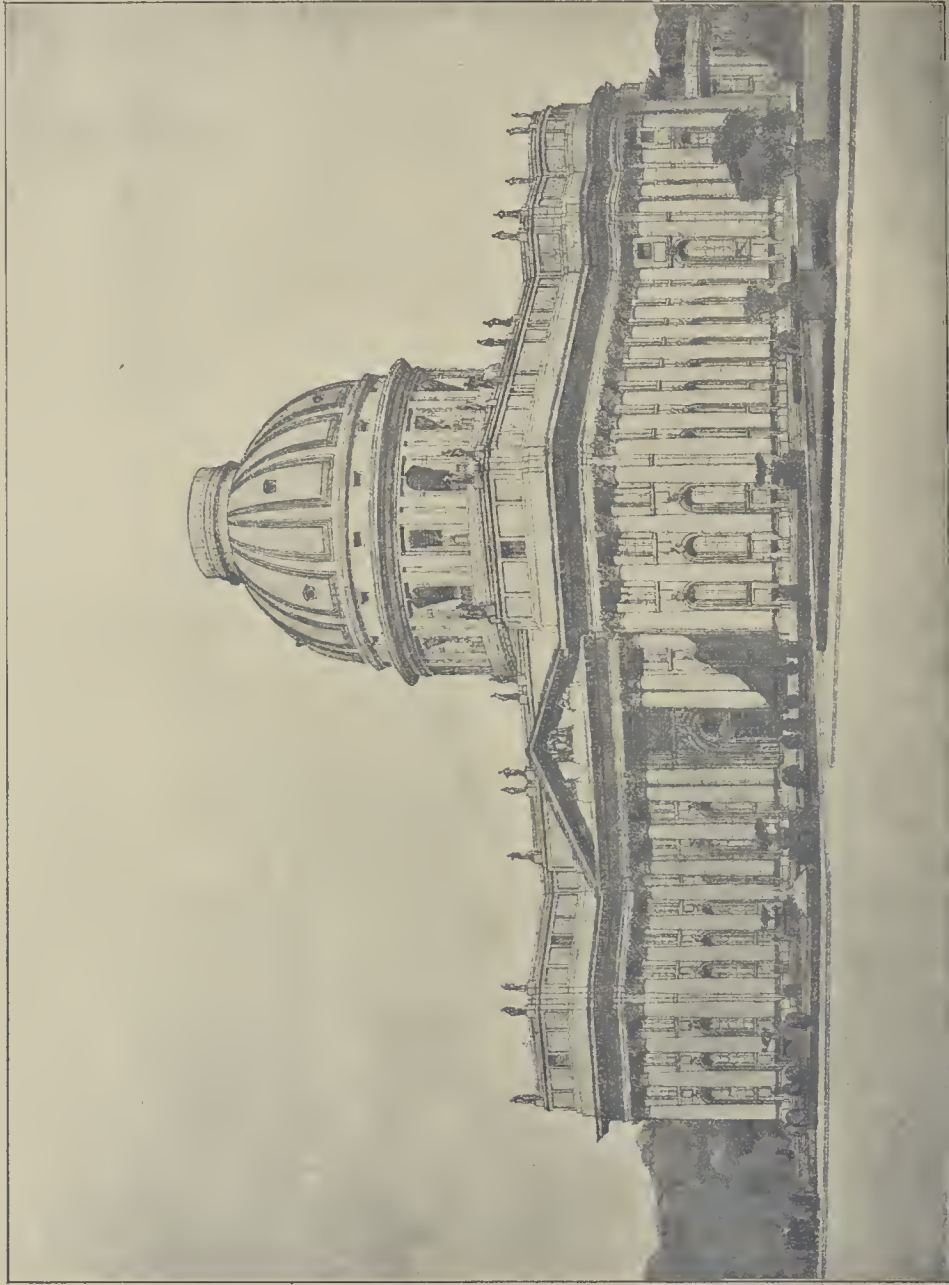
THE BUILDER. JUNE 23, 1906



-VUE PERSPECTIVE



THE BUILDER, JUNE 23, 1906.





FOURTH PREMATED DESIGN (NO. 17). BY HERR O. WAGNER, OF VIENNA.

PREMATED DESIGNS FOR THE PEACE PALACE AT THE HAGUE.



SIXTH PREMIATED DESIGN (NO. 130). BY HERR F. SCHWECTEN, OF BERLIN.

INK PHOTOGRAPHIC CO. L. 4. 5 EAST HINDING STREET FETTER LANE E.C.

PREMIATED DESIGNS FOR THE PEACE PALACE AT THE HAGUE



SECOND PREMIAED DESIGN (NO. 104). BY M. MARCEL, OF PARIS.

PREMIAED DESIGNS FOR THE PEACE PALACE AT THE HAGUE.

The result is interesting and is not without originality, and, though the plan is not without some particularly interesting or defined, and, while the exterior is greatly to be praised, both for its simplicity and for its lightness of character. But the round ends of the principal facade injure this effect, and the room of the Administrative Council on one side and a series of smaller rooms on the other are laid out only with rough colonnades.

The plan is well studied, and is distinguished from most of the others by a notable economy of space.

Design No. 130.
The exterior of this design is well composed, though not particularly interesting or defined, and, while the noticeably unsymmetrical plan shows some careful study, the small, narrow light-areas seem out of place in a building occupying an open site.

General Building News.

CHURCH, WALTHAMSTOW.—The new St. Columba Presbyterian Church was opened by the Mayress of Kensington on Saturday afternoon last week. Owing to the necessity of providing for the school that the rear for Sunday-school purposes, the problem of accommodating 500 persons with architectural effect on a site with a frontage out of proportion to the depth was not an easy one to solve. The difficulty was met by planning the church in the form of a square, each side measuring 32 ft., with a semi-circular gallery running round two sides, and the pulpit and rostrum in one angle. The seating on the ground floor is octagonal in form, and in the gallery semi-circular, the whole facing the pulpit with the least possible interruption of view by columns. The gallery is supported on columns, but the roofing is in one span formed with four arched lattice girders, and four angle ditto. The ceiling is diagonally boarded. The main flooring, faced with maple wood blocks, is formed with a fall of 15 in. to the rostrum, and the pews, out of Orham wood, are 2 ft. 10 in. apart, and 20 in. deep, and are cast-iron. A large front vestibule has been provided communicating with inner porches so as arranged to prevent cold currents of air from entering the building. The staircase to the gallery is constructed with fireproof material, and the stairs are formed with iron flights. Provision has been made for inlet and outlet ventilation, for heating by hot-water, and for lighting by electricity. The main front is faced with red bricks with Corsham Down stone dressings. The staircase leading to the gallery and the heating chamber is formed within a tower rising to a height of 71 ft. above the ground level. The total cost of the work is 4,500. Messrs. Sands & Burley, of Walthamstow, are the builders; Messrs. Webster & Sons carried out the stone-work; Messrs. John Lawson & Co. the heating and lighting; and the seating was executed by the Bennett Furnishing Company. Mr. W. McDougal was the clerk of works. The whole was carried out from plans and designs and under the general superintendence of the architect, Mr. J. Williams Dunford, of Queen Victoria-street, E.C.

PETERBOROUGH CATHEDRAL.—The Peterborough Cathedral Restoration Committee is about to undertake the repair of the north transept on the advice of their architect, Mr. G. F. Bodley, R.A. The north wall leans a good deal, but Mr. Bodley thinks the settlement took place a considerable time ago, and that the masonry has now got its bearing. The cracks and displacements require to be carefully treated.

PRESBYTERIAN CHURCH, LEEDS.—The foundation-stone of a new Presbyterian church was laid on the 16th inst. at Leeds, at the junction of Avenue-hill and Harchills-avenue. The church is to cost about 6,000. It will consist of a nave, with chancel, transepts, organ chamber, vestry, tower, and vestibule. It will be in the Early English style, and formed of Bramley pitch-faced wallstones and Callington dressings, lined with brick. The roof will be open-timbered in pitch-pine covered with red tiles. The seating accommodation is for 500, with provision for a gallery to be erected at a subsequent date to seat 80 additional. The designs show a tower and spire about 115 ft. high, but at present only the square portion of the tower, up to the springing of the spire, will be built. Mr. W. H. Bevers, of Leeds, is the architect.

FREE METHODIST CHAPEL, HAZLEBERE.—The foundation-stones of a new Free Methodist chapel were laid a short time ago at Hazlebere, High Wycombe. The contractors for the work are Messrs. Nash & Son, the architects being Messrs. E. Hooper and A. W. Nash, of High Wycombe.

WESLEYAN CHAPEL, RYTHYR.—A new Wesleyan Methodist chapel has just been erected at Rythyr. The work has been carried out to plans prepared by Messrs. Hornsey & Monkman, architects, of York. The new building possesses a classroom at the rear. There is also a vestry with heating chamber and other conveniences. The entire place will find accommodation for upwards of 130 people.

WORKMEN'S HALL, CWMAAM.—The opening of

the Cwmaam Workmen's Hall and Institute took place on Monday. The architect for the work was Mr. T. Rodric, Aberdare, and the contractor Mr. F. Willis, Rystrad.

SANATORIUM, MIDHURST, SUSSEX.—The King's Sanatorium, situated at Midhurst, was opened by His Majesty last week. The main block is devoted to the patients, each of whom has a separate room with a balcony on to which the bed can be wheeled if necessary, the upper story being set back in order that the balcony for this floor should not interfere with the light and air of the rooms below. The twelve rooms for the well-to-do are in the centre, the eighty-eight for the others in the wings. Recreation-rooms are provided on the ground floor, while in the basement is a hydrotherapeutic department. The administration block containing the dining-rooms, nurses'-rooms, and kitchen, with its accessories, is separated from the main building by an ornamental garden. The communication between the two is by a corridor permitting of the direct access of nurses and domestic servants to the grand corridor leading to the patients' rooms. Annexed to the administration block are the rooms of the resident medical staff, the consultation-rooms, and the operating theatre, and in a convenient situation, isolated from the other parts of the sanatorium, is the pathological laboratory. A clinical and research laboratory is also provided, as it is intended that scientific work, both preventive and curative, shall be one of the prominent objects of the sanatorium. The laundry is fitted with the latest appliances, and precautions are taken for sterilisation of the linen. Adjoining it is the engine-house, from which is supplied the motor-power for the dynamo that generate the electric light and the steam for heating the buildings. A chapel has been erected at the expense of Sir John Brickwood. It consists of two naves at right angles to each other, meeting in a chancel common to both. The sides enclosing the angle which looks to the south are formed by open arches protected only by a cloister. By this arrangement a divine service will practically be conducted in the open air, warmth being provided by heating the floor. The architect was Mr. H. Percy Adams, Messrs. Longley & Sons being the builder. Mr. E. R. Delby was the engineer.

Foreign.

FRANCE.—The Académie des Beaux-Arts has declined this year to award the Duc prize set on foot for the encouragement of "hautes études architectoniques." The next award of the prize falls due in 1908.—The Government has commissioned M. Henri Martin to execute two large decorative paintings for the vestibule of the "Salles des Autorités" at the Sorbonne.—M. Gaston Latouche, the painter, has been elected a member of the Conseil Supérieur des Beaux-Arts.

—At the Ecole des Beaux-Arts the competition in decorative design organised by the "Société d'Encouragement à l'Art et à l'Industrie" has just been adjudged on. The first prize has been awarded to M. Desroches, a student of the Art-school at Lyons. Of the ten prizes awarded this school has obtained five.—Mme. Octave Feuillet, widow of the eminent author, has presented to the town of St. Lo the collection of pictures formed by her late husband, also a number of miniatures and two marble statues by M. Crauk.—M. Denys Puech, the sculptor, has presented to the town of Rodez a sum of 40,000 francs to contribute towards the foundation of an art-museum, in which, among other things, will be placed the models and casts of his works. In the course of excavations on the site of the ancient Alesia (the scene of the victory of Cæsar over Vercingetorix) the remains of an ancient theatre have been found.—The Lycée for girls at Besançon is to be enlarged, at an estimated cost of 187,500 francs.—The Municipality of Périgueux are about to build a new college at an estimated cost of 215,000 francs.—The Ecole Pratique de Commerce et d'Industrie at Mazamet is to be enlarged, at a cost of 140,000 francs.—The enlargement of the Lycée for girls at Anancy is to be carried out shortly, at a cost of 229,000 francs.—On Tuesday last was inaugurated, in the Luxembourg Garden, a monument to the memory of the political economist Le Play. M. Allar is the sculptor and M. Delaire the architect. In the Square Lamartino at Passy a monument was inaugurated last week to the memory of Benjamin Godard, the composer, designed by M. Champell (sculptor) and M. Jaumin (architect). A medalion in memory of the painter Paul Merwart has been set up in the forest of Fontainebleau; it has been executed by M. Ernest Dubois.

BURGARA.—Mr. Foulman, the British Vice-Consul, reports that the activity of the building trade creates another opening for British cement, window-glass, iron bars, and girders.—The Sofia Municipality has concluded a loan for street paving, the construction of new baths and slaughter-houses, a new drainage system, and other improvements.—A fine theatre, sub-

sidised by the State, is to be opened this autumn in the capital.—Phillipopolis, Varna, and Ruzhuk are also busily engaged in municipal improvements.

SPANISH MARBLE AND STONE.—It is stated in the annual report of the British Consul at Barcelona that of the marble and stone exported from that port by far the largest quantity is sent to the United Kingdom. There was a great increase in the exports of these articles last year, and the United Kingdom took 8,717 tons.

Sanitary and Engineering News.

DRAINAGE AND INFECTON IN LAMBETH.—According to the annual report of the Medical Officer of Health for Lambeth, which has just been issued, of the total number of 1,694 houses in which infectious disease occurred during the year, 117 were found to have defective drains, 541 were found to have defective fittings, and 40 were found to have defective traps, and 34.2 per cent. gave no results with the tests. The test used was the chemical test (Kingzett's), and when a result is obtained the drain (tested) is defective, but when no result is obtained it would be unsafe to say that the drain was sound. Year by year, it is stated, the number of defects found decreases. The percentage of houses showing defective drains had fallen from 22.3 in 1891 to 11.7 in 1905. In connexion with an outbreak of diphtheria in the infants' department of St. Mark's School, Kennington Oval, in September, it was a significant fact that about that time certain works were being carried on within 100 yds. of the school by a ventilating-shaft, and that during the progress of this work, sewer-gas was escaping from the open sewer into the street, off and on, for a period of from two to three weeks. Inquiries showed that all the notified children, with one exception, had to pass the sewer opening going to and from school.

VENTILATION OF SEWERS.—At a Conference of representatives of Metropolitan Borough Councils held at Greenwich, the following resolution was adopted:—"That in the opinion of this Conference the ventilation of the new main sewers in course of construction by the London County Council would be materially improved if the London County Council would abolish By-law No. 5 made on October 30, 1900, and which by-law provides:—

"Every person shall erect a new building shall provide in every main drain or other drain of such building which may immediately communicate with any sewer, a suitable and efficient intercepting-trap at a point as distant as may be practicable from such building, and as near as may be practicable to the point at which such drain may be coming from the sewer." He shall, except in cases where the means of access to be provided in compliance with the preceding by-law shall give adequate means of access to such trap, provide a separate manhole or other separate means of access to such trap for the purpose of cleaning it."

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Messrs. Jay, Broll, & Co., of 31, Old Queen-street, Westminster, have been appointed London agents for Messrs. W. Truswell & Son, heating and ventilating engineers, of Newcastle, Staffordshire.

COMMONS AND FOOTPATHS PRESERVATION SOCIETY.—At the annual general meeting, held on June 13, Mr. C. J. Shaw-Lefevre was re-elected President and Sir Robert Hunter a Vice-president of the Society. In moving the adoption of the report, the President stated that the Society had gained the day in every case in which they had instituted legal proceedings in respect of encroachments by railway companies and other private bodies upon common land, more especially in the neighbourhood of London. In the course of his address Mr. Shaw-Lefevre justified the action of the Society in their endeavours to maintain the right of public access to Stonehenge.

STATUE OF SIR WILLIAM VERNON HARCOURT.—A statue, sculptured by Mr. Waldo Story, of Rome, has been set upon one of the four pedestals in the members' lobby of the House of Commons. The statue, which is life-sized, represents Sir William Vernon Harcourt in his robes as Chancellor of the Exchequer, and the stone has been tinged in colour that it may harmonise with the tint of the pedestal from which the paint has been removed; the three other pedestals will be similarly treated during the recess. Mr. Waldo Story's bust of the deceased statesman is in the possession of his son, Mr. Harcourt.

FIRST GARBEES CITY, LTD.—The company, having a nominal share capital of 300,000l., offer for subscription all the remaining 55 shares, amounting to 164,240l., for carrying on, in succession to the Garden City Pioneer Company, the development of the Letchworth estate, which was bought from several owners for 131,568l. 9s. 6d., or about 40l. an acre for an area of some 3,818

acres; the then subsisting buildings being valued, for insurance purposes, at 84,470*l*. Sites for 520 houses, 25 shops, 7 factories, a church, a chapel, a public-hall, schools, etc., have been let or chosen, and up to last March 31 ground rents to an amount of more than 1,500*l*. per annum have been created; some sites for shops have been let for ground rents at rates of from 40*l*. to 60*l*. per acre. Mr. Justice Neville is Chairman of the Company, and Mr. Barry Parker and Mr. Raymond Unwin, of Baldoek, Herts, are appointed as consulting architects.

NEW GOVERNMENT BUILDINGS.—In the House of Commons on the 14th inst., Mr. P. W. Wilson asked the First Commissioner of Works whether he had received any representations respecting the towers which appeared upon the plans of the new Government buildings facing Great George-street, and whether he was prepared to authorise the construction of any or all of those towers. Mr. Harcourt: Yes, sir, I received a strong representation from the Council of the Royal Institute of British Architects in favour of the completion of the towers on the Great George-street front of the new public offices. "I replied to them in the following letter:—"I am much obliged by your letter of the 15th. Though I maintain my own opinion that the proposed very high towers on the Great George-street front of the new public offices are not architecturally or aesthetically desirable, I am not prepared to put my artistic opinions against those of the Council of the Royal Institute of British Architects. I have, therefore, given immediate instructions that the building now in course of construction shall be continued and completed on the lines originally laid down by Mr. John Brydon. I need not say that I shall always greatly value any criticism or assistance that the Institute is good enough to afford me in that part of my duties which is connected with architecture. I may add that I have asked the contractors to see that as far as possible the masons to be engaged on this work shall be those who were discharged on its suspension, and the contractor has promised to meet my wishes.

HOUSING OF THE WORKING CLASSES.—On the 18th inst., the Select Committee of the House of Commons on the Housing of the Working Classes Acts Amendment Bill (Sir J. Dickson-Poynder presiding) heard the evidence of Dr. J. C. Thresh, Medical Officer of Health to the Essex County Council and to the Rural District Councils of Chelmsford and Maldon. He gave the results of his experience of the difficulties he had encountered in attempting to put in force the Housing of the Working Classes Act. His chief reason, in his opinion, of the inadequate supply of cottages in agricultural districts was that the wages paid to the agricultural labourer did not enable him to pay a rent which would adequately remunerate either landowners or speculative builders for the provision of cottages of a satisfactory type. The vicious system of paying a portion of the wages on house rent accentuated this difficulty. The building by-laws had had, in his opinion, little effect in preventing buildings, although they were in many cases too stringent. By the action of the Chelmsford and Maldon Rural District Councils the Local Government Board had been persuaded to allow a relaxation of restrictions which had proved that what was desired, but had had very little effect upon building operations. The stringency of the building by-laws had served as a mere excuse in most cases for people who never intended to build unless actually compelled. The obstacles to the establishment of factories in rural districts and small provincial towns were various. In some cases the land could not be obtained, as the landlord wanted no factory in the neighbourhood. In other cases the landowner increased the price of the land. The greatest difficulty was that of obtaining sufficient labour. Employers complained that they could not get as much or as good work out of the countryman as out of the townsman. These and other obvious disadvantages more than outweighed the advantages of cheaper labour. He thought the Bill before the Committee was a palliative, but would not be a sufficient cure for the evils to be dealt with.—On the 18th inst. the Select Committee of the House of Commons on the Housing of the Working Classes Acts Amendment Bill (Sir J. Dickson-Poynder presiding) heard further suggestions from the Chairman of the National Housing Reform Council (Alderman W. Thompson, Richmond) with regard to the means of stimulating the local authorities to great activity. He considered that the problem of housing the poorest of the poor was insoluble except by a system of subsidies, such as were given in the Irish Labourers Acts, and were now being extended by the Bill before Parliament. The lowering of rent to meet the capacity of the bulk of the badly-housed might be met by a scientific attack on the items which caused the expenditure on housing to mount up, with a view to reducing the capital outlay on land, building, roads, and sewers, and the annual charge for rates and taxes and repairs. One of his suggestions in connexion with repairs was that a tenth of the rent should be separately charged to the occupier as a repairs rental, a proportion of

this amount to be returned to the tenant in the form of a bonus when the actual cost of the repairs is kept below the percentage allowed. He advocated the establishment of a central land housing and transit commission, and the institution over suitable areas of town and village development committees somewhat on the lines of Continental *Comités de Patronage*, whose special functions were to make themselves acquainted with the exact needs and conditions of their districts, and to put them officially before the local authorities or the State authorities when the locality was in default. These bodies acted also as useful intermediaries between public and private enterprise.—Mr. J. H. Diggle gave evidence as to housing difficulties in South Lincolnshire, notwithstanding the thrift of the agricultural labourers. The more land that could be attached to labourers' houses the better from the point of view of return for the capital outlay, and the advantage of the occupier. The rural population was undoubtedly kept low in consequence of the want of houses. It would be an advantage to the farmer that the labourers should have more land. Where there were small holdings it was found that the people remained on the land, and their sons and daughters were available for the farm.

LIVERPOOL CATHEDRAL.—Lord Derby presided at the annual meeting of the Liverpool Cathedral Committee on the 13th inst., when it was announced that the Duke of Connaught would visit Liverpool to lay the foundation-stone of the Lathom Chapter-house on July 17. The report of the committee congratulated the Duke on the completion of the first portion of their work. The foundations of the Cathedral choir, Lady chapel, and Chapter-house were finished by the contractors in the month of April. After 75,000*l*. had been spent on the purchase of the site, legal and general expenses, and construction of foundations, there was 101,000*l*. available for the first portion of the cathedral, which was estimated would cost about 240,000*l*. Thus about 80,000*l*. would be required, and the committee appealed not only for this sum, but for such further funds as would justify them in undertaking a further portion of the great design on which they had embarked. The Chairman, in moving the adoption of the report, said they must try and keep the work going with increasing fervour, and at no distant date they would be able to have services in the Cathedral. The Bishop of Liverpool said that their aim from the beginning had been that the Cathedral should be built by every school of thought among church people in the diocese. The report was adopted. Sir Robert Hampson pointed out that the foundations already finished included also the two towers and the cross transept, so that, if funds permitted, the second portion of the Cathedral could go on contemporaneously with the first. Sir William Forwood, Chairman of the Executive Committee, stated that the money they had in hand would take about five years to expend. They would then want about 39,000*l*. per annum, and also 80,000*l*. to complete the first portion.

HISTORICAL DOCUMENTS.—In the Parliamentary Papers Mr. Boland asks the Secretary to the Treasury whether, in view of the interest caused in Ireland by the publication of the Historical Documents Commission of the MSS. at the Franciscan Monastery in Dublin, he will consider the advisability of securing the publication of similar historical documents bearing on the same period now at the Irish College in Rome. Mr. McKenna replies that inquiry shall be made into the suggestion, but no funds are at present available for the purpose, and he could give no pledge on the subject.

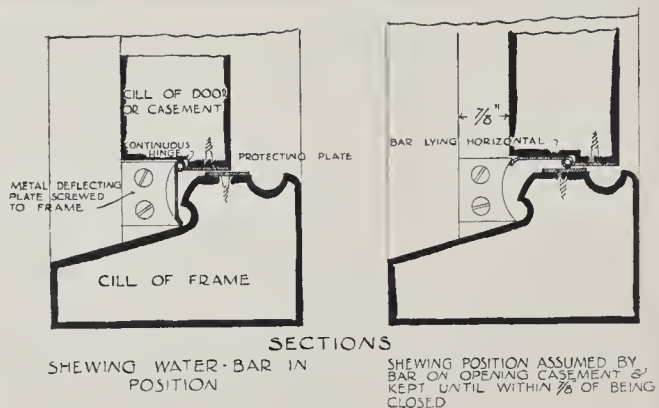
A NEW WATER-BAR FOR CASEMENTS.—Messrs. Johnson & Webber, architects, Torquay, have

designed a water-bar for inward-opening doors and casements, which is now being made by Mr. James Gibbons (Wolverhampton). The peculiarity of the invention is that the water-bar is continuously hinged under the bottom-rail of the casement, and lies in a horizontal position while the casement is open, and is deflected into a vertical position when the casement is closed, thus covering the joint between the bottom-rail and the sill (see illustration).

ELECTRIC LIGHTING, SALFORD.—On the 13th inst., at the Salford Town Hall, Mr. W. R. Harper, on behalf of the Local Government Board, heard an application from the Salford Corporation for permission to borrow 7,720*l*. to extend the Frederick-road Electricity Station. The Deputy Town Clerk, Mr. J. H. Jackson, said that the opening of the station took place in 1901, since when the demand for the supply of current had grown so considerably that additional plant was now required. The total cost of the electricity scheme so far was 550,409*l*., and the outstanding debt 484,289*l*. The undertaking at first was not successful, but recently there had been great improvement.

INTERNATIONAL BUILDING TRADES EXHIBITION.—The Directors of the Crystal Palace Company are considering a scheme for holding an International Exhibition of all trades connected with building, during the spring and summer of 1907. This Exhibition would give those participating in it an opportunity of bringing their specialities before all persons connected with the building interests for a much greater period of time than has been the case at the ordinary Trade Exhibitions, which generally lasted only a few days. An endeavour will be made to bring together manufacturers of building materials and architects, and an International Jury will be appointed, who will make awards according to the merits of the exhibits, and thereby afford the persons participating an opportunity of obtaining a formal recognition of the excellence of their wares.

GLASGOW SCHOOL OF ART.—The Governors of the Glasgow School of Art, authorised by the Scotch Education Department, have granted six maintenance bursaries of 20*l*. each, with free tuition, and seven travelling bursaries of 10*l*. each, and one of 5*l*., competed for during the session now concluding. The judges appointed by the Governors to make the awards were:—For drawing and painting—Sir Francis Powell, LL.D.; Messrs. E. A. Walton, R.S.A. (assessor approved of by the Scotch Education Department); John Henderson, with Professor Jean Deville and the headmaster. For architecture—Messrs. T. L. Watson (convenor); David Barclay, Hippolyte J. Blanc, R.S.A.; Professors Bourdon, B.A., Gourlay, M.Gibson, Mr. James S. Boyd (recorder). For modelling—Messrs. W. Forrest Salmon, John Keppie, John Henderson, with the director and the headmaster. For design and decorative art—Messrs. W. Forrest Salmon, James Morton, Alex. N. Paterson, M.A., Charles R. Mackintosh, Wm. Meikle, with Professor Girdalton and the headmaster. The following are the winners:—Six maintenance scholarships, value 20*l*. each, with free tuition: Drawing and painting—Eleanor Moore, David R. Lockie, John Currie. Architecture—Edw. G. Wylie. Modelling—Mary Buchan. Design and decorative art—James S. Rennie. Seven travelling bursaries of 10*l*. each: Drawing and painting—Wm. M'Arthur, Andrew Watson. Architecture—Wm. A. Robb, Wm. Lindsay. Modelling—John Currie. Design and decorative art—Mary R. Henderson, Wm. Brown. Extra Design bursary of 5*l*.: Robert Hood. Twenty-one governors day-class studentships and thirty governors evening-class studentships were awarded. The Institute of Architects' prize was gained by Thomas C. C. Mackie.



the anatomy printed by Hilda McFarlane (judge, Dr. W. K. Hume), and the prize offered by Messrs. Wm. Meikle & Sons by Isobel Spence. Day and evening bursaries offered by the Haldane Trust, tenable at the Glasgow School of Art for next session, have also been awarded. The judges for these were—Mr. Alex. N. Thomson, R. A., and Mr. John Henderson. Four day-class bursaries, value 15*l.* each, were awarded to John Turnbull, Clara Tucker, Wm. J. Anderson, and Ellison Young. Extra bursary of 5*l.*—A. E. H. Miller. Seventy evening-class studentships were awarded, tenable in the evening classes.

NEW LIBRARIES IN LONDON.—The Libraries Committee of Greenwich Borough Council reported on Tuesday having decided to invite tenders for pulling down Bexley House, London-street, and erecting on the site a branch library, according to the plans prepared by Messrs. Willis & Anderson. Tenders will be invited as soon as the working drawings are completed. On Tuesday the Hackney Public Libraries Committee reported that the specification for the central library having been prepared, and the quantity surveyor having the bills of quantities well in hand, they had decided to invite builders to send in their names to the town clerk by a given date. By this means the number of sets of bills of quantities required will be ascertained, and all builders tendering can be supplied with quantities on the same day. Mr. Carnegie recently offered the Public Libraries Committee of Lewisham 4,500*l.* for the erection of a branch library at Hither Green, conditional on a full site being provided. In September, 1903, Mr. Cameron Corbett offered to give a site if the building was erected in twelve months from then. On Tuesday the Committee reported that Mr. Cameron Corbett had agreed to give the site as previously proposed. Immediate steps are to be taken for the completion of the conveyance.

COMBINED DRAINAGE.—At a conference recently held at the Fulham Town Hall, at which twenty-two of the London Borough Councils were represented, it was resolved to form a committee to enquire into the Local Government Board to urge the views of the conference with regard to the unsatisfactory state of the law relating to combined drainage in the metropolis. On Tuesday the Law and Parliamentary Committee of Fulham Borough Council reported having received a letter from the President of the Local Government Board stating that he would be prepared to consider the representations in the memorial proposed to be submitted by the Borough Councils concerned, but that he does not think it necessary to trouble the delegation to wait upon him with reference to the matter.

WATER SUPPLY TO KENSINGTON HOUSES.—At the meeting of Kensington Borough Council on Tuesday the Public Health Committee reported that their attention had been drawn by the Medical Officer of Health to the provisions of sec. 48 (2) and 48 (3) of the Public Health (London) Act, 1891, which required that prior to the occupation as a dwelling-house of any house erected since the coming into operation of the Act in question, the sanitary authority shall have certified the premises to have a proper and sufficient supply of water, and that any owner who occupies such house or permits the same to be occupied as a dwelling-house without such certificate shall be liable to penalties. The Committee found on referring to the minutes of the late Vestry that an order had been given in April, 1894, as follows:—“(1) That it be instructed to the surveyor to make inspections and grant certificates in all cases when application is made to him under the provisions of the Statute.” Their report concluded as follows:—“We are of opinion that the enforcement of this provision of the Act should be transferred to the Public Health Department, with whom rests the responsibility for seeing that effect is given to the by-laws framed by the sanitary authority under sec. 50 of the Act with respect to the cleansing of cisterns, and we accordingly recommend—(a) That the above-mentioned order of the late Vestry of April 11, 1894, be revoked. (b) That it be an instruction to the Medical Officer of Health to cause inspections to be made of all buildings newly erected or rebuilt, and to report to the Public Health Committee as to there being a proper and sufficient supply of water thereto, with a view to the required certificates being granted before such buildings are occupied, or to such other steps being taken as may be necessary for the enforcement of the provisions of sec. 48 of the Act.” The report was adopted.

BUILDING CONTRACTS.—Mr. John Good, Honorary Secretary of the Master Builders' Association of Dublin, has addressed a letter to the principal Irish newspapers to the effect that on Thursday, June 14, the Association, at a largely-attended meeting, adopted unanimously the following resolution:—“That, although conditions of building contracts have been under consideration for many years, we now regret to learn from the public Press that the members of the Royal Institute of Architects of Ireland have, at a recent meeting, adopted without discussion a set of conditions, without any consultation with the Builders' Association as to their views on a matter so vitally important to their interests,

contrary to the custom and practice adopted in England and Scotland, where this matter was the subject of many conferences between the architects and builders prior to its mutual adoption. While willing and anxious at all times to carefully consider any proposals whereby equitable terms of contract might be agreed upon, we respectfully decline to be forced to accept or sign conditions which are, in our opinion, inequitable and unfair, and which differ very materially from any accepted conditions at present in use in the United Kingdom.” Mr. Good adds that the members of the Master Builders' Association will continue to accept and sign the conditions of contract at present in use in the city of Dublin, and also those agreed on between the Royal Institute of British Architects and the Association of Master Builders' of Great Britain and Ireland.

BUILDING OF IRISH SCHOOLS.—Mr. A. P. Farrell asked the Secretary to the Treasury in the Parliamentary Papers if he will state whether any proposition has been yet made in providing for extended building expenditure under Plan VI, for the erection of National Schools in Ireland. Mr. McKenna replies that no settlement has yet been reached, the Commissioners of National Education having objected to the new plans prepared by the Board of Works at the instance of the Treasury. The Commissioners have now been asked to submit for the consideration of the Irish Government and the Treasury their own suggestions for plans for schools to be built in future years.

GAS-HEATED BOILERS FOR DOMESTIC HOT-WATER SERVICES.—Mr. Thomas Potterton's ingenious “Victor” gas-heated boiler, which was mentioned by us in connexion with the gas exhibition at the Horticultural Society's Hall some months ago, is worthy of a more detailed notice in view of the tests recorded by the inventor in his new catalogue. The boiler has two waterways, the lower being of a flat diamond shape, and on the lower surface of this the flames of the Bunsen burners impinge. The upper waterway is of saddle shape, and receives the heat from the products of combustion on a side to the flue; it thus serves the purpose of a feed-water heater. A dipped pipe outside the boiler connects the two waterways. The flow-pipe to the cylinder or tank is taken from the upper part of the lower waterway, and the return-pipe is connected to the upper waterway, as the water in the latter is always of lower temperature than that in the former. Records are given of a number of tests, but the following may serve as an example:—With a consumption of 36 cubic ft. of gas per hour 8 gallons of water in a storage tank were raised from 46 deg. Fahr. to 130 deg. in half an hour, to 145 deg. in one hour, and to 212 deg. in 2½ hours, and at the end of the test the temperature of the products of combustion entering the flue was only 176 deg.

Capital and Labour.

CONDITION OF THE BUILDING TRADES.—Employment in these trades was quiet generally, except with painters, who were well employed. It was better than a year ago and a year ago. Returns received through the trade correspondent from 41 London employers show that in the last week of May they paid wages to 9,882 work-people of all classes, compared with 9,951 in April, and 11,973 in May, 1905. Employment generally seemed very quiet, except with painters, who continued busy. Returns from Trade Unions in London show little change on the whole in the state of employment as compared with a month ago and a year ago. The percentage of unemployed Trade Union carpenters in London at the end of May was 8.2, compared with 6.5 in April, and 8.3 in May, 1905. With plumbers, the percentages unemployed for the three periods were 13.7 for May, 1906, 13.5 for April, 1906, and 14.2 for May, 1905. In the case of both carpenters and plumbers, the percentage unemployed in May, 1906, was lower in London than in any other district of the Kingdom. Bricklayers and plasterers reported a slight improvement in employment; masons and painters reported a decline. Seventy-four returns were received from Employers' Associations in towns outside of London. On the whole, employment in these towns was quiet.—*Labour Gazette.*

Legal.

THE ALLEGED OBSTRUCTION OF LIGHT TO ST. GEORGE'S CHURCH, HANOVER-SQUARE.

MR. JUSTICE BUCKLEY, in the Chancery Division last week resumed the hearing of the motion by the plaintiff in the case of Anderson v. Francis & Adams for an interim injunction to restrain, until the trial or further order, the obstruction by the defendants of the light to St. George's Church, Hanover-square.

In the result it was arranged that no injunction should be granted, his lordship consenting to try

the case on July 3, the action being set down without pleadings, there being given liberty to each party to inspect the premises and make experiments in the presence of the other as to the degree of obstruction.

Mr. Eve, K.C., and Mr. George Cann appeared for plaintiff; and Mr. Stokes for the defendants.

ANCIENT LIGHT DISPUTE.

THE case of Fear v. Morgan came last week before the Court of Appeal consisting of Lords Justices Vaughan Williams, Romer, and Fletcher Moulton, on the defendant's appeal from a judgment of Mr. Justice Kekewich in the Chancery Division.

The action was brought by Mr. and Mrs. T. F. Fear for an injunction to restrain the defendant, Mrs. Margaret Jane Morgan, her servants and agents, from erecting or permitting to remain erected on her land at Aberystwyth, consisting of the plaintiffs' premises, any wall, building, or structure so as to darken, injure, or obstruct any of the ancient lights of the plaintiffs. The plaintiffs also claimed a mandatory injunction and damages. The plaintiffs were lessees for a term of 21 years from June 30, 1900, of No. 16, North-parade, Aberystwyth, consisting of 10 dwelling houses, wine and spirit vaults, and out-buildings in the rear. In a portion of the plaintiffs' buildings looking towards the east were two windows, faced by land belonging to the defendant, upon which where the same adjoined the plaintiffs' land there formerly stood in front of the defendant a wall about 6 ft. 10 in. high. The plaintiffs alleged that the windows were ancient lights, and that in May, 1903, the defendant began to build upon the wall so as to increase its height. The plaintiffs alleged that this had deprived them of a substantial quantity of light, thus diminishing the value of their premises.

The defendant, by her defence, pleaded that the lease of the premises was originally vested by the Corporation in one Watkins, that Watkins surrendered that lease to the Corporation in view of another lease being granted, which was assigned to the plaintiffs, and that in view of that surrender by Watkins all rights of light, if any, to the plaintiffs' windows over defendant's premises became extinguished. Defendant also said that her lease, one granted originally to Watkins, gave her power to raise her wall as she had done. She further denied that there had been any substantial interference with the plaintiffs' lights. At the trial the claim for a mandatory injunction was not pressed, and, in the result, Mr. Justice Kekewich held that it was immaterial whether the plaintiffs entered into the property by virtue of the prolongation of the old lease or whether they came in under a new lease in 1900. Under the new lease Watkins got the benefit of the uninterrupted enjoyment up to that time of any light that had been acquired by right. That being so, it was competent for him to say that he would not insist upon it. But he had to regard all the surrounding circumstances in order to determine whether, when Watkins took the lease, he was entitled to insist upon his rights of light. In his lordship's opinion, Mr. Watkins was entitled to insist upon his right, and in his judgment the access of light to the windows in question must not be obstructed. He accordingly granted the plaintiffs a declaration in that sense, and judgment was entered accordingly. Hence the present appeal of the defendant.

At the conclusion of the arguments of counsel for the appellant, and without calling upon counsel for the respondent, their lordships affirmed the decision of Mr. Justice Kekewich, and dismissed the appeal with costs.

Patents of the Week.

APPLICATIONS PUBLISHED.*

10,531 of 1905.—A. SMITH: Means for Utilising the Waste Heat of Stoves and Fireplaces for Heating Purposes.

This invention consists in the means of utilising the heat of a fireplace or stove by shutting off direct communication between the source and the chimney, and by interposing in the path of the whole of the said products enter, and from which they pass into the chimney or other uptake, the said cylinder having within it a smaller cylinder water-charged to form part of a hot-water heating apparatus.

12,415 of 1905.—C. H. THOMPSON: Ventilating Water-closets.

This invention relates to a ventilating water-closet, and consists of a casing fastened to the edge of the closed hall, pistons working within cylinder formed in said casing, said pistons having

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

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —, Contracts, iv. vi. viii. x.; Public Appointments, xvi.; Auction Sales, xxviii. Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

Contracts.

BUILDING.

- JUNE 24.—Ashburton.—ENGINE-HOUSE, ETC.—**The Managers of Stormdown and Owlcombe Mines, near Ashburton, invite tenders until noon of June 24 for (a) erection of engine-house; (b) erection of caliner house, flues, chambers, and chimney stack. Plans, specifications, and conditions of contract can be seen at the office of Mr. Wm. A. Crose, Manager.
- JUNE 25.—Ardley.—SCHOOL WORKS.—**The Ardley (E. and W.) District Sub-Committee of the West Riding C.C. invite tenders:—(1) For conversion of late board room into teachers' sitting room at West Ardley Western Schoolhouse; (2) for carrying out alterations to drainage, etc., at West Ardley Hill Top School. A plan of the alterations at Hill Top School may be seen, and copies of specifications for both contracts obtained, from office of Mr. Alexander Angus, Education Officer, Northgate, Wakefield. Sealed tenders must be submitted for each school. Sealed tenders, duly endorsed, must be sent not later than 10 a.m. on June 25.
- JUNE 25.—Batley.—HOUSES.—**Two houses in Victor-street, Batley. Plans and specifications may be seen, and bills of quantities obtained, at office of Mr. John H. Brerley, architect, Commercial-street, Batley, from June 18 to 25, on which later day sealed and endorsed tenders are to be sent not later than 4 o'clock p.m.
- JUNE 25.—GREATHEAD.—ALTERATIONS TO POORHOUSE.—**Edinburgh Parish Council invite tenders for alterations in connexion with the forming of isolation rooms in male and female dormitories, Craigleith Poorhouse. The plans can be seen, and schedules of quantities obtained, on application to Mr. R. M. Cameron, Architect to the Council, 53, Great King-street, Edinburgh. Sealed tenders to the Clerk, Parish Council Offices, Castle-terrace, Edinburgh, not later than 10 a.m. on June 25.
- JUNE 25.—Whitley.—SCHOOL WORKS.—**The Flockton District Sub-Committee of West Riding C.C. invite whole or separate tenders in connexion with the various works to be done at the Whitley Upper Provided School, near Huddersfield. Bills of quantities may be obtained on application to the Education Officer, Northgate, Wakefield. Sealed tenders, duly endorsed, to be sent to Mr. James Whaley, Divisional Clerk, Northgate, Wakefield, not later than 10.30 a.m. on June 25.
- JUNE 26.—Aberaman.—HOUSES.—**Twenty-one houses at Aberaman for the Treman Building Club. Plans and specification can be seen at office of Mr. T. Rodrick, architect, Ashbrook House, Aberdare. Endorsed tenders to be sent to Mr. F. Broese, Secretary, Aberaman-gardens, Aberaman, not later than June 26.
- JUNE 26.—Abergavenny.—CHURCH AND SCHOOL.—**A new Presbyterian church and school at Abergavenny for the Building Committee. Plans and specification can be seen, and quantities obtained, on payment of a deposit of 2l. 2s., at the offices of Mr. E. A. Johnson, F.R.I.B.A., architect, Abergavenny, to whom endorsed tenders are to be sent by June 26.
- JUNE 26.—Almondbury.—COTTAGES.—**The Loyal Dartmouth Lodge (No. 429), Almondbury, invite tenders for any of the various works required in the erection of four cottages at Almondbury. Apply for quantities to Mr. James H. Hall, architect and surveyor, Milton-place, Fartown, Huddersfield, not later than June 26.
- JUNE 26.—Portsmouth.—BUSINESS PREMISES.—**Messrs. Timothy White Company, Ltd., invite tenders for the erection of business premises in London-road, Portsmouth. Drawings and specifications may be seen at the offices of the architect, Mr. J. W. Watmley, F.R.I.B.A., 7, King's-terrace, Southsea, from whom bills of quantities may be obtained. Sealed tenders on the form and in the envelope supplied, must be delivered at or before 12 o'clock noon on June 26, at the architect's office.
- JUNE 26.—Salford.—SCHOOL, ALTERATIONS.—**The Cornwall Education Committee invite tenders for proposed alterations and additions to Salford Council School, according to plans and specification, which may be seen at the Council School, Salford, or at the office of Mr. C. Andrew, Architect to the Committee, Biddick-court, St. Austell. Forms, upon which all tenders must be made, may be had from the Architect, or at the School. Sealed endorsed tenders to be sent to Mr. F. R. Pascoe, Secretary, Education Office, Truro, on or before June 26.
- JUNE 26.—Troedyrhiv.—HOUSES.—**Three houses at Troedyrhiv. Drawings and specification may be seen at offices of Mr. J. Lewellyn Smith, architect, Aberdare and Merthyr. Sealed endorsed tenders to be sent in on or before June 26.
- JUNE 26.—Uverston.—HOUSE.—**The erection of a house at Newby Bridge, near Uverston, for Miss Bannister. The drawings and specification may be seen, and copies of the quantities obtained, from the architects' offices. Tenders to be delivered to the architects, Messrs. Settle & Brundrit, A.R.I.B.A., Uverston and Barrow-in-Furness, not later than noon on June 26, endorsed "Tenders Newby Bridge House."
- JUNE 27.—Aberystwyg.—CHAPEL.—**For new Baptist chapel at Aberystwyg. Plans and specifications at Mr. John Davies's, architect, 11, The Green, Aberystwyg. Tenders to be sent (sealed) not later than
- JUNE 27 (2) a.m. on Mr. Arthur Pritchard, Secretary of Building Committee, 10, Charles-street, Aberystwyg.**
- JUNE 27.—Bootle.—LAVATORY.—**The Corporation of Bootle invite tenders for the reconstruction of a lavatory, etc., in the Town Hall. Plans may be seen, and bills of quantities obtained, at the office of the Borough Engineer. Tenders, sealed and endorsed "Town Hall Lavatory," to be delivered at office of Mr. J. Henry Farmer, Town Clerk, Town Hall, Bootle, not later than 9 a.m. on June 27.
- JUNE 27.—Carnarvon.—ALTERATIONS.—**Alterations and additions to 83, Pool-street, Carnarvon, for Mr. John Griffith. Plans and specifications may be seen at Mr. John Griffith's office, to be delivered to Mr. John Griffith on or before June 27.
- JUNE 27.—Fernihill, N.B.—ALTERATIONS.—**Mason, carpenter, and slater works of alterations to farm buildings at Fernihill, Shodeckley Estate (Mr. George Simpson). The plans and specifications may be seen at the farm, and offers will be received by Messrs. Chalmers, advocates, 18, Golden-square, Aberdeen, up to June 27.
- JUNE 27.—Fintay.—AJOININGS, ETC.—**The mason, carpenter, and slater works for the underdone on the Fintay Estate:—(1) Dairy at Brownhills (Mrs. Siggel); (2) places on to Mulling Estate; and (3) poultry house and pig-house at Birns, Mr. William Stewart, builder, Inverurie, will meet intending offerers on June 25 current at the respective places—Birn, Birns, Mulling, and Mullingbrae at 1 o'clock afternoon—to point out the work and afford any other information required. Plans and specification may be seen either at the above places or in the hands of Mr. Stewart, Inverurie. Offers for the works will be received by Mr. Alex. Stronach, jun., & Son, advocates, 25, Belmont-street, up to June 27 current.
- JUNE 27.—Longwood.—HOUSES.—**Four dwelling-houses for the Longwood Industrial Society. Plans may be seen, and quantities obtained, from June 20 to 27, Mr. Sanderson M. Baldwin, architect, Longwood, Minlithbridge.
- JUNE 27.—Luddenden Foot.—SHOPS AND HOUSE.—**Two shops and house at Luddenden Foot. Plans can be seen, and quantities obtained, at the offices of Messrs. Richard George E. Smeaton, architects, 22a, Commercial-street, Halifax, from June 21 to June 27, on which later date tenders are to be sent not later than 5 p.m.
- JUNE 27.—Manchester.—FARM BUILDINGS.—**Manchester Sanitary Committee invite tenders for alterations to Litchford and Cooper Fold farm buildings, on the Blackley Estate. Drawings may be seen, and specification and bills of quantities obtained, at the office of the City Architect, Town Hall, upon payment of 1l. 1s. Sealed tenders, enclosed in the official envelope, to be delivered not later than 5 p.m., June 27.
- JUNE 27.—Sevensoaks.—ALTERATIONS TO WORKHOUSE.—**Guardians invite tenders for alterations and additions to the Union Workhouse, situate at Ide Hill, Bolton, near Sevensoaks. Plans and specification for new building for steam cooker; (2) heightening of furnace chimney. Drawings and specifications can be seen, and forms of tender obtained, during usual office hours, at the office of the architect, Messrs. Llewellyn & Pawley, 68, High-street, Sevensoaks. Tenders, sealed and endorsed respectively "New Building" and "Furnace Chimney," to be delivered to the office of Mr. C. G. Smeaton, architect, Sevensoaks, not later than 4 o'clock p.m. on June 27.
- JUNE 27.—Stoke.—COTTAGES.—**For the erection of five cottages at Stoke-under-Ham. Plans and specification can be seen at Mr. William Terrell's, North-street, Stoke-under-Ham, to whom sealed tenders must be delivered not later than 5 p.m. on June 27.
- JUNE 28.—Brynmawr.—INSTITUTE.—**An institute at Brynmawr for the Institute Committee. Plans and specifications may be seen, and quantities obtained, upon payment of a deposit of 1l. 1s., at the office of the architect, Mr. E. R. Bates, 26, Westgate-chambers, Newport, Mon. Tenders, endorsed "Tender for Institute," to be sent to Mr. Llewellyn Thomas, J.P., Heatherwood, Brynmawr, on or before June 28.
- JUNE 28.—East Calder.—SCHOOL, ADDITION.—**Mason, joiner, slater, plaster, and plumber works of additions to Catholic school, East Calder. Schedules of quantities to be had from Messrs. M. Lachlan & Walker, architects, Stirling. Offers to be lodged by June 28.
- JUNE 28 JULY 11.—Mason Dinington.—SCHOOLS.—**Northumberland C.C. Education Committee invites tenders for the work of remodeling and extending the Mason Dinington (mixed) Council School, situate near Newcastle-upon-Tyne, also for the erection of a new infant Council school to accommodate 150 scholars, to be erected immediately adjoining the existing mixed school buildings. Name and address to Mr. C. Williams, Secretary to the Education Committee, Pearl Buildings, Newcastle-upon-Tyne, not later than June 28, together with a deposit of 2l. 2s. Plans of both works may be inspected at the Committee's offices, and sealed tenders, endorsed "Tenders for Dinington New School and Improvements," must be forwarded to the Secretary not later than 10 a.m. on July 11.
- * JUNE 28.—REGISTRY FOR SHIPPING AND SEAMEN.—**Tenders are invited for the registry of shipping and seamen—adaptation for the Commissioners H.M. Office of Works, Drawing Office. Plans, copy of conditions, and form of contract, may be seen on application to Mr. J. B. Westcott, M.V.O., at the Office of Works. Bills of quantities and forms of tender may be obtained at unadvertised address on deposit of 1l. 1s. Tenders, endorsed "Tenders for Registry of Shipping and Seamen—Adaptation," to be delivered, addressed to the Secretary, at H.M. Office of Works, Storey's-gate, S.W., before 12 o'clock noon, June 28.
- JUNE 29.—Eston Junction.—SCHOOL.—**North Riding of Yorkshire Education Committee invite tenders for the several works in connexion with the proposed alterations and additions to Eston Junction Council School. Forms of tender to be obtained between the hours of 9 a.m. and 4 p.m. Tenders to be delivered to Mr. Douglas Smith, Secretary, County Hall, Northallerton, not later than June 29, sealed and endorsed "Tender for Alterations, Eston Junction School."
- JUNE 29.—FARMHOUSE.—**FARMHOUSE.—New farmhouse on the Whitechapel Estate, near Southmolton, Devon. Plans and specifications at offices of Messrs. E. H. Harbottle & Son, architects, County Chambers, Exeter. Bills of quantities may be obtained upon payment of 1l. Sealed endorsed tenders to be sent to architects on or before June 29.
- JUNE 30.—ASHBURTON.—VILLA RESIDENCES.—**The Directors of the Ashburton Waterworks Co., Ltd., invite tenders for the erection and completion of two villa residences in the Higher Western Field, on the Druid Estate, Ashburton. Drawings, conditions, and bills of quantities may be seen, and forms of tender, together with bills of quantities, obtained, on application at the offices of Mr. R. Montague Lake, civil engineer, 15, Priests-square, Plymouth, on which later date tenders may be seen, and forms of drawings and specifications may also be seen on application to Mr. W. H. Langler, Secretary of the company, Maybrough, Ashburton. Sealed tenders, endorsed "Tender for Villas," must be delivered to the Secretary not later than June 30.
- JUNE 30.—BELFAST.—SCHOOLS.—**The Jaffe Memorial Schools, Cliftonville, Belfast. Plans and specifications may be seen at the office of Messrs. Young & Mackenzie, architects, Scottish Provident Buildings, Belfast, and schedule of quantities obtained from Mr. A. Ferguson, building surveyor. Sealed tenders, addressed to Sir O. J. Magee, Bart., must be lodged with architects on or before June 30.
- JUNE 30.—BRIGG.—HOUSES.—**Three dwelling-houses in Gemmar School-road, Brigg. Plans and specifications may be seen at the office of Mr. W. H. Buttrick, architect, Home-street, Scunthorpe, to whom tenders are to be sent not later than 12 o'clock noon on June 30, sealed and endorsed "Tender for Dwelling-houses."
- JUNE 30.—Derby.—SHED.—**Derby Board of Guardians invite tenders from Derby tradesmen for erecting shed for carts at the workhouse. Plans and specifications can be seen at the office of Mr. W. H. Buttrick, architect and surveyor, 4, Albert-street, Derby. Sealed tenders, endorsed "Cart Shed," to be delivered to Messrs. E. G. Jackson, Clerks, and Guardians, Poor Law Offices, Derby, on or before June 30.
- JUNE 30.—HALIFAX.—SHOP.—**Alterations and extensions to shop in Broad-street, Halifax. Plans may be seen, and bills of quantities obtained, at offices of Messrs. Jackson & Fox, architects, 7, Rawson-street, Halifax. Tenders must be delivered not later than 12 noon on June 30.
- * JUNE 30.—HAYWARD'S HEATH.—**New School.—The East Sussex Local Education Authority invite tenders for new public elementary Council school at Hayward's Heath, and request that names and addresses be sent to the County Surveyor of East Sussex (Mr. P. J. Wood), County Hall, Lewes, on or before June 30, from whom full particulars can be obtained.
- JUNE 30.—Llantfagan.—COTTAGE.—**A cottage at Bryn Eglwys, Llantfagan, for Mr. J. F. Ball. Plans and specification to be seen at Bryn Eglwys. Tenders, sealed and endorsed "Tender for Cottage," to be sent to Mr. E. F. White, architect and surveyor, 27, Bangor-street, Carnarvon, by June 30.
- JUNE 30.—Micheledever.—PARISH ROOM.—**A parish room at Micheledever to accommodate 200 persons. Plans and specifications may be seen at the offices of the surveyors, Messrs. Hall, Paine & Goldsmith, 48, West-street, Fareham, and quantities and forms of tender obtained. Tenders should be delivered to the surveyors not later than June 30.
- JUNE 30.—RHOSYMEDE.—CHAPEL, WORK.—**For alterations and improvements to the Congregational Chapel, Rhosymede, Ruabon. Plans and specifications can be seen by appointment with Mr. Arthur Davies, 61, Chapel-street, Rhosymede, to whom tenders are to be delivered (sealed and endorsed) not later than June 30.
- JUNE 30.—BISHOP AUCKLAND.—HOUSE.—**Manager's house near Greenwood Gate, for Messrs. The North Bitchburn Coal Company, Ltd. Plans and specifications may be inspected, and particulars obtained, on application at the offices of the architect, Mr. R. Thompson, 7, Market-place, Bishop Auckland, up to June 30, to whom sealed tenders, properly endorsed, are to be delivered on July 2.
- JUNE 2.—BESSEMER.—HOTELS.—**Rebuilding of the Blue Bell Hotel, Monton Green, Eccles. Copies of quantities may be obtained from the architect, Mr. N. Hartley Hacking, 50, Blackfriars, Manchester, on payment of 2s. Plans may be seen at the architect's office from 9 a.m. to 5 p.m. Sealed tenders to be delivered to the architect not later than July 2.

July 2.—**Handsworth.**—**CURROR.**—Handsworth L.D.C. invite tenders for alterations and additions to be carried out at Wilton Sewage Pumping Station. Particulars and form of tender may be obtained on application to the Surveyor, Mr. H. Richardson, 6, Mansel Street, S.E. Tenders to be sealed and delivered on or before July 2.

July 2.—**Leinfair.**—**CARETION, ETC.**—Repairs, etc.—Montgomeryshire Education Committee invite tenders for repairs and improvements required at the following Council schools:—Leinfair Caretion, Carno, Haddington, Talos, (Llanwrtwl) Plans and specifications may be seen on application to the Clerk, at the Education Offices, Newllyn, and any further information may be obtained if desired on written application being made to the County Surveyor, Welshpool. Tenders are to be sealed and marked "Tender," and are to be forwarded so as to be received by the Clerk of the Education Committee, County Education Offices, Newtown, by July 2.

July 2.—**Lochgelly.**—**HOUSES INTO COTTAGES.**—Brick and digger, joiner, plumber, slater, plaster, glazier, iron, grates, and painter works of 100 houses, also for nine cottages, to be erected in Lochgelly, Perthshire, by the City Company, Ltd. Schedules of quantities may be had, and plans may be seen, at the office of Mr. William Birrell, architect and surveyor, 290, High Street, Kirkcaldy, on or before July 2, sealed and endorsed "Tender," and to be delivered on or before July 2, sealed and endorsed "Tender," etc.

July 2.—**Plymouth.**—**INFIRMARY.**—The Plymouth Guardians invite tenders for the erection of infirmary buildings at the Plymouth Workhouse. Names and addresses of tenders may be seen, at the office of Mr. T. R. Rooke, 11, The Crescent, Plymouth, on or before July 2.

July 2.—**Wraybury.**—**NEW SCHOOL, ETC.**—The Bucks County Education Committee invite tenders for new infants school at Wraybury, and minor alterations to existing school, under the supervision of the Works Department, Education Office, Aylesbury. Plans, specifications, and conditions may be seen at the Works Department, Education Office, Aylesbury. The competition will be limited, and tenders will be received for the quantities supplied. Applications to be sent to Mr. G. Watkins, Education Secretary, Education Office, Aylesbury, before July 2.

July 2.—**Leeds.**—**WORKSHOPS, ETC.**—Leeds Corporation invite tenders for the various trades required in the erection of new workshops, cement warehouse, and other buildings, Dept. 135, Kirkstall-road, Leeds. Drawings may be seen, and instructions to persons tendering, conditions of contract, specification, bills of quantities, form of tender, and form of agreement, obtained on application at the depot, and on depositing 3s. for a full set of quantities, or 1s. for the quantities for each separate trade. Sealed tenders, endorsed "Tender for New Workshops, Cement Warehouse, etc.," may be sent to Mr. Robert E. Fox, Town Clerk, must be delivered at the Town Clerk's Office, Town Hall, Leeds, not later than 11 a.m. on July 10.

July 2.—**Northalerton.**—**ROOFING.**—The erection of about 1,000 sq. yds. of roofing, at the North Yorkshire Farmers' Stock Mart, Northalerton, is to be done by the City of York. Plans, specifications, and conditions may be seen at the office of Mr. Robert E. Fox, Town Clerk, must be delivered at the Town Clerk's Office, Town Hall, Leeds, not later than 11 a.m. on July 10.

July 2.—**West Boldon.**—**SCHOOL.**—Durham C.C. Education Authority invite tenders for alterations to West Boldon infants school. Plans, specifications, and conditions of contract may be seen at the school, and the tender may be sent to Mr. T. R. Rooke, 11, The Crescent, Plymouth, on or before July 2.

July 3.—**Whitton.**—**SCHOOL ALTERATIONS.**—Durham C.C. Education Authority invite tenders for alterations to Whitton Council School. Plans, specifications, and conditions of contract may be seen at the school and at the office of Mr. W. Rushworth, F.R.I.B.A., architect, County Education Offices, Durham. Quantities may be obtained on application to the architect, to whom sealed endorsed tenders must be delivered not later than July 3.

July 4.—**Camelford.**—**RESIDENCE.**—A small residence at Camelford for Mr. W. J. Jeffery. Particulars and to Mr. Otto B. Peter, F.R.I.B.A., architect, Lancaster. Tenders to be sent in by July 4.

July 4.—**Llanddeussant.**—**CHAPEL WORKS.**—Additions and alterations to the "Emy" C.M. Chapel, Llanddeussant, Anglesey. Plans and specifications may be inspected at the Chapel House. Tenders, sealed, endorsed "Tender," to be delivered to Mr. T. R. Rooke, 11, The Crescent, Plymouth, not later than 12 noon on July 4. Mr. Jos. Owen, F.R.I.B.A., architect and surveyor, Menai Bridge and Colwyn, Anglesey.

July 4.—**Neath.**—**BUSINESS PREMISES.**—Business premises in Windsor-road, Neath, Plans, etc., can be seen on application to Mr. Andrew Bracey, house agent, 10, Windsor-road, Neath. Quantities may be obtained on deposit of 2s. Tenders to be sent in under seal to above address, endorsed "Tender for Business Premises, Windsor-road, Neath," on or before July 4.

July 5.—**Gosport.**—**SCHOOL.**—Gosport and Alverstoke Education Committee invite tenders for the erection of a new school in Clarence-square, Gosport, to accommodate 330 boys. Plans and specifications may be seen at the offices of the architect, Mr. H. Post, Surveyor to the District Council, Gosport, and quantities and conditions of contract may be obtained on deposit of 5s. Sealed tenders endorsed "Clarence-square School," should be delivered to Mr. George R. Walker, Secretary, Education Office, High Street, Gosport, not later than noon on July 5.

July 5.—**London.**—**COAL OFFICES.**—The Midland Railway Company invite tenders for the erection of seven coal offices at Finchley-road. Plans and specifications may be seen, quantities and particulars obtained, on application at Engineer's Office, Derby Works, on or before July 10. Tenders to be sent by post to the Secretary of the Way and Works Com-

mittee, Midland Railway, Derby, before 9 a.m. July 5.

July 5.—**St. Keverne.**—**RESIDENCE.**—The erection of residence at St. Keverne for Dr. E. Leverton-Smyth, according to plans and specifications which may be seen by appointment at the proprietor's residence or at the office of Mr. Sampson Hill, architect, Green-lane, Redruth, from whom all particulars relating to the work may be obtained. Sealed endorsed tenders are to be sent to the proprietor, St. Keverne R.S.O., on or before July 5.

July 6.—**Monkstown.**—**DUBLIN.**—**VESTRY, ETC.**—The Dean's Grange Joint Burial Board, Monkstown, County Dublin, invite tenders for erection of vestry and heating arrangements to mortuary chapel in Dean's Grange Cemetery. Plans and specifications may be seen at the cemetery (Registrar's Office) during office hours, 8.30 till 4 o'clock. Tenders to be delivered at Dean's Grange Cemetery on or before July 6 next. Mr. W. Burnell, Clerk to the Burial Board.

July 7.—**Burton.**—**ALTERATIONS TO SCHOOL.**—The Staffs. Education Committee invite tenders for alterations and improvements to Sireton County School, near Burton, and request that builders should apply to Mr. Graham Balfour, Director of Education, Staffs. County Office, Burton, for particulars to be supplied on payment of 1s. The drawings and specifications can be seen at the offices of the Education Committee at Stafford.

July 9.—**London.**—**INFIRMARY EXTENSIONS.**—The Guardians invite tenders for alterations and additions at the Union Infirmary, Bowbridge-road, Newark. Persons desirous of tendering are requested to forward their names and addresses and a cheque for 2l. 2s. as a deposit to Mr. A. J. Franks, Clerk to the Board, Union Offices, Newark, on receipt of which tenders and specifications may be inspected during ordinary business hours here, or at the office of the architect, Mr. Arthur Marshall, R.I.B.A., 10, Abchurch-lane, London, E.C. Sealed tenders, endorsed "Alterations at Infirmary," must be sent in to Clerk not later than July 9.

July 9.—**London.**—**WORKSHOPS.**—Cottages at Newllyn, Westbury, Wilts, for Messrs. A. Laverton & Co. Drawings, specifications, and conditions at office of Mr. W. H. Stanley, A.M.I.C.E., architect, Trembling-street, W.C. Bills of quantities may be obtained on deposit of the sum of 1s. Sealed tenders, endorsed "Tender for Cottages, Westbury," to be delivered not later than July 9, at noon.

July 10.—**London.**—**SCHOOLS.**—Tenders are invited for the erection of two elementary schools on the Law-lane site, South Lambeth-road, S.W., and on the Francis-road site, Tooting Greenway, S.W. Bills of quantities and forms of tender may be inspected at the Education Offices (Architect's Department), Victoria-buildings, W.C. on deposit of 1s. in each case. Each tender to be enclosed in envelope provided, and delivered at Education Offices, Victoria-buildings, W.C. (Room 119), not later than 11 a.m. on July 10.

July 12.—**Dewsbury.**—**NEW POST OFFICE.**—The Commissioners of H.M. Works and Public Buildings invite tenders for the erection of a new Post Office, Dewsbury. Drawings, specification, and copy of the conditions and form of contract may be seen on application to the postmaster, at nos. 10 and 5, Victoria-buildings, W.C. Bills of quantities and forms of tender may be obtained at H.M. Office of Works, Storey's-gate, S.W., or payment of 1l. 1s. Tenders must be delivered to the Secretary, H.M. Office of Works, etc. Storey's-gate, S.W.; and endorsed "Tender for Dewsbury Post-office."

July 12.—**Llanerchymedd.**—**SCHOOLS.**—Additions and alterations to the Llanerchymedd Council School, together with new infants school, out-offices, inspected by tenders for new head post-office at Llanerchymedd, and at the office of Mr. Jos. Owen, F.R.I.B.A., County Architect, at Menai Bridge. Tenders, endorsed "Llanerchymedd School," may be sent to the Architect, to be delivered to Mr. H. Williams, Secretary of Education, Education Offices, Llanfair, by not later than 10 a.m. on July 12.

July 14.—**Bournemouth.**—**SCHOOLS.**—The Bournemouth Education Committee invite tenders for the erection of new elementary schools in the Alton-road. Full particulars and form of tender can be obtained, and plans may be seen, at the office of the Borough Engineer, provided that the sum of 2l. 2s. has been previously deposited. Tenders to be sent in envelopes provided for the purpose, to the Secretary to the Education Committee (Mr. F. W. D'Alton), on or before 12 noon of July 14.

July 17.—**Edmonton.**—**ALTERATION, ETC.**—To School.—Tenders are invited for alteration and addition to Bretton-road School and annual cleaning and repairs to Bretton-road and Gray-road schools. Those wishing to tender should send names to Mr. Henry W. Dobb, Town Hall, Lower Edmonton, on or before July 2, when specifications, plans, and bills of quantities will be sent. Tenders to be delivered to the Secretary, Education Offices, Bretton-road, Upper Edmonton, N., on or before Monday, July 17.

No DUTY.—**BATHGATE.**—**CHURCH.**—Estimates wanted for the mason, joiner, slater, plumber, plaster, marble, heating, for the proposed new Catholic church and addition to schools, Bathgate. Contractors wishing to tender, apply for schedules of quantities to Chas. G. Menart, architect, 28, South Molton-street, Perth.

No DUTY.—**Gateshead.**—**ALMSHOUSES.**—The Trustees of Thomas Powell's Almshouse (Charity) invite tenders for the building of proposed almshouses at High Shippeoth, Gateshead. Full particulars may be obtained from A. L. Armour, 16, West-street, Gateshead-on-Tyne.

No DUTY.—**Gendross.**—**CHAPEL.**—For "Saron" new Wesleyan Chapel, Gendross, near Swansea. Plans and specifications, and particulars from Mr. Charles S. Thomas, architect and surveyor, Wind-street, Swansea.

No DUTY.—**Ilkley.**—**HOUSE.**—Detached house, Heber's Cliff, Drive, Ilkley. Names to Mr. Joseph

J. Wood, A.R.I.B.A., architect, 10, Park-row, Leeds, who will forward quantities and other particulars.

No DUTY.—**Magherahamlet.**—**BEINFEST.**—Residence.—A teacher's residence at Magherahamlet, Ballymahon. Plans and specifications may be seen, and full particulars given, by Rev. Wm. Carse, Magherahamlet.

No DUTY.—**Redhill.**—**BOURNEMOUTH.**—**REPAIRS.**—For rebuilding "The Horse and Jockey." Redhill in the Borough of Bournemouth, for Messrs. Eldridge, Pope, & Co., Ltd. All particulars may be obtained at the office of the architects, Messrs. H. E. Hawker, Mitchell, St. Peter's-chambers, Bournemouth.

ENGINEERING, IRON, AND STEEL.

JUNE 26.—**London.**—**BOILERS.**—The Board of Directors of the Southern Railway Company, Ltd., invite tenders for six locomotive boilers, as per specification and drawing which may be seen at the offices of the Company. The charge for each specification is 1l. 1s., which will not be returned. Tenders must be sent in, addressed to the Secretary, Mr. Edw. J. Thornton, 46, Queen Anne's-gate, S.W., marked "Tender for Boilers," and not later than 12 o'clock noon on June 26.

JUNE 27.—**Nottingham.**—**HEATING.**—Nottingham Education Committee invite tenders for alterations to the heating apparatus at each of the following Council schools, viz.:—Radford Boulevard (boys' and girls' departments), Forster-street (girls' department). Plans may be seen at the offices of the City Architect, Mr. Frank B. Lewis, Guildhall, on payment of a deposit of 1l. 1s. for each school. Sealed tenders to be delivered to Mr. W. J. Abel, Clerk, Education Offices, Victoria-street, at or before 10 a.m. on June 25.

JUNE 27.—**Portsmouth.**—**PLANT, ETC.**—Portsmouth Town Council invite tenders for the supply, delivery, and erection of water-softening plant, water storage tank, steam, exhaust, piping, and sundry ironwork. Specification and drawings may be obtained at the Town Hall, Portsmouth, on payment of a fee of 2l. 2s. A copy of the specification may also be inspected, but not obtained, at the offices of the Consulting Engineers, Messrs. Kincaid, Waller, Manville, & Dawson, 29, Great George-street, Westminster, S.W. Tenders must be for the whole of the above work, and no tender for a particular item will be considered. Sealed tenders, endorsed "Tender for Contract No. 21," must be forwarded to Mr. Alexander H. Hold, Town Clerk, Town Hall, Portsmouth, on or before noon on June 27.

JUNE 27.—**Stockbridge.**—**BOILER, ETC.**—Steam boiler food pump, condensors, heating pipes, radiators, etc. at the new police and fire station, Stockbridge. Specifications, etc., obtained on personal application only, from Mr. R. Morham, City Architect, Public Works Office, City Chambers, Edinburgh. The estimates must be sent by 10 a.m. on June 27, sealed, and marked "Tender for Heating Apparatus, etc., Police and Fire Station, Saunders-

JUNE 27.—**Stoke.**—**MACHINERY.**—Stoke-upon-Trent Guardians invite tenders for supplying and fixing certain machinery and utensils at the bakery at the workhouse in accordance with specification, which may be seen at the office of Mr. A. P. Miller, architect, Frederick-street, Hinley. Tenders, marked "Machinery for Bakery," to be sent to Mr. C. D. G. the Guardians, Union Offices, Stoke-upon-Trent, by 9 a.m. on June 27.

JUNE 28.—**Birmingham.**—**BRIDGE.**—Birmingham Tradesmen's Committee invite tenders for work in connection with the reconstruction and widening of Fazeley-street Canal Bridge. The drawings and specifications may be inspected, and quantities and forms of tender obtained, on deposit of 10s. at the office of Mr. T. Arnall, Assoc. M.Inst.C.E., Acting City Engineer, Council House, Birmingham. Tenders, endorsed "Fazeley-street Bridge," to be sent in by June 28.

JUNE 30.—**Newton.**—**RETORT BENCHES.**—Newton-in-Makerfield U.D.C. invite tenders for the erection of two retort benches of retorts with generative furnaces. Drawings may be seen, and specifications obtained, on application to the gas engineer, Mr. Arthur Bowes, A.M.Inst.C.E., Tenders, endorsed "Tender for Retort Benches," addressed to the Chairman of the Gas Committee, must be delivered at office of Mr. C. Cole, Clerk to the Council, Town Hall, Earlestown, Lancashire, not later than June 30.

JUNE 30.—**Sheffield.**—**IRON FENCING, ETC.**—The Improvement Committee of the Corporation invite tenders for wrought-iron fencing and gates at the parish churchyard. Specification and quantities may be obtained at the office of Mr. Charles F. Wike, C.E., City Surveyor, Town Hall, Sheffield, on payment of 10s. Tenders, endorsed "Parish Churchyard Fencing," are to be sent in not later than 9 a.m. on June 30, addressed to "The Chairman and Members of the Improvement Committee, City Surveyor's Office, Town Hall, Sheffield."

JUNE 2.—**Selly Oak.**—**MACHINERY.**—King's Norton and Northfield U.D.C. invite tenders for the supply and fixing of the laundry and general machinery at the Selly Oak Baths, in accordance with the drawings and specifications prepared by the Consulting Engineer, Mr. W. M. Inst. C.E. Drawings, specifications, and other particulars may be seen on application at the Surveyor's office, 23, Valentin-road, King's Heath, and Form of tender obtained on deposit of 10s. "Machinery for Selly Oak Baths," are to be delivered at the office of Mr. Edwin Docker, Clerk to the Council, 10, Newhall-street, Birmingham, not later than 12 o'clock noon on July 2.

JULY 9.—**Doddington.**—**WATER TANK.**—North Wiltford Guardians invite tenders for the erection of a new water tank at their workhouse, Doddington, near March, Cambridgeshire. Plans and specification may be seen at the Board-room, Union Workhouse, Doddington, between the hours of 10 a.m. and 4 p.m. Sealed tenders, endorsed "Machinery for Selly Oak Baths," are to be delivered to Mr. George Sharnam, Clerk, Poor Law Offices, Broad-street, March, free of expense, not later than 4 o'clock p.m., July 9.

JULY 12.—**Walsley.**—**RASTROONS.**—Walsley U.D.C. invite tenders for the supply and delivery

of alternating-current transformers required during the next two years. Copies of the specification may be obtained on application to the Engineer, Mr. J. A. Crowther, at his office, Sesswell-road, Leicester. A charge of 1s. will be made for each copy of the specification. Sealed tenders on the form provided for the purpose addressed to Mr. H. W. Cook, Clerk of the Education Office, Letchworth, Herts., and endorsed "Tender for Transformers," to be delivered on or before July 15.

AUGUST 7.—Lancaster.—STEAM HEATING.—County Lunatic Asylum, Lancaster. Visiting Committee invite tenders for reconstructing and improving the steam heating arrangements and hot-water service of the asylum. Further information may be obtained on application to the Medical Superintendent. Tenders will be received up to the morning of August 7. Mr. J. T. Cheetham, Clerk and Steward.

MISCELLANEOUS.

JUNE 25.—Broadstairs.—Motor-wagons.—Broadstairs and St. Peter's U.D.C. invite tenders for the hire of a steam motor-wagon for street-watering purposes within their district during the months of July and August next. Further particulars and form of tender may be obtained on application to Mr. Howard Hurd, Town Surveyor, Council Offices, Broadstairs. Sealed tenders, endorsed "Hire of Steam Motor-wagon," must be delivered by 12 o'clock noon on June 25, addressed to Mr. L. A. Skinner, Clerk to the Council, Council Offices, Broadstairs.

JUNE 25.—Edinburgh.—ELECTRICITY CABLES.—Edinburgh Corporation invite tenders for the supply of lead-covered paper-insulated copper cables for electricity supply conductors for the year ending May 15, 1907. The specification and form of tender can be obtained from Mr. Frank A. Newington, engineer, Electricity Supply Station, Dewar-place, Edinburgh, on payment of a deposit of 2s. 2d. Tenders must be sent to the Town Clerk, City Chambers, Edinburgh, on or before June 25, and must be endorsed "Tenders for the Supply of Electricity Cables."

JUNE 25.—Knutsford.—FITTING-UP SNOW-GROUND.—Mid-Cheshire Farmers' Association invite tenders for the following:—(1) For fitting-up the show ground; (2) for the supply of necessary tents and canvas walling; (3) for a supply of poultry and pigeon pens and dog bitches. Tenders should reach Mr. W. Page, Secretary, Lower Pever, Knutsford, not later than June 25, at 12 o'clock noon.

JUNE 25.—Salterhebble.—WOODWORK.—The wood-work at the Rose Show, Salterhebble, July 26. Particulars on application. Sealed Tenders, endorsed "Woodwork," to be in hands of Mr. W. Wilson, Secretary, 3, Exeter-street, Salterhebble, Halifax, by Monday morning's post, June 25.

JUNE 26.—Alford.—LIGHTING.—The Alford U.D.C. invite tenders for lighting the town of Alford with gas or other light from August 24, 1906, to May 14, 1907. Tenders to be sent to Mr. J. E. H. Sergeant, Clerk, by Crier, Alford, not later than June 26.

JUNE 26.—Portsmouth.—SEAWATER.—Portsmouth, Sea U.D.C. invite tenders for the removal of house refuse from July 1, 1906, to June 30, 1907, such removals to be weekly during the months of July, August, and September, and fortnightly during the remainder of the time. Forms of tender and further particulars can be obtained from the Surveyor, 46, St. Andrew's-road, Portsmouth-by-Sea. Tenders, endorsed "Tenders for the Removal of House Refuse," to be addressed to, and reach, Mr. T. Austen, Clerk, Council Office, Portsmouth-by-Sea, on or before 12 o'clock noon, June 26.

JUNE 26.—Winchester.—DOORS.—Winchester Corporation invite tenders for swing doors to main entrance at Guildhall. Specification and particulars can be seen at the City Surveyor's office. Tenders, sealed, and endorsed "Swing Doors," are to be delivered to Mr. Thomas Holl, Town Clerk, by June 26.

JUNE 27.—Glasgow.—WRIGHT-WORK FITTINGS.—Glasgow Corporation invite tenders for the wright-work fittings for Pollockshields District Library. Specification and forms of tender can be obtained at the office of the City Engineer, City Chambers, and sealed tenders, marked "Pollockshields Library—Tender for Wright-work Fittings," must be lodged with Mr. A. W. Myles, Town Clerk, City Chambers, Glasgow, not later than 10 a.m. on June 27.

JUNE 29.—Nottingham.—STEEL-WIRE ROPE.—The Public Parks Committee of the Nottingham Corporation invite tenders for supplying and fixing about 650 lbs. of galvanized steel-wire rope, together with all necessary oak straining and intermediate posts, at the recreation ground, Victoria Embankment. The plan may be seen, and copies of the specification and form of tender obtained, from Mr. Frank B. Lewis, City Architect, Guildhall, on payment of a deposit of 1s. Sealed tenders to be sent in not later than 10 a.m. on June 29, addressed to The Town Clerk, Guildhall, Nottingham, and endorsed "Tender for Steel-wire Rope, Recreation Ground, Victoria Embankment."

JUNE 30.—Turro.—STEAM ROLLING.—The R.D.C. of Turro invite tenders for steam rolling in their district. The district is divided into two divisions, and there are about 225 days' rolling required in one division, and about 144 in the other. Two rollers of 10 or 12 tons must be kept constantly at work in each division from November 1, 1906, until the work is completed. For further information apply as to the North Division to Mr. John Retzlack, Surveyor, Ventonizips, Calistock, S.O.; and as to the South Division to Mr. James P. Carbis, Surveyor, Ruan High-lanes, Gramound-road. Tenders are to be sent to Mr. G. C. Hancock, Clerk, St. Agnes, Cornwall, on or before June 30.

JULY 2.—Droxford.—STEAM ROLLERS.—Droxford R.D.C. invite tenders for the hire of three steam rollers, two fitted with scarifiers, to be used on a portion of the main and district roads in the Droxford District, for a certain period between October 1, 1906, and March 1, 1907, under conditions of contract to be obtained upon application of office to Mr. Francis Clark, Clerk to the Council, Bishop's Waltham. Sealed tenders, endorsed "Tenders for Steam Rolling," to be sent not later than July 2.

JULY 3.—Swalwell.—Paved-roads.—Durham C.C. Education Authority invite tenders for improvements

to playgrounds at Swalwell Council school. Plans, specifications, and conditions of contract may be seen, and forms of tender obtained, at the school and at the ground, Swalwell. Sealed tenders must be delivered to Mr. J. Rusworth, F.R.I.B.A., Architect, County Education Offices, Durham, not later than July 3.

JULY 3.—Cranbrook.—STEAM ROLLING.—Cranbrook R.D.C. invite tenders for steam rolling and scarifying during the ensuing season. Forms of tender must be obtained of Mr. T. H. Crampton, Clerk, Cranbrook, and tenders must be sent in before July 4.

JULY 10.—Birkenhead.—HAVERS.—The Corporation of Birkenhead invite tenders for the supply of Manila havers as required at their ferries during a period of twelve months from August 1, 1906. Particulars and forms of tender may be obtained at the Manager's office, Woodside Ferry. Tenders, sealed, and endorsed "Tender for Manila Rope," to be sent in to Mr. Alfred Gill, Town Clerk, Town Hall, Birkenhead, not later than 5 o'clock p.m. on July 10.

JULY 10.—Dorset.—STEAM ROLLING.—For steam rolling the rural main roads of the county of Dorset. Specification and form of tender, and further particulars, may be obtained from Mr. Walter J. Fletcher, County Surveyor's office, Wimborne.

NO DATE.—Warrington.—FITTINGS.—The supply and fixing of the following fittings, in the Beaman Council school, Warrington:—Sinks, lavatories, water-closets, sinks, locks, cloakhooks, iron screens, and grates. Specifications, further particulars, and forms of tender can be obtained on or after June 25 from the architect, Mr. P. Silcock, F.R.I.B.A., Egypt-street, Warrington.

PAINTING, etc.

JUNE 25.—Dykebar, Paisley.—PLUMBER WORK.—The Dykebar Sanitary Board invite tenders for the execution of the plumber work of the New District Asylum, at present being erected at Dykebar, near Paisley. Plans may be seen in the office of Mr. T. Graham Abernethy, Board Engineer, County-place, Paisley; and copies of the specifications and schedules may be obtained from Mr. J. Caldwell, City Clerk, County-buildings, Paisley, on payment of 2s. for each schedule. Sealed tenders, marked "Renfrew District Lunacy Board—Tender for Plumber Work," must be lodged with the Clerk not later than June 25, at 12 o'clock noon.

JUNE 26.—New Shoreham.—PAINTING, ETC.—New Shoreham U.D.C. invite tenders for repairs to lych gate at cemetery, painting lamps, etc., and exterior of town hall, further particulars of which can be obtained of Mr. W. N. Taylor, Town Clerk, Town Hall, Shoreham. Tenders to be delivered to Mr. Harold Brown, Clerk to the Council, Church-street, not later than noon on June 26, endorsed "Tender for Lych Gate, New Shoreham."

JUNE 26.—Plymouth.—PAINTER'S WORK, ETC.—Plymouth Guardians invite tenders for painter's, carpenter's, and mason's work required to be done at certain of their scattered hotted. A specification of the work required may be seen at office of Mr. W. Adams, Clerk to the Guardians, 15, Princess-square, Plymouth, on application between the hours of 10 a.m. and 4 p.m. Tenders, setting out separately the cost of the work to be done at each of the homes mentioned in the specifications, must be sent not later than 12 noon on June 26, endorsed "Tender for Painting, Carpentering, and Masoning."

JUNE 27.—Rochdale.—PAINTING.—Rochdale Corporation invite tenders for the painting and decorating of certain rooms and corridors at the easterly end of the Town Hall. Further information can be obtained at the office of Mr. S. S. Platt, Borough Surveyor, Town Hall. Tenders, endorsed "Tender for Painting Town Hall," to be sent to the office of Mr. W. H. Hickson, Town Clerk, Town Hall, Rochdale, not later than 9 a.m. on June 27.

JUNE 27.—Tongwynlais.—PAINTING, ETC.—Painting, decorating, etc., at the Baptist Church, Tongwynlais. Specification may be seen, and form of tender had, on application to Mr. B. Israel, Secretary, Tongwynlais. Tenders to be received not later than June 27.

JUNE 27.—Torpoint.—PAINTING.—The Guardians of the St. Germans Union invite tenders for painting, etc., the front hall, committee-room, board-room, clerk's office, and lavatory at the workhouse, Torpoint. The tenders to include alternative prices for (a) paper, and (b) dressico for the walls of the board-room. Specification of the work required to be done may be seen at the workhouse. Sealed and marked tenders to be sent to "The Chairman of the Board, Workhouse, Torpoint, R.S.O.," by June 27.

JUNE 28.—Chesterfield.—CLEANING AND COLOURING.—Chesterfield Education Committee invite tenders for cleaning and colouring Hlooper-street and St. Helen's-street Council schools, the work to be done during the month of August next. Particulars, and forms of tender may be had from Mr. C. J. Kerlake, Secretary, Education Offices, Poljambro-road, Chesterfield, to whom tenders should be delivered not later than June 28.

JUNE 28.—Cork.—PAINTING.—Cork Guardians will, on June 28, up to the hour of 11 o'clock a.m., receive in the tender-box, Board-room, Workhouse, tenders for painting of Works, under the direction of the resident, according to specification, which may be inspected in the Board-room. Mr. John Cotter, Clerk of Union.

JUNE 28.—Edinburgh.—PAINTING.—Painter work at George Heriot's School, Heriot-Watt College, and Trust Offices. Specifications and schedules of measurement may be obtained from Mr. John Anderson, Superintendent of Works, Market Dispensary, 10, York-place, Edinburgh, on or before June 28, at 10 o'clock a.m.

JUNE 29.—Manchester.—PAINTING, ETC.—Prestwich Guardians invite tenders for painting, paper-hanging, etc., at their offices, Cheetham Hill-road, Manchester, where copies of the specification can be obtained. Tenders, endorsed "Tender for Painting," to be addressed to Mr. Edward W. Ozden, Clerk to the Guardians, Union Offices, Cheetham

Hill-road, Manchester, and delivered not later than 10 a.m. on June 29.

JUNE 29.—Dewsbury.—PAINTING.—Dewsbury and Healdwood Sanitary Boards invite tenders for the painting of two steel bridges over the River Calder and the Calder Canal. Specification and form of tender may be obtained, and the general conditions of contract applied for at the Engineer's office, Town Hall, Dewsbury. Tenders to be in hands of Mr. H. Ellis, Clerk to the Board, Town Hall, Dewsbury, on or before June 29.

JUNE 29.—Dykebar, Paisley.—PLASTER WORK.—The Renfrew District Lunacy Board invite tenders for the execution of the plaster work and tile work of the new district asylum at present being erected at Dykebar, near Paisley. Plans may be seen in the office of Mr. T. Graham Abernethy, architect, County-place, Paisley, and copies of the specifications and schedules may be obtained from Mr. J. Caldwell, jun., Clerk, County Buildings, Paisley, on payment of 2s. for each schedule. Sealed tenders, marked "Renfrew District Lunacy Board—Tender for Plaster Work (or 'The Work')," must be lodged with the Clerk not later than June 29, at noon.

JUNE 30.—Manchester.—CLEANING AND PAINTING.—Manchester Education Committee invite tenders for the cleaning and painting of the Municipal and Secondary school, Whitworth-street. Specifications may be obtained at the School of Technology, Sackville-street, on a deposit of 1s. Tenders, on the form provided, addressed to the Education Committee, must be delivered at the School of Technology, Sackville-street, Manchester, not later than 12 o'clock noon on June 30.

JUNE 30.—Warrington.—PAINTING, ETC.—The Secretary of State for War invites separate tenders for painting, colouring, lime-whiting, etc., at the military barracks at Manchester, Salford, and Rufford. Names of the tenders to be sent to Royal Engineer Office, 14, Elliott-street, Liverpool, before June 30, together with 10s. for either of the bills of quantities, which, with form of tender, to be sent to each candidate.

JULY 2.—Ecclesfield.—PAINTING.—The Ecclesfield District of the Education Department of the C.C. of the West Riding of Yorkshire invite tenders for painting and decorating the new building at the Ilk Green Provisional school. Application to be made to the Divisional Clerk for specification. Tenders should reach the divisional Clerk, Mr. W. C. Hildes, Education Offices, Ecclesfield, not later than July 2.

JULY 6.—Warrington.—PAINTING, ETC.—Warrington Building and Sites Committee of the Education Committee invite tenders for the painting and cleaning of certain schools. Specifications, forms of tender, and all further information may be obtained at the office of the Borough Surveyor, Town Hall, at which place tenders must be delivered before 12 o'clock on July 6.

JULY 9.—Whitley.—PAINTING.—The Vicar and Wardens of Whitley Lower invite tenders for the painting and decorating of the White Horse Parish Church. Further particulars of the work required to be done may be obtained from the Vicar. Tenders to be delivered, free of charge, on or before July 9, at 10 o'clock a.m., to the Vicar, Whitley Church.

JULY 11.—Chelsea, S.W.—PAINTING, DISTEMPERING, ETC.—Tenders are invited for painting, distempering, general repairs, etc., to the infirmary in Fulham-road, S.W., and children's home, in Mansfield-street, Chelsea, S.W., for the Guardians of St. George's Union, in accordance with specifications, etc., to be obtained from Mr. W. Ernest Huxford, 5, Tavistock-square, W.C., between 10 a.m. and 5 p.m. Tenders, endorsed "Tenders for Painting, etc., at St. George's Infirmary and Children's Home," and delivered to the Clerk, St. George's Infirmary, Fulham-road, Mount-street, W., not later than 11 o'clock on July 11.

JULY 11.—London.—PAINTING, ETC.—St. George's Guardians invite tenders for painting, distempering, general repairs, etc., to the infirmary in the Fulham-road, S.W., and at their children's home in Milman-street, Chelsea, S.W. Specifications and all particulars may be obtained from Mr. W. Ernest Huxford, F.R.I.B.A., 5, Tavistock-square, W.C., between the hours of 10 a.m. and 5 p.m. Tenders must be signed, sealed, and endorsed "Tender for Painting, etc., at St. George's Infirmary and Children's Home," and forwarded to Mr. Thomas Wortock, Clerk to the Guardians, St. George's (Hanover-square) Hall, Mount-street, W., not later than 11 o'clock on July 11.

JULY 11.—Preston.—PAINTING.—Preston Corporation invite tenders for painting, etc., public conveniences in various parts of the borough. Specification, form of tender, and all other information may be obtained at the office of the Borough Surveyor, Town Hall, Preston, to whom sealed tenders, endorsed "Tenders for Painting, etc., Conveniences," must be delivered not later than 12 o'clock on noon on July 11.

JULY 13.—Preston.—PAINTING.—Preston Corporation invite tenders for painting, etc., required throughout the Cattle Market, Brook-street. Specification, form of tender, and all other information may be obtained at the office of the Borough Surveyor, Town Hall, Preston, to whom sealed tenders, endorsed "Tender for Painting, etc., Cattle Market," must be delivered not later than 12 o'clock on noon on July 13.

JULY 16.—Ipswich.—PAINTING.—Ipswich Education Committee invite tenders for the painting and distempering of the school in all or any of the following Council schools during the August holidays:—Outside painting: London-road girls and infants, St. Mary Elms boys, Cavendish-street boys, Nacton mixed, Westside, colouring and whitewashing, Westside (including teacher's house), Whitton (including teacher's house), Trinity-street girls and infants, Springfield boys, girls, and infants, etc. Further particulars, and a copy of the specification and any further particulars may be obtained on application to Mr. E. T. Johns, Tower-chambers, Tower-street, Ipswich. The price for painting school must be given in pounds and plainly endorsed "Tender for Ipswich Work," must be delivered to Mr. J. Hepburn Home, Secretary, Education Committee's Offices, Tower House, Tower-

to the Chairman, Improvements Committee, City Hall, Dublin, and endorsed "Tender for Lane," must be received by Mr. P. Tobin, Secretary, City Hall, not later than 12 o'clock noon on June 27.

JUNE 27.—Runcorn.—ROAD METAL.—The U.D.C. of Runcorn invite tenders for the supply of about 500 tons of 2-in. and about 500 tons of 1½-in. broken stone for road metal, to be delivered in such quantities as may be required; to be Pennamawr stone or stone similar in nature and equal in quality. Tenders to state the price delivered at the following places in Runcorn, namely:—Stone Croft, Top Locks, and Crane Wharf, Hallon-road, and to be accompanied with samples of the metal to be supplied. Tenders to be sent to Mr. E. Marshall, Secretary, Town Hall, Runcorn, not later than June 27, and to be endorsed "Tender for Road Metal," and addressed to the Chairman of the Highways Committee. Forms of tender may be obtained on application to the Surveyor.

JUNE 28.—Ashford.—ROAD METAL.—Ashford U.D.C. Kent, invite tenders, with samples, for 2,500 cubic yds. (more or less) of 2-in. gauge broken granite, etc., as per form of tender, to be obtained from Mr. William Terrill, Surveyor, at his office, North-street, Ashford, Kent. Sealed tenders, with samples, to reach the Surveyor not later than 5 p.m. on June 28, endorsed "Tender for Granite."

JUNE 28.—Belfast.—STORES.—Belfast Gas Committee invite tenders for a year's supply of the following stores, viz.:—(1) lime, (2) iron castings, (3) brass cocks and castings, (4) hardwood, (5) rope and gaskin, (6) glass, (7) malleable iron and tin plate. Schedule, with forms of tender, may be had on application at the Gasworks. Tenders, endorsed "Tender for Stores," will be received by Sir Samuel Black, Town Clerk, not later than June 28.

JUNE 28.—Greenwich.—STORES.—The Council of the Metropolitan Borough of Greenwich invite tenders for supplying and landing at the Council's depot, Banning-street, East Greenwich, 6,500 ft. super. of 2½-in., and 6,500 ft. super. of 3-in., toolled York stone.

Specifications, particulars, and forms of tender can be obtained at the Borough Engineer and Surveyor's Office, Town Hall, Greenwich-road, S.E., between the hours of 10 a.m. and 4 p.m. (Saturdays between 10 and 12). Tenders, which must be made on the forms supplied at the Town Hall, must be sealed up, and endorsed "Tender for York Stone," and must reach Mr. Francis Robinson, Town Clerk, Town Hall, Greenwich-road, S.E., before 12 o'clock noon on June 28.

JUNE 29.—North Darley.—PIPS.—North Darley U.D.C. invite tenders for the supply of the following during July, August, and September:—50 yds. of 6-in. best glazed pipes; 1,300 yds. of 5-in. best glazed pipes; 300 yds. of 12-in. best glazed pipes; also various bends and junctions. Forms of tender may be obtained from the Surveyor, Mr. E. F. Lowe, Council-room, Darley Dale, Matlock. Tenders, endorsed "Tender for Pipes," are to reach the office of Mr. F. C. Lynn, solicitor, Matlock, Bath, by June 29.

JUNE 30.—Droylsden.—STORES.—Droylsden U.D.C. invite tenders for the supply of the following materials:—Granite setts, griststone setts, chippings, pitch and oil, earthenware pipes and gullies, bricks, Portland cement, and lime. Full particulars and forms of tender may be obtained from Mr. Charles Hall, Surveyor to the Council, 10, Ashton-road, Droylsden. Tenders, endorsed "Tender for —," must be sent to Mr. Wm. Richards, Clerk to the Council, Council Offices, Droylsden, not later than June 30.

JULY 2.—Ealing.—STORES.—Ealing Town Council invites tenders for the supply of (1) household coal; (2) coke; (3) oats, straw, etc.; (4) linps, pipes, etc.; (5) cement; (6) ironmongery; (7) iron castings, etc.; (8) paints, oils, etc.; (9) disinfectants; (10) granite; (11) flint; (12) stationery; (13) timber. Printed forms of tender, conditions of contract, and full particulars, may be obtained on application to the Borough Surveyor, Mr. C. Jones, M.Inst.C.E., at his office, Town Hall, Ealing. W. Tenders, in the

envelopes provided, to be delivered at the office of Mr. C. Jones, Borough Surveyor, Town Clerk, Town Hall, Ealing, W., not later than 12 noon on July 2.

JULY 2.—Wisbech.—GRAVEL AND GRANITE.—Wisbech Town Council invite tenders for the supply of highway materials, including granite, granite chips, granite dust, double-sifted gravel, footpath gravel, coarse sand, 2-in broken stone, clunch, and Portland cement. For particulars and forms of tender apply to the Borough Surveyor, Exchange-square, Wisbech, to whom samples should be sent. Sealed tenders to be delivered to Mr. C. E. F. Copeman, Town Clerk, Wisbech, not later than 10 a.m. on July 2.

JULY 3.—Halifax.—STORES.—Halifax Gasworks Committee invite tenders for the supply of (1) brass lamp fittings; (2) brass main cocks and unions; (3) oxide of iron; (4) sulphuric acid; (5) lime; and for the purchase of (1) gas carbon; (2) spent oxide of iron, during the twelve months ending June 30, 1907. Forms of tender and further information may be obtained on application to Mr. J. Wilkinson, E.C.S., Engineer, Gasworks, Halifax. Tenders, properly endorsed, must be sent to Mr. Keighley Walton, Town Clerk, on or before July 3.

JULY 3.—London.—STORES.—Bombay, Baroda, and Central India Railway Company Directors invite up to noon on July 3, tenders for the supply of the following stores, viz.:—Class A—(1) Axles for carriages and waggon; (2) boiler plates; (3) brass boiler tubes; (4) crank arms; (5) spiral and volute springs; (6) tyres for carriages and waggon; (7) wheels for carriages and waggon. Class B—(1) carriage fittings; (2) copper plates; (3) laminated springs. Class D—(1) Panel plates; (2) trolley wheels and axles. Tenders must be made on forms, copies of which, with specifications, can be obtained at offices of Mr. W. V. Constable, Officiating Secretary, Gloucester House, Bishopsgate-street Without, London, E.C., on payment as follows:—For Class A, 1l. 1s. each; for Class B, 10s. 6d. each; and for Class D, 2s. 6d. each (which will not be returned).

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*TEACHERS	Acton & Chiswick Polytechnic	Not stated	June 26
*CLERK OF WORKS	Hackney Guardians	3l. 7s. per week	June 30
*CLERK OF THE WORKS	St. George's Union	10s. per week	July 2
*DISTRICT BUILDING SURVEYOR	Birmingham Corporation.	3l. per week	July 6

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*CONTRACTOR'S PLANT, Tooting.—Franciscan-road, All Saint's Church, Tooting	J. G. Killingworth & Son	June 25
*MATERIALS AND RESIDENCE: 17, TOOTING—Netherfield House, Tooting, Beckrd	James Fisher	June 26
*FREEHOLD FARM AND BRICKWORKS, NEWPORT—At The King's Head Hotel, Newport	Parsons & Jolliffe	June 27
*DEALS, BATTENS, ETC.—Great Hall, Winchester House, 111 Broad-street, E.C.	Churehill & Sims	do.
*FREEHOLD ESTATE, ELTHORNE, MIDDLESEX—At the Mart	Edwin Fox & Sons	do.
*FREEHOLD BUILDING LAND, CHELMSFORD—At the Mart	White & Sons	June 25
*FREEHOLD BUILDING LAND, WAND-WORTH—At the Mart	R. Huch Henry	July 2
*FREEHOLD BUILDING LAND, CHELMSFORD—At the Mart	B. Palfrey & Co.	July 4
*FREEHOLD BUILDING LAND, KEVIN—At the Mart	J. P. Skelahan	July 5
*FREEHOLD BUILDING SITE, FORDERS END—At the Mart	Edwin J. Gilliers	do.
*FREEHOLD PROPERTY, SITTINGBOURNE—At The Bull Hotel, Sittingbourne	Ja-xson & Sons	July 6
*BUILDING PLOTS, BUSLIP PARK ESTATE—On the Estate	Venton, Ball, & Cooper	July 7
*BUILDING SITE, HAMMER-SMITH	Daniel White	July 11
*BUILDING LAND, MITCHEAM—At the Mart	Denise Watney & Sons	do.
*FREEHOLD PROPERTY, BROMPTON-ROAD, S.W.—At the Mart	Edwin Fox & Bunsfield	do.
*WILLESDEN PADDOCK, DOLLIS HILL, EDGWARE-ROAD—At the Mart	Daniel Watney & Sons	July 12
*FREEHOLD BUILDING LAND, ST. EDWARDS-ON-SE—At the Mart	Daniel Smith, Son, & Oakley	July 13
*FREEHOLD BUILDING SITE, WARDOUR-ST., W.—At the Mart	Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.	July 17
*FREEHOLD BUILDING PLOTS, TOOTING BEC, STREATHAM—On the Estate	Edwin Evans, etc.	July 18
*FREEHOLD SITE, HAGGERSTON—At the Mart	Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.	July 26
*FREEHOLD LAND, KING'S CROSS—At the Mart	Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.	do.
*FREEHOLD BUILDING SITE, CITY OF LONDON—At the Mart	Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.	do.

PATENTS.—Continued from page 709.

spindles projecting through the top of said casing, lugs projecting from the upper sides of the said casing, an operating hinge plate pivoted to said lugs, a seat and cover pivoted to the front edge of the said operating plate, an inlet into one of the said cylinders, valve ports communicating between the said cylinders, means by which the valve ports open and close, one of the said ports being opened and closed by a ball actuated by a coiled spring supported within one of the said cylinders, the other valve port opened and closed by a regulating tapered screw plug, the shanks of said plug projecting through the side of said casing, an outlet from one of the said cylinders, said outlet adapted to communicate with a spray pipe adapted to enter into a vent pipe communicating with the ball of the closet.

12,776 of 1905.—L. HEINTZ: *Locks and Fastenings.*
This invention consists of a locking bar fitted and displaceable within the thick part of the door casing, and furnished with catches capable of engaging on the lowering of the bar with some projections fixed to the door, the said bar being capable of being added without need of a special lock to any existing door, a projection with which it is furnished being placed in the lower part of the bar beneath the bolt of the lock, so that when the bolt is shot the bar cannot be raised, the said bolt being absolutely independent of the bar.

14,007 of 1905.—W. G. WAKEHAM: *Fittings of Swinging Windows and the like.*
The invention relates to a catch for securing the sashes of casements, doors, and the like, which are hung on pivots. The invention comprises the arrangement of two or more dove-tailed catches arranged in convenient position on each stile, a member of such catch being arranged on the swinging sash, and the other member on the sliding sash.

14,079 of 1905.—THE ELECTRIC AND ORDNANCE ACCESSORIES COMPANY: *Air Heaters for Use in Connection with Certain Systems of Ventilation, and for Analogous Purposes.*
The invention comprises an air heater consisting of a fire flue connected with a fireplace, and an external casing, provided at its opposite ends with air intake and delivery openings, and separated from the said flue by an air passage or passages.

14,395 of 1905.—C. A. PARK: *Apparatus for Heating Water.*
The invention consists of apparatus for heating water by means of steam of the type in which the supply of steam to the water tank is controlled by a thermostatic device, actuated by variations in the temperature of the water in the apparatus, wherein the thermostatic device is located in a chamber formed in the cold water inlet pipe, which pipe terminates some distance above the bottom of the water tank, the lower part of said

tank being connected to the lower part of said chamber, so as to provide for circulation of the water there-through, which circulation may be assisted by discharging steam into the upper part of the inlet pipe.

15,962 of 1905.—L. H. TEALE: *Construction of Domestic Fireplaces.*
The invention consists of a fireplace with cooling air spaces beneath and behind the fire, having air inlets and outlets.

16,855 of 1905.—E. MARQUARDT: *Draught Inducers for Chimneys, Ventilators, and the like.*
This invention relates to a chimney ventilator of the like, having a pipe covered by a perforated plate, and consists in constructing such perforated plate in the form of upward sloping parts meeting at an angle at the middle of the pipe, and in providing an additional lid or cover, the inner cells of which are parallel to the corresponding outer cells of the pipe, and to the perforated plate and which extend down below the lower edge of such perforated plate.

18,617 of 1905.—F. W. MARILLIER: *Locks and Fastenings for Sliding Doors.*
This invention relates to locks or fastenings in which a latch bolt moves vertically between guides, and consists in arranging a spring to draw the latch bolt, and a latch nose exterior to the front of the casing being parallel with the spindle of the pivoted pawl, so as to latch by mere

contact with a striking plate on the endwise movement of the door, said pivoted pawl setting on the bottom of the latch body.

19,392 of 1905.—A. DAVIDSON: Padlocks and similar Locks.

This invention relates to padlocks and the like operated by keys having a wing capable of being protruded from such key, and consists in the provision of a lever or part arranged to automatically move and hold back the bolt or locking part, when unlocking takes place, and capable of being freed to release the part or locking part when the handle is pressed down, so as to make the padlock self-snapping.

24,490 of 1905.—O. DIECKMANN: Grates for Stoves and Fireplaces.

This invention consists of a grate front of adjustable length and width, and is characterised in that the lower parts are exchangeable, all parts being arranged in such a manner as to adjust the length of it as well as the width according to the size of the stove, so that one and the same grate front can be used for different sizes of stoves.

24,970 of 1905.—J. JAARNA: Relating to Stoves.

This invention consists of means for regulating the draught, and comprises a flue, an aperture upon a level with the fire-basket communicating with the said flue, a damper for closing said aperture, a second aperture formed at or near the upper end of the said stove, which also communicates with the flue and the grate to prevent the entry of the fuel to the latter aperture.

27,245 of 1905.—D. WHITEHEAD and H. ADAMS: Ventilating Shaft Top.

This invention consists in the construction and combination of parts consisting of an inverted cone made of metal or glass, an up shaft, and a head with meshed protector, the whole forming an easily detachable air ventilator or skylight.

9,805 of 1906.—T. F. SALING: Flush Hinges.

This invention consists of a flush hinge comprising leaves formed at their ends with inwardly-projecting flanges, having bevelled corners, and upon their inner sides with longitudinally extending recesses, a link disposed between the flanges of said leaves, and having bevelled edges to coact with the recesses in said leaves, and wedge-shaped stops at its ends to coact with the bevelled corners of said flanges, and pivot pins passed through said flanges and into said link.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

Table listing property sales including items like 'Onion Broad, Suffolk', 'Ravenswood-rd.', 'St. James'—13, Duke-st.', etc., with associated values.

Table listing property sales including items like 'Strood Common, Hants.—Freehold meadow and plot of land', 'East Meon, Hants.—"Spencer's Farm"', etc., with associated values.

Table listing property sales including items like 'Pimlico.—200 to 222 (even), Vauxhall Bridge-rd.', 'Totterham.—321 to 337 (odd), High-rd.', etc., with associated values.

Table listing various properties and their values, including Church Farm, Little Burlings, and others.

PUBLISHER'S NOTICES.

Nat. Tel., 612, Gerrard. Telegrams, "The Builder, London."

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDERS, LEGAL ANNOUNCEMENTS, &c., &c.

Six lines or under 2s. 6d. Each additional line 1s. 6d.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under 1s. 6d. Each additional line (about ten words) 1s. 6d.

Terms for series of Trade advertisements, as set forth under other special positions, on application to the Publisher.

SITUATIONS WANTED (Single-handed—Labour only). Four lines (about thirty words) or under 2s. 6d. Each additional line (about ten words) 1s. 6d.

ADVERTISEMENTS for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day.

ALTERATIONS IN STANDING ADVERTISEMENTS OR ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

ADVERTISERS IN "THE BUILDER" may save Replies addressed to the Office, Catherine Street, Covent Garden, W.C., from charge. Letters will be forwarded if addressed and postage are sent together with sufficient stamps to cover the postage.

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

MEETINGS.

SATURDAY, JUNE 23.

Northern Architectural Association.—Students' Sketching Club excursion. Edinburgh Architectural Association.—Visit to Gosford House, Longniddry. Carpenters' Company.—Dinner to the Incorporated British Institute of Certified Carpenters (Carpenters' Hall, London Wall). 6 p.m.

MONDAY, JUNE 25. Royal Institute of British Architects.—To present the Royal Gold Medal for the Promotion of Architecture, conferred by His Majesty the King, to Sir Laurence Alma-Tadema, R.A. 8.15 p.m.

THURSDAY, JUNE 28, to SATURDAY, JUNE 30. Incorporated Association of Municipal and County Engineers.—The thirty-third Annual Meeting to be held at Westminster. The meeting will be held at the Institution of Mechanical Engineers, Storey's Gate.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 18s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 25s. per annum. Remittances payable to J. MORGAN should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

PRICES CURRENT OF MATERIALS.

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

Table listing prices for Hard Stocks, Grizzles, Picked Stocks for Facings, Flettons, Red Wire Cuts, Best Fathom Bed, Best Bed Pressed, Buabon Facing, Best Blue Pressed Staffordshire, Do. Bullnose, Best Stourbridge Fire Bricks, GLAZED BRICKS, Best White and Ivory Glazed Stretchers, Headers, Quoining, Bullnose, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered, Squints, Best Dipped Salt Glazed Stretchers and Header, Quoining, Bullnose and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered, Squints, Second Quality White and Dipped Salt Glazed.

Table listing prices for Thames and Pit Sand, Thomas Ballast, Best Portland Cement, Best Ground Blue Lias Lime 1900.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Table listing prices for Grey Stone Lime, Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

Table listing prices for Bath Stone—delivered on road wag. s. d., gons, Paddington Depot, Do. do. delivered on road waggon, Nine Elms Depot.

PORTLAND STONE (20 ft. average)—Brown Washed, delivered on road waggon, Paddington Depot, Nine Elms Depot, or Fimbo Wharf.

White Banded, delivered on road waggon, Paddington Depot, Nine Elms Depot, or Fimbo Wharf.

Table listing prices for Ancaster in blocks, Beer, Breamhall, Darley Dale in blocks, Red Corshill, Closeburn Red Freestone, Bed Mansfield.

YORK STONE—Robin Hood Quality. Scappled random blocks, 5 in. sawn two sides landings to sizes (under 40 ft. super.), 6 in. rubbed two sides ditto, ditto, 3 in. sawn two sides slabs (random sizes), 2 in. to 2 1/2 in. sawn one side slabs (random sizes), 1 1/2 in. to 2 in. ditto.

HARD YORK—Scappled random blocks, 3 in. sawn two sides landings to sizes (under 40 ft. super.), 6 in. rubbed two sides ditto, 3 in. sawn two sides slabs (random sizes), self-cast random flags.

Hopton Wood (Hard Bed) in blocks 2 0 per ft. cube, del. rly. depot, 6 in. sawn both sides landings 2 7 per ft. super, del. rly. depot, 3 in. sawn both sides random slabs 1 0, 2 in. do. 0 8 1/2.

SLATES.

Table listing prices for 20x10 best blue Bangor, 20x12, 20x12 1/2, 16x8, 20x10 best blue Fort, 16x8, 20x10 best Eureka un-lading green, 20x12, 18x10, 16x8, 18x10, 16x8.

TILES.

Table listing prices for Best plain red roofing tiles, Hip and Valley tiles, Do. Ornamental tiles, Hip and Valley tiles, Best Buabon red, brown or brindled do. (Edwards), Do. Ornamental brand, Hip tiles, Hip and Valley tiles, Best Buabon red, brown or brindled do. (Edwards), Do. Ornamental brand, Hip tiles, Hip and Valley tiles, Best "Hartshill" brand plain tiles, sand-faced, Do. pressed, Do. Ornamental do., Hip tiles, Valley tiles.

WOOD.

BUILDING WOOD. At per standard. Deals: best 3 in. by 11 in. and 4 in. s. d., by 9 in. and 11 in. s. d., Deals: best 3 by 9, Battens: best 2 1/2 by 7 in. and 3 in., Battens: best 2 1/2 by 7 in. and 3 in., Deals: seconds, Battens: seconds, Foreign Sawm Boards—1 in. and 1 1/2 in. by 7 in.

At per standard. Fir timber: best middling Danish or Memal (average specification), Seconds, Small timber (8 in. to 10 in.), Small timber (6 in. to 8 in.), Swedish balks, Pitch-pine timber (30 ft. average).

JOINERS' WOOD.

Table listing prices for White Sea: fir; yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Second yellow deals, Battens, 2 1/2 in. and 3 in. by 7 in., Third yellow deals, Battens, 2 1/2 in. and 3 in. by 7 in., Petersburg fir: first yellow deals, Do., Battens, Second yellow deals, Battens, Third yellow deals, Do., Battens.

White Sea and Petersburg—First white deals, Battens, Second white deals, Battens, Third yellow deals, Battens, Pitch-pine deals, Under 2 in. thick extra, Yellow Pine—First, regular sizes 44 0 upwards, Odiments, Seconds, Yellow Pine odiments.

WOOD (continued).

Table listing various wood products such as Joist's Wood, Kauri Pine, and Wainoot Oak Logs, with prices per standard unit.

GILS, &c.

Table listing various oils and gils like Raw Linseed Oil, Boiled Oil, Turpentine, and Genoa Ground English White Lead.

VARNISHES, &c.

Table listing various varnishes and finishes such as Fine Pale Oak Varnish, Pale Copal Oil, and Superfine Hard-drying Oak.

JOISTS, GIRDEBS, &c.

Table listing steel joists and girders, including Rolled Steel Joists, Compound Girders, and Steel Compound Slanchions.

METALS.

Table listing various metal products like Common Bars, Staffordshire Crown Bars, and Sheet Iron Black.

LEAD, &c.

Table listing lead products such as Sheet Lead, Zinc Sheet, and Copper Sheet.

ENGLISH SHEET GLASS IN CRATES OF STOKZ SIZES.

Table listing sheet glass in crates with sizes like 15 oz thirds, 21 oz fourths, etc.

ENGLISH BOLLED PLATE IN CRATES OF STOKZ SIZES.

Table listing English bolled plate in crates with sizes like 21 per ft. delivered, 24, etc.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications...

TENDERS.

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

ABERGAVENNY.—For alterations, etc., at 2, Bleanth-place. Mr. E. Foster, architect, Bella Vista, Abergavenny. Thomas & Sons, 5512 10 T. S. Foster, Abergavenny. 497 10 Abergavenny. £194 0

CARLISLE.—For erecting a caretaker's cottage at the meeting of the old and new works, Gettsdale, for the Corporation. Mr. H. C. Marks, City Engineer and Surveyor, 36, Fisher-street, Carlisle. J. Howard, Brampton. £796 18 6

CEFN HIRGOED.—For erecting a smallpox hospital at Cefn Hirgoed, near Brynastir, Bridgend, for Glamorgan Smallpox Hospital Committee. Mr. H. Dawkin Williams, architect, Blackmill, Quantities by architect.—F. C. Williams, 54, 180 J. G. & A. v. a r d. T. Williams & Co., 2147 J. Evans, Llanvly. D. W. Davies, 4, 990 Bridgend. £3,695

CONWIL ELVET (Wales).—For erecting minister's house near Blaencroed Chapel, for Rev. J. Lewis, Blaencroed, Conwil Elvet, Carmarthen. Mr. D. Davies, architect, Penrhifallan, Henton, Cardiganshire. J. Daniels, 445 other, South Wales. £353 H. Lewis & Co., 405

DRAYCOTT.—For Victoria Mills extension, Draycott, Mr. F. S. Antill, architect and surveyor, Draycott, near Derby. Quantities by architect.—E. Hind, 27,955 0 J. Perks & Son, £7,377 0 H. Vernon, 7,940 0 T. W. Youngman, 7,275 10 W. Gell & Son, 7,922 11 H. Vickers & Son, 7,270 0 Walker & Slater, 7,787 0 W. Foster, 7,237 0 W. Woodcock, 7,795 0 J. Dickinson, 7,198 0 R. Weston & Son, 7,637 0 J. Wright, 7,155 0 A. Smith, 7,619 0 T. Barlow & Co., 6,860 0 W. Maule & Co., 7,400 0 J. & J. Warner, 7,155 0 J. Parker & Son, 7,358 0 Micklethorpe, J. Brown & Son, 7,295 0 near Draycott. 6,849 0 F. Messom, 7,286 0

ENFIELD.—For making-up Forest-road, Freesty-water, and Hollow-road (part only), for the Urban District Council. Mr. B. Collins, Surveyor, Public Offices, Enfield.—Holwood—Forest-street. Mowlem & Co., £1,328 000 £790 G. Bell & Sons, 1,261 000 709 E. J. Betts, 1,175 000 783 W. Adams, 1,147 000 785 J. Jackson, 1,120 000 740 Jennings & Grenfell, Freesty-water, Waltham Cross. 1,045 000 660

GRIFFITHSTOWN.—For alterations to Congregational Chapel and additions to schools. Mr. R. L. Roberts, architect, Abercrombie.—W. Branch, 5849 A. & J. Richards, E. Sainsbury, 735 Griffithstown. 2540 Bess & Son, 710 J. P. Morgan, 602 J. Jenkins, Ltd., 699

LAMBOURN.—For erecting Primitive Methodist schoolroom, for a Building Committee of the Lambourn Primitive Methodist Church. Mr. Joseph Lawrence, architect, Galford-street, Reading. W. Adams, £138 12 6 Middlebush, 216 10 0 Tydeman Bros., 135 0 6 Hedges Bros., 110 10 0 W. T. Adams, 125 0 0 Edwards & Son, 100 0 0 Brain & Son, 117 0 0 Incpun, Sarks. 103 13 0

LANGWATH BASSETT.—For erecting a new mixed school at Langwath Bassett, near Mansfield, for Derbyshire County Education Committee. Mr. H. Tatham Sudbury, architect, Estate Offices, Ilkeston. Quantities by architect.—C. Vallance, £3,690 0 Harker, Rud-kin & Beck, £3,500 0 H. Vickers & Son, 3,067 0 G. G. Middleton, 3,325 0 Lund & Swan, 3,019 0 H. Chettle, 3,260 0 D. Roberts, 2,939 0 G. Mayne, 3,249 0 A. J. Warner, 2,965 0 W. Fort & Sons, 3,217 0 Lee & Kirk, 2,965 0 Moulie & Co., 3,199 0 F. H. & J. W. A. Burgess, 3,172 0 Moore, 2,900 0 J. Greenwood, 3,140 0 Harris & Hunt, A. Eastwood & Ripley. 2,850 0 Sons, 3,129 0

LIANTHRAN.—For providing and laying about 200 lineal yards of 9-in. and 3-1/2 in. lead pipe, the construction of a small bacterial filter, and other appurtenant works in connexion therewith, at Cron-tan-rail, Llantrisant, for Llantrisant and Llantwit Major Rural Sanitary Council. Mr. G. S. Morgan, Surveyor, School-street, Pontydund, Glam.—W. Burton, £325 11 3 Barnes, Chap- C. Savers, 319 11 11 M. & Co., £263 0 3 J. E. Evans, 311 0 0 J. Morgan, 251 10 0 R. Jones, senr., 299 18 11 John & West., 289 18 8 J. Sutherland, 281 6 7 E. Jones, junr., 236 16 2 W. John., 276 7 7 W. Saunders, A. G. Collins & M. I. A. I. Co., 272 17 11 Pontydund. 236 1 0 H. Morgan, 265 0 6 London and County Works Contracting Co., 263 5 4

LONDON.—For proposed motor-car works (Messrs. Panhard & Levassor) show-rooms and offices, etc., at Uxbridge-road and Waple-way, Acton, W., for Mr. Harvey du Cros, M.P. Mr. Harry Perival, architect, 15, Craven-street, W.C. Quantities by Mr. F. A. Brink, 12, Craven-street, W.C.—Spencer, Sauto, & Minter, London., £13,257 Co., Ltd., £14,197 J. Dorey & Co., J. C. Richards & Co., Ltd., 13,154 Co., 13,479

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MAIDENHEAD.—For new Council school, for the Mayor and Corporation of Maidenhead. Mr. E. J. Shrewsbury, architect, Queen-street-chambers, Maidenhead.—W. E. Theaker, £8,430 J. K. Cooper & Sons, £8,105 W. E. Cox & Son, £8,307 Silver & Sons, Ltd., 7,996 W. Creed, £8,397 E. Bissley, £7,920

MEABE (Somersetshire).—For erecting a parish-room, for trustees. Mr. G. Alves, architect, Glastonbury.—R. T. Fisher, £326 0 000 £25 0 0 £351 0 0 R. T. Stead, £327 0 000 20 0 0 £47 0 0 H. A. Baker, Meare. 326 3 000 12 10 000 338 13 9

MEABE (Somersetshire).—For erecting a parish-room, for trustees. Mr. G. Alves, architect, Glastonbury.—R. T. Fisher, £326 0 000 £25 0 0 £351 0 0 R. T. Stead, £327 0 000 20 0 0 £47 0 0 H. A. Baker, Meare. 326 3 000 12 10 000 338 13 9

MIDLETON (Ireland).—For extension to and improvement of water supply, for the Urban District Council of Middleton, Mr. S. A. Kirkby, C.E., Court House, Cork.—

D. Twomey £1,400 } J. J. Coffey, Broderick-street, Middleton, Co. Cork* £1,350

NELSON (Lancashire).—For erecting a house on the Carr Hall Estate, for Mr. D. Parker, Mr. H. Whitaker, architect, 21, Market-square, Nelson.—

Mason: A. Robinson Victoria, Brierfield... £455 0 0
Joiner: R. Blackham, Clayton-street, Nelson 283 0 0
Plumber: P. Quinn, Colne-road Brierfield... 88 0 0
Plasterer: E. Butler, Portland House, Barrow-in-Furness... 77 10 0
Tiling (roof): A. Smith, Bridge-street, Burnley 55 12 6

NEWPORT (Wales).—For granolithic footways, for the Town Council, Mr. D. A. Donald, Burgh Surveyor, Blyth Hall-buildings, Newport.—

A. Walker & Son, Ltd., Newport... £1,191 4 7
Stewart's Granolithic Stone Co., Ltd., 905 15 1
J. Fairweather & R. Young... 895 8 0
L. Reoch... 867 6 4
W. Brand & Son... 863 11 8
J. Laburn... 855 16 3
W. Pearce & Son... 806 13 1
W. Lawson, Wormit, Fife*... 748 1 8

NORWICH.—For erecting the new County Council offices and additions to the Shire-homes, for the Norfolk County Council, Mr. Edwin J. Trench, A.R.I.B.A., Royal Insurance-buildings, Norwich. Quantities by Mr. W. Harker, Bousfield, Norwich:—

J. Thompson & Co., Norwich... £14,055 0
J. Downing & Son... £12,823 0
Stephen, Baslow & Co., Norwich... 12,814 0
R. W. Riches... 13,998 0
Coulson & Loftis... 13,824 0
W. Sindall... 13,440 0
H. J. Lizzell... 13,440 0
P. L. M. & Co., Norwich... 12,640 0
Fotheringham... 12,950 0
J. Hurn... 12,914 0
J. S. Smith... 12,888 0
Bell & Sons... 12,850 0
T. G. H. Norwichey... 12,240 0

OXFORD.—For additions and alterations to Cherwell Hall College and for rebuilding Milham Ford School, for the Church Education Corporation, Mr. W. Andrew, architect and surveyor, Parkstone, Dorset:—

Milham Ford, Cherwell Hall.
Brucker Bros. £4,842 0
Baker & Pearsy 4,905 5
Bloxham 3,937 0
Slarey 3,924 0
Nowles & Son 3,823 0
G. Curtis 3,845 0
Wyatt & Son 3,760 0
Simm & Son 3,794 0
Orvan Bros. 3,839 0
J. Woodbridge 3,787 0
Parnell & Sons 3,617 0
Hutchins & Son 3,589 0
A. J. Colborne 3,461 13
Kingsley & Son, Oxford* 3,366 0

PAINTON.—For water-supply works, for the Urban District Council, Mr. F. W. Vanstone, Engineer, Palace-chambers, Paignton.—

Jenkins & Son, Leamington £3,720
PENRYNHOE.—For erecting thirty or more cottages near Penryn, Cornwall, for the Bargod and Aberdwr Building Club, Mr. P. V. Jones, architect and surveyor, Hengoed:—

Fodden & Lee, £322 18 0
T. Matthews, £18 18 3
T. L. Evans, £18 0 0
W. J. Madley, £217 0 0
G. Barnett, £214 0 0
J. Lloyd, £203 0 0
J. Williams, £201 0 0

SWINDON.—For metalling, sewerage, paving, and channelling portion of Drew-street, on the Even Swindon Estate, for Mr. J. Morrison, J.P., Messrs. Drew & Sons, surveyors, Regent-streets, Swindon:—

Tudman Bros. £501 4 10
W. J. Rogers, Swindon* 423 0 0

TONYREFALL.—For the widening of the Ely River bridge and erection of a masonry drain at Wainwright, Tonyrefail, for Llantrisant and Llantwit Ffandre Rural District Council, Mr. G. S. Morgan, Surveyor, School-street, Pontydund, Glam.:—

S. Morgan £347 12 0
T. Lewis 291 7 0
J. E. Evans 273 0 0
A. G. Collins & Co. 261 12 2
R. Jones, junr., 220 14 2
John & West, 213 11 5
R. Jones, senr., £206 11 10
J. Sutherland, 206 5 0
Barnes, Chaplin, & Co., 189 0 11
G. L. Morgan, 162 19 5
Pontypridd*, 175 17 0

WHITTINGTON (Salop).—For erecting a school at Gohoven, for the Elementary Education Department, Messrs. Shaylor & Ridge, architects, Oswestry:—

W. H. Thomas, Salop-road, Oswestry* £2,992
WORMIT.—For constructing a 9-in. outfall sewer at Serrogside, for the Town Council of Newport, Mr. D. A. Donald, C.E., Burgh Surveyor, Blyth Hall-buildings, Newport:—

J. Fairweather £285 2 0
T. S. Dick 236 6 8
D. Horburgh, 253 8 3
P. Gissitt, 247 16 6
W. Brand & Son, 243 7 2

WREKENTON (Co. Durham).—For erecting new Wesleyan Chapel and school, Mr. J. Orwin, architect and surveyor, 20, Collingwood-street, Newcastle-on-Tyne:—

D. Elliott £1,595 0 0
J. Niles, 1,327 14 0
Glen & Mollitt, 1,519 19 8
W. Hall, 1,455 10 7
Arnell, 1,309 6 2
Belam, 1,375 0 0
J. White, 1,353 0 0
North Durham Stone Co., £1,329 0 9
W. E. Hall, 1,269 0 0
E. Dyson, 1,225 12 6
W. H. Ayton, 1,209 0 0
R. Davidson, 1,196 0 0
Felling, 1,196 0 0

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The Builder.

VOL. XC.—No. 3308.

JUNE 30, 1906.

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The Adhesion of Concrete to Steel.



ONE of the most important assumptions made in all theories of concrete-steel construction is that a perfect bond exists between the constituent materials.

If the bond were readily broken there would always be the liability that the reinforcing bars might become free to slide within the enveloping concrete, thus militating against the combined action which renders concrete-steel capable of behaving as a homogeneous structure.

While there is comparatively little adhesion between concrete and a plane surface of smooth, perfectly clean steel simply pressed upon its surface, it is found that when a round bar of steel has been embedded for a certain distance into a block of concrete, the bond between the concrete and the steel becomes very great. Numerous experiments have been made for the purpose of ascertaining values of the adhesion between concrete and embedded bars of iron and steel. Among those who have conducted investigations of this kind may be mentioned Professor Bauschinger, Professor Ritter, M. de Joly, M. Feret, M. Considère, and Professor Hatt.

The experiments of Professor Bauschinger indicated an adhesive resistance of from 570 lb. to 710 lb. per square inch of metallic surface, those of Professor Ritter

showing the value to be between 568 lb. and 668 lb. per square inch. Very similar conclusions were drawn by M. de Joly, but the following observations made by that engineer are worthy of special notice. His experiments seemed to indicate conclusively that no sliding movement commenced to take place until the elastic limit of the metal had been passed, and that the real cause of failure in the bond was to be accounted for by shearing of the concrete, a view that was supported by the fact that a coating of concrete generally remained on the iron rods after they had been pulled out. This point ought not to be overlooked, and we may add that in the present day it is becoming more and more recognised that failure of the bond is less likely to occur from sliding of the reinforcement inside the concrete than from failure of the concrete by shearing. From the investigations conducted by M. Feret the main conclusions drawn were: That the adhesive resistance varied at different points along the rods used, increasing with the roughness of the metallic surface, the proportion of cement used, the fineness of the cement, the size of the sand particles, the proportion of water used in mixing, and the age of the concrete. Professor Hatt also observed that the adhesion of the concrete varied at different parts of the rods tested, the values of the adhesive resistance ascertained by him being from 636 lb. to 756 lb. per square inch of metallic surface.

The results we have quoted serve to demonstrate the fact that the adhesion between concrete and ordinary round

steel bars may be taken with safety at about 500 lb. per square inch. Applying this value to the case of a round bar $\frac{1}{2}$ in. diameter embedded for a length of 1 ft., the total calculated resistance would be $0.5 \times \pi \times 12 \times 500 = 9,425$ lb., and if the bar were embedded for a length of 10 ft., it would be 94,250 lb., or about seven and a half times the ultimate resistance of the $\frac{1}{2}$ -in. diameter bar of mild steel. As a matter of fact, a $\frac{1}{2}$ -in. diameter bar, embedded for a length of only about 20 in. in a concrete block, can be pulled asunder without perceptibly impairing the hold of the concrete upon the embedded metal, except around the point of entry. In practice, however, the adhesive resistance of the two materials is not taxed beyond a value corresponding with the elastic limit of the metal, and as a general rule the factor of safety keeps down the value to one-third or one-fourth that of the elastic limit. In the case of a $\frac{1}{2}$ -in. diameter steel bar the tensile force with an adequate factor of safety might be anything from, say, 2,000 lb. to 3,000 lb., but could not possibly be within measurable distance of the adhesive resistance offered to the movement of the bar if this were properly embedded in concrete of suitable proportions and consistency. Even assuming the bar were stressed up to the elastic limit, and taking that limit as high as 56,000 lb. per square inch, sufficient adhesive resistance would be afforded by embedding the bar for a length of less than 6 ft. in the concrete.

We have purposely delayed reference to the investigations of M. Considère,

because these were conducted upon specimens tested as beams in which the reinforcement was surrounded by concrete subject to tensile stresses beyond its elastic limit. For this reason the results obtained by M. Considère were not so high as others which we have mentioned. Using air-hardened concrete and ordinary rods of 0.24 in. diameter, Considère found the adhesion between the two materials to be 256 lb. per square inch of metallic surface; and using water-hardened concrete of richer proportions and rods of 0.17 in. diameter the adhesive resistance ranged from 326 lb. to 500 lb. per square inch of surface. Other tests by Considère indicated that the adhesive resistance varied inversely with the proportion of water used in mixing the concrete, the ascertained values in this series ranging from 71 lb. to 171 lb. per square inch of metallic surface.

Applying Considère's results to the case of a $\frac{1}{2}$ -in. diameter rod embedded for a length of 10 ft., as before, we find the adhesive resistance would be from 13,400 lb. for very dry concrete up to 94,250 lb. for semi-fluid concrete of rich proportions. Thus, even the lowest result of 71 lb. per square inch for concrete of manifestly improper consistency gives an adhesive resistance of more than 70 per cent. higher than the elastic limit of a $\frac{1}{2}$ -in. diameter rod of ordinary mild steel, and about 20 per cent. higher than the elastic limit of high carbon steel with an ultimate strength of between 40 and 50 tons per square inch.

Taking into account the figures stated above, it is abundantly evident that the adhesion between concrete and ordinary round bars is ample for all practical purposes, and fully justifies the general employment of such bars in reinforced concrete construction of all kinds.

Some American engineers hold the opinion that a mechanical bond in addition to that existing between concrete and the more or less irregular surface of a round bar is desirable for the purpose of enabling the construction to remain secure even if adhesion has been partially destroyed by concussion or other mechanical agencies. Several kinds of corrugated, twisted, and indented bars of square and circular cross sections have been patented in the United States, and one of them, the "Indented Steel Bar," is now being offered in Great Britain. This bar is of peculiar form, and may be best described by likening it to a bar which, originally of square cross section, has been flattened alternately in horizontal and vertical directions so as to form a series of projections with bevelled edges along all four surfaces. No doubt so long as the concrete remains intact the projecting surfaces would form a mechanical bond even in the total absence of cohesion between the concrete and the metallic surface, but it is also evident that they offer no protection against that shearing of the concrete around the reinforcement, which the most recent experience shows to be the cause of slipping under high stresses.

In a circular issued by the patentees the suggestions are made that the use of plain bars is on the decrease as engineers are beginning to realise the danger

of adhesion being destroyed by vibration and shock, that the adhesion of plain bars is reduced 60 per cent. after continued immersion in water, and that the adhesion of plain material is not sufficient to utilise the full available strength of high elastic limit steel. We do not for a moment think that these suggestions are made otherwise than in good faith, but at the same time we believe the patentees would be well advised in making some inquiry as to the exact extent to which they are supported by practical and scientific evidence before repeating them in another edition of the circular. So far as our own knowledge extends, the use of round bars is certainly not on the decrease, and we hope such bars will never be found unsuitable for the purposes of reinforcement, as it is very desirable that concrete-steel construction should always be possible with materials which are readily obtainable in the open market without the direct or indirect payment of royalties to patentees. As for the other points, the tests of M. Considère upon water-hardened concrete and the examination of concrete-steel piles after long submersion seem quite sufficient to dispose of the second suggestion, while the third is not supported by the experience of the authorities already quoted in this article. Moreover, remembering that high unit stresses, such as are permissible in high carbon steel, involve excessive tension and surface cracks in the concrete, it is not easy to see what advantage is offered by the use of high carbon steel as reinforcement, to counterbalance the serious disadvantage that it is very apt to break if bent cold, or if improperly treated after bending by the aid of heat.

NOTES.

The Highgate Tramway Disaster. By the serious occurrence of last Saturday London has been provided with a sufficiently convincing proof of the extreme importance attaching to the question of tramway brakes. It is true that none of the gradients on the inner system of metropolitan tramways is so long and steep as that of the Archway-road, but there are many where the failure of braking apparatus would entail most alarming consequences, and along some of the newer routes recently opened to electric traction in the outer districts, hills of considerable height and length have to be negotiated. From the evidence heard by the Coroner on Tuesday, it is clear that the hand brake with which the runaway car is fitted was capable of application in such a way as to cause four wheels of the vehicle to lock, and to remain fast even after the brake was taken off, thereby making the emergency magnetic brake perfectly useless. The chief engineer of the tramway company said that the driver ought to have applied the magnetic brake instead of the hand brake. While admitting that if the wheels were skidding the magnetic brake could not be used, this witness expressed the opinion that skidding could only result from bad driving. Even accepting that view, merely for the sake of argument, we must still say that the brake apparatus is not satisfactory because it

offers to drivers two opportunities of causing disaster (1) by applying the wrong brake first; and (2) by using that brake unskillfully. But it has yet to be proved that there was no defect either in the hand brake on the car in question, or in the mechanism of the wheels and axles. Whatever may be the upshot of the Coroner's inquest and the Board of Trade inquiry, it is tolerably certain that this regrettable event will lead to the adoption of safeguards not at present existing for the protection of the public, notwithstanding the fact that the apparatus now employed is said to have received the approval of the Board of Trade. While referring to the subject, we may point out that in addition to the risk of running away downhill in a forward direction, tramcars may run down backwards on steep inclines. Consequently it would be a wise precaution to employ a third brake such as has been fitted, on the recommendation of Colonel Druitt, to cars on the Penrynmequick branch of the Plymouth Corporation Tramways.

The Death of Mr. Stanford White. ALL the architectural world, in this country as well as in the United States, will have received a most painful shock at the news of the murder of Mr. White, the partner in the eminent firm of McKim, Mead, & White, whose names are familiar to all our readers. It is only two or three years since Mr. McKim, the head of the firm, was in this country to receive the Gold Medal of the Institute, and made, it may be safely said, friends in England wherever he went. Whatever he the real history of this terrible affair, all who knew Mr. McKim will sympathise with him in regard to the blow which has fallen upon his firm by the tragical end of one whose name and work had for so many years been linked with his.

A Light Case. THE case of *Fear v. Morgan* (reported in the *Builder*, p. 709) is somewhat complicated, but seems to have decided no new principle of law. Two houses had originally belonged to one common owner, and had been leased under one lease for a term of ninety-nine years. By subsequent assignments and underleases they had come into different hands, and at different times the interest under the original lease had been surrendered to the successors in title of the original owner, who had granted two separate leases for long terms. It was one of the terms of an agreement to renew the lease of one of the houses that the premises at the back of it should be raised, and this erection obscured the light to the other house, and the occupier, who held as underlessee of one of the renewed leases, brought an action to restrain the defendant, the lessee of the other house, from so obstructing the light. The decision appears to be that the fact that the predecessors in title of the plaintiff and defendant claimed from one common landlord did not prevent the acquisition of rights to light by these lessees one against the other, and that, whether the plaintiff held under a prolongation of the original lease or under the further lease granted on its surrender, the lights, being ancient lights

could not be obstructed. This decision is based on authorities of old-standing, and although it seems to have been argued that they had been affected by the decision in *Colls v. Home and Colonial Stores*, the Court of Appeal have held that this is not so, and that they still remain good law. There seems to have been no question as to the amount of obstruction caused by the erection or as to the diminution of the light, which was the ground for decision in *Colls' case*.

Aforestation in England.

THERE is no doubt that the care of woodlands and of timber trees has been surprisingly neglected in England. Some landlords have thought much of the preservation of game, and others of the improvement of agriculture; very few have given a thought to the preservation and improvement of trees. The Company of Carpenters has, therefore, acted wisely in publishing two prize essays on the "Adaptation of Land for Aforestation," by Mr. Leslie Wood and Mr. P. T. Shaw.* While there must always be a large demand for foreign timber these essays show clearly that the home supply can be considerably increased if timber trees were systematically managed. For example, Mr. Wood states that "the ash is, on the whole, the most useful tree grown in England on account of its elasticity, and at the same time its hardness," and while its price is about the same as that of oak, there is a steadier market. Yet to all intents and purposes the ash is a mere hedgerow tree—not one landowner in a hundred troubles to plant young trees or to take care of those which are becoming mature, and when he does realise the older timber he leaves the future to take care of itself. We hope, therefore, that these two essays will have a wide circulation.

Fires in Railway Buildings.

Two of the most destructive fires which have occurred for some years past in premises belonging to railway companies are those at the St. Rollox Works of the Caledonian Railway Company at Glasgow, and at Southampton Docks, where a large shed belonging to the London & South-Western Railway was totally destroyed. At Glasgow the fire broke out in the boiler-house of the carriage works and rapidly spread to the adjoining shops, causing the complete destruction of the buildings and their contents. Probably all the buildings involved by these two fires were erected before fire-resisting construction attained the prominence it occupies in the present day, and we may hope that such of the companies as are concerned will make sure against any repetition of similar disaster. Unfortunately, engineers are not too ready to employ methods and materials of construction affording absolute protection against the spread of fire. For many types of building they still pin their faith to unprotected steelwork and ordinary glass, looking upon reinforced concrete and armoured glazing as things of doubtful character, apparently for no other reason save that of comparative novelty. Perhaps a few more fires may bring councils of wisdom:

* London: Laughton & Co., 3, Wellington-street, W.C.

The Collapse of a New Building at Kingston.

WHILE the severity of some building regulations continues to form a fruitful topic of discussion, it does not seem possible that the rules prevailing in Kingston-on-Thames can be of vexatious character. That is certainly a natural inference to draw from the sudden collapse of a shop and dwelling-house in King's road immediately after completion on Saturday last. We are not in a position to speak definitely as to the precise cause of this surprising *dénouement*, but it is evident that the main portions of the structure must have been in a particularly delicate state of equilibrium. The stable character of brick buildings designed in the good old-fashioned way leaves nothing to be desired. But there is a limit to economy, and people who apply brickwork and other structural material in slender proportions, such as prevail generally in suburban London, would do well to introduce a framework of steel for the purpose of binding together all the essential parts of the buildings they erect. At the same time, it must be remembered that a steel frame, if not properly connected, may in itself prove to be a source of danger, a fact illustrated by the failure of a steel-frame building during construction in New York a year or two ago.

The National Physical Laboratory.

WE are glad that the scope of the work carried out at the National Physical Laboratory is extending rapidly. Last Monday a large new electro-technical building was opened by Mr. Haldane, and Dr. Glazebrook announced that buildings for metrology, metallurgical chemistry and engineering were being erected. The Government grants have been largely supplemented by private donors, and we agree with the director in thinking that the opportunities for research and investigation will be hard to equal elsewhere. The new ampere balance for determining the unit of electric current has now been completed, and readings obtained by means of it agree in the most satisfactory manner. The investigations recently carried out on standard cells and resistance standards will be a great help to electricians. The determinations of the values of the constants of the insulating materials used in the construction of telephone cables which Mr. Campbell communicated in a paper to the Royal Society last week are deserving of high praise. The methods he used in carrying out this research are highly ingenious, and the publication of them will be a help to many. The arrangements for the testing of ammeter shunts struck us as being very complete and satisfactory. In the new building arrangements are made so that currents up to 5,000 amperes can be easily obtained. The thermometers of ordinary range are dealt with at Kew, but the very high or very low range thermometers are tested at Bushy House. Temperatures down to the temperature of liquid air are readily obtained, and the high temperatures are obtained by a series of electric furnaces, one of which can maintain the temperature constant at 2,000 degrees Centigrade. The large Moissau arc furnace was also interesting,

and should prove useful for reducing the so-called "infusible" oxides. It seems to us that by means of these electric furnaces it would be possible to maintain platinum in the molten state and so make determination of the light emitted from it per unit centimetre an easy matter. It would be interesting to know the exact value, in British candles, of this standard which was first proposed by M. Violle twenty-two years ago.

Birkenhead New Water Supply Scheme.

It appears that Birkenhead now intends to follow the example of Liverpool by going to the mountains of North Wales for additional water supplies. The complete scheme formulated provides for the construction of three reservoirs in Denbighshire, and the necessary aqueducts following a course of about 42 miles from the source of supply to a large new service reservoir near Birkenhead. The proposed works comprise three sections, the first of which will be undertaken as soon as practicable, the second will not be necessary for some thirty or forty years, and the third may not be required for eighty or a hundred years, but under the scheme prepared all the sites, including extensive gathering grounds, will be purchased so as to make absolutely sure of future as well as of present supplies. The first reservoir will be formed in the valley of the River Alwen, by the construction of a masonry dam capable of holding up about 2,100 million gallons of water with the surface level of 1,700 ft. above the sea. This reservoir will supply 8,100,000 gallons daily, in addition to 7,000,000 gallons of compensation water. The second section of the works involves the construction of a similar reservoir with the capacity of 1,700 million gallons, on the Brenig, a tributary of the Alwen. This reservoir will supply 5,900,000 gallons daily after due provision for compensation water. The third section of the scheme fore-shadows a reservoir, below the confluence of the Alwen and the Brenig, capable of supplying between 4 and 5 million gallons daily, besides compensation water. Thus the total supply from Wales reaching Birkenhead early next century should be 18 million gallons daily. The project is undoubtedly a good one so far as Birkenhead is concerned, and ought to make the town quite safe against the possibility of water famine for a very long time.

Newport Market Schools.

MR. E. T. HALL has been appointed architect for an extension of the Newport Market Army Training School, in Coburg-row. The refuge and schools were originally established in 1863, through the instrumentality of the late Mr. and Mrs. W. E. Gladstone and Mr. Shaw Stewart and others, in association with the House of Charity, Greek-street, Soho, in the buildings of Newport Market as an industrial school, with a boys' band and a refuge for the homeless poor. The market-house—a curious survival from past times—consisted of an octagonal structure having a glazed upper story, the use of which as a slaughter-house, did not, by some means or other, cease upon the passing of the Public Health Act, 1849. A quaint, old, barn-

like building to the south, erroneously described as the slaughter-house, had been the place wherein the cattle were stabled, the dealers meeting in the "chaffering-floor" over the stalls. During its occupation as the refuge that building with its stalls and large-framed timber work suffered very little change. But in July, 1882, the Newport Market area, extending over some 10,000 sq. ft., was cleared, having been reserved for working-class dwellings under a special clause of the late Metropolitan Board of Works' Act, 1877, for improvements in that quarter, and the site was taken for Sandringham-buildings, erected on the east side of Charing Cross-road by the Improved Industrial Dwellings Company. A temporary home was found in Long-acre for the refuge and schools, which in December, 1884, were removed to No. 76, Coburg-row.

THE New Dudley Gallery is at 169, Piccadilly (as nearly as possible, we believe, on the site of the old one), in the large new block of building which now occupies a frontage of which the Egyptian Hall was a part. The situation is good enough, but unfortunately the room, like another new gallery lately opened in Bond-street, is very insufficiently lighted at one end, and can never therefore be as satisfactory a room for exhibitions as the old Dudley Gallery, which was one of the best-lighted rooms of its class in London. The main feature of the first exhibition held in this room is a collection of sketches in Japan by the late Mr. Charles Wigram, who in 1857, at the age of 23, was commissioned by the *Illustrated London News* to go out and make sketches in connexion with the Chinese war; and finding his way afterwards to Japan, was so well satisfied with the country as to remain there for the rest of his life. The sketches exhibited are chiefly of characteristic figures of Japanese life, very clever, and interesting also because they portray the people of Japan at a time when the country was much less Europeanised than now. There are also a number of sketches and some finished pictures, including one or two important portraits, by his brother Mr. T. Blake Wigram, whom we fortunately still have with us.

THE Society have disposed of their property, consisting of 100 acres, at Park Royal, Willesden, together with the freehold ground-rent of the Plumes tavern, for 28,500l. At their last monthly meeting the Council unanimously agreed to accept an offer made to them for a building lease of Harewood House, No. 13, Hanover-square, and to take steps for securing new premises. In November, 1894, they entered into occupation of Harewood House, which had been offered for sale after the death of Lord Harewood. In, or after, 1766, the brothers Adam decorated the interior for the Duke of Roxburghe, and at the same time remodelled the two fronts, adding pilasters and a rounded bay, on the west side, which had an extended frontage to Harewood-place. After the Duke's decease the house was bought by Edward, first Earl of Harewood. The alterations

and restoration of the house, with some additions on the north side, were carried out for the Society by Messrs. Holland & Hannen, under the directions of Mr. Arthur Vernon. The original drawings state that the fabric was to be coated with "Liardet" stucco; the first elevations are depicted in early views of the square, including those of 1720 (first state) and 1754 by Sutton Nicholls; and one by Overton, 1727. In 1800 T. Malton published a good view in aquatint of the altered west front.

AT the Modern Gallery there are two small exhibitions of water-colours. The first, a set of sketches of Spain, Corsica, and Italy, by Mr. Ernest Thesiger, contains some very good work; the colour is pleasing, and in most of the sketches there is a great feeling of atmosphere and sunlight. "An Olive Yard, Ajaccio" (7), is a very effective painting of dark trees against a light sky. In "The Gesuati, Venice" (37) the colour and the treatment of the water are very satisfactory. The other exhibition, "The Garden of Allah," by Major Englehart, consists of sketches of Biskra, its neighbouring oases, and the surrounding desert. It is an interesting collection in many ways; there are several very characteristic sketches of Arab life, and though the figures are not always perfectly drawn, yet as a whole they are well put in, and full of life and movement. There are also paintings of the desert under many different aspects. "Drying Bricks by the Cemetery" (22) is a beautiful sunset effect; a "Sand Storm" (28) gives a very different idea of the desert. "The Valley of the Biskra River" (1) is one of the most successful of the drawings.

WE may remind our readers that the great historical pageant at Warwick, which has been in preparation for a long time past under the management of Mr. Louis N. Parker (who originated and arranged the Sherbourne pageant), commences on Monday next, to be repeated on each day of the week. We gave some information as to the principal points in the pageant, as well as some historical notes on Warwick and the neighbourhood, in the *Builder* of February 3 (page 113), to which we refer the reader. The pageant will probably be well worth a visit to Warwick.

ARCHITECTURE AT THE ROYAL ACADEMY.—IV.

In the way of domestic architecture there seems less than usual at the Academy of any attempt to produce house design with a distinct and dominating idea. There are various pretty sketches of houses of the irregular picturesque type, and to many persons, no doubt, this kind of treatment represents what is best and most fitting in a country house, rendering it what is called "homelike." To our thinking, this is hardly house architecture in the true sense of the word. In an old house a picturesque irregularity of grouping and outline is often very pleasing from association; whether it arises from additions made at different times and under different tastes, or whether, if built at one time, it is simply the expression of the naïveté of country construction in which each portion of a house has been put up just as materials and construction seemed to sug-

gest at the moment, and without much consideration of its relation to the rest. The plans of such old houses are for the most part as naïve as the exterior architecture, and, if considered from the modern point of view, often very inconvenient and ill-arranged; and in the case of an old house it is easy to pardon this, for the sake, again, of association. The irregularities and inconveniences are, so to speak, historically interesting. To what misunderstandings or accidents of building was it due that half of a long passage had to be boarded on a slope instead of level; or why was one of the bedrooms inconsequently floored with a 3-in. step up from the passage, over which the unsuspecting visitor trips on entering his room? These things do not annoy us in an old house; they are part of its history; but the visitor who tripped over such an unexpected step in a new house would possibly swear at the architect. Irregularity of exterior grouping, without any definite object, does not produce any physical inconvenience, and hence it is accepted as "picturesque"; but is it any more good architecture than irregularities of level are good building? Architecture is not naïveté, it is design; and there is no design in throwing a building into an irregular assemblage of brick or stone walling, timbering and plaster, battering buttresses where they are not constructively required, and gables introduced at random. We are not saying, of course, that houses should always be symmetrical in design; but that a symmetrical design should have an obvious motive, and should be design, and not either accident or with the appearance of accident. Irregularity of arrangement, for the mere sake of irregularity, is one of the easiest things possible, and is worth very little when it is done.

Hence we cannot attach any importance to sketches of houses with no plans, such as Nos. 1,390 and 1,397, showing the same house; the latter really a landscape sketch in ink line, with the house in the foreground. Mr. Langton Dennis's "House at Crowborough" (1,589), to which a plan is attached, is pretty, and the small colonnetted loggia at the top of the projecting bay is a nice feature. Mr. Schultz's "House at How Green, Hexer" (1,411), is an example of a house with an unsymmetrical plan which shows an original treatment. The plan is V-shaped, but with the right leg of the V longer than the other; it is here that the offices are added on. On the front, or the base of the V, there are two recesses, leaving a projecting bay in the centre, and on the first-floor level a balustrade balcony runs right across in a straight line. The dining-room and library form the base of the V; the billiard-room is in the left diagonal and the drawing-room in the right. The whole is both picturesque and well arranged; the perspective, in coloured chalks or pastel, is effective.

Mr. Compton Hall's "New Entrance Front, Dunham Masie" (1,399), shows a fronton attached to the front of the house, with three stories of orders one over the other, Roman Doric in the ground story, forming a framework to the entrance door, and Ionic in the two upper stories, the upper one of all being a dwarf order of low proportions. It is not a bad way of giving architectural emphasis to an entrance.

Mr. Percy Robinson's small "House at Chapel Row" (1,456) shows a nice treatment of a small symmetrical house, white rough-cast with a red-brick arch over the entrance recess and a high red-tiled nipped roof; no plan is given, but there is a pleasing simplicity about the exterior. Simplicity is what is wanting in the group of "Three Houses, Regent's-park" (1,441), by Mr. W. Henry White; there is no distinct motive in the design, and no plan is given. Mr. Prentice's "New House, Eglinton-drive, Glasgow" (1,454), is an example of a design with a definite treatment; this is a symmetrical house with a slightly projecting centre and pilaster projections emphasising the angles; both a plan and north point are shown, from which we see that the dining-room, with an apse, faces north, the drawing-room west—both these are good aspects; the morning-room faces south and east, the principal window south; east would have been better. The ground-floor windows are wide and comparatively low, with round-arched heads, and filled in with small panes; the round heads look very well

outside, but this form of head in a sitting-room sometimes leads to a little difficulty as to how to finish it and arrange the curtains, etc., inside. There is a high tiled hipped roof and a cornice of great projection; the slope of the roof is carried straight down over the centre projection of the wall, which does not look very well. It gives the impression of a bit being snipped out of a roof here, but this is a good exhibit in the main. "Houston Court, Kensington" (1,415), by Mr. J. D. Coleridge, is not exactly domestic architecture, but a block of houses in flats, in E-shape in plan of front, except for a ground-floor block of shops which runs straight along the front street line. The main building is treated with a stone front half-way up, and brick above, and is a simple and suitable design with no florid ornament about it. The same praise may be given to Mr. H. G. Todd's "Proposed House in Wimpoole-street" (1,431), a stone front, also very simply treated with the windows grouped within a series of vertical panels. Mr. Geoffrey Lucas's "Cottages at South Mymsms" (1,452) has the same merit as Mr. Prentice's house above-mentioned, that of showing a distinct and carefully considered treatment and not a mere random picturesque. It is a long block of white rough-cast wall with two stories of windows, stopped at each end by a block of red-brick wall slightly projecting, and with a simple decoration in bricks of a different colour; the entrance to the two centre houses is by a round-arched porch-entrance in the centre, to the two end doors in the brick pavilions; it is a cottage group which would at once be recognised as the work of an architect.

Mr. Arnold Mitchell's "House at Harrow Weald" (1,465) is simply a water-colour sketch of a rather picturesque cottage which might be either old or new—the sketch would suggest that it was an old cottage; and there is no plan to tell us anything about the arrangement or construction. This is a kind of drawing which, for all its reference to architecture, might as well be in the water-colour room. Mr. Hutchinson's "House on Hawkhill, Walmers" (1,482), is a picturesque design properly worked out in plan and elevation; it is very simply treated, with brick walls half-way up and rough-cast above, and a high tiled roof with a strongly-marked eaves cornice; the staircase hall is marked externally by a half-octagon bay with chequers of brick and stone at the top and below the main window; a small carefully-executed drawing of a very pleasing house. Mr. Baggallay's "Shenley Hill, Herts, as Rebuilt" (1,490, no plan), is a perspective view in line of what may be either a stone house or rough-cast walls with stone groins; it is a good example of an unobtrusive country mansion of the symmetrical order, with a projecting columned porch with a heavy broken pediment, and a carved shield and mantling on the wall above; it is very likely more attractive in reality than in the drawing. Mr. Ernest Newton exhibits a pen-line drawing of his "House near Godstone" (1,490, no plan), which was illustrated in our issue of May 12; in an E-plan in the front wall, with a wrought-iron railing round the flat over the centre porch and a large dormer above; a cornice carried all round, and windows with flat brick-arch headings; *simplex munditiis*. Mr. Horace Field's equally simple front of "Nos. 14 and 15, Great College-street" (1,501), is a good specimen of a street front suitable to its surroundings; it is apparently mainly a brick front shown on an elevation rather too much covered with lines which disturb its effect; a nice little point in it is that the two stone-framed doorways, symmetrically placed, have one a curved and the other an angular pediment, a difference in detail which gives a little character to it.

Messrs. Ernest L. George & Yeates's "Busbridge Hall" (1,540) was illustrated in our issue of May 19; it is a quiet domestic-looking building, as usual with them, the main feature of which is the recurrence of three similar projecting bays with balustrades at the top, equally spaced along the front, which the plan shows to represent respectively (on the ground floor) drawing-room, hall, and dining-room, which thus have all the same aspect and the same architectural expression; what the aspect is there is no north point to show. The same aspect cannot be equally good for all three,

and one would think the hall should be distinguished externally from the two rooms; but this is a case in which the expression of the interior is sacrificed to breadth and repose of effect, and there is something to be said for that; at all events, it is a very pleasant, quiet-looking house. Mr. Raffles Davison has a pretty sketch of "An Artist's Cottage" (1,538, no plan); and in Messrs. Cockett & Dick's "New Premises, Pilgrim-street, Newcastle" (1,546), we come on a rather bold and important bit of street architecture. The ground story is shops, with a strongly-marked lintel and cornice carried right through over the windows in two courses (but the stone beam over the wider windows must be clandestinely supported by a girder in the rear); over this a projecting bay, segmental in plan, runs up on each side of the front, ending under the boldly-projecting cornice; the horizontal cornice is stopped in the centre, and a high-pitched raking cornice of the same section springs from the top of it; with the exception of that deceitful stone lintel over the shops, this is a good and bold piece of masonic design. Mr. Voysey's "House at North Luffenham" (1,548, no plan) is another of the pretty sketches which are "merely that and nothing more," and the battered buttresses we are getting tired of; they are no longer a novelty, and we do not know that they have any, other special merit. Mr. W. H. Briery is to be commended for showing a plan of "Burrough Court, Leicestershire" (1,567); but there is not much distinction of style in the exterior. In Mr. C. T. Bathurst's "A Block of Business Premises" (1,569) we come on a good bit of street architecture of some originality; as this is simply the case of the treatment of a street front, a plan is hardly required. This is a plain stone front half-way up, and brick above, but with slightly projecting pilaster-like piers of stone carried up to the top; the windows are arranged so as to give character and variety, and this is a very good example of a plainly-treated street front with a certain individuality. Messrs. Oldrid Scott & Son's "House at Sunningdale" (1,573) is shown in a pretty water-colour drawing in which the effect of the green outside shutters to the windows, showing against the white hall, looks more French than English. Mr. Needham Wilson's "Springfield Dukes, Essex" (1,586), is evidently a pencil sketch of an old farmhouse with a pond in the foreground, and its proper place would be in the Black and White books; as Messrs. Silkock & Reay's "Cottage Homes, Churchhill, Somerset" (1,591, no plan), looks as if it ought to be in the water-colour room; it is a very nice drawing of an effect and a composition evidently suggested by Walker's "Harbour of Refuge"; but then we should like to know how the Cottage Homes are planned. Mr. E. A. Hunt sets a good example in giving both a pretty large plan and north point in connexion with his "Redlands, near Haslemere" (1,597); a picturesque house with low walls and high roof and some character in the arrangement of the windows. We may point out, however, that west is not a good aspect (in summer) for the large kitchen window, and the drawing-room would be rather deficient in light at the inner end. Mr. Figgis's two small water-colour sketches of two aspects of a "House at Bromley" (1,600) are simply sketches which do not tell us anything, except that the one with the high flight of steps makes a good little bit of composition. Mr. Lofthouse's "New Shipping Offices, Middlesbrough" (1,608), is a pleasing bit of street architecture, though the finish of the centre gable is rather heavy and awkward. Mr. E. T. Powell's "Great House Court, East Grinstead" (1,605), has a small plan which implies that it must be a new building, otherwise we should have supposed it to be a piece of curious old patchwork produced by additions at different periods. It is picturesque enough, and, of course, there are people who like this kind of quasi-ancient treatment; but it is not what we should call house architecture.

Among a few drawings of domestic interiors, Mr. Christian Eliot's "Dining-room, Byrkeley Lodge" (1,392), shows a dignified room wainscoted with dark wood, three-quarters of its height, with a portion of it cut off the common arrangement of two wall-

columns and a scuff; the centre part of the ceiling shows a circular moulded panel, decorated with that very high-relief naturalistic plaster foliage the fashion for which has been revived lately, and which we think bad art. The interior of the "Garden Entrance Vestibule" of the same house (1,507) we like better, because the detail of this kind seems less exuberant; it is apparently an oak-panelled apartment which, with its floor in large squares of black and white marble, looks very well. "An Interior" (1,525), by Mr. Thomas Johnson, is a good water-colour drawing of a room with Elizabethan detail. Mr. Charles Strange's small water-colour drawing of "Music-room at Beechwood" (1,448), rather slight and sketchy, gives an impression of a pleasantly-decorated room with white woodwork and a prevalent gold tint on the walls, but there is nothing to enable one to judge of the detail.

There is not much to speak of in the way of decorative work. The large drawing of a "Monstrance for Westminster Cathedral" (1,400) is showy and wanting in refinement, and, in fact, looks too much as if it might have come out of an ecclesiastical furnisher's repository. The drawing entitled "Decorations" (1,426), by Mr. E. J. Lambert, is a good piece of work showing the adaptation of late Renaissance painted detail to the surfaces and groins of a quadrangular vault, with designs of figure subjects in the lunette. Mr. Weatherley's "Font Counterpoise weights, Longborough Parish Church" (1,429), we suppose represents the application of modern wrought-ironwork bracket, chain, and counterpoise weight to an existing font-cover; an elaborate piece of ironwork, perhaps better if it had been a little simpler. Mr. Walter Keith's "Design for Golden Chalice of the XVIII Century Period for the New York Cathedral" looks well at first sight and as to general line and effect, but some of the detail is by no means good; for instance, the lower part of the exterior of the bowl is covered with a miniature representation in relief of a late Gothic screen arcading, buttresses and all; of course distorted in line on a convex surface, and in every sense a total misapplication of detail. Mrs. Ostrahan's two drawings of figures for stained glass, "St. Matthew" and "St. Thomas" (1,463, 1,466)—figures on what may be called a background of square leaded lights, look very well; so does the simple window design for the peristyle of the dome in the City Hall, Belfast (1,443), by Mr. J. C. Bewsey; a window divided into upright panes by thick strongly-marked bars, with a wreath and symbolical device in the centre of the upper portion. Mr. J. J. Stevenson's "Monument in Largs Cemetery, Ayrshire" (1,472), looks very well in the drawing in which it is shown standing in the foreground of an extended landscape. The monument is a classic erection on this plan, with two columns standing free at the two outer ends and solid piers at the re-entering angles; the space between these is partly occupied by a screen and inscription tablet, leaving an open space above it. It is a good and rather novel piece of monument design.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The last ordinary general meeting of the present session of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, W., Mr. John Belcher, A.R.A., President, in the chair.

The minutes were taken as read, and the following gentlemen were introduced to the Chairman after their election as Fellows, *i.e.*, Mr. R. Sheekleton Balfour, President of the Architectural Association; Mr. H. P. G. Manle, Master of the Architectural Association Day School; and Mr. W. A. Forsyth.

Deceased Members.

Mr. Alexander Graham (Hon. Secretary) announced the decease of the following gentlemen, *i.e.*, Mr. A. Mossley, aged 94, of Fulham, elected an Associate in 1838, a Fellow in 1850, and who was placed upon the retired list in 1902; and Mr. Philip Wilkinson, London, elected a Fellow in 1890.

Presentation of the Royal Gold Medal.

The Chairman said:—"Ladies and gentlemen,—I count myself peculiarly fortunate in

that it falls to my lot to-night to present the Royal Gold Medal to so great an artist as Sir Lawrence Alma-Tadema. You know how sincerely I have desired, how earnestly I have striven, to effect a close relation between the arts, to bring the painter and the sculptor into association and collaboration with the architect for the achievement of the noblest results—results which shall be a triumph of art in its unity and entirety. It is a very happy occasion for me, therefore, when I am called, on behalf of this Institute, to do honour to a man like Sir Lawrence, who is not only one of the first of living painters, but has also shown so fine an appreciation and so great a knowledge of architecture—both on its artistic and its practical side—that it has been said that if choice or destiny had not determined him an eminent painter, he might have been a still more eminent architect.

The gold medal presented by the King is, as you are aware, conferred annually upon one who is recommended by this Institute and approved of by His Majesty as having designed or executed a building of high merit, or as having produced a work tending to promote or facilitate the knowledge of architecture.

Our distinguished member, Sir Lawrence Alma-Tadema, is qualified on both grounds. Indeed, he has rendered such good service to our art—indirectly for the most part it is true, yet not the less substantially and really—that, though he is known to the world chiefly as a great painter, the Institute has felt no hesitation whatever in presenting his name to the King for the Royal Gold Medal; and His Majesty has, with equal readiness we believe, recognised Sir Lawrence's merit and graciously approved the Institute's choice.

We have all admired the fine architecture which is so beautiful a feature in many of Sir Lawrence's pictures. Before we speak of that, however, let me tell you, what probably some may not know, that Sir Lawrence is an architect. If you have had the privilege of examining the house and studio which he has built himself in St. John's Wood, you will have recognised the hand of a master in every part of it. Not only is it an interesting and delightful building for the ordinary visitor, full of beautiful features which meet you and surprise you at every turn, but it possesses also many details which are worthy of the architect's careful study. The smallest and most insignificant details, in fact, such as would probably escape the layman's attention altogether, have received an amount of thought and care which is both unusual and suggestive. I learnt much that has been useful in Sir Lawrence's house, and its many novel and effective features impressed me greatly. If you ask me what "style" it is—rather an incautious and self-betraving question—I reply, "It is real Alma-Tadema," and that means, at any rate, that it is instinct with life.

"To copy and imitate is death to art" is one of Sir Lawrence's principles, and though his archaeological knowledge and skill are beyond dispute, and in respect of certain periods and countries unrivalled, yet in his own house he has known well how to be original—both in the arrangement of the plan and in the adaptation of forms and materials to his particular purpose. All is fresh and beautiful, and parts of the house possess a character and environment which would make a Roman of the times of the Empire feel quite at home—even in St. John's Wood. I say a Roman advisedly, of course, because, as we all know, ancient Rome has been Sir Lawrence's chief theme as a painter. He has, I believe, saturated himself with the beauties and glories of Italy—as that great country was before its sun went down. He is probably the first living authority on the art work of Greece and Rome, and that not merely on the æsthetic side, but on the practical constructive methods that were then in use.

His research has been of the widest scope. He has not been content with studying the grand structures and remains of ancient buildings. He has ventured amongst the tombs, both Etruscan and Lycian. He has had an eye for Assyrian bas-reliefs, terracotta slabs, and all those miscellaneous relics which are to him who knows how to read them a revelation of the history of the past,

an index of the power and spirit of vanished nations. This is how it is that Sir Lawrence has been able to use his great gifts to portray for us the architecture of the past, particularly of Rome, in all its magnificence. He is never satisfied with a mere suggestion or rough indication of a building. Every single detail, each moulding or other ornament, is most carefully and truthfully set forth. It must be the best of its kind, too—something selected for its beauty, and finished and refined with perfect taste. What a wealth of material, too, he employs, and how he revels in the expressive qualities of each kind! Has anyone else presented, or will anyone ever present, the translucent properties of marble so well as he? Whether it be marble, stone, bronze, or silver, he has studied the forms most suitable to each, and everything may be perfect both in form and colour. And then he portrays the whole for us under the sunny skies of Italy, that the beauty of the artist's work may be lighted up and intensified by the beauty and glory of the world of nature!

As an indication of the interest that Sir Lawrence takes in other forms of art than that which he has made expressly his own, I may cite two well-known pictures of his. "Architecture in Ancient Rome," in which he depicts the architect engaged on his work, and another in which the sculptor Phidias is represented putting the finishing touches to the Parthenon frieze and explaining it (apparently) to his friends and patrons. He has also given us a picture of a sculptor's studio and a corresponding one of a painter's studio.

Architecture figures more or less conspicuously in quite a large proportion of Sir Lawrence's paintings, as you may see by the photographs which he has kindly lent for your inspection this evening. In some it is quite a (if not the) prominent feature, as, for instance, the picture in which he has reconstructed the Roman Colosseum, and another representing the Baths of Caracalla in all their splendour—magnificent paintings, both of them, impressing us with a conviction of the absolute accuracy of every detail, such as only an architect could reproduce.

I must not attempt to speak of all Sir Lawrence's paintings that contain architectural accessories—a bit of an exterior in this one, a bit of an interior in that, and so on—pictures in which the architectural element is naturally and properly limited, and made subservient to the figures in the composition. But this I should like to say, that, however much, or however little, may ultimately find place in the actual canvas, it has all been carefully planned and set up in section first.

There is one of Sir Lawrence's pictures which presents a complete architectural work, filling indeed the major part of the canvas. I refer to the painting known as "Down the River," which contains the whole of a well-designed bridge of five arches, a reconstruction—idealised no doubt—of the celebrated Bridge of Augustus at Rimini. The four piers contain good-proportioned niches occupied by bronze statues, and framed with column, cornice, and pediment. The parapet is perfectly plain, and, like the arches, without moulding. The bold cornice which separates parapet and arches is horizontal. The arches vary in height, and evidently follow the curve of the roadway. Over the centre arch is a raised stone block panelled for lettering, and above that again a recumbent river-god. At one end of the bridge may be seen an arched entrance to the roadway. The whole treatment is simple and dignified, and the effect of the long horizontal line of the cornice is particularly good.

But as a wonderful illustration of Sir Lawrence Alma-Tadema's architectural knowledge, and the clearest proof of the practical value of his archaeological researches, I desire to direct your attention to the series of designs which he made for Sir Henry Irving for the scenery to illustrate Shakespeare's play of "Coriolanus." Here we have whole buildings, and even groups of buildings, exteriors, and interiors presented with a marvellous appearance of solidity, and marked, not only by a wealth of beautiful detail, but also—which is perhaps more wonderful—by complete constructional fidelity.

Mr. Phene Spiers, writing of these scenes in the *Architectural Review*, makes a point of the constructive genius displayed in them, and remarks that Sir Lawrence's "interpreta-

tion, based on the most profound archeological research, of the variety of design in Etruscan architecture comes to us virtually as a revelation." Quite apart from the beauty of the colouring or the picturesqueness of the grouping, the actual designs fill us with admiration. In the Roman Forum scene, for instance, as shown in the original drawings, Sir Lawrence has reconstructed the Forum buildings for us after a manner which we instinctively feel is absolutely true, not only to the general form and spirit of Roman work, but also to the particular period in which the play passes; and as for detail, even the construction and framing of the timbers are carefully shown.

In the widely-projecting timber eaves which constituted a striking feature in the typical Etruscan Temple the artist has treated a somewhat difficult problem. This great projection (over 7 ft.) of the beams which support the boarding of the roof and gutter was intended to protect the wall decorations beneath them.

But these single beams, relatively to the whole, looked thin and weak; so Sir Lawrence added two extra ones underneath, of shorter length, thus dividing the projection into three parts. He also terminated each timber end with a bracket, just as we see in some of those old ceilings where the joists are exposed and the span is great. Mr. Spiers, himself no mean authority, speaks of this treatment as both original and effective. Then there is the house of Tullus Alfidius—a beautiful design with a projecting and overhanging balcony of wood, full of detail, evincing great technical knowledge. The charm of the whole scene in which this is presented will not easily be forgotten. In another scene there is a very striking entrance doorway or projecting portico, the upper part of which, covered in by a semi-circular roof of bronze plates, forms a kind of outlook. The constructive timbers, with their tenons and pins, are all carefully shown in this design. The general form has been probably suggested by some old tomb, but the details are fresh and original.

Amongst the beautiful interiors presented in these designs we may mention the Senate House and Coriolanus's house. In the latter the excellence of the plan, the beauty of the colouring, and the effects of light and shade attract our attention and excite our admiration. The arrangement of the Senate House is simple and without impressive. The beautifully-moulded square Etruscan piers, enclosing the hemicycle of stone seats ranged in tiers above one another, are very fine in scale, their apparent size being increased by their contrast with the small figures of the projecting Etruscan frieze above. Between the piers and the frieze is an architrave marked by a curious and effective square block corbel.

I have indicated a few of the most striking features of this wonderful series of designs, but no words of mine can convey any adequate conception of the amazing wealth both of knowledge and of skill to which they bear witness. When we consider the many and varying elements which go to make up their truth and their beauty, we can only wonder that they all fall within the scope of one man's powers. To one of the rarest of gifts as a painter Sir Lawrence Alma-Tadema adds the powers of a great architect, and endows all his work with a perfection of taste and a fulness of knowledge which in their combination are unrivalled.

The rising generation, who are not too old or too proud to learn, may profit much by Sir Lawrence's example. He has shown to all men the immense importance of accurate and careful detail. He is a living witness to the truth that the ultimate refinement of all work depends upon the amount of thought and study bestowed upon each and every part. Furthermore, all his work is an illustration of the right and true use of archeological knowledge. Though he is well versed in all the forms and details in use amongst the Romans, he has not been content merely to copy and imitate their work—he has advanced it along the old lines, after the traditional manner and in the true spirit of the original. He has not cast aside the experience of the past, but has shown us how it can be rightly used and carried forward. His work has given us a true insight into the methods by which alone our beloved art can be advanced and made to live.

In the presentation of the Royal Gold Medal we recognise and acknowledge Sir Lawrence Alma-Tadema's services to architecture—in promoting a knowledge of and quickening an interest in it—and we are glad to be thus permitted to honour him. He has had many honours conferred upon him. He is the possessor of the Order of Merit. He received his first gold medal at the age of twenty-six; I am not sure how many he has received since. But not one of all the many distinctions that have been conferred upon him has been bestowed with more heartfelt pleasure and more real esteem than the medal I have now the honour of presenting."

The President then conferred the medal upon Sir Lawrence, who was received with great applause.

In acknowledging the gift, Sir Lawrence said—"The sun has often shone upon me in the course of my life, but it has never warmed me more than at this moment, when the apostles of architecture have bestowed upon me that great distinction, the Royal Gold Medal, for services rendered to the well-beloved sister art. Our kind President has honoured me by explaining to you my connection with architecture; and I am proud to think that my services to an art which I love beyond expression have been thought worthy of consideration, although, when I compare my achievements with my love, it seems to me that I have done very little."

The sister arts have always appeared to me indivisible—different parts of a single whole; and I realise that from this point of view I might be regarded as a link of some interest, my own particular art being so closely concerned with architecture that I was myself at times almost tempted to believe I knew something about it! It would no doubt be enlightening if we could point out to one another the causes that lead us each to his peculiar bent in the pursuit of a common ideal; but none of us really knows what impelled him to choose a certain pathway in the kingdom of art.

Art is so manifold in its aims and expressions that it seizes every one of us in a different way, and yet in the same way; it seems to take possession of us, and forces from us different expressions of the same truth. What this truth is no man has yet been able to define; it always seems to me that art is an expression of the human mind which exists merely because it is an expression of beauty; and, to quote Winckelmann's fine definition, "Beauty is one of the great secrets of nature, of which we all behold and receive the influence, but of which a general and clear understanding belongs to the eternally unattainable truths." Indeed art is a thing about which one cannot speak or reason; yet it is a thing that fills one with emotions and expressions which one spends one's life trying to communicate to one's fellow-creatures, in the silent language of one's craft; if once art has a foothold in a man's nature it masters him, and forces him to do this. It convinces him that he is bound to do this. It communicates his impressions, that he may not keep them to himself, and that there is no happiness for him unless he can share with all the world that which possesses him so deeply. Every artist is conscious, therefore, that he has little to say concerning his artistic aims and ideals beyond what can be read in his work.

I have taken the liberty of showing you, by permission of the President and Council, a few reproductions of my pictures, in order to prove to you how greatly my mind has always been pre-occupied by architecture in the execution of my own art. I should, of course, have preferred to show you the pictures themselves, but, with the exception of a few, they are all abroad. You will see that in some I have tried to reconstruct antique buildings; in others I have been concerned with the proportions of figures to architecture—I am even showing you a composition of a Gothic entrance to a cathedral, exhibited as long ago as 1857, to prove to you that my very beginnings were architectural; and a painting of the Church of San Clemente in Rome, dated 1863, will show you that during my first visit to Italy, at a moment when I was steeped in studies of the Merovingian period, I was mainly pre-occupied by the study of Early Christian churches.

I cannot sit down without a sincere expression of gratitude to the President for his

all too kind words of goodwill towards me and my art; and to you, ladies and gentlemen, for the way in which you have sympathised with me in the receipt of this honour, which, I am happy to feel, has met with the approval of His Majesty."

In the Meeting-room there was a large collection of prints and photographs of the artist's work, in some form or other representing architecture, which had been lent by Sir Lawrence Alma-Tadema for exhibition, and some of these, on the invitation of the Chairman, Sir Lawrence said a few words about.

The President.

Sir Aston Webb, R.A., said he desired to propose a vote of thanks to the President for the two years of office that he had served so well. "We are very proud," said Sir Aston, "of having Mr. Belcher as our President—both as President, as an architect, and as a man. We feel that, as our President, he has guided our affairs with discretion—and it has required some discretion to guide us safely through these last two years. He has guided us in such a way that he has made all members of this Institute friends, and therefore he cannot have made one enemy. As an architect we all honour him for his work, and, if I may say so, for the individuality which is shown in his work. He has worked on traditional lines, but in all his buildings there has been the individual character of Belcher himself visible from beginning to end of them. That is the character that we look for in all good work, and that is the main character that I think you will like me to emphasise in our President's work. As a man, I will not venture to say much. He is my friend, and he has always been faithful and just to me, and he has been faithful and just, I know, to everyone with whom he has had dealings. Nothing more can be said, or need be said, about a friend. I will ask you to extend this vote of thanks with the greatest enthusiasm, which I know you all feel to Mr. John Belcher, our President, for the arduous two years he has served us. It is a pleasure to find that he is quite well and fit again and ready to carry on that arduous undertaking of entertaining something like 2,000 foreigners and Englishmen whom we hope to see next month at our Congress."

Mr. John Slater said: "No words are necessary from me to supplement the remarks made by Sir Aston Webb in proposing the vote of thanks to our President, Mr. Belcher; but as, I am sorry to say, I am the oldest member of Council, I should like to second this vote of thanks and to express my appreciation and the appreciation of all the members of Council for the tact and urbanity he has always shown in presiding over our deliberations. We must not forget one of the greatest services Mr. Belcher has rendered to the Institute in bringing back within this fold a large number of architects whom we were always very regretful to have parted with, and whom we welcome here with open arms again. That is one of the greatest services Mr. Belcher has done, and I have the greatest possible pleasure in seconding the vote of thanks."

The vote of thanks was then heartily agreed to.

In reply, Mr. Belcher said he remembered that when Sir Aston Webb spoke to him about following him in the chair that he had so worthily filled, he (Sir Aston) said, "I can assure you I have had a very pleasant time." "I looked at him with immense surprise," said Mr. Belcher. "I could not believe him, and it was with great fear and trembling that I accepted the position; but I am bound to say that I have had a very pleasant time, and I have enjoyed myself very much. But I believe it is more to your good nature and constant support, especially the members of Council, and the way in which our worthy Secretary and the staff have always helped me. I have had no difficulties, and everyone has been most kind and lenient to me. I thank you sincerely, and I beg you to support me in the extension of my time of office through the Congress. I shall have need of your help. I am sure, and I hope the attendances will be good and constant at all the meetings, and that you will do your utmost to make the Congress a pleasant one to our foreign guests."

The meeting then terminated.

SOCIETY FOR THE PROMOTION OF HELLENIC STUDIES.

THE annual general meeting of this Society was held in the Rooms of the Society of Antiquaries, Burlington House, on Tuesday, Professor Percy Gardner presiding.

Mr. Geo. A. Macmillan read the annual Report of the Council for the session, in which reference was made to the death of Sir R. C. Jebb, the President. An important departure in the constitution of the Society by the creation of a class, to be known as Student Associates, was recommended by the Council for adoption. They had long felt that there was a class of younger students specially interested in the objects of the Society, and likely by inclination and training to be useful members, who were debarred by the entrance fee from coming forward as candidates. They had endeavoured to devise a scheme which should confer a boon on the class in question, and inflict no injustice on those who had already assumed the full responsibilities of membership. This could only be done by giving part privileges for a part payment, and in the scheme produced they believed that this intention was achieved in the fairest manner possible to the largest number. The annual grants of 100*l.* to the School of Athens and 15*l.* to the School of Rome had been renewed for a further period of three years. The School at Athens had now transferred its operations from Crete to Laconia, and Mr. Bosanquet was to be congratulated on the success which had already attended the excavations on the site of ancient Sparta. One hundred and sixty-two volumes and 164 pamphlets had been added to the library.

With regard to finance, they were able to report a surplus of 172*l.* The appeal on behalf of the Endowment Fund had resulted in the receipt of 357*l.* 10*s.*, and to this was to be added a bequest of 200*l.* from Canon Adam Farrar, which was the first legacy the Society had received. During the year forty-two new members had been elected, and twenty-four had been lost by death or resignation. The number of members at present on the list was 951, and there were in addition 170 subscribing libraries and forty hon. members. On the whole, the Society could look back on a successful year, but it was hoped that members would bring in new candidates in order that the Society might be in a position to meet the increasing claims made upon its resources for the promotion of Hellenic research in every department.

The Chairman, in moving the adoption of the Report, first made reference to the losses the Society had sustained by death, and said that he considered it better, instead of being impartial and comprehensive, to select for consideration "two or three of the more important recent discoveries which had been made in the branch of Hellenic learning which was concerned with the artistic remains of ancient Greece. As a matter of fact, although excavations had proceeded in many cleared sites—Ephesus, Lindus, Pergamus, and Miletus—striking discoveries this year had been few. Nothing, perhaps had been fresher, or given greater hope for the future, than the discoveries made by Mr. Bosanquet and his colleagues of the British School of Athens at ancient Sparta, a site now handed over to them as a lasting place for research. Of all spots in the world the Athenian Acropolis was dearest to phil-Hellens. During the last year that sacred spot had somewhat changed its appearance through the partial restoration of the Erechtheum. No question had been more earnestly discussed in archeological circles in recent years than the propriety of rebuilding in some measure the partly-surviving temples of Greece. Opinions on the subject had differed widely, but at the Archeological Congress last year it appeared from speeches made by Dörpfeld, Homolle, and others that something like a working agreement had been arrived at to the effect that existing stones should, when their former position in the edifice was known, be restored to the buildings, and modern work, undecorated, should be added only when there was a necessity to support ancient work. Such strict rules were unknown when Ross put together the little temple of Wingless Victory out of the ruins of a Turkish bastion. Yet he thought that most of them felt a debt of gratitude to

Ross. Their modern responsibilities were more burdensome, but M. Homolle had succeeded in reconstructing, at Delphi, the treasures of the Cnidians and of the Athenians, taking but very few liberties, the cella wall of the temple of Apollo, at Bassæ, had been in part rebuilt, at Olympia two columns of the Heræum had been set up, and the venerable lion of Charonea had been re-erected. The Parthenon had only been so far repaired as was necessary to prevent it falling, and, curiously enough, the question of the moment in regard to that most perfect of Greek shrines was not whether more pillars should be set up, but whether some of the sculptured frieze which still remains *in situ* should be removed and placed in the museum since it was visibly perishing by the action of the climate. Such a removal was advocated by most of the European archaeologists, but naturally the Greeks did not want it carried out. He imagined that that put an end to any question of the restitution of the Parthenon sculpture in the British Museum to Athens, because it was quite clear that we should not send them back to be placed in a museum. But the greatest interest attached, as he had suggested, to the recent attempts at the legitimate restoration of the Erechthion. The west wall of it was first set up, and then the east end with its great porch was taken in hand. It was remarkable how practical work on a building sharpened the eyes of those who studied it. For half a century past the Erechthion had been the subject of numerous treatises, but now they seemed to have reached a new level. Dr. Dörpfeld, in one of his astonishingly persuasive papers, had maintained that the original plan of the building was cruciform; in the middle, running from side to side, a corridor flanked on each side by an important shrine—on the one side the temple of Athens and on the other side that of Poseidon. But even Dr. Dörpfeld's study of the remains of the temple did not lead them to the true reconstruction of the east end, which was the discovery of a young architectural member of the American School—Mr. Stevens. In the course of trying to assign to its original place several surviving stones of the edifice Mr. Stevens found certain fragments decorated with a beauty for which the Erechthion was almost unique, which must have been part of two windows opening on either side of the eastern entrance door. This had made the restoration of the east end possible. With characteristic generosity Dr. Dörpfeld had not spared his praise of his young colleague. If one had to select amongst works of classical archaeology published during the year the book most worthy of mention one could not hesitate—it was the great work in which Professor Furtwängler, with his colleagues, Dr. Fiechter and Dr. Thiersch, had published the results of his excavations in Aegina. The previous excavator of the great temple at Aegina was the English architect Cockerell, who had done excellent work, but in archaeology, as in mining, they reaped ample reward by re-examining by the help of modern methods the waste products of former industry. Professor Furtwängler had found evidence to his (the speaker's) mind entirely convincing that the temple of Aegina was dedicated either to Zeus nor to Athene, but to an obscure goddess called Anphia. He had discovered the foundations of an altar, the propylon, and other buildings of the sacred enclosure, and, above all, he had secured considerable further remains of those wonderful pedimental sculptures which were the pride of the museum of Munich, and which gave one in as high a degree as any extant work of art the impression that they belonged to a race at once hardy and artistic, and at once truthful and lovers of the ideal. Combining the new fragments with those already at Munich, Furtwängler had made an entirely novel arrangement of the two pediments, and from the plates which were exhibited in the room it could be seen how far more striking was the new grouping of the warriors who fought on either side of Athens than that which had passed as authoritative for the last century. He would say nothing of the achievements of the British School, as that body would have its own meeting in the autumn.

Mr. Pearse seconded the motion, and the Report was adopted.

On the motion of Mr. Macmillan, it was

agreed that the President of the Society be elected for a period of five years, and should not then be immediately eligible for re-election.

Mr. Cecil Smith (Keeper of the Department of Greek and Roman Antiquities in the British Museum) gave a short illustrated communication on the pediments of the Parthenon, in which he discussed the central groups in the two pediments, and pointed out that it had entered a new phase since the discovery recently made that they must remove one of the figures from the east pediment to the west.

PRESERVATION OF PLACES OF HISTORIC INTEREST.

On Tuesday, by permission of the Duke of Westminster, the annual meeting of the Council of the National Trust for Places of Historic Interest and Natural Beauty was held at Grosvenor House, under the presidency of H.R.H. Princess Louise.

Mr. L. Harcourt, M.P. (Chief Commissioner of Works), in moving the adoption of the Report and accounts, said they would agree that the National Trust and the First Commissioner of Works were brothers in arms in defence of places of historical interest and of natural beauty. They had to fight for the preservation in their respective spheres of objects which every Englishman would wish to be preserved. Their functions did not overlap, but they interlocked and supplemented one another. He was not able to buy places of natural beauty or artistic merit, and was limited by Act of Parliament only to historic monuments. The National Trust, on the contrary, had a larger field, and by the aid of the generous and confident public were able to do more for the nation in many ways. They had saved Gowbarrow Fell and had become Lords of the Manor of Hindhead, with its appendages of the Devil's Punch Bowl and Gibbet Hill—sinister names, but places of singular beauty. They had also managed to coerce his colleague, the Postmaster-General, on the subject of telegraph-poles, and he expected that Mr. Buxton, with his well-known affection for nature, was a willing victim to their friendly threats. They were taking steps to preserve and protect bits of Malvern Hills and the Pass of Aberglaslyn, both of which he knew well and greatly admired. They had still open an option on Derwent-water, which he hoped the generosity of the public would enable them shortly to complete, because it was a district instinct with literary associations as well as of scenic beauty. He hoped they would realise the assistance which was given in the case of historic monuments by the Office of Works. A great deal of energy had been employed by the higher staff in his office in helping to preserve these objects of historical interest and antiquity, and the time given was not in office hours. Only a few days ago Sir S. Macdonald and Mr. Fitzgerald at his instance used their short Whitsun holiday in visiting the Orkneys, and the result was that the standing stones of Stennes, which were the Stonehenge of Scotland, had been transferred to the guardianship of the Office. They had also recently taken over the care of the Edwardian walls and Elizabethan ramparts of Berwick-on-Tweed, and he thought they would all agree that the method of conservation of Carisbrook Castle and other places showed an intelligent appreciation of the needs of these great works. Unfortunately, however, the powers of his office were limited by an Act of Parliament, and he had but small resources. The expenditure of the Chancellor of the Exchequer allowed little for archaeology or art, and therefore they had to depend upon individual effort and upon private and public generosity. It would, however, give him the highest pleasure to work with them as a fellow-worker for the preservation of those objects which they all desired to preserve.

Sir Robert Hunter (Chairman of the Committee), in seconding the motion, said that the Report showed that the past year had been one of considerable achievement on the part of the Trust. At the commencement of the year they owned about 180 acres of land, and at the present moment they had purchased, or were in course of purchasing, acres which would bring their possessions up to about 1,700 acres. They had not only

bought Gowbarrow, but also Hindhead. There was no doubt but that they wanted wild places like Hindhead at the present time. At a time when the needs of men lead to the aggregation of the population in a few centres it was good and refreshing to be able to escape from the buildings and scenes of the town and come in contact with wild and untutored nature. Of course, Hindhead itself had been considerably tamed in the last twenty-five years. Owing to an advertisement given by Professor Tyndall, but never contemplated by him, a number of cottages and houses had been erected on land which was enclosed about fifty years ago before the Commons Preservation Society had woken to life. Happily about 750 acres of land were still left open and unenclosed, and the Trust had acquired that land. It was manorial land, and the Trust had acquired the rights of the Lord of the Manor. Owing to it being impossible to build on the land the Trust acquired it for 5l. an acre, whereas Gowbarrow cost them 18l. an acre. Hindhead was bought through the agency of a local committee, and the purchase was made possible by the generosity of a lady who at the sale guaranteed a further sum of 500l. They were anxious that that lady and other public-spirited guarantors should not be called upon to pay the whole of the sum they guaranteed, and they wanted about 400l. to relieve them of the burden. He was glad to hear how much had been done in the direction of preserving buildings of historic interest by the Board of Works. In that branch of their work the Trust had an undertaking of greater moment than any they had yet attempted, as they were in course of purchasing one of the great houses in England. There were few of them who were not sensitive of the extreme beauty of those noble houses of the Tudor Period, one of the most beautiful was Barrington Court, in Somerset. The condition of the house was somewhat peculiar. For the last two centuries it had been in general decay, and the owners had shown their interest in it by removing every scrap of wood from the inside. One wing of the building was inhabited by a farmer and the other by mice and bats. The façade of the house was, however, still intact. Its noble lines and mullioned windows and beautiful chimneys were still in the state substantially in which they were built, and a very little repair would enable the façade to be preserved in perpetuity and in the same condition as it was when the ill-fated Duke of the battle of Sedgemoor, which was fought close by. They had had for the purposes of their work 24,200l., and of that sum they had actually spent 11,400l., leaving a balance of about 13,000l., which was a little more than the amount required for the purchase of Gowbarrow. The revenues from their property yielded a little more than the cost of maintaining them.

The Report was adopted.

Mr. T. G. Jackson proposed the election of the members of the Council for the ensuing year, and, referring to the work of the Trust, said that in connexion with South Kensington the ceilings of two cottages were offered for sale. He thought it was a mistake to take such ceilings away from their surroundings, and suggested that it would be better for the National Trust to purchase the cottages and other properties of the same kind from time to time. As such properties could be let it would be a sound investment. Ancient buildings, such as Barrington House, would in France be considered national monuments, and would be brought under the guardianship of the State. In England, such matters were left to individual effort, and in the National Trust they had an organisation which was adapted for exercising guardianship over such buildings.

Professor Baldwin Brown seconded the motion, and remarked that the Council was trying to see if they could bring into line all the different bodies which had similar aims to the National Trust, so as to bring certain pressure to bear on Parliament to get a Commission appointed to see how best these valuable assets of the nation could be dealt with.

The motion was carried.

Canon Rawnsley moved:—"That the time has arrived when a constitution of high authority and more suitable character should be conferred upon the National Trust for

Places of Historic Interest or National Beauty, together with larger powers in relation to the protection and management of the property which the Trust holds for the nation; and that the Council be, and it is hereby, requested and authorised to take such steps to secure those objects as it may deem expedient." He pointed out that under their present system they were unable to deal with important questions of making by-laws for the government of their estates. Although they were only at the beginning of things they had now estates of 17,000 acres, worth about 25,000l., and they required to make by-laws for their preservation. They asked therefore for a Royal Charter, and would require a short Act of Parliament to obtain power to make by-laws to safeguard these properties.

On the motion of Mr. C. Brinsley Marley, seconded by Mr. Shaw Lefevre, a vote of thanks was passed to Her Royal Highness for presiding.

Her Royal Highness Princess Louise briefly replied, and said she felt that the Trust was doing much for the welfare of the country.

A vote of thanks to the Duke of Westminster concluded the proceedings.

PROFESSOR PITE ON ARCHITECTURAL STUDY.

The closing meeting of the Architectural Association Studio was held on Monday, June 18. An interesting exhibition of work executed by members of the studio during the past session had been arranged, and a large number of students and members of the association were present.

Professor Beresford Pite addressed the students. He said: "I have come this evening prepared to say something with regard to the present state of study, which I have a lingering suspicion are directed towards the examinations in these days. So far so good, but I cannot help feeling that a critical point with the examinee is, 'Who is the examiner?' and the absence of comfort on this point destroys to some extent the value of the examination system. An examination to be really useful can only be conducted by the person who teaches. Examinations have uses we all know. The system is not the best for the architect or artist, but unfortunately in these days we have to get through examinations, so we must make the best of the system, and, in directing our studies in some really useful lines, prepare the way for effective architectural study."

"With a view to becoming a really good architect, what lines ought I to take?" First, the study of good buildings. Every building is the expression of definite thought, therefore I must put my thoughts as far as I can alongside the thoughts of the builder. Get in the position mentally of him who built. Use every building as I would a book. The book expresses on paper, with set type and in words and grammar common to the language which the author uses, clearly and unmistakably the individual thoughts of the writer. The building in like manner is a book in which the construction, the composition, and the details are the words, the form, and the grammar.

We read a book—Homer, Virgil, Shakespeare, Molière—not to study the printer's type, the words, and the grammar and to copy them, but to get in touch with the writer's thoughts. The thoughts of the author are the "man" in the book, and as the mind of him who writes comes in touch with him who reads the book, sympathy of thought arises. As in literature, so in architecture, painting, and the arts of design. It is useless to study form without a clear conception and understanding of its purpose. For instance, mouldings is more insane than to copy Gothic mouldings without taking note of the material in which they are executed. We may as well try to imagine taking Paley's "Gothic Mouldings" and executing them in stucco. Learn nothing without learning the thought which produced the form. To study the development of Gothic art without relation to its cause is absolutely useless. Until this day we lack an effective history of English Gothic architecture—a history of definite thought and purpose. The result of bestowing the attention on form and style has been that the buildings of the Gothic

Revival and of the present-day Renaissance are nothing more than mere feasts of ornament. It has become the thing, after drawing from a Gothic or Renaissance picture book for some four or five years, to send in designs for competitions—designs which are copies, but to which no intelligent study of the thought which underlies the architectural expression is given, and the result is comparable, say, to copying the Farnese Palace in stucco. Get beneath the forms to the motives of the designers who made them, and find out how they thought, and by a parallel process we should be able to transmute XXth century thought into our designs.

The study of thought in Greek architecture is the most difficult of all; the thought is so far removed from that of our own day. It is difficult to understand the mental position of men who could build on the same hill within a short distance of each other and in the same generation the Parthenon, the Erechtheion, and then the Propylea. We look at the Parthenon's Doric severity, with its exceedingly flat, delicate, and yet strongly defined mouldings. This could only have been built by men Spartan in type. Let us but turn our heads and we see the Ionic Erechtheion, a building so entirely different, almost effeminate in effect, and with ornament repeated almost to redundancy, and then we have the Propylea, with the two brought together. But upon investigation we find that the Doric is European in origin and the Ionic Asiatic, and, spreading the one east and the other west, they meet here, the two coming together forming the elaborate architecture represented in the Temple of Diana at Ephesus.

The Roman work is not so difficult to interpret. The Romans were a great constructive nation, but they were not artistic, so they employed the Greeks to do their architecture for them and set them to pile order upon order, and we find detail running riot, while in the Pompeian decoration we see Greek fancy set loose.

In the dark ages following the destruction of the Roman Empire new methods are seen growing up, first markedly developed in the Basilica of Constantine at Constantinople—a domed architecture. This new development is delightful to watch—the erection of domes first on circular, then on square plans, and lastly supported by grouping other domes around, as at St. Mark's, Venice. No further possibilities of geometric form in domes remaining, domed vaulting ceases about 1000 A.D., practically with the fall of the Byzantine Empire, after which the Turks come and, as they always do, chop up the old buildings and use the bits as best they can.

We now turn to the development of Gothic art, and, taking England as our most accessible field of study, we find that at the time of Augustine we have the Saxon buildings, with their homely arrangement of wooden logs, soon replaced by crude stone architecture. We must bear in mind their limitation of material, and the fact that the masons had nothing to copy in their carving; they knew nothing of the arts of Greece and Rome. At times they attempted to imitate in stone the goldsmith's and embroiderer's arts, as seen on a chalice or vestment, or they attempted to copy their ornament from the illuminated manuscripts of the time.

After the Norman Conquest the quarries of Caen were thrown open to the Saxon, and materials became to a certain extent more plentiful when the country became more settled. The ecclesiastic travelling to Rome for his Orders or his Bishopric came back with his mind filled with the churches of Rome as he saw them—came back with the Basilica in his mind—and imparted his memories of them to the workmen, and we see the introduction of the apse and transepts. Vaulting now filled the mason's thoughts—vaulting which of necessity must be constructed with small stones. Until the discovery of the method of supporting the cores with a skeleton of stone ribs we find a constant failure of these vaults. With the application of this idea ribbed vaulting became universal in all important buildings, and we can study the enormous effect this had upon the whole of Gothic architecture, and by sympathetic thought imbue ourselves with the ideas which animated the men who made Gothic archi-

ture what it was. For instance, we shall note how entirely the development of mouldings reflected the growth in knowledge and skill of the mason untouched by external influence; how the square edge was formed into a round, with chamfers. Then the corner was left on the round and the chamfers hollowed. The corner was found to "flush" in fixing, so it was formed into a fillet, and so feature by feature—each a development in the mason's mind of what had been done before—the characteristic mouldings of Gothic architecture were evolved, and we are able by putting ourselves in the positions of the masons to see into the thoughts which animated him in his work. Gothic architecture was essentially a mason's architecture, and until the mason lost the mastery of his art we see no joiner's art worthy of the name.

Until the decline of the art of the mason the joiner never thought for himself, but copied the ornament of the stoneworker for wooden detail, this treatment not being successful for woodwork, linenfold panelling being the only exception, and this was copied from paintings representing hangings. It was not until the time of Elizabeth that woodwork developed itself with the introduction of the mitre, a discovery which so pleased the joiner that he could never have enough of them, and we find forty mitres in a cupboard door where we should use four.

And so we come down to the times of Inigo Jones and Wren, when architecture ceased to be a craft and became a learned profession; but if we place ourselves in sympathy with the thoughts of the old builders, and try to imagine their difficulties and surroundings, we shall derive much more pleasure, and profit considerably more than we do, from our study of old work. Try to understand the reason and thought underlying all architectural expression.

Since Wren's time, architecture having become a learned profession, all practical building is learned from books; consequently, no one knows how to do a thing unless he has learnt it from a book. It is an age of handbooks and textbooks, and architecture as a building art has ceased to exist.

Let us, however, take up the study of Classic, Gothic, and Renaissance art for the thought underlying the expression, and let thought influence our design. Furnish the mason with stonework details, the scheme in which he will at once see. Draw a block of stone on the paper, and then draw the mouldings inside, so that you will understand the limitations of the grain and qualities of the wood before designing the carving and joinery. Learn the limitations of material. It is not impossible to put ourselves in the craftsman's position. The workman's standpoint is the right one.

Study also the planning of large buildings as well as homely buildings. Put your mind in sympathy with the mind of the master. Study the buildings of any one great architect—for instance, Bramante or Michael Angelo. Follow his education, surroundings, and difficulties, examine all his works, give other men's works the go-by, and endeavour to get at the thought and reason underlying the works of this man; or even study the works of more modern masters, say Pugin or Butterfield (not to mention names of living architects). Get your thoughts in sympathy with their thoughts. This is a line of study which will be of the greatest interest and profit, although examinations do not trouble you to do this.

In conclusion, cultivate high ideals. Cultivate a compassionate contempt for modern work. Under no circumstances design from the plates published by building papers of current competitive designs. Believe that the best work of the XXth century is yet to be done. Such are the vast possibilities open to an architect that we must not rest content with the present. Let nothing satisfy you until you have done something as good as Gothic, and better than Renaissance. Express thought in your work. See that it is greater than that around us at present. Work with an intelligent use of the materials we have. Get your lines of study above the examination standpoint."

A hearty vote of thanks was passed to Professor Pite for his address, and Mr. W. G. B. Lewis, in proposing this, referred

to the work done by students during the past session, and thanked Mr. Gilbert Jenkins, the assistant instructor, for his help. He remarked that even more enthusiasm was wanted by architectural students, and it was only by continued striving to do the best that could be done that good work would be accomplished. He advised the students to cultivate their appreciation of form, as this was essential before they could begin to appreciate the thought which evolved it. He strongly advised them to devote more time to sketching and measuring, so as to increase their powers of observation and at the same time develop their powers of accurately portraying what they saw on paper. By doing this they would accustom themselves to seeing what actual work looked like when drawn in projection, and thus be able to more clearly picture, in making a design, how it would appear in execution.

Mr. Hadwen, as one of the students, proposed their thanks to Mr. Lewis for his unstinted labour on their behalf, and for the able instruction which the students had received. He coupled with Mr. Lewis's name that of his assistant, Mr. Jenkins.

With many expressions of regret by the students at the severance, after thirteen years as instructor, of Mr. Lewis's connection with the studio, the meeting terminated.

THE INCORPORATED BRITISH INSTITUTE OF CERTIFIED CARPENTERS.

The Master and Wardens of the Worshipful Company of Carpenters entertained to dinner the Incorporated British Institute of Certified Carpenters in the Carpenters' Hall, London Wall, on Saturday last week. The chair was occupied by Capt. G. R. B. Drummond, M.V.O., Master of the Carpenters' Company, supported by Sir Aston Webb, E.A., Mr. J. Willson, J.P., President of the Institute, Mr. J. Classon, Preston, Past-Master of the Carpenters' Company, Professor H. Adams, Mr. Warden W. Robertson, Mr. H. Phillips Fletcher, Col. A. C. Preston, V.D., Mr. E. Cutler, Mr. G. A. Tanner, Mr. W. Cox, Hon. Secretary, and others.

The loyal toast having been honoured, Mr. J. Classon, Preston, proposed "The Incorporated British Institute of Certified Carpenters." He said that when he was Master of the Company it was intended to hold a dinner at which the members of the Institute were to be guests, but about the time the President (the late Professor Banister Fletcher) died, and it was impossible to hold the dinner in those circumstances. As to the Institute, it was formed in 1890, under the presidency of Mr. Pocock, and it consisted at that time of eleven members; but since then it had grown considerably, and now there was a membership of 189, which was not a bad record, especially when they considered that in such societies the first few years were always the most difficult. During the next sixteen years there was no doubt that the membership would greatly increase, and he hoped the Society would have a long and useful career. The Institute, he was happy to say, was free from what he thought was the bane of almost all trades in England at the present time, i.e., trades unionism. Trades unionism was a very valuable thing when properly applied—the Carpenters' Company was originally a trades union—practically it was now—for it was formed to control the guild of the carpenters of the city of London, and if the old records were read it would be seen that the Company had power to do certain things with regard to carpenters, which would be considered, even at the present day, tolerably drastic, but he had no hesitation in saying that, though the Carpenters' Company were drastic, they were nothing like so drastic as the trades union terrorism which existed at the present day without the sanction of the law. It was because he recognised that the Institute was perfectly free of trades unionism that he welcomed them there that night. When trades unionism was used for the benefit of members of the trades, then it was good; but when it was used to terrorise the members and to prevent them working where they desired to work, then it did harm. The Institute had had three Presidents since it had been

incorporated. In addition to Professor Fletcher, there had been the late Professor Roger Smith and the present President, Mr. Willson, whose practical experience and knowledge as to technical work was very great.

The President, in reply, said they were pleased to be there as the guests of the Carpenters' Company, for the Institute was very closely associated with the Company. Some sixteen years ago the first examination in carpentry and building construction was held in that hall, and out of that examination sprang that Institute. He believed that all, or nearly all, of them possessed the certificate granted by the Company, and they would be glad to know that at the last examination, this month, there was a record number of candidates, i.e., sixty-seven, and of these sixty presented themselves for examination, and only four failed. Candidates came from all parts of the United Kingdom, and it said much for the value of the certificate which the Company granted that this should be so. The trend of construction at the present time showed, perhaps, that carpenters were being left on one side, and iron construction was being now used; but he did not think the carpenter would be superseded altogether. Some two and a half centuries ago, after the fire of London, when most of the wooden houses were destroyed, people decided that wooden houses were dangerous, and that brick and stone buildings must be built. That caused a great deal of anxiety amongst the carpenters, but they had survived the calamity, as he hoped they would all others.

Mr. J. Clark, Principal of the Technical College, Tunbridge Wells, then briefly proposed "The Worshipful Company of Carpenters," which, he said, was a most progressive body of men who did all they could for carpentry and the building industries.

The Chairman, in response, said that there were many members of the Company who were not carpenters, but they had been so associated with the trade that they could not fail to take a great interest in the calling. It was sometimes supposed that the ancient guilds existed for the sake of social gatherings and banquets, but that formed a very small part of what the Company did. As to the work of carpenters, he had been much struck with the exhibition of carpentry and joinery work which the Company held in that hall every three years. That exhibition excited a great deal of admiration.

The President of the Institute (Mr. Willson) then presented Mr. E. Cutler, the late Secretary of the Institute, and Mr. Silas Evans, the oldest member, with testimonials in recognition of their services to the Institute. Last year Mr. Cutler received a purse on the occasion of his retirement as Hon. Secretary, and the testimonial, an illuminated address—which carries with it the Life Fellowship of the Institute—was not ready, and its presentation had to be deferred until the present occasion.

Mr. Warden Robertson then briefly proposed the toast of "The Visitors," coupled with the name of

Sir Aston Webb, R.A., who, in response, said that there was no craft which was more rightly proud of its productions than the carpenters. Now that apprenticeship was dying out, for good or for ill, it was very essential that the splendid guilds of the city of London should take up the education of the younger men in those crafts to which each company was allied, and the Carpenters' Company had nobly undertaken that duty. Whether it was possible for institutes or classes to take the place of apprenticeship was not for him to say, but they must all acknowledge the enormous assistance and help which the Company had been to the noble craft of carpentry. As Mr. Willson had suggested, there was a serious competitor to carpentry in the field—iron and concrete were taking its place in many cases. In Westminster was one of the most magnificent roofs which had ever been put up, and that roof had been in existence some 400 or 500 years. Near this roof was another magnificent roof, an iron roof, constructed some thirty years ago, which was thought at the time to be one of the wonders of London; and now the iron roof was a heap of scrap-iron, and the old chestnut or oak roof was as fine as ever,

and must be smiling, he thought, at the collapse of its monstrous rival. This seemed to show the last word had not yet been said as between wood and iron. Ruskin once said in an admirable paper that endurance was better than strength, and endurance was what the carpenter's art had got. Iron might be stronger, but from the experience up to the present day he thought they could say that endurance lay with carpentry, and if endurance was the great thing in carpentry, it was the great thing in all buildings with which they were concerned. The outstanding test was the workmanship put into the building—its endurance and permanency, without which the finest design would be of little account. And there was no work where the faults more easily came home to roost. He hoped those city halls would last, for we were all proud of them. What would the city of London be without its guilds? If they took away the churches—and they were being taken away fast—and the guilds, they would have left not much beyond a number of money-making buildings. If the monuments of a higher motive than that of money-making, important as that was, were removed, the utility of a city was seriously affected. It would be a great loss if these buildings were to disappear. He had ventured to refer on a previous occasion to the modesty of some of the city companies in letting their premises and retiring into the background. He did not think the Carpenters' Company would ever do that; they now stood at a corner seen of all men and nobly representing a noble calling, that of carpentry.

Mr. J. H. Freeman then proposed the toast of "The Officers and Council of the Incorporated British Institute of Certified Carpenters," coupled with the names of Mr. W. Cox (Hon. Secretary) and Mr. W. Dixon.

Mr. Cox, in the course of his reply, said that the Institute numbered among its members principals and teachers of the leading polytechnics and technical schools throughout England and the colonies, as well as examiners and lecturers to various municipal bodies. This fact was by some deplored, the feeling being that every man should be engaged in the trade, but when one considered that the apprenticeship system was dead, it was evident that a great future, as well as a great responsibility, rested upon the shoulders of those engaged in the teaching profession, as no doubt the training of the future craftsmen would have to be undertaken in trades training schools, and he had no doubt that when that time comes we should see the Worshipful Company of Carpenters to the fore in the work of training the nation. He felt a good deal of pride in belonging to an Institute of men of proved ability, all of whom had passed the test of examination—in the case of Fellows a double test, for it was necessary for these gentlemen to have obtained both a first-class Carpenters Company certificate, as well as first-class in Honours from the City and Guilds of London, before their application was entertained. The Council of the Institute were proposing to place a sum of money at the disposition of those Fellows successfully passing a higher or University examination, so that they might be in a position to take their place with the best men engaged in the craft, and he looked forward to the day when they might crown their achievements by being admitted as freemen to the Carpenters' Company.

Mr. Dixon also replied, and the proceedings shortly afterwards concluded.

NEW NAVE, ST. JOHN'S CHURCH, MALONE.—The new nave of St. John's Church, Malone, was dedicated on the 14th inst. by the Lord Bishop of Down and Connor and Drogheda. The architect was Mr. Henry Seaver, and the work has been carried out under his supervision by Messrs. W. J. Campbell & Sons, the contractors for the church. The nave is in harmony with the rest of the building. It is approached on the north side by an old English open porch made of oak, and tile hung. Over the vestibule a gallery has been constructed, and a robing-room has been provided for the choir. Choir-stalls, a reredos, and holy table in English oak have been provided, and the chancel and sanctuary have been panelled in oak, this portion of the work having been executed by Messrs. Purdy & Millard, Belfast. The church has a system of heating installed by Messrs. Musgrave & Co., and it will seat from 700 to 800 persons.

THE ARCHITECTURAL ASSOCIATION
SUMMER VISITS.

IV.—HOUSES NEAR DORKING.

AN excellent choice of modern domestic work was made for the occasion of the fourth summer visit on Saturday, June 25, at Abinger Common, a charming spot on the Surrey Hills near Dorking.

A start was made from Gomshall station, and in the course of an enjoyable drive many old brick cottages possessing sterling character engaged the attention of the party, numbering some twenty-five members of the Architectural Association.

The interest of the afternoon's study was centred in "Goddards," a country retreat designed by Mr. E. L. Lutyens as a home of rest for women workers in London. The founder, Mr. F. J. Mirrielees, welcomed the visitors, and gave the company a description of the building, its surroundings, its purpose, and equipment. Amongst other apartments the accommodation comprises a large common room, dayrooms, recreation room, a skittle alley, and a good proportion of bedrooms. The plan is arranged somewhat in an H form, with the large room in the centre. Between the wings on the north or road side is a very pleasant forecourt, with wide hedges, stone-paved paths, and grass plots; while on the south aspect a delightful formal garden has been laid out. Other gardens are to be found on the east and west fronts, and with the selection of the plants and general scheming of the lay out the architect has collaborated with Miss Jekyll. The results are eminently successful, although a tendency to overcrowd the growths and permanent features was felt to exist.

The walls are rough cast throughout, the breadth of which is disturbed by the red brick mullioned bays, windows, and doorways. Old weathered tiles cover the roofs and dormers, but the lower courses of the main eaves have old lichen stone slates, a combination of material very prevalent in this part of the country.

The interior is perhaps the more interesting part of the work. Cottage tradition influences the construction, and consequently the effects. Oak timbers of generous sizes are much in evidence in the common room. A fine effect is produced from the ceiling timbers, the supporting beams, posts, and struts, and from the half timber porch and east wall of this apartment. The furnishing of this and other rooms is one of the most instructive elements of the place. Almost all the better pieces are Sussex antiques, the dressers and tables in particular possessing strong character. The building in every way proved a most interesting study to architects.

The next halt was made at "Pasture Wood," a large country house designed and built some twelve years ago by Mr. W. Flockhart for the founder of "Goddards." The architect, who is engaged upon an extension of the east wing, was present, and gave all the information concerning the buildings which the experts present were desirous of knowing. The house is an excellent example of the best domestic work of that time. The plan is one in which the principal rooms of the ground and bedroom floors surround a large staircase-hall, and are arranged to take advantage of the natural beauties of the hilly site. Many materials appear in the fronts, of which half timber work predominates. There are some big effects in the tiled roofs, some of which are slightly "mansarded" in form, and in the brick chimney stacks.

A large block of stables, by the same architect, showing much individuality, was included in the visit; and, finally, some estate cottages designed by Messrs Dunn and Watson. These latter include rooms for stablemen and gardeners, and are extremely interesting. The principal effect is gained from a tile-hung overhanging upper story. The detail is excellent. Indeed, these cottages were not the least attractive of the many and varied buildings seen during the course of a long and enjoyable afternoon.

BUSINESS PREMISES, AYR, N.B.—Now business premises have just been completed in Main-street, Ayr. Mr. Wm. McClelland, architect, of Ayr, prepared the designs.

THE LONDON COUNTY COUNCIL.

The first meeting of the London County Council after the Whitsun recess was held on Tuesday in the County Hall, Spring-gardens, Mr. Alderman Evan Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to sanction the borrowing by Islington Borough Council of 17,156*l.* for the extension of street arc lighting. It was also agreed to lend Wandsworth Guardians 3,700*l.* for poor law purposes.

Cost of Erection of Schools.—Mr. A. J. Shephard, Chairman of the Education Committee, in submitting the adjourned Report of the Education Committee on this question, said he did not bring up the report willingly, for if the cost of erection were reduced, the Council would not be likely to get such a good class of buildings. He brought up the Report in deference to a strong wish that the cost might be reduced. He might mention that two of their officials had reported on the German schools, from which it appeared that the schools now being erected in London were about equal to the German schools of ten years ago, and the schools at present being erected in Germany were greatly superior to London schools.

Sir Thomas Brooke Hitching said that if a little more skill, better judgment and supervision were shown in the erection of these buildings, greater economy could be secured.

Sir Melville Beachcroft said that the population was far more shifting in character than it was, and there was no doubt that schools built to-day might be untenanted to-morrow, and the Council ought not to lose sight of that.

Mr. Stephen Collins, M.P., said that although he was in favour of economy in the erection of schools, still he did not believe in making the buildings cheap and nasty, and he thought that some of the present proposals would go a long way to do that. He did not believe in doing away with glazed bricks, which made for cleanliness and lightness, and in the interest of the children he thought glazed bricks ought to be used.

Mr. McKinnon Wood, M.P., said it was not intended to abandon the use of glazed bricks altogether.

Mr. Barnes denied that the supervision exercised in the erection of schools was not satisfactory. It was often more thorough than that shown in the erection of a royal palace.

Mr. Saunders said that these buildings should be something more than sanitary. The only buildings which relieved the dull monotony of some of our sordid streets were the schools. Now it was suggested that these schools should be built to last only thirty years! London was a city whose public buildings ought to be worthy of the city. In Berlin the finest buildings were the elementary schools, and the cost of erecting them was not less than the cost of the London schools. In South Germany the schools were infinitely finer than the London buildings. The schools in Germany reflected the spirit of the people, who believed in education. There was no need for temporary buildings, for if they were not needed for elementary purposes owing to the population shifting, then they could be used for secondary schools.

Mr. Bray moved that the Report be not received, in order to give other Councillors an opportunity of expressing their views. He was in favour of the views expressed by Mr. Saunders.

Mr. Thomas seconded, and spoke against the suggested proposals, as did several other speakers.

The motion was then voted upon and rejected, and the Report was received.

New Schools, &c.—The Council then considered the following recommendations of the Education Committee, which were agreed to after discussion:—

"(a) That, whilst placing on record its opinion that on educational grounds the average number of children per adult teacher should on no account be raised, the Council, in view of the urgent necessity of increasing school accommodation in various parts of London . . . do accept the effective

accommodation calculated on the basis set forth in the foregoing report as the accommodation for school provision purposes."

(b) That the necessary steps prescribed by sect. 9 (1) and (2) of the Education Act, 1902, be taken with a view to giving public notice, and informing the Board of Education, of the Council's intention:—(i) to provide a new public elementary school for 800 children for subdivisions Q and X of the Hackney (School Board) division (Bethnal Green, N.E., and Haggerston); (ii) to provide 500 additional public elementary school places for subdivisions P, Q, R, and S of the East Lambeth (School Board) division by the enlargement of the "Oliver Goldsmith" London County Council school (Canterbury, N.); (iii) to provide a new public elementary school for 600 children, with power to enlarge for 800, upon the Hortensia-road site (Chelsea); (iv) to provide a public elementary school for 1,600 children on the Barnsbury Park site (Islington, S.), or, alternatively, a school for 800 children on that site, and a school for 500 children in the north-eastern corner of subdivision 7 A of the Finsbury (School Board) division (Islington, S.); (v) to provide 1,200 additional public elementary school places in subdivision A of the Marylebone (School Board) division (St. Pancras, S.); (vi) to provide additional accommodation for 300 children by the enlargement of the Addison gardens London County Council school (Hammer-smith, W.); (vii) to provide a public elementary school for 600 children, with power to enlarge to 800, on the Sherington-road site (Greenwich); (viii) to provide a public elementary school for 1,200 children in subdivision Z of the Hackney (School Board) division (Hoxton); (ix) to erect a public elementary school for 600 children in subdivision T of the Marylebone (School Board) division (St. Pancras, E.); (x) to erect a public elementary school for 1,000 children in subdivision U of the Marylebone (School Board) division (St. Pancras, N.); (xi) to enlarge the London County Council school (St. Pancras, N.) by the addition of 300 public elementary school places; (xii) to provide 600 public elementary school places in the neighbourhood of King's Cross (Holborn); (xiii) to provide 500 additional public elementary school places in subdivision BA3 of the Finsbury (School Board) division (Islington, W.); (xiv) to enlarge the Hungerford-road London County Council school (Islington, W.) by 414 places; (xv) to erect a public elementary school with accommodation for 600 children in the neighbourhood of Rylands-lane Lambeth (Kennington); (xvi) to provide 1,600 additional public elementary school places for subdivision C of the Chelsea (School Board) division (Kennington, N.); (xvii) to erect a public elementary school, with accommodation for 600 children, for subdivisions E, F, I, J, K, of the West Lambeth (School Board) division; (xviii) to provide 500 additional public elementary school places in subdivision X of the Marylebone (School Board) division (Marylebone, W.); (xix) to erect a public elementary school for 600 children in the north-western part of subdivision O of the Marylebone (School Board) division (Marylebone, W.); (xx) to provide a public elementary school for 1,100 children in subdivision E of the Marylebone (School Board) division (Marylebone, W.); (xxi) to provide 500 additional public elementary school places by the enlargement of the Rauce-street London County Council school (Newington, W.); (xxii) to provide a public elementary school for about 600 children in subdivision F of the Marylebone (School Board) division (Paddington, N. and S.); (xxiii) to provide 600 additional public elementary school places for subdivisions AH, AI, and AJ of the Southwark (School Board) division (Rotherhithe); (xxv) to provide public elementary school accommodation for from 500 to 600 children for subdivisions AD, AE, and AF of the XI, X2, Y of the Westminster (School Board) division (St. George, Hanover-square, and Westminster); (xxvi) to provide a public elementary school for 550 children in the eastern part of subdivision I or J of the Marylebone (School Board) division (St. Pancras, E. and W.); (xxvii) to provide a public elementary school for 550 children in subdivision K of the Marylebone (School Board) division (St. Pancras, W.); (xxviii) to provide public elementary school accommodation for 800 children for subdivisions D, G, J, K, of the Tower Hamlets (School Board) division (Stepney and Whitechapel); (xxix) to erect a public elementary school, with accommodation for 600 children, with power to enlarge to 800, for subdivisions BY and BZ of West Lambeth (School Board) division (Wandsworth).

(c) That the Board of Education be informed of the views contained in the foregoing report relating to the erection of a school for subdivision C of the Tower Hamlets (School Board) division, and D, T2, and U of the Hackney (School Board) division (Whitechapel), and that they be requested to sanction the erection of a permanent public elementary school for about 600 children on the Buxton-street site (Whitechapel).

Refreshment House, Avery Hill.—The Parks and Open Spaces Committee recommended:—

"(a) That the estimate of expenditure on capital account of 2,900*l.*, submitted by the Finance Committee in respect of the erection of a refreshment house and shelter at Avery-hill, be approved.

(b) That expenditure not exceeding 2,000*l.* be sanctioned in respect of the provision of a refreshment house and shelter, including incidental expenses, at Avery-hill; and that, in the event of the Works Committee being satisfied with the sufficiency of the estimate based on quantities of the cost of erecting the building, the drawings, specification, bills of quantities, and estimate be referred to that Committee with a view to the work being executed without the intervention of a contractor; but that if the Works Committee be not prepared to undertake the work at the amount of the estimate based on quantities, tenders be invited by advertisement."

An amendment to reduce the cost to 1,000*l.* was carried.

* See our issue for June 16, page 673, where we will be found the full report of the Committee.

An Arboreal Nursery.—The Committee recommended that about six acres of land at Avery Hill be appropriated for the purposes of a nursery for trees and shrubs, and that an expenditure not exceeding 350l. be sanctioned for the preparation of the ground, the estimated annual cost of maintenance being about 2550l.

Sir Algernon West moved that the report be referred back on the ground that the estimate for maintenance was far too low, and that there was no justification for taking away six acres which had been purchased as an open space and recreation ground for the people.

Mr. Stuart Sankey, the Chairman of the Committee, declared that the policy of growing shrubs by the Council instead of purchasing them would be found to be one of real economy, and show a saving of 500l. a year.

The amendment was carried, and the subject was referred back.

Epileptic Colony, Ewell.—The Asylums Committee reported as follows:—

"The Epileptic Colony, Ewell, was inaugurated in 1903 to provide special accommodation for epileptics of unsound mind who were able to work and were suitable for colony life. The Council on January 22, 1901, voted the sum of 85,000l. for its erection, and on July 7, 1905, a further sum of 5,018l. 16s. 7d. being the extra cost of the building work carried out by the Works Committee. A total sum of 90,018l. has also been voted for its equipment (estimates Nos. 3895 and 4144). It at present accommodates 266 male and fifty-seven female patients, and consists of an administrative block and eight detached villas. The area of land allocated for the colony is 112 acres. The total cost of the colony, including equipment, cultivation of land, and purchase of live stock (but excluding the value of the land) is approximately 313,11s. 3d.

We think that the accommodation provided at the colony may now be extended, by an additional villa for male patients. Each of the existing villas accommodates 32 patients, and is under the charge of a resident married couple. We believe that economy in administration can be effected in a larger villa, accommodating seventy-two patients under the charge of two married couples. At night time this villa could be supervised effectively by one attendant, instead of the two who would be required if two villas were erected. Until plans have been prepared we are not in a position to submit an estimate of the cost of the proposed building, but it is estimated to cost between 7,000l. and 8,000l. Provision has been made in the capital estimates for the current year for the expenditure necessary for the preparation of plans, and we therefore recommend:—(a) That the estimate of expenditure on capital account of 100l. submitted by the Finance Committee in respect of the preparation of plans for the provision of an additional villa at the Epileptic Colony to accommodate seventy-two male patients and staff be approved; (b) that an expenditure not exceeding 100l. on capital account be sanctioned for the purpose referred to in resolution (a)."

Costly Wallpaper.—Mr. Cyril Cobb asked Lord Welby if it were true that wallpaper recently used in No. 7, Committee Room cost 15s. a piece.

Lord Welby said he would make inquiries, and later in the sitting he informed Mr. Cobb that the wallpaper had cost 10s. a piece. It was ordered by an officer of the Works Department, over whom, so far as the cost of the paper was concerned, the Council exercised no control.

Electrification of Additional Tramways.—The Highways Committee reported:—

"The construction for the underground conduit system of electric traction of the Council's authorised tramways from the terminus in Trafalgar-road, Greenwich, via Blackwall-lane, to the Blackwall tunnel, has been completed, and also the reconstruction of the existing tramways from the Obelisk, Lewisham, via High-street, Lewisham, and Rushey-green, to the terminus at Catford, and of the tramways from the new lines in Woolwich-road from its junction with Blackwall-lane, as far as Tunnel-avenue.

The reconstruction of the existing lines in Vauxhall-bridge-road, and the construction of the tramways over the new Vauxhall Bridge, both for the underground conduit system of electric traction, have also been completed. In view, however, of the fact that the London County Council (Vauxhall Bridge Tramways) Act, 1896, only authorises the use of animal traction for the lines over the bridge, they cannot be worked electrically until the Council shall have obtained the powers, which it is seeking in its Tramways and Improvements Bill for the present session of Parliament, to enable electrical power to be used for working the lines. In these circumstances, the tramways from Victoria Station to Vauxhall Station, via Vauxhall-bridge-road and Vauxhall Bridge, are for the present being worked by horse traction."

Deptford and Greenwich Generating Stations.—The Committee recommended and it was agreed:—

"(a) That the estimate of expenditure on capital account of 2,450l., submitted by the Finance Committee in respect of the provision of an additional high-tension cable for use between the Greenwich electricity generating-station and the Deptford temporary generating-station, be approved.

(b) That expenditure, on capital account, not exceeding 2,450l. be sanctioned for the provision of the high-tension cable referred to in the foregoing resolution (a).

(c) That the contract entered into in pursuance of the resolution of November 13, 1905, with the Western Electric Company be extended so as to include the provision, at a cost not exceeding 2,450l., of the additional high-tension cable referred to in the foregoing resolution (a); that the chief officer steps in the matter; and that the seal of the Council be affixed to any necessary documents in connexion therewith."

White Hart-lane Estate—Finishing of Roadways on Section A.—The following recommendations of the Housing of the Working Classes Committee were agreed to:—

"(a) That the supplemental estimate of expenditure on capital account of 900l., submitted by the Finance Committee in respect of the paving of the footways on sect. A of the White Hart-lane estate, be approved.

(b) That additional expenditure on capital account not exceeding 900l. be sanctioned in respect of the paving of the footways on sect. A of the White Hart-lane estate, that the contractor be ordered to provide and lay Patent Victoria stone and to make up the footways required for 6s. a square yard be accepted; that the contractor do prepare, and obtain the execution of, the necessary contract to give effect to the arrangement; and that the seal of the Council be affixed thereto when ready."

Brickmaking, Norbury Estate, Croydon.—They also recommended, and it was agreed:—

"(a) That the estimate of expenditure of 1,500l., submitted by the Finance Committee in respect of the moving of bricks on the Norbury estate, Croydon, and in respect of the provision thereon of the necessary tram-rails and trucks be approved.

(b) That expenditure not exceeding 1,500l. be sanctioned in respect of the moving of bricks on the Norbury estate, Croydon, and in respect of the provision thereon of the necessary tram-rails and trucks."

Cottages, Totterdown Fields Estate, Tooting.—They reported that 106 further cottages, containing accommodation for 684 persons, on section B of the Totterdown Fields Estate, are almost finished. Upon the completion of these cottages accommodation for 4,146 persons in 570 tenements will have been provided on the estate.

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

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

Lines of Frontage and Projections.

Kensington, South.—Buildings on the site of Nos. 42, 43, and 44 Hyde Park-road, Kensington-road, Kensington, to abut also upon Hyde Park-gate.—(Messrs. Weatherall & Green for the Trustees of the Camden Charity).—Consent.

Kensington, South.—A deviation from the plan approved on October 4, 1904, for the erection of buildings on a site on the south side of Kensington-road, Kensington, to abut also upon Palace-gate, so far as relates to an alteration in the frontage line at the north-eastern angle of the buildings (Messrs. Millard & Pryce for the Royal Exchange Assurance Company).—Consent.

Islington, North.—Buildings upon a site at the junction of Hornsey-rise and Upper Hornsey-rise, Hornsey (Mr. E. Bates for Messrs. G. W. Cook and E. R. Smith).—Consent.

Chelsea.—Buildings on the south-eastern side of Fulham-road, Chelsea, to abut also upon College-street and Kimbolton-row (Messrs. Elms & Jupp for Mr. E. Bingham and Messrs. T. Crapper & Co., Ltd.).—Consent.

Dulwich.—An open wooden porch at "The Limes," Dulwich, to abut also upon (Mr. W. Griffiths for Messrs. J. Bowyer & Co.).—Consent.

Hammersmith.—Nine houses with shops on the western side of Askew-road, Hammersmith, northward of "The Sun" public-house (Mr. F. J. Brewer for Mr. A. Gard).—Consent.

Hampstead.—Retention of an iron sign erected on the forecourt of Nos. 139A and 139B, Finchley-road, Hampstead (Messrs. E. T. Morris & Co.).—Consent.

Kensington, North.—Projecting balconies in front of a proposed building between Nos. 10 and 12, Bosworth-road, Kensington (Messrs. Chapman & Shepherd for the Bosworth Temperance Club).—Consent.

Kensington, North.—Open porches in front of Nos. 1 to 23 (odd numbers only) inclusive, Kingsbridge-road, St. Quintin Estate, Kensington (Messrs. Trant Brown & Humphreys for Messrs. Daley & Franklin).—Consent.

Kensington, North.—Projecting bays with gables over, and porches to Nos. 19 to 65 (odd numbers only) inclusive, and Nos. 22 to 44 and Nos. 48 to 70 (even numbers only) inclusive.

High Lever-road, St. Quintin Estate, Kensington (Messrs. Trant Brown & Humphreys for Messrs. Daley & Franklin).—Consent.

Lewisham.—The retention of a greenhouse in the garden of "Hyndford House," Inglemere-road, Forest-hill, Lewisham, abutting upon Bampton road (Messrs. G. Hayward & Co.).—Consent.

Norwood.—The erection of houses with shops on the western side of Norwood-road, and dwelling-houses on the northern side of Trinity-road, Norwood (Mr. T. L. Fearon).—Consent.

St. George, Hanover-square.—That permission be given to Mr. G. Odono to retain a projecting iron and glass shelter at the entrance to No. 152, Victoria-street, Westminster, extending beyond the general line of buildings in the street.—Consent.

St. George, Hanover-square.—The retention of the bases to five projecting pilasters on the Piccadilly frontage and to five projecting pilasters on the Old Bond-street frontage of buildings upon the site of Nos. 44, 45, and 46, Old Bond-street, and Nos. 57, 58, 59, and 60, Piccadilly (Messrs. Callard, Steward & Wood, Ltd.).—Consent.

Kensington, South.—Retention of a photographer's showcase erected on the forecourt of No. 154, Holland Park-avenue, Kensington (Mr. A. Langlier).—Consent.

St. Pancras, West.—A bay-window, balconies, and porch at No. 1, Albert-terrace, Regent-square (Mr. W. Eastman for Mr. William Sanders, M.P.).—Consent.

Wandsworth.—Buildings on the western side of Thrale-road Streatham, southward of Clairview-road (Mr. W. Bartholomew for Messrs. Antill & Squires).—Consent.

Hammersmith.—Retention of a projecting illuminated sign at the "Red Cow" public-house, Hammersmith-road, Hammersmith (Messrs. Bull & Bull).—Consent.

Strand.—The retention of an iron and glass shelter at the Adelphi Hotel, John-street, Adelphi (Messrs. Jeffries & Co. for Messrs. Flower & Sons, Ltd.).—Consent.

Wandsworth.—Four houses on the eastern side of Sauer-street, Wandsworth, between Tooting Bec-road and Prentis-road (Mr. J. S. Gibson for Mr. J. Carmichael).—Refused.

Brixton.—A shop front in the passage-way leading to the railway arches (Nos. 33x and 34x) on the western side of Brixton-road, Brixton, and to the roofing over of a portion of such passage-way (Mr. H. Tanner, junior, for Messrs. Sanders & Co.).—Refused.

Brixton.—A shop front in front of the railway abutment, between Nos. 456 and 462, Brixton-road, Brixton (Mr. H. Tanner, junior, for Messrs. Sanders & Co.).—Refused.

Marylebone, East.—A one-story motor-house and an iron and glass covered way at No. 20, St. John's Wood-road, St. Marylebone, to abut upon Grove-road (Mr. A. W. G. Harding).—Refused.

Marylebone, East.—An addition at No. 3, Accacia-road, St. John's Wood (Mr. W. R. Phillips for Mr. J. M. Swan, R.A.).—Refused.

Marylebone, West.—A covered way in front of No. 36, Abercorn-place, St. John's Wood (Mr. H. Tanner, junior).—Refused.

Wandsworth.—The retention of four one-story shops in front of Nos. 65, 67, 69, and 71, Westcote-road, Streatham (Mr. J. Harding).—Refused.

Width of Way.

Kensington, South.—The retention of the forecourt fence-wall in the front of three houses on the southern side of a roadway leading out of the south side of St. John's-hill, so far as relates to an alteration in the height of such two-story building, and of the addition to such building (Mr. E. S. Barr).—Consent.

Dulwich.—Working-class dwellings at the rear of No. 184, Camberwell-grove, Dulwich, to abut upon Stories-road, with external walls at less than the prescribed distance from the centre of the roadway of Stories-road (Mr. A. Laycock).—Refused.

Clapham.—A further deviation from the plan approved for consent to the erection of a two-story building on land at the rear of Nos. 20, 22, 24, and 26, St. John's-road, Battersea, with external walls at less than the prescribed distance from the centre of a roadway leading out of the south side of St. John's-hill, so far as relates to an alteration in the height of such two-story building, and of the addition to such building (Mr. E. S. Barr).—Consent.

Dulwich.—Working-class dwellings at the rear of No. 184, Camberwell-grove, Dulwich, to abut upon Stories-road, with external walls at less than the prescribed distance from the centre of the roadway of Stories-road (Mr. A. Laycock).—Refused.

Clapham.—A further deviation from the plan approved for consent to the erection of a two-story building on land at the rear of Nos. 20, 22, 24, and 26, St. John's-road, Battersea, with external walls at less than the prescribed distance from the centre of a roadway leading out of the south side of St. John's-hill, so far as relates to an alteration in the height of such two-story building, and of the addition to such building (Mr. E. S. Barr).—Consent.

Dulwich.—Working-class dwellings at the rear of No. 184, Camberwell-grove, Dulwich, to abut upon Stories-road, with external walls at less than the prescribed distance from the centre of the roadway of Stories-road (Mr. A. Laycock).—Refused.

Width of Way and Lines of Frontage.

Paddington, South.—A urinal in Cambridge-grove, Southwick-street, Paddington, at the rear of the "Marquis of Clanricarde" public-house (Mr. W. H. Collins for the City of London Brewery Company, Ltd.).—Consent.

City of London.—The retention of an oriel window in front of No. 7, Wood-street, City, at less than the prescribed distance from the centre of the roadway of such street (Mr. W. H. Waterman).—Consent.

Width of Way and Construction.

Greenwich.—Retention of two wooden sheds of a temporary character at the premises of the Cheep Wood Company, No. 66, Deptford-green, Greenwich (the Cheep Wood Company).—Consent.

Lines of Frontage and Construction.

Islington, East.—The erection of a wood and glass time-keeper's box in front of the "Myddleton Arms" public-house, Canonbury-road, Islington (Mr. B. T. Kingham for the London General Omnibus Company, Ltd.).—Refused.

Formation of Streets.

Hammer-smith.—That an order be issued to Messrs. F. Newman & Blatt, sanctioning the formation or laying out of a new street for carriage traffic in continuation northward of Willow-vale, Uxbridge-road, Hammer-smith (Messrs. Williams & Wallington).—Consent.

Wandsworth.—That an order be issued to Messrs. F. Newman & Blatt, sanctioning the formation or laying out of new streets for carriage traffic upon the Streatham Lodge Estate, Streatham Common-south, Wandsworth (Mr. C. H. Copley Du Cane for the Trustees of the De Cane Estate).—Consent.

Woolwich.—That an order be issued to Mr. H. Bustard, sanctioning the formation or laying out of a new street for foot traffic only, to lead northward out of Godfrey-street and Lower Pellipar-road, Woolwich, and in connexion therewith the erection of a Sunday-school upon the site approached by such street (for the Building Committee of the Pellipar-road Sunday-school).—Consent.

Lewisham.—A building on the land at rear of No. 43, Springbank-road, Hither-green, Lewisham (Mr. P. Roche).—Consent.

Wandsworth.—That the Council do consent to the application of Mr. F. Newman for an extension of the time within which the formation or laying out of new streets for carriage traffic on the Streatham Lodge Estate, Streatham High-road, Streatham, approved by the Council on April 29, 1902, was required to have been completed.—Consent.

Wandsworth.—That an order be issued to Mr. J. C. Radford refusing to sanction the formation or laying-out for carriage traffic of a street to lead out of the southern side of a proposed continuation of Chalfield-avenue, Putney.—Refused.

Space at Rear.

Hackney, South.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of four shops and dwelling-houses on a site on the western side of Mare-street, Hackney, between the "Dolphin" public-house and No. 175, with irregular open spaces at the rear (Mr. D. Morris).—Consent.

Deviation from Certified Plans.

St. George, Hanover-square.—Deviations from the plan certified by the district surveyor, under section 42 of the Act, so far as relates to the proposed rebuilding of Nos. 22 and 23, Grosvenor-square (Messrs. Reed & Macdonald for Messrs. Holloway Brothers).—Consent.

Cubical Extent.

Hackney, North.—Additional cubical extent to the Stamford Hill Brewery, Stamford-terrace, Hackney (Mr. C. G. Smith for Messrs. Michell, Goodman, Young & Co., Ltd.).—Refused.

Alteration of Buildings.

Strand.—An addition at the rear of Nos. 7 and 8, Rupert-street, Strand (Mr. R. H. Kerr for Mr. C. Manzel).—Consent.

The applications marked † are contrary to the views of the local authorities.

Archaeological Societies.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—The closing meeting of the session was held on Wednesday, the 20th inst., Mr. Compton, Vice-President, in the chair. A ten-cady of a very ornate character, probably of the time of Queen Anne, was exhibited, but the allegation that it had belonged to Anne Boleyn obviously could not be entertained, as tea was not introduced into Europe until early in the XVIIIth century, and Pepys in his diary mentions it as something new in his day. Mr. Patrick, Hon. Secretary, read, in the absence of the author, a paper by Mr. Richard Mann on "The Roman Residency at Darenth, Kent." This Roman villa, admittedly the largest ever discovered in England, was excavated in 1894 and 1895 by Mr. George Payne, F.S.A., at the expense of Mrs. Rella Hoare, under an agreement made by Mr. Clowes, her son-in-law, with the Ecclesiastical Commissioners, the owners of the property, and is fully described in "Archæologia Contiana," Vol. XXII. It has been suggested in some quarters that this

vast building bears evidence in the curious system of tanks and drainage of having been a trading establishment, probably that of a "fuller or dyer," but Mr. Mann questions whether it may not with greater probability be described as having been the central station or headquarters of an official having control of the surrounding district, and in a very ingeniously arranged plan of the remains he showed how this may have been the case. —Mr. Patrick opened the discussion, and was disposed to agree with the author of the paper that the buildings were far too extensive to have formed the residence of a person engaged in the trade of a dyer or fuller, but were more likely from their position, adjacent to the Watling-street, and in the centre of a group of Roman buildings which extended over the surrounding neighbourhood, to have been the official residence of the governing authority of the district. —Mr. R. H. Forster did not agree with the early date attributed to the remains by Mr. Mann (early in the Roman occupation), and pointed out that the large building supposed by him to have been the quarters of a body of cavalry was more likely to have been the stables of a mansion or posting-house on the road to London. He also urged that the absence of any fortifications precluded the idea that the buildings were the residence of a military or civil governor, particularly at the early period assigned to them.

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding. **Improvement of Gracechurch-street.**—The Improvements and Finance Committee submitted for adoption an arrangement for acquiring so much of the premises Nos. 1 and 2, Gracechurch-street, as is needed to widen the public way thereat, for the sum of 2,200*l.*, to include all interests.—The Court approved.

The London Almshouses.—The Freeman's Orphan School Committee were authorised to accept the tender of Messrs. R. and E. Evans for repainting the exterior of the London Almshouses at the sum of 159*l.* 10*s.*

Southern Bridge.—The Bridge House Estates Committee asked for authority to accept the tender of Messrs. E. Parry & Co., of 81*s.* per annum for cleansing, watering, gravelling, and repairing Southwark Bridge for three years from midsummer next.—This was granted.

Loan Exhibition.—The Coal and Corn and Finance Committee reporting on the reference of May 10, 1906, referring back for re-consideration the adverse Report of this Committee on the Reference of April 3, 1906, on the Report of the Library Committee as to holding a Loan Exhibition of Pictures in the Art Gallery in the summer of 1907, at a cost of 450*l.*, exclusive of insurance, recommended the adoption of the proposal of the Library Committee, and the holding of the exhibition accordingly.—The matter was referred to the Library Committee.

Pollution of the Thames.—Mr. William Henry Williamson moved that having regard to recent legal decisions on the question of sewage pollution, this Court is of opinion that the time has arrived when a conference of the various authorities interested in the subject of the purification of the estuary of the River Thames and elsewhere should be convened for the purpose of considering the existing situation, and with a view to taking such further action as may be deemed necessary in the interest of the public health, and that it be referred to the Port of London Sanitary Committee to arrange and hold such conference accordingly, Mr. Cloudsley seconded, and the motion was adopted.

METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of the managers of the Metropolitan Asylums District was held on Saturday last week at the offices, Victoria Embankment, E.C.

Proposed New Central Laboratory.—On the recommendation of the Finance Committee, it was agreed to apply to the Local Government Board for an order authorising the expenditure of a sum not exceeding 9,090*l.* on the erection and fitting up of a central laboratory at Peckham Rye. The Works Committee submitted a report dealing with the same matter, in the course of which they recommended that Messrs. Fowler & Huggan be appointed to take out the quantities for the work. This also was agreed to by the Board. The architects' estimate for the building is 7,990*l.* Laboratory fittings will cost some 950*l.*, and the rest of the amount is made up of salaries, commissions, etc.

Joyce Green Hospital.—On the recommendation of the Finance Committee it was agreed to apply to the Local Government Board for sanction to the expenditure of 114*l.* 11*s.* 7*d.*, on the

provision of additional bathing, lavatory, and disinfecting accommodation at this hospital.

South-Western Hospital.—The Works Committee reported that they considered it desirable that bills of quantities should be taken out for the adaptation of two wards at the South-Western Hospital as cubicle wards, the cost of which adaptation was estimated at 1,730*l.* As the work was of a comparatively minor character it was recommended that the architects, Messrs. T. W. Aldwinckle & Son, should take out the quantities. This the Board agreed to.

Darenth Asylum.—The Asylums Committee submitted a report by the Chief Engineer on the exhaustor and engines at the gas works at this Asylum, in which that officer pointed out that the working of the gas works was absolutely dependent upon the exhaustor being capable of dealing with the make of gas, and that for this reason this particular portion of the plant should be doubled. During the last winter the present exhaustors, which are capable of dealing with 5,000 cubic ft. per hour, had to be run faster than was desirable, and in the event of a greater demand for gas arising during the coming winter they would very likely be taxed beyond their capacity. Under the circumstances the engineer recommended that a new plant capable of dealing with 10,000 cubic ft. per hour should be provided in time to meet the coming demands. Dealing with this report the Committee stated that the Bryan Donkin Company had quoted the sum of 117*l.* for the supply of the new plant, an offer which had been accepted. The Committee's action was endorsed.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XXV.

VARIETIES OF SLIDE-RULE.

IN this, the concluding article of the present series, we give a brief account of the chief varieties of slide-rule other than the type illustrated in Figs. 16, 17, and 18.

Faber Improved Calculating Rule.—This type of the Gravet slide-rule, illustrated in Fig. 20, embodies the following features:—

- (1) The body and the slide are about $\frac{1}{2}$ in. longer at each end than in the ordinary type, this additional length being provided for the purpose of affording a firm hold for the cursor when this appliance has to be used near the extremities.
- (2) Scales A and B are graduated 1—100, and not 1—10, 1—10, as in the ordinary manner.
- (3) The body is fitted with a longitudinal spring, intended to cause the slide to work evenly and smoothly at all times.
- (4) On the spaces provided by the extra

length the inscription $\leftarrow + \rightarrow$ is engraved at

each end of scale A, and the inscriptions QUOTIENT + 1, PRODUCT - 1, at the left-hand and right-hand ends of scale D respectively. These inscriptions enable the operator to fix the position of the decimal point at the end of any calculation, without the necessity for remembering the various rules given in Articles XXI, and XXII.

(5) The cursor is made with an extension of the metal frame, on which is engraved a semi-circular scale graduated from -6 to +6, and provided with a rotary pointer registering digits and movements of the decimal point during calculations.

(6) The spaces 1—2, 2—3, 3—4, and upwards, which are divided into ten parts each, are marked with decimal values, as 11, 12, 13, and so on. This graduation is optional, being considered superfluous by most operators.

(7) The special constants engraved on scales A, B, C, and D are as follows:—A and B: $\pi = 3.1416$; B: $M = 100 \div \pi = 31.83$; C: $c = \sqrt{4} \div \pi = 1.28$, and $c^2 = c \times \sqrt{10} = 3.368$. By the aid of constant M the circumference and curved area of a cylinder can be read with only one setting.

(8) The left-hand slot at the back of the body is double the usual width, thus permitting the sines of angles to be read at both ends of the rule—a simple but most convenient improvement.

(9) The graduations on all the scales are incised, thus making them far more distinct than graduations which are impressed on the scales.

As may be gathered from the foregoing description, this is a well-arranged and very useful type of slide-rule for practical work.



FIG. 20

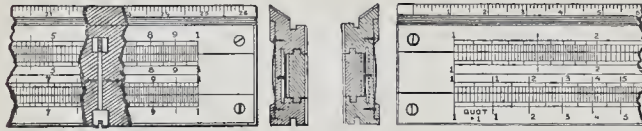


FIG. 21

FIG. 22

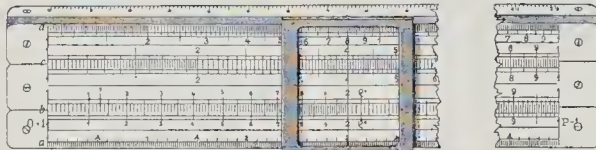


FIG. 23

Illustrations to Student's Column.

Davis Improved Slide-Rule.—To overcome the liability of the slide to become too tight in damp climates and too loose after a time when used in a dry atmosphere, Messrs. Davis, of Derby, have introduced a special slide-rule, having a spring steel back adjustable by three screws, as illustrated in Fig. 21. The ordinary rule of the same firm, Fig. 22, is similarly fitted with a steel back, but without the adjusting screws, and all their slide-rules are made with elongated ends, permitting the cursor to be used in any position without overhanging.

Sheppard Cubing Slide-Rules.—These are made in two forms, by Stanley, with decimal and duodecimal graduations respectively. In each variety the body is provided with two slides, on the back of which are marked lines of squares, square roots, and numbers, so that all powers and roots can be obtained. In using the rule for obtaining cubic dimensions, length is taken on the upper scale of the body, breadth on the upper slide, thickness on the lower slide, and the result is read on the lower scale of the body.

For many calculations which have to be performed by architects, quantity surveyors, and builders the duodecimal rule is extremely convenient, because results are given directly in feet and inches, but for general use the decimal rule is to be preferred.

Reitz Cubing Rule.—This slide-rule, made

by Nestler, of Lahr, is similar to the ordinary type, but has two additional scales, as shown in Fig. 23. One of these, at the top of the rule, is a logarithmic scale from 1 to 1,000, divided by the figuring into three equal scales from 1 to 10. Therefore the cube of any number represented on scale D is found exactly above it on the upper additional scale, and, conversely, the cube root of any number represented on the upper additional scale is found exactly below it on scale D. The other additional scale, at the bottom of the rule, enables the operator to find the log. of any number on scale D. This variety of slide-rule is a most convenient instrument for all calculations where cubes and cube roots are frequently required. It is supplied by W. H. Harling, and can be obtained from other makers of mathematical instruments.

Universal Slide-Rule.—Another rule, made by Nestler, for all ordinary calculations, at the same time giving cubes and cube roots directly, and permitting various tacheometrical computations to be readily performed.

Logologarithmic Scales.—These, shortly termed "log-log," or "logo-log," scales, are applied in conjunction with the ordinary logometric scales of a slide-rule for finding any power and any root of any given number. The principle involved in the log-log scale

will be readily understood by the following illustration:—

Suppose we have to find the value of $5^{2.5}$ by logarithms, the ordinary process is expressed

$$(\log. 5) \times 2.5 = 0.6990 \times 2.5 = 1.7475.$$

$$\text{antilog. } 0.17475 = 14.95.$$

But by the logologarithmic method the operation is effected thus:—

$$\log. (\log. 5) \times \log. 2.5 = 0.8445 + 0.3979 = 1.2424.$$

$$\text{antilog. (antilog. } 1.2424) = 14.95.$$

Such is the principle of the log-log scale, which is graduated so that the divisions represent the logarithms of the logarithms of the numbers marked upon it, and when used in conjunction with the ordinary logarithmic scales of the slide-rule any powers and roots (within the limits of the scale) can be obtained with the greatest facility.

Some varieties of slide-rules having log-log scales are mentioned below.

Dunlop-Jackson Slide-Rule.—This is an ordinary slide-rule, as made by Davis, with a spare slide having log-log graduations from 1.07 to 2, and 2 to 1,000 on the front, and from 0.001 to 0.5, and 0.5 to 0.93 on the back.

Jackson-Davis Double Slide-Rule.—This is a slide-rule of the Davis type having clips for the attachment of the log-log scale against one edge without the necessity for removing the ordinary slide.

Perry Slide-Rule.—The essential feature of the logologarithmic rule as originally arranged by Professor Perry was the substitution of a log-log scale for the usual D scale. In the improved form of the rule made by Thornton this inconvenient feature is obviated by the retention of scale D and the provision of two log-log scales, one above scale A, ranging from 1-1 to 10,000, and the other below scale D, ranging from 0.001 to 0.93.

Fuhr Logologarithmic Slide-Rule.—In this instrument the measuring scale on the bevelled edge has been replaced by a log-log scale in two parallel sections, the first half ranging from 1.1 to 2.9 and the second half from 2.9 to 100,000. The cursor has a metal tongue, the end of which corresponds with the hair-line on the cursor glass, and serves as a marker for the log-log scale. At the bottom of the groove two logarithmic scales are substituted for the usual measuring scale; of the two scales, the upper is for calculating the efficiency and output of dynamos and electric motors, and the lower for calculating loss of potential and other results in electric circuits. While available for all ordinary computations, this type of rule is particularly suitable for mechanical and electrical engineers.

Hudson Beam, Girder, and Shaft Rule.—This instrument, made by Stanley, gives at sight safe loads for rectangular beams or flanged girders of iron and steel, dimensions of rectangular beams or flanged girders for given loads, safe loads for wrought-iron or steel shafts, diameters of wrought-iron or steel shafts for given loads, and the average tensile, compressive, shearing, torsional, and



FIG. 24

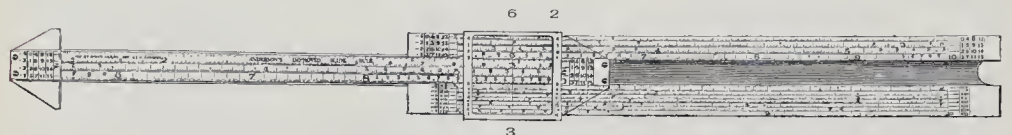


FIG. 25

Illustrations to Student's Column.

transverse strength of cast-iron, wrought-iron, and mild steel.

Hudson Pump Scale.—An instrument, made by Stanley, giving at sight the dimensions and discharges of pumps, the diameter of pipes for any given discharge, the velocity of flow through pipes corresponding with any given discharge, and the usual proportions of auxiliary pumps for boilers and engines.

Hudson Horse-Power Computing Rule.—A double slide-rule, made by Stanley, giving at sight the horse-power of engines from the usual data, the size of engine for any given power, and other results useful to the designer or user of steam engines.

Pickworth Power Computer.—A double slide-rule, made by Davis, giving at sight the horse-power of steam, gas, and oil engines, the size of engine for any given power, the speed of pulleys and belts, the speed ratios of pulleys and gearing, and other useful results.

Honeysett Hydraulic Slide-Rule.—An instrument, made by Stanley, specially arranged for calculating the flow of water in pipes.

Anthony Hydraulic Calculator.—A circular form of slide-rule, made by Stanley, for computing the flow of water in pipes, canals, and other channels.

McPherson Hydraulic Slide-Rule.—A rule made by Thornton, and specially designed for calculations connected with waterworks, drainage, and irrigation practice.

Thornton Engine Indicator Slide-Rule.—An ordinary slide-rule, as Fig. 16, having on the bevel edge a scale of inches divided into tenths and fiftieths, and a cursor provided with a projection to serve as a pointer for the inch scale. This rule is also applicable to harmonic analysis.

Anderson Improved Slide-Rule.—The idea of arranging a long scale in parallel sections or lengths was suggested in a paper read by Dr. Everett before the British Association in 1866, since which year several slide-rules and calculating scales embodying the principle have been introduced. None of these have become popular, and apparently it was reserved for Colonel Anderson to devise a sectional length slide-rule, which is made by Casella, in such a form as to render the instrument of practical value in the everyday work of architects, engineers, and others. As shown by Figs. 24 and 25, the Anderson slide-rule is somewhat similar to the ordinary variety, but has only three scales, two on the body and one on the slide.

The upper scale, eight times the length of either half of scale A on the ordinary slide-rule, comprises four lines, with graduations as follows:—Line (0), 1 to 1.77+; line (1), 1.77+ to 3.16+; line (2), 3.16+ to 5.62+; line (3), 5.62+ to 10.

The lower scale, eight times the length of scale D on the ordinary slide-rule, comprises eight lines, with graduations as follows:—Line (0), 1 to 1.33+; line (1), 1.33+ to 1.77+; line (2), 1.77+ to 2.37+; line (3), 2.37+ to 3.16+; line (4), 3.16+ to 4.21+; line (5), 4.21+ to 5.62+; line (6), 5.62+ to 7.5; line (7), 7.5 to 10.

The scale on the slide comprises four lines graduated to correspond with the upper scale.

The lines are distinguished at each end of the scales and slide by positive and negative "line numbers" (L.N.), which serve the purpose of indicating different decimal multiples and submultiples of the numbers engraved on the scales. Only two columns of line numbers are engraved on the cursor.

Additional line numbers can be added mentally, but, as those on the rule give a range on the upper scale and slide from 0.1 to 1,000 and on the lower scale from 0.1 to 100, this course is rarely necessary.

To facilitate adjustments, each end of the slide is provided with a transparent indicator extending over all the scales on the rule.

The graduation on the scales is simple and easily read. The whole numbers 1 to 10 are figured in red, the prime divisions are subdivided into tenths, which are figured in black, these are subdivided into hundredths, and these again to thousandths as far as their size permits. Hundredths and thousandths are not figured, but some of the main subdivisions are indicated either by dots or diamonds to guide the eye.

The following examples illustrate the advantage of the Anderson rule in giving results without the customary manipulation

of the decimal point, and without the application of rules such as are necessary when the ordinary slide rule is employed.

Example (1): (a) Multiply 2 by 4. (See Fig. 24.)

Set L.H. index of slide to 2 on upper scale (L.N. 1), bring cursor to 4 on slide (L.N. 2). As L.H. index is used, the result is read on the line whose L.N. is the sum of the L.N.s of the two factors. Hence the result is on (1 + 2) L.N. 3 = 8, and L.N. 3 being in the first column, the answer is in units.

(b) Multiply 20 by 40. (See Fig. 24.) Set L.H. index of slide to 2 on upper scale (L.N. 6), bring cursor to 4 on slide (L.N. 6). Read result on (5 + 6) L.N. 11 = 8, which must be taken as 800, because L.N. 11 is in the third column, and signifies hundreds.

Example (2): (a) Multiply 2 by 3. (See Fig. 25.)

Set R.H. index of slide to 2 on upper scale (L.N. 1), bring cursor to 3 on slide (L.N. 1). As R.H. index is used, the result is read on the line whose L.N. is one more than the sum of the L.N.s of the two factors. Hence the result is on (1 + 1 + 1) L.N. 3 = 6, and L.N. 3 being in the first column, the answer is in units.

(b) Multiply 2,000 by 3. (See Fig. 25.) Set R.H. index of slide to 2 on upper scale (L.N. 13), bring cursor to 3 on slide (L.N. 1). Read result on (13 + 1 + 1) L.N. 15 = 6, which must be taken as 6,000, because L.N. 15 is in the fourth column, and signifies thousands.

The foregoing examples show the direct and unerring manner in which products can be correctly interpreted by aid of the line numbers. They are equally useful for setting the decimal values of all results obtained by other forms of calculation.

Apart from certainty of interpretation, the great advantage of the Anderson slide-rule is to be found in the high degree of accuracy obtainable by the extended scales, which give definite results to one decimal place further than the ordinary scales.

Special Cursors for Parallel Slide-Rules.
Faber's Digit Registering Cursor and the **Pointed Cursor** have already been described, and reference was made in Article XX, to the **Dennert and Pape cursor**. Others which deserve mention are the following:—

Broken Line Cursor. with interrupted hair-line permitting adjustment with greater certainty on any graduation.

Magnifying Cursor. with plano-convex glass in which the hair-line is set; also made with ordinary glass and hair-line, and a swivelling lense attached by arms to the cursor frame. Both of these devices are useful for minute readings.

Precision Slide-Rule.—An instrument, made by Nestler, having the scales divided into two parallel parts, so that the accuracy of a 20-in. rule is obtainable in a length of 10 in. This rule can be obtained through all dealers in mathematical instruments.

Goulding Cursor.—An arrangement by which small spaces on the scales can be mechanically divided, thus enabling results to be read up to seven figures.

Ratchet Cursor.—An ingenious attachment facilitating the direct calculation of any power and root by the ordinary slide-rule. In addition to the slide-rules mentioned above, there are other logarithmic instruments, such as the Fuller and Fuller-Bakewell calculating rule with a spiral scale 500 in. long, the R.H.S. calculator with a spiral scale 50 in. long, and various forms of the Boucher pocket calculator. All of these are valuable aids in certain branches of practical mathematics, but for general purposes are less serviceable than the parallel slide-rule, of which the more important types have been considered in this series of articles.

NATIONAL COLLECTIONS: RECENT ACQUISITIONS.—For the Gallery of British Art, Millbank, the trustees and director have bought out of the interest of the Clarke Bequest Fund the late Mr. C. W. Furse's "Diana of the Uplands"; Mr. J. Loewenthal has presented a bust of Mr. W. P. Frith, R.A., executed in marble by Mr. John Thomas, and Mr. J. W. Carille has presented "The Last Load," by John Linnell. To the National Gallery the late Mr. C. Hartree's executors have presented "Sunny Days in the Forest," by N. Diaz; and Mr. S. W. Graystone has presented marble busts, by Sir Edger Boehm, R.A., of Mr. and Mrs. Wynn Ellis.

ARMSTRONG COLLEGE, NEWCASTLE-ON-TYNE:

COMPLETION OF THE BUILDINGS.

THE site acquired in 1887 by the College of Science comprised 6 acres of land, and was then known as Lax's gardens; it is situated between the Barras Bridge on the east, and the Leazes—a public common—on the west. A new road known as College-road now divides the site from east to west, and of the 6 acres two are occupied by the College buildings, and two as garden ground to be retained for possible future extensions, whilst the remaining two acres may be considered as salable, and is partially covered by the Grand Hotel and assembly-rooms. The buildings forming the College have been erected in three periods, and form four sides of an irregular figure. The first block occupies part of the north and east sides of the quadrilateral; it comprises the physical and chemical laboratories, and was commenced in 1887. The second, to the east and south, accommodates the engineering laboratory, drawing and lecture rooms, and the school of art, and was erected between the years 1892-4. The third block just completed occupies the west side overlooking the Castle Leazes, and possesses (inclusive of the "Sir Lowthian Bell" tower) a frontage 100 yds. in length towards the new Queen Victoria-road; it also embraces at the rear, and projecting into the quadrangle, the great hall to accommodate 750 persons. The cost of the erection of the first and second blocks was each about 20,000l., together they do not equal the floor area or the cost of the latest building scheme, which includes the administrative apartments, great hall, library, botanical and zoological laboratories, and will, with the boundary railing, carriage drives, etc., approximate 60,000l.

The buildings have been designed to provide the precise accommodation which experience has suggested to the staff and council as necessary to cope with the demands of the XXth century, and although the character of the old buildings erected nineteen years ago has not been allowed to dominate the latest scheme of the buildings, consideration has been given to ensure that the whole shall agree architecturally in style.

The south and west boundaries are enclosed by a tall wrought iron railing, that on the west being divided by paneled and moulded stone pillars, broken at two points by wide gates, over which is some ornamental cresting combining the College monogram. The carriage drive is semi-circular in form, and leads to the main entrance, which occupies the lowest stage of the "Sir Lowthian Bell" tower, and is placed in the centre of the west elevation. This entrance gives access to the spacious hall, which communicates by corridors with the north and south wings, with the principal staircase and the great hall. The outer entrance is placed under an open portico and the entrance hall, 23 ft. in width, is arranged in two bays with a semi-dome ceiling, carried on coupled columns of Hoptonwood marble with verde antique bases and carved Ionic capitals; the walls are lined to the height of the doors with red marble, having a green marble capping and skirting; whilst the floors are of marble arranged in circular form with radiating panels.

The staircase opposite the main doors is largely constructed of Hoptonwood stone with a massive balustrade, supported on a series of columns. Beyond the main staircase is the great hall for use during convocation and for examination and lecture purposes; it is 70 ft. by 50 ft., and is a small gallery at the south end. It is a lofty apartment, with a coved plaster ceiling supported by ornamental trusses with traiered and moulded panels, brackets, and pendants, and arranged in seven bays, in each of which are modelled figures in slight relief, representing "Practical" and "Theoretical" science, bearing suitable emblems, and enclosed by panels with modelled styles. Around the walls is a stencilled frieze formed of medallions containing the emblems of the various sciences taught in the College. The medallions are connected by festoons, and the roof timbers and other features are bordered with patterns in quiet colours. The dado is of panelled oak 10 ft. high, broken by pilasters, and at the frieze level by small shield-like panels to receive the names of prizemen. Over the chief entrance door is a balcony—opening off the staircase landing—of plaster and circular pediment, and with carved scroll work and mantling enclosing the College arms.

The hall is lighted by a series of two-light windows, set over the dado and divided by two moulded transoms, the mullions being wrought in the shape of columns with modelled capitals and bases the middle range of lights is intended to receive the arms of benefactors. On the north is a large seven-light window, the three centre ones contain the territorial coats of the district which contributes to the college, viz., Northumberland, Cumberland, Westmoreland, Durham, and Newcastle, and above them respectively the arms of the University of Durham and of the Armstrong College; three of the four side lights are filled with the arms and crest with suitable mantling of Lord Armstrong, Sir Lowthian Bell, and Mr. T. G. Gibson. From the

middle of the ceiling depend two large electroliers, and at the sides ten smaller ones, all specially designed. The floor is of oak boards in narrow widths together with a platform of the same material, designed to put together in varying dimensions. The great hall is accessible from corridors on three sides.

Returning to the entrance hall, a corridor runs north and south, and connects the new with the old blocks; for a certain distance—extending to the doors opening into the administrative apartments—the corridor has a marble floor and low dado, and is enclosed by double swing doors. On the left of the entrance is the principal's office, panelled in oak in which are arranged bookcases, and cupboards for stores and robes; adjoining is the Council-room, which measures (including a large square bay at one end, and a deep recess at one side) about 40 ft. by 20 ft. It is lined to the height of 11 ft. in oak, having a heavy cornice broken by the doors with circular pediments and pilasters, and a large open fireplace lined with old Dutch tiles, and containing a dog-grate. In the pediment over the fireplace is a carved shield, crest, and mantling on which is emblazoned the College arms. The frieze is deep and covered with American leather paper, and the ceiling is divided into panels by ribs filled with ornamental plaster work. The oak furniture, upholstered in leather, was specially designed by the architect, and made by Messrs. Robson & Sons. Adjoining the Council-room is the staff-room, and beyond occupying the north-west angle of the building is the union or men's common-room, about 42 ft. square, each room has a deal painted panelled dado, and solid wood block floors. On the right or south side of the main entrance is the general office with strong and store rooms, the office of the secretary, and minor committee-room, and beyond them the junior electrical engineering laboratory, with professor's room and a gallery at one end, this laboratory occupies a corner position, is well lighted, and partially lined with encaustic bricks; opening off it is a lecture-room 40 ft. by 27 ft., with demonstration table complete, and below the senior electrical engineering laboratory and preparation-room, near to it is the storage for accumulators, and opening off the gallery in the junior laboratory a photo metric and standardising room arranged over the corridor.

On the first floor the chief apartment is the library, 60 ft. by 45 ft., with two large bays on the side towards the Leazes: it has a large open fireplace with a dog grate, enclosed by an oak chimney piece, large double doors opening into the north and west wings, and with the fireplace designed to combine with the bookcases and panelling, which the students, past and present, intend to provide as a donation to the College. The remainder of this floor is occupied by lecture-rooms for mathematics, classics, and naval architecture. The classrooms and corridors have each a panelled wood dado. On the second floor the northern half is occupied by two botanical laboratories, one 48 ft. by 30 ft., and the other 60 ft. by 18 ft., with a museum, lecture, preparation, and dark rooms, each with a glazed tiled dado, and replete with appliances. In the southern half of the second floor are lecture-rooms for history, literature, and languages, and a number of small rooms for professors.

On the third floor is the zoological department comprising a large laboratory, 36 ft. by 31 ft., and a combined museum and laboratory, 72 ft. by 34 ft., together with a private laboratory, lecture, professors', and preparation rooms, contiguous to these laboratories are flat asphalted roofs intended to receive glass conservatories. Below the great hall and lighted from the quadrangle, is a refectory or dining-room for students, 60 ft. by 30 ft., a dining-room for the staff, and the usual kitchen offices, together with a range of men's lockers and lavatories. In the tower are some lecture-rooms, and on the third floor a large glass dome transmits light through a circular well arranged on each floor.

The whole of the new buildings are warmed on the atmospheric steam-heating system, whereby, by a series of radiators, each or all of the rooms can be heated to any degree of warmth required by comfort, according to the weather, and a uniform temperature maintained until the steam valve to each radiator is changed either to a greater or reduced opening. From each room a ventilating shaft of proportionate size is taken to a large chamber in the tower, in which are two powerful fans 5 ft. in diameter worked by electricity.

On the exterior the buildings are of stone and red brick, and the roofs covered with red tiles. The tower, 120 ft. in height, as previously mentioned, is situated in the centre of the west elevation. The lowest stage comprises an open corridor of the Ionic order, with a straight pediment, which affords protection to a shield bearing the College arms and enclosed by scroll work and cherub supporters. Surmounting the three stages immediately over the entrance, which are formed successively of the Doric, Ionic, and Corinthian orders is an arched pediment containing a large shield bearing the arms of Sir Lowthian Bell, the donor of the tower which bears his name. Flanking the first floor stage of

the tower the masonry continued from the ground floor forms a pedestal, on which are seated figures of "Science" and "Art." The upper stages of the tower are pierced with windows having broken pediments, which are surmounted by an open curved balustrade, and the angles of the tower octagonal on plan terminate in turrets. The main elevation is flanked at each end by large gables, and is pierced at each floor level by large transomed and mullioned windows, broken by square buttresses with small conical terminations. Between the tower and the angle gables are projecting bay windows square on plan as to the ground floor and octagonal above. The external mullions have carved angle volutes, from which are suspended elongated shields. An open ornamental parapet, of stone balusters and scroll work crowns the bays and intervening spaces, and partially screens the fourth floor, which is set back from the main wall and constructed in oak half-timber work, with deeply-projecting eaves, supported on brackets.

The whole of the work has been carried out from the designs and under the supervision of Mr. W. H. Knowles, architect, of Newcastle. Between the tower and the angle gables are projecting bay windows square on plan as to the ground floor and octagonal above. The external mullions have carved angle volutes, from which are suspended elongated shields. An open ornamental parapet, of stone balusters and scroll work crowns the bays and intervening spaces, and partially screens the fourth floor, which is set back from the main wall and constructed in oak half-timber work, with deeply-projecting eaves, supported on brackets.

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Fifty Years Ago.

FROM THE BUILDER OF JUNE 28, 1856.

BUILDING BY CONTRACT.

THERE seems to be so many evils in the practice of building by contract, that it is difficult to determine how it can have gained the popularity it has; but probably it is to be ascribed to the laudable desire of knowing what the thing will cost before we buy it. It is, no doubt, satisfactory to know, not only that the proposed works will cost no more than such a sum, but that someone has bound himself to execute them for that sum. Would not the architect's estimate answer this purpose? No! because there is no guarantee of its accuracy beyond the *bonâ-fide* result of a fallible judgment; whereas, if the builder make the mistake, the loss is his, and not mine, says the employer, and herein is my guarantee that I spend no more. The real state of the case is, that if the architect has a mistake in his estimate, the building costs the proprietor more money, but not more than it is worth. If the error is with the contractor, the employer does not pay more money, but experience shows there is strong presumptive evidence that he does not get the article he intended to have—certainly a semblance of it, but not one that looks as well, or that will last as long as he intended it should, or one that has cost *anybody* as much as it ought to have done to realise that intention.

The result of the system of public competition for the execution of buildings or works has been to deteriorate workmanship, to introduce bad materials, to provoke disputes, to involve litigation, to offer a premium to rascality, to disappoint those embarking in building speculations, and to lower the tone of moral principle in masters and men.

CHURCH IMPROVEMENT, STEVINGTON.—The reopening, after alterations, of the Stevington Primitive Methodist Church took place on the 14th inst. The old seats and floor have been taken out, and the chapel lengthened 7 ft. 6 in., and a new vestry and classroom, 10 ft. by 10 ft., new kitchen, new floor has been put to the chapel, and a 4 ft. 6 in. dado round the walls. Four new windows have been put in, besides two in the gable, which, with four of Boyle's fresh-air inlets inserted in the walls, serve for ventilation. The seating arrangements have been improved, and a lobby has been formed with a door-room each of two aisles. Mr. E. H. C. Inskip prepared plans and specifications, and the building work was entrusted to Mr. T. Dickens, of Bedford, the wood work and interior fittings and decoration being carried out by Mr. C. Negus, of Bedford.

Illustrations.

DESIGN FOR THE PEACE PALACE AT THE HAGUE.

WE publish this week Mr. Cross's fine design for the Peace Palace at The Hague, which was specially mentioned in our second article on the designs in our last issue.

The following extracts from the Report accompanying the design, which have been sent to us by the author, will explain his intentions in the design:—

"The problem to be solved appeared to the author to be best met by the production of a design containing all the architectural essentials of a single monumental edifice, of which the two departments (A) the court-house and (B) the library form separate groups of buildings connected only at the ground floor level. In the accompanying design ("Temple of Peace") a monumental and regular system of planning has been adopted, resulting in the accommodation being obtained in two perfectly symmetrical blocks of buildings connected by spacious colonnades enclosing a large open central court, whence access is gained to the staircase hall of either department.

Subsidiary exits to the park are provided from each of the buildings, and the whole structure is conveniently accessible from the back of the site. The period of design selected—that of the Italian Renaissance—is one eminently suitable both to modern everyday requirements and to monumental architectural effect. It was thought that the large single Doric order proposed to be employed would result, if properly detailed, in the erection of a building of a stately, durable, and imposing character, fully suggestive of its purpose, and free from meaningless rococo ornamentation and embellishments. The estimated cost of the design, exclusive of the lofty column of Peace and the external sculpture, was 135,000."

MANSIONS AND FLATS, CLEVELAND-ROW, ST. JAMES'S.

The accompanying illustration shows an elevation of these buildings, facing St. James's Palace and Bridgewater House, now nearing completion.

The block has been designed for three town houses which front Cleveland-row, and suites of residential flats, having an aspect to Cleveland-square and the Green Park. The London Fencing Club, whose premises formerly occupied this corner of the site, have new accommodation on the fourth and fifth floors of the latter block. The elevations have been governed by the main horizontal lines of the neighbouring property. The windows are grouped symmetrically and enriched with iron balconettes. The whole building is surmounted by a modillion and dentil cornice, the former being coupled to bring the whole in scale with the cornices of the adjoining buildings.

The general contractor for the work is Mr. J. Carmichael, and it is being executed from the designs and under the superintendence of the architect, Mr. Frank T. Verity.

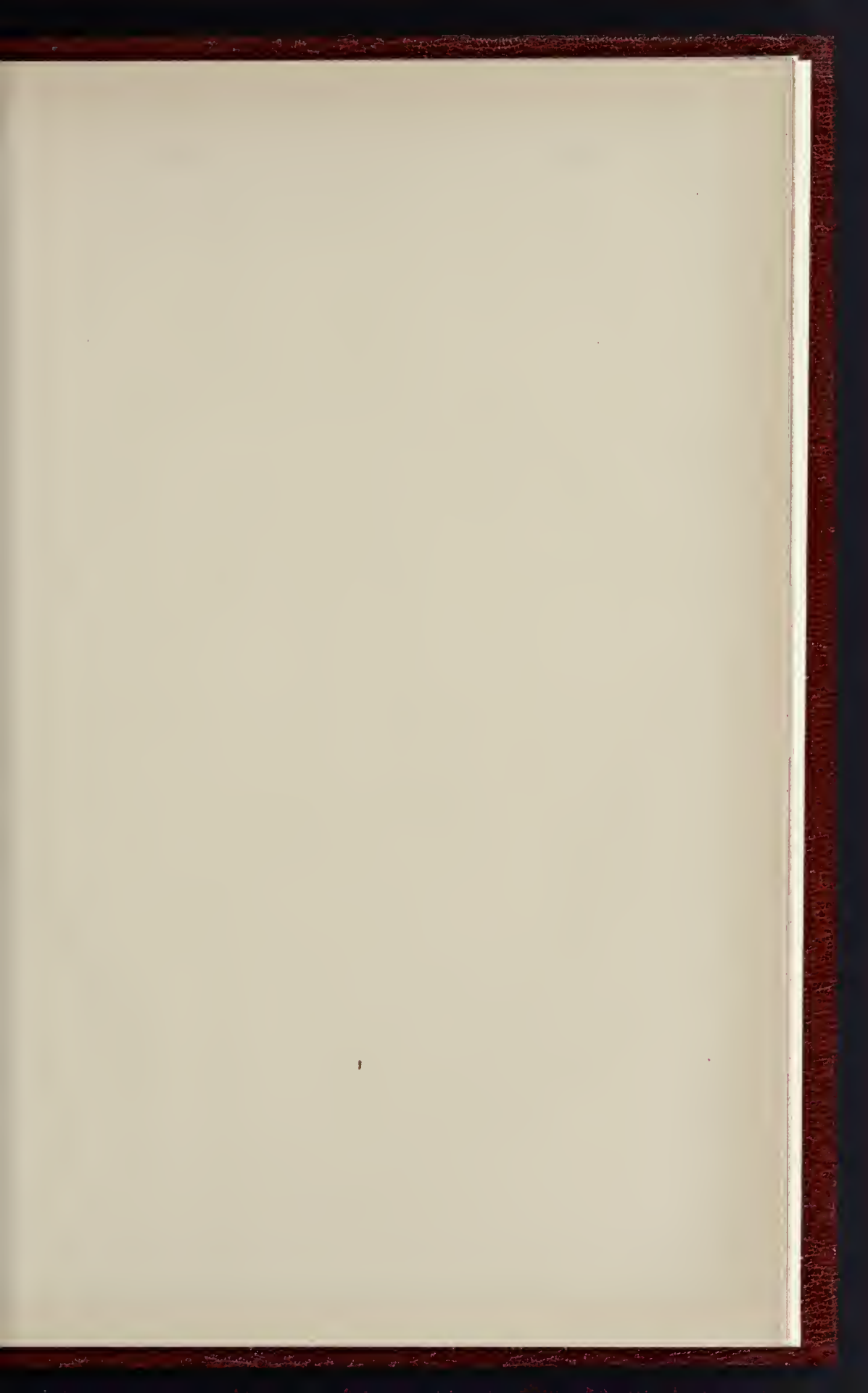
SOME ENTRANCE PORCHES:

HARE HALL, ROMFORD.

HARE HALL is a fine example of late Renaissance mansion, standing back from the main Chelmsford road, about two miles east of Romford station. Its date is about 1666. The north, east, and west fronts are wholly faced with Portland stone. The late Mr. Edward Castellan restored and remodelled the building, adding new dining and drawing rooms, garden loggia, and entrance porch. Messrs. James Smith & Sons were the contractors.

HYDE HOUSE, BULSTRODE-STREET.

This building has just been completed. It is faced with best red-facing bricks dressed with Portland stone. The contractors were Messrs. Patman & Fotheringham. Mr. Ammonier did the carving, and Messrs. Wrang the ironwork, both to the staircase and the area railings. Messrs. Seth-Smith & Monro were the architects.





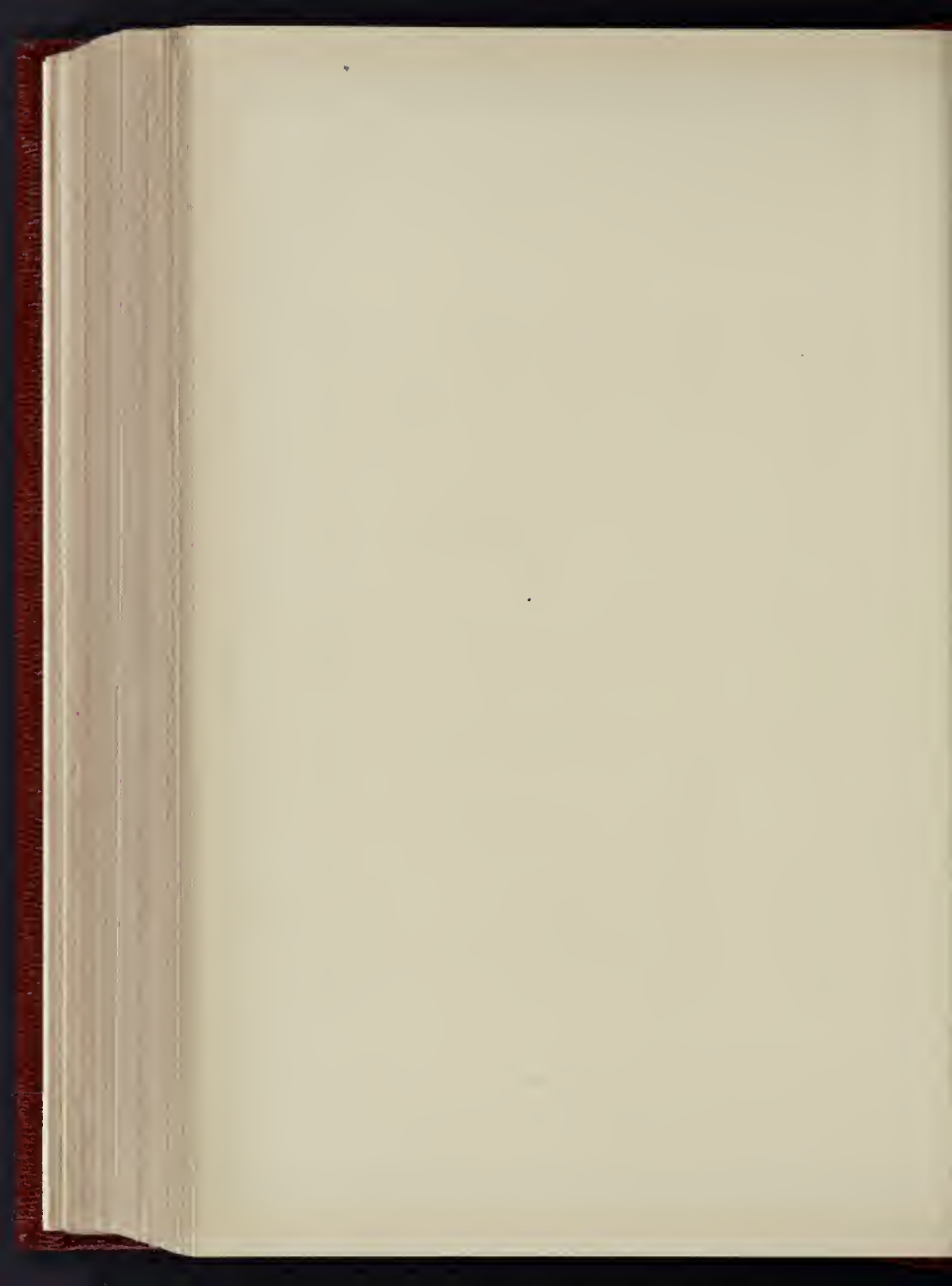
MANSIONS • CLEVELAND

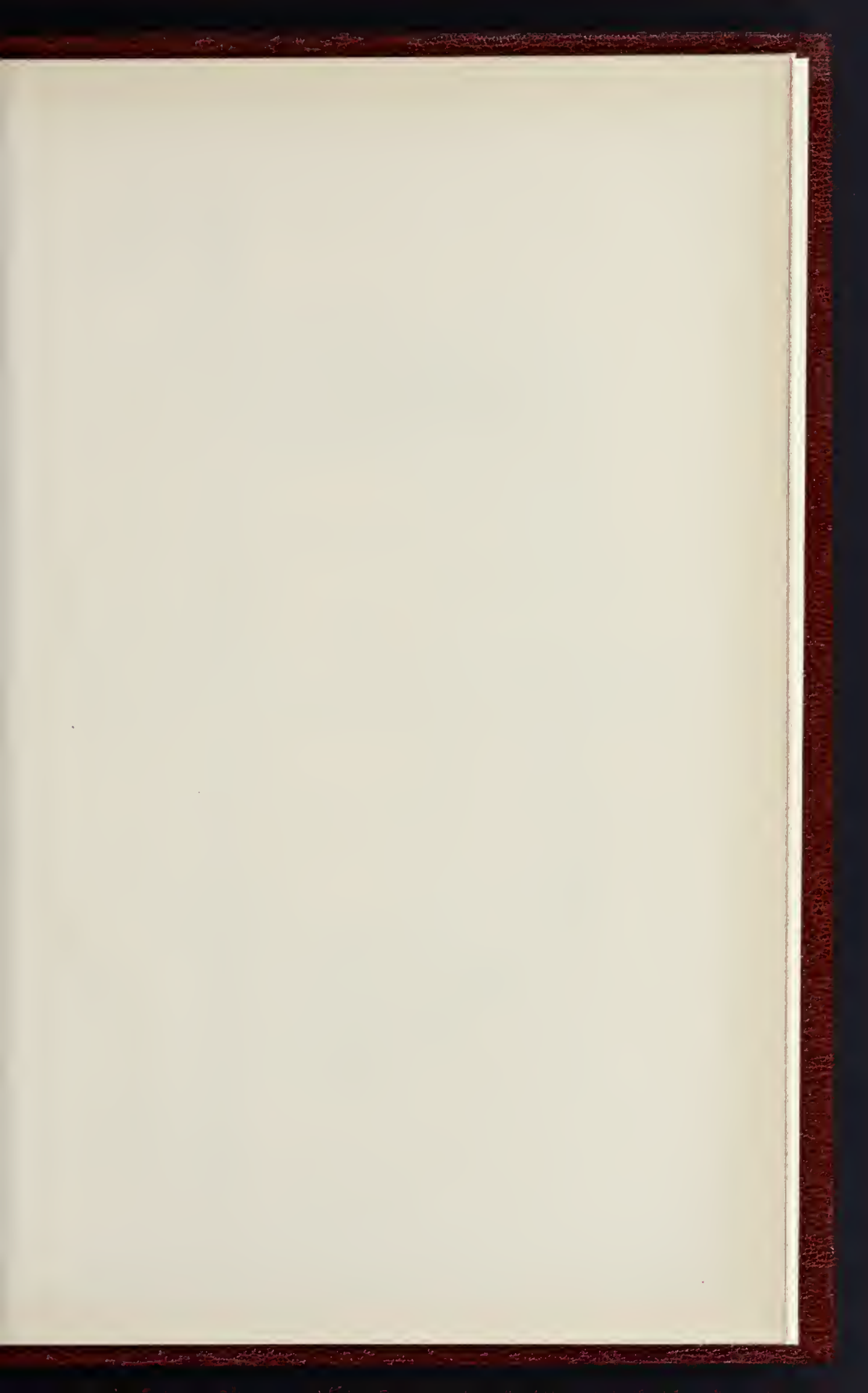
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ST JAMES'S · S W

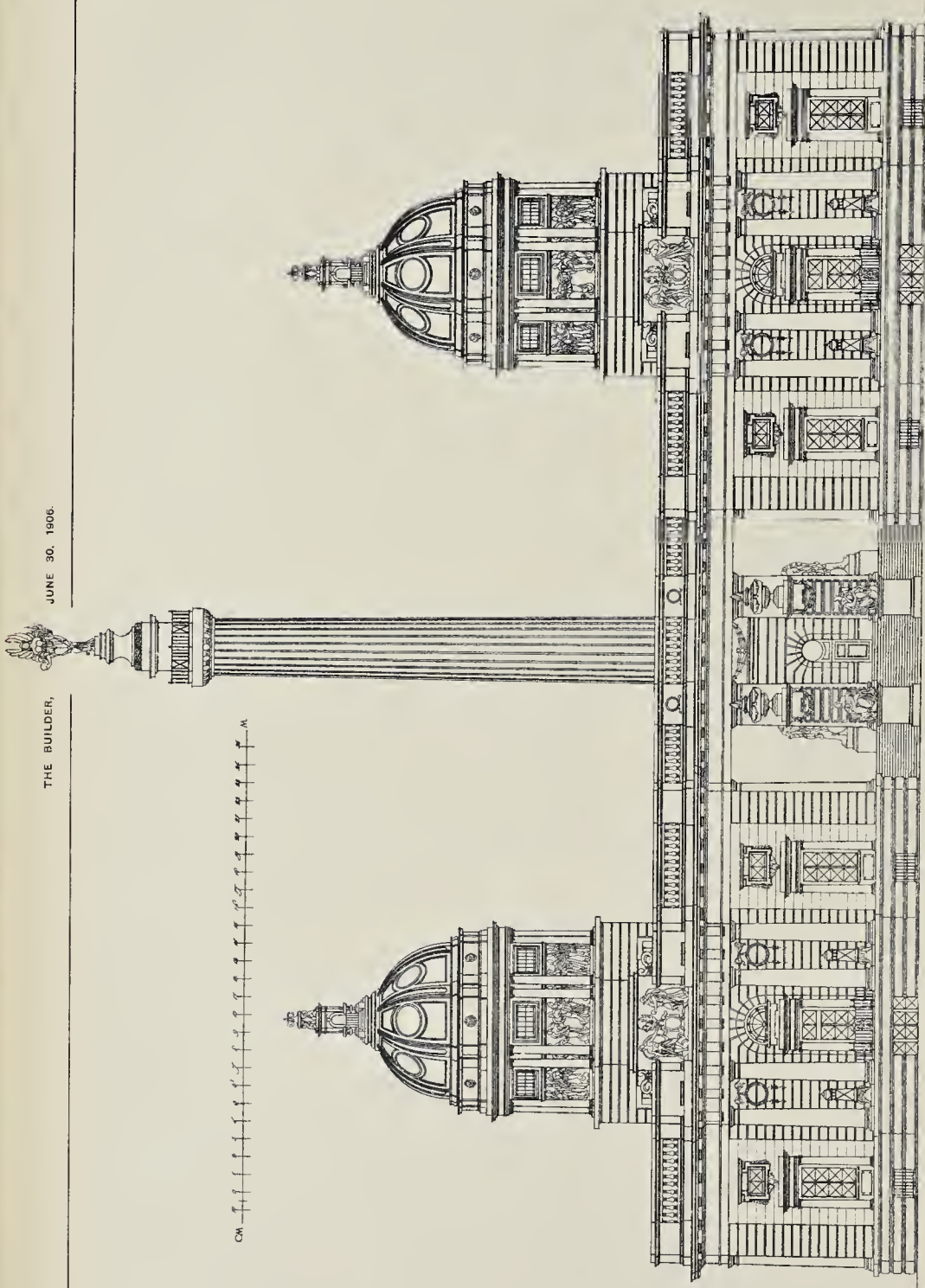
Frank J. Smith F.R.C.S. &
Architect.



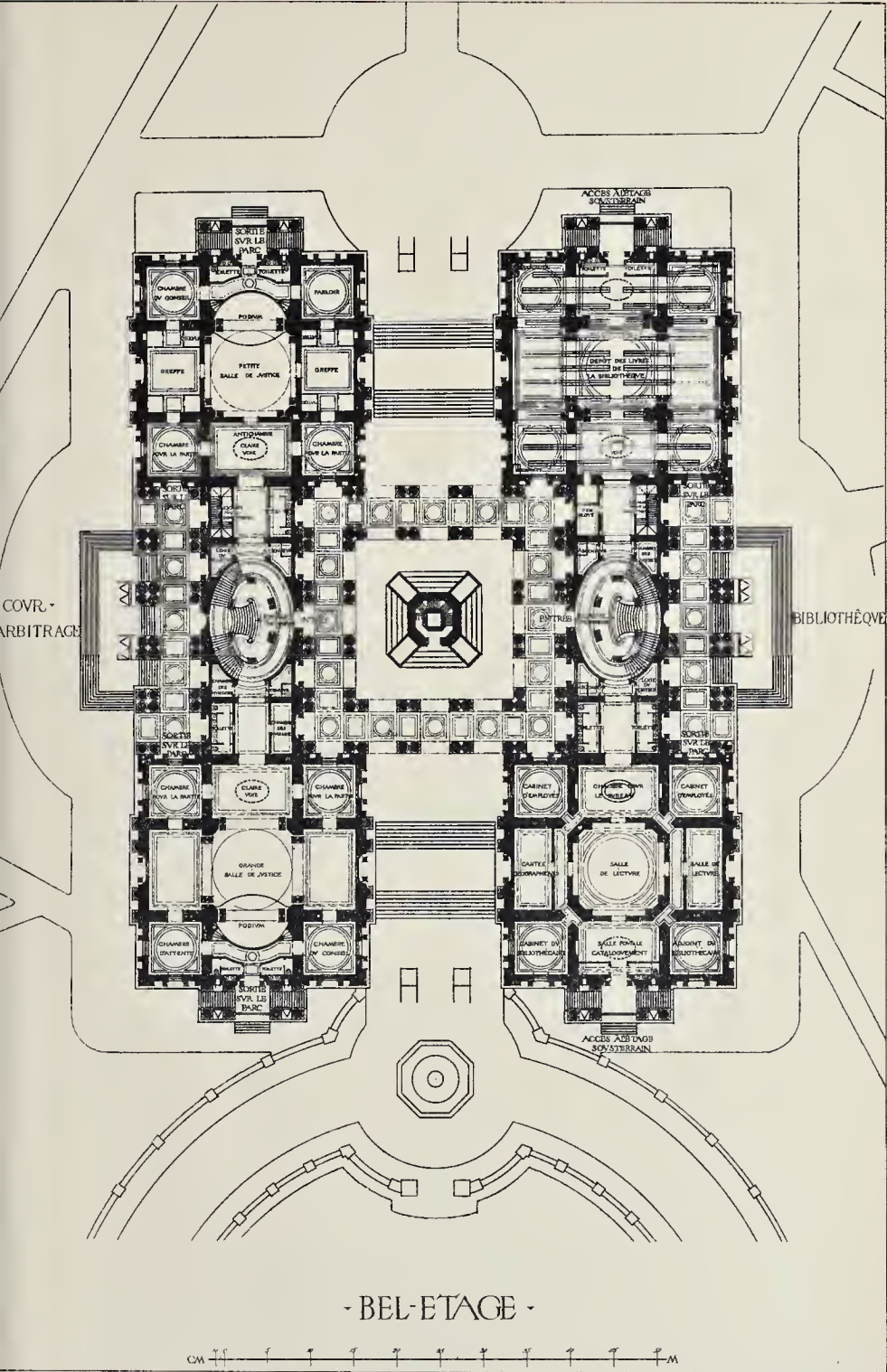


THE BUILDER,

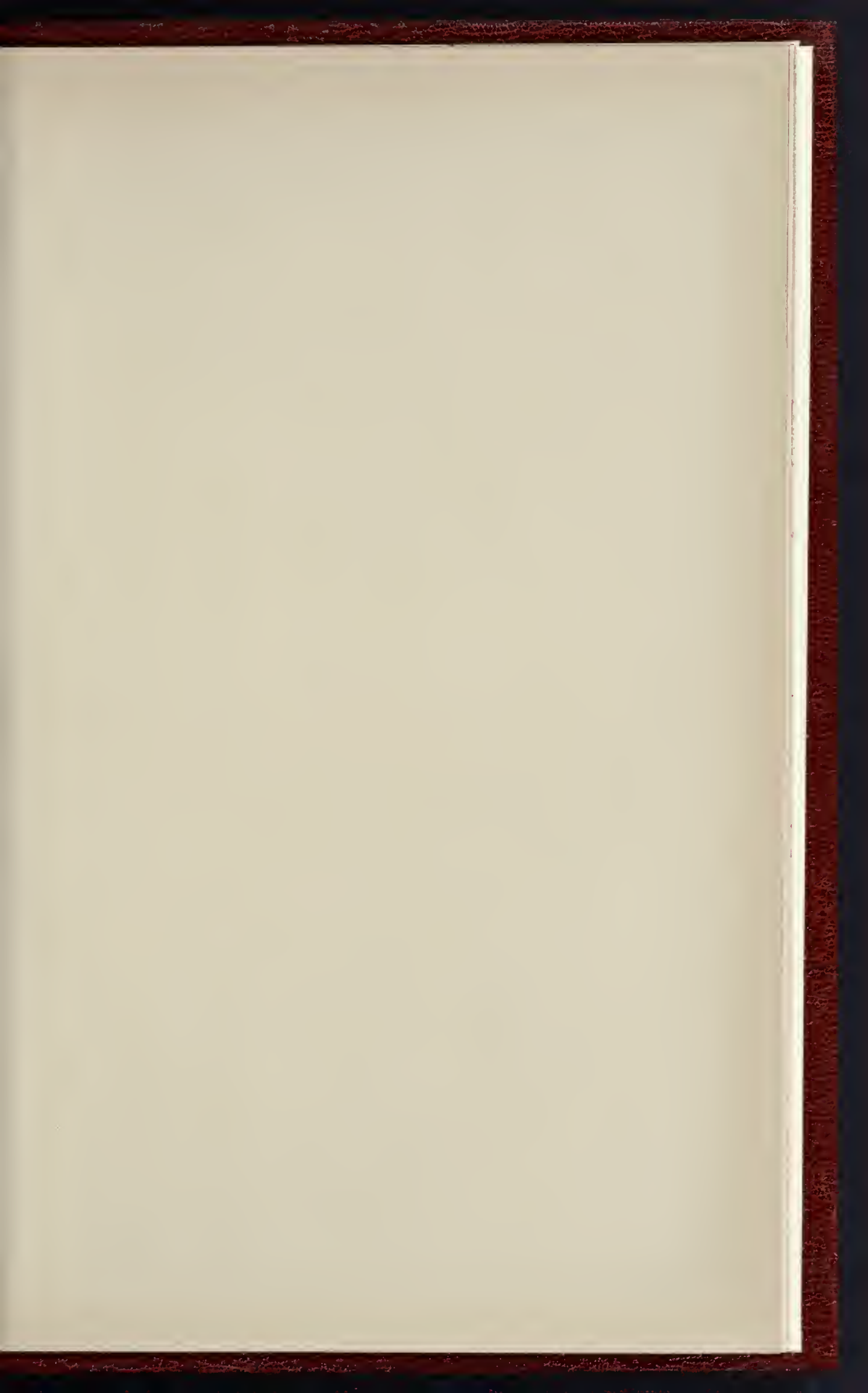
JUNE 30, 1906.

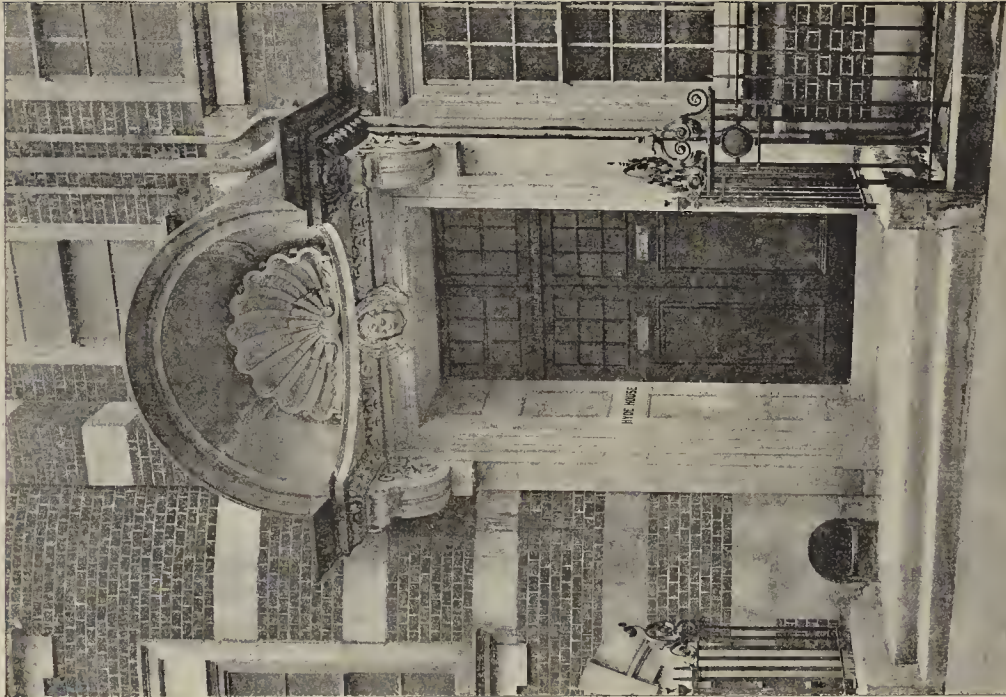


ELEVATION DE LA FAÇADE PRINCIPALE



- BEL-ETAGE -





THE BUILDER, JUNE 30, 1906

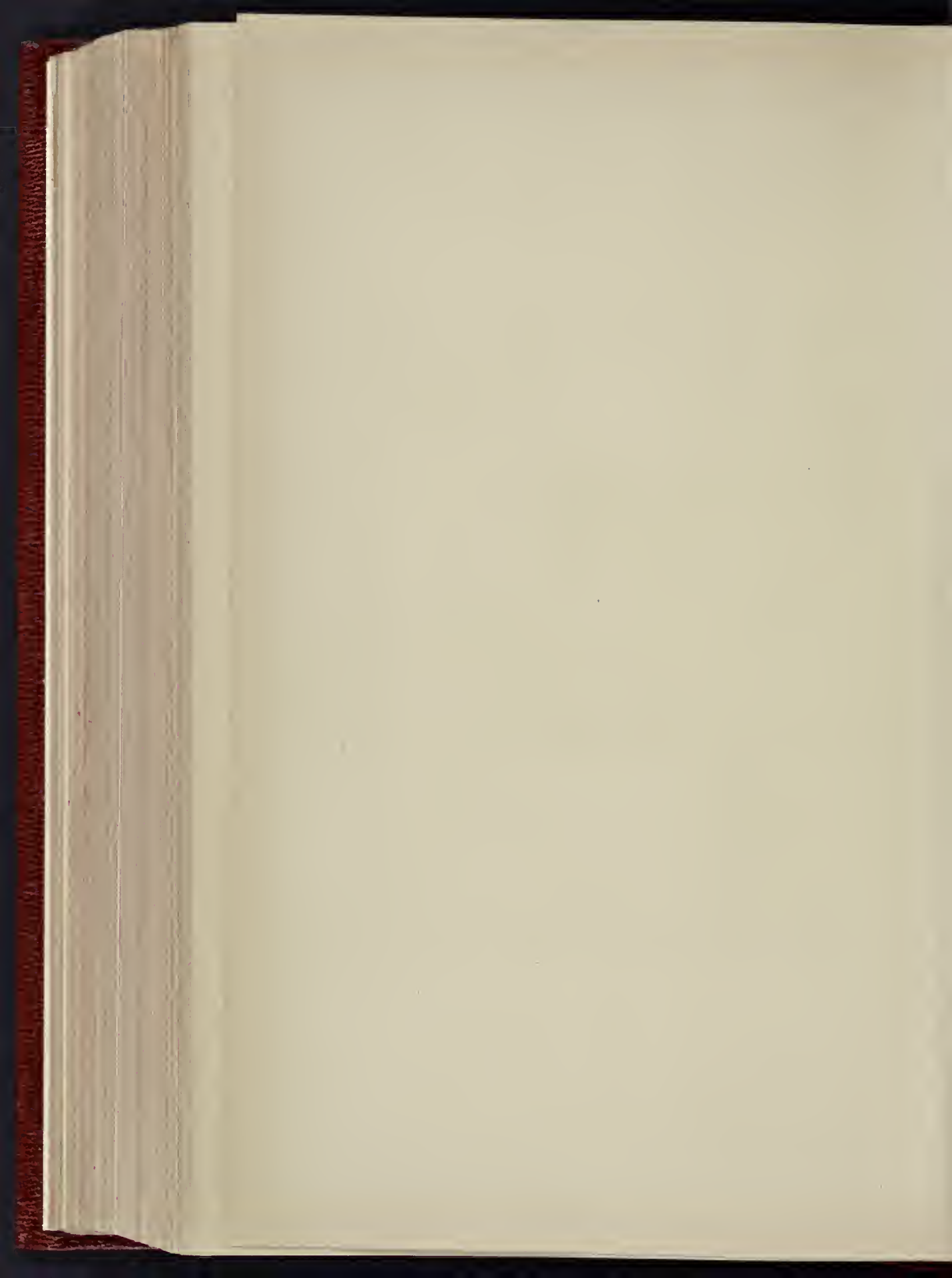
SOME
 ENTRANCE PORCHES.
 ———
 MESSRS. SETH SMITH & MUNRO,
 ARCHITECTS.

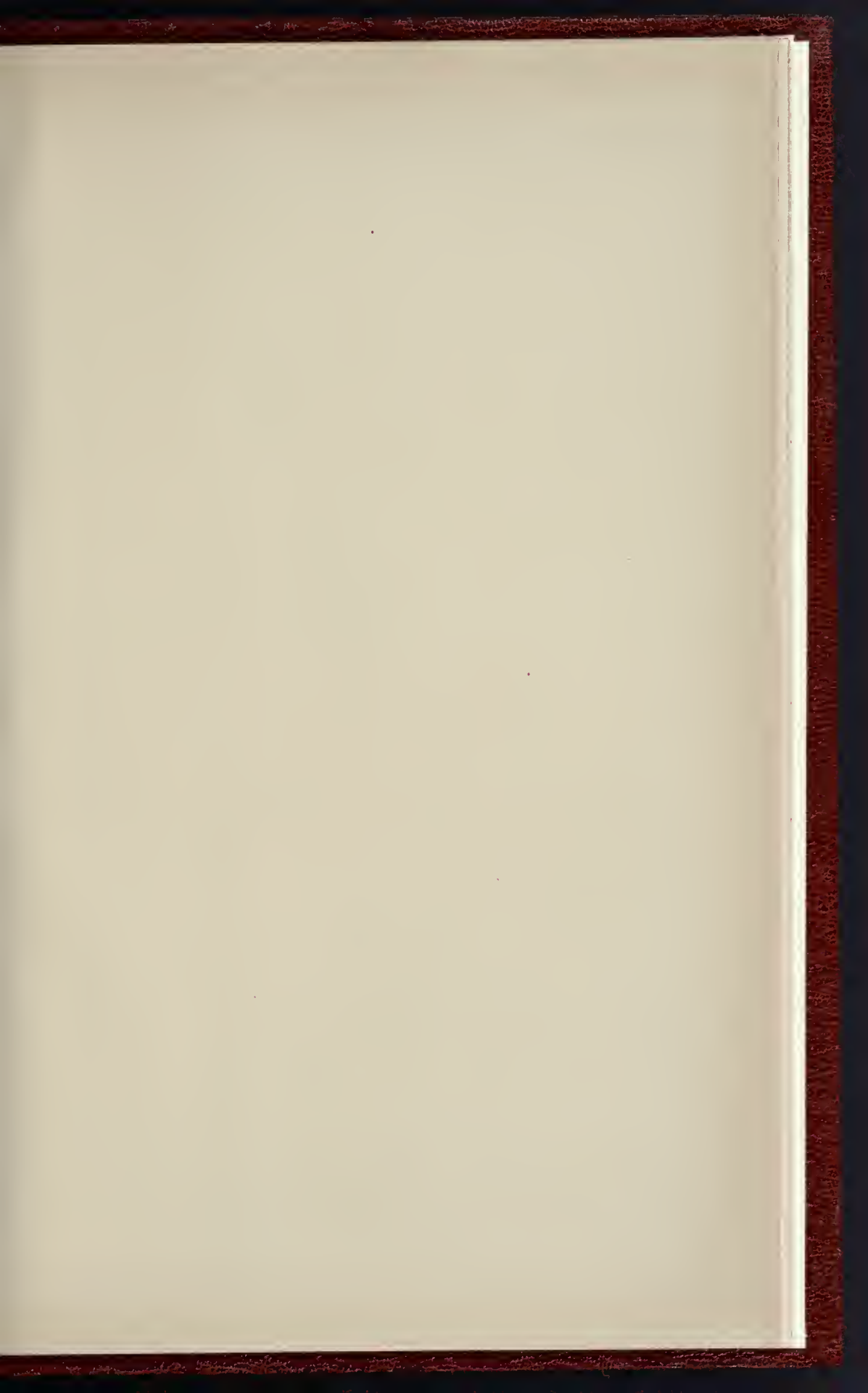
1. FRONT ENTRANCE, HARE HALL,
 ROMFORD.
2. ENTRANCE, NO. 10 BULSTRODE
 STREET, W.
3. GARDEN LOGGIA, HARE HALL,
 ROMFORD.



3.

INK PHOTO J. BRUCE & CO. L^{td} 4, 5 EAST BRIDGE STREET, LONDON E.C.







DESIGN FOR THE PEACE PALACE AT THE HAGUE
PERSPECTIVE



INK PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE C C

UE.—By Mr. A. W. S. Cross, F.R.I.B.A.

Competition.

OFFICES FOR HOLBORN COUNCIL.—In a report circulated on Monday, the Establishment Committee of Holborn Borough Council stated that they had considered in detail the plans sent in by the six selected architects for the additional office accommodation required. With a view to affording the members of the Council sufficient time for the inspection of the plans, arrangements had been made by which the plans could be on view in the Council Chamber for a week, after which they would be considered, together with the Committee's full report upon them, at a special meeting to be held on July 4.

BOOKS RECEIVED.

NOTES ON ENGLISH BOND (Notes sur la Liaison Anglaise). By Robert Williams, F.R.I.B.A. (B. T. Batsford).

CONCERNING MODELS OF BUILDINGS. By John B. Thorp. (London: Drawing and Tracing Office.)

LONDON TOPOGRAPHICAL RECORD; Vol. III. (The London Topographical Society.)

THE CATHEDRALS OF THE RHINE AND NORTH GERMANY. By T. Francis Bimpus. (T. Werner Laurie, 6s.)

Correspondence.

THE CARABINIERS WAR MEMORIAL, CHELSEA.

SIR.—Some of your contemporaries have been led to ignore my connection with this monument, and in the *Times* I am referred to as if I were a bricklayer and stonemason. That, however, would not disgrace me, for the whole of the work has been admirably executed by the contractor, Mr. Thos. W. Haycock, Ebury-street.

The present time being the sixty-first anniversary of my entry into the architectural profession, I feel somewhat sore on the ground that Capt. Adrian Jones—notwithstanding his disclaimer (which I have here) of any desire "to sail under false colours"—has allowed his friends to trumpet his name as the so-called designer of the monument, and has refrained from informing the Press generally that the architect is

JOHN LIDDELL.

Obituary.

MR. MOSELEY.—The death a few days ago at his residence, the Hollies, Munster-road, Fulham, is announced of Mr. Andrew Moseley, who had attained the age of ninety-four years, formerly of Churchfield House, King's-road, S.W., and District Surveyor for Fulham. Mr. Moseley was architect of the Westminster Palace Hotel, a Fellow of the Royal Institute of British Architects, and served as a member of the Council. He retired from the profession, and he was, it appears, the *doyen* of the members of the Institute. The brothers, Messrs. W. & A. Moseley, were architects of the Westminster Palace Hotel, Victoria-street, S.W., 1858-61, of which a drawing and two plans were published in the *Builder* of April 10, 1858, and Mr. William Moseley's detailed description in our issue of March 8, 1862. The western portion of the building shown in the drawing was taken for the India Board.

MR. COLLINS.—We regret to announce the death, at the age of thirty-two years, of Mr. Horace W. Collins, of Clinton-road, Redruth. Having served his articles to the late James Hicks, of Redruth, he began to practice in that town ten years ago. Mr. Collins made the plans and designs for the renovation, with decoration and many improvements of the Wesley Chapel, Redruth; the remodelling of the interior, with decorative work, etc., of the Wesleyan Chapel at Troon (1896); a hotel, with shops, at Llanerdd (1900); the rebuilding of the Manor House, Marbury, Tavistock; for Mr. R. Collins; South Downs Wesleyan Schools, Redruth; schools at Laner, near Redruth; rebuilding for the Redruth Brewery Company of the Pendrives Arms Hotel, Gwentlan; the enlargement, with improvements, of the Druids' Hall, Redruth, for the Public Rooms Company, Ltd. (1905); extension of the Gerauns School, Portscatho; and a villa residence in Clinton-road, Redruth for Mr. J. Simmon. Of his most recent work there are drawings in the current Royal Academy Exhibition—a boating-cottage near Falmouth, and the proposed Secondary School, Redruth.

MR. WILKINSON.—The death, on June 13, is also announced of Mr. Philip Wilkinson, aged eighty years, of No. 68, Lincoln's Inn-fields, W.C., and of No. 2, Greville-place, St. John's Wood, N.W. Mr. Wilkinson was elected a Fellow of the Institute in 1890.

MR. CHURCH.—The death occurred a few days ago of Mr. W. D. Church, the senior partner of the firm of W. D. Church & Son, architects, of 12, South-place, Finsbury. Deceased was the architect of several churches in London, viz. St. Mark's, E.C.4., Mr. George James Snelus, F.R.S., M.I.Mech.E., and of the Iron and Steel Institute, of which he was a Vice-President, died in his seventieth year at his residence, Ennerdale Hall, Frizington, Cumberland, on June 18. He began life as a school-teacher, but having obtained a Royal Albert Scholarship, he went through a course at the Royal School of Mines, and was then appointed chemist to the Dowdles Works. On his return from the United States, whither he had proceeded upon the nomination of the Iron and Steel Institute to frame a report upon the Danks rotary puddling furnace, Mr. Snelus took out a patent in this country for a process, with which his fame is closely associated, whereby he obtained a basic lining immune from the action of a basic slag by lining the Bessemer converter with lime rendered impervious to water by having been burned at a very high temperature. In 1883 the Iron and Steel Institute awarded him, conjointly with Sidney Thomas, their Bessemer medal, and his invention won for him also gold medals at the Inventions Exhibition, 1885, and the Paris Exhibition, 1878. Mr. Snelus was elected a Fellow of the Royal Society in 1887.

General Building News.

METHODIST CHURCH, BELFAST.—The new Methodist church erected on the Lisburn-road was dedicated recently. The building forms part of a larger scheme, in accordance with the objects of which it will in the course of a few years be used as a lecture-hall. The walling is of rubble masonry from the Ballyvaughan Quarry, with white Scotch stone for angle quoins and string courses. The tracery of the large window in the main gable and the dressings of the other windows in the main front are of red freestone. The dressings of entrance doors and gable barge are also of red stone. The internal dimensions of the hall are 52 ft. by 34 ft. The joist work throughout is of selected pitch-pine. Pews have been provided for 260 persons, and additional seating for 70 is provided by chairs. The speaker's platform has a paneled pitch-pine and mahogany front. At the back of the platform is a wide seat under an arched recess, paneled and mounted up to the springing line of the arch. The heating apparatus has been fitted up by Messrs. Musgrave & Co. At the rear of the main hall are two classrooms, the larger of which is to be used as a church parlour, and the smaller as a temporary vestry. The general contractor for the work was Mr. Thomas McMillan, and the architect Mr. St. John Phillips.

CHURCH RESTORATION, CORHAMPTON, HAMPSHIRE.—The church of Corhampton, situated on the banks of the River Meon, has just been repaired and restored, at a cost of 800*l.*, under the superintendence of Mr. T. G. Jackson, R.A. The Saxon chancel arch has been strengthened, the bell cote, dating from 1600, reconstructed, and the bells, dated 1619 and 1829, rehung, and the Saxon west window opened. Some XIIIth century decorations and ancient consecration crosses are to be seen on the walls, and a stone altar slab, formerly used as a seat under the yew-tree, has been placed in the porch. The porch, a comparatively modern structure of brick and plaster, has been taken down, and a new one erected with a buttress on the east side to serve as a support for the south wall of the church, which was in a very weak state. The walls and foundations have been repaired and strengthened, iron wall-plates and tie-rods being used. The windows in the gable at the west end of the nave, which were bricked up, have been opened and glazed to give additional light in the church. The roof has been stripped and repaired throughout and retiled, mostly with the old tiles; the ceiling taken down and replaced to show part of the roof timbering. The interior walls have been stripped of whitewash and battening, and the panework of the windows brought out and repaired. The deal pews, which were much decayed, have been removed, and a wooden block floor laid for the new seats, which are of oak. These were made on the spot by the local carpenters, Mr. T. Green and Mr. Couzens, from designs prepared by Mr. Jackson, as were also the new organ-desk and the lectern. The old Jacobean pulpit has been repaired and set on a new base, and the altar-rails, dating from 1636, repaired and cleaned of the paint with which they were covered. The work of repairing and re-seating the church has been carried out by Messrs. Green, of Meonstoke, and under the direction of Mr. R. Long, of Oxford, clerk to the works.

SCHOOL, SWINTON.—The new school in connexion with St. Peter's Church, Swinton, opened recently, will accommodate 640 boys and girls. There are twelve classrooms grouped on either side of a central hall 80 ft. long by 28 ft. wide. The building has cost over 8,000*l.* The internal

woodwork is of pitch-pine, and the rooms are heated by pipes and radiators on the low-pressure system, and are lighted by gas. The building is of one story, and glazed folding screens divide the classrooms from the central hall. The exterior is faced with red Accrington bricks with golden buff terra-cotta architectural features. The classrooms and hall have tiled dados with plastered walls above, and the corridors, cloak-rooms, and paving, dados of glazed bricks, with red brick lining over. Messrs. Gerrard & Sons, Ltd., of Swinton, were the general contractors; and Messrs. C. K. and T. C. Mayor, of Manchester, the architects.

HARTLEY PRIMITIVE METHODIST COLLEGE, MANCHESTER.—A new part of the Primitive Methodist College in Alexandra-road, South, Manchester, has been built by Mr. Hartley. This new portion contains some 120 rooms, and is the largest part of the College. The entrance to the new extension is immediately beneath the clock tower, by a corridor which extends northward into the new portion, and by joining the old portion of the College forms practically an unbroken corridor 260 ft. in length, running parallel with the whole front of the buildings. Branching off to the west from this new corridor at right angles are two secondary corridors, from which are entered the studies. One hundred and seven new studies are provided, each 11 ft. by 9 ft., the whole grouped in three-story buildings around a rectangular quadrangle. The lecture-hall is 60 ft. wide and 32 ft. deep. The lecturer's desk faces three sides of a large octagon, around which is a rising gallery containing a separate desk for each student. Along the main corridor at its north end the College chapel is entered. This structure provides sitting accommodation for 150 persons. Its length is 44 ft. and its width 30 ft. There are a chancel and organ chamber at the west, and a north and south transept. The vestibule at the east end of the chapel, and the entrance door from the College grounds. All the windows are filled in with stone tracery and clear leaded lights, and the whole of the woodwork is in oak, lightly wax polished. A two-manual organ has been built by Messrs. Hardy & Son, of Stockport. A new library has been provided on the first floor, and the old library on the ground floor has been converted into a common room for the students. The new dining-hall, on the west of the corridor, 48 ft. long and 30 ft. wide, is finished in varnished pitch-pine, with paneled wainscoting. The old dining-hall has been converted into a second lecture-hall. The College and grounds cover an area of over 5*1*/₂ acres. There are 305 rooms in all, and all the corridors in the buildings make a consecutive length of 944 lineal yds. or well over half a mile. Messrs. Fred. W. Dixon & Son, of Manchester, are the architects of the whole of the designs, under whose supervision the work has been carried out.

COTTAGE HOMES, HALIFAX.—The Mayor of Halifax, Councillor R. D. Ward, J.P., decided some time ago to build twenty-four cottages for the homes, in proximity of his own residence, for the benefit of the poor. The "Cottage Homes" consist of three blocks, situated on the south side of Upper Washer-lane, overlooking the Calder Valley. Each block comprises eight cottages, four of which enter from Upper Washer-lane, and four underneath being approached from a terrace 34 ft. wide, entering at the extreme ends of the three blocks. The buildings appear as one story high to the roadway and two stories to the terrace side. Each house consists of a living room, 14 ft. by 15 ft. 3 in., with an additional recess, 7 ft. 6 in. high to the roadway and two stories to the terrace side. Each house consists of a living room, 14 ft. by 15 ft. 3 in., with an additional recess, 7 ft. 6 in. high to the roadway and two stories to the terrace side. Each house consists of a living room, 14 ft. by 15 ft. 3 in., with an additional recess, 7 ft. 6 in. high to the roadway and two stories to the terrace side. Each house consists of a living room, 14 ft. by 15 ft. 3 in., with an additional recess, 7 ft. 6 in. high to the roadway and two stories to the terrace side. Each house consists of a living room, 14 ft. by 15 ft. 3 in., with an additional recess, 7 ft. 6 in. high to the roadway and two stories to the terrace side.

FREE LIBRARY, TWICKENHAM.—The foundation-stone of the new free library, Twickenham, has just been laid. The new building has been designed by Mr. Howard Goadby, F.S.I., of Twickenham, and the contractor is Mr. E. E. Nightingale. Opening out of the entrance lobby is the hall, 19 ft. by 22 ft., on the right of which are the stairs leading to the first floor and the doors to the magazine-room; on the left, the entrance to the newsroom, and immediately opposite, the counter and entrance to the lending library. The lending library has been designed on the "open access system." The lending library is 43 ft. long by 26 ft. broad, and provides shelving accommodation for 21,000 books. The newsroom is 40 ft. by 22 ft., and has direct side and front

light. The magazine-room is 23 ft. by 30 ft., and will seat thirty people. Behind the newsroom is the staff workroom, with separate back entrance. The basement contains a book-store and file-room, 42 ft. by 26 ft., heating chamber, fuel store, and lavatories. The staircase from the ground floor to first floor will be constructed of oak and teak, and the walls panelled with wainscot oak. A domical ceiling will form a feature over the hall, and immediately opposite the main entrance is a stained-glass window. Leading from the first floor landing are the librarian's and committee room, reference-room, and lecture-hall. The latter is 23 ft. by 40 ft., and a platform will be constructed at one end. The hall will seat 110 people. At the rear of the platform are ladies' and gentlemen's retiring-rooms, with lavatories attached. The reference-room will seat twenty-five students, and is 30 ft. by 23 ft. The walls will be lined with shelves to accommodate 500 folio books and 2,500 octavos. A book-lift will run from floor to floor. The warming medium will be low-pressure hot water, generated by means of a boiler in the basement, and distributed to the various rooms, in which radiators will be fixed. The ventilation will be effected by special fresh-air inlets, and the vitiated air will be extracted by shafts leading to a chamber in the roof, fitted with a 36-in. electric fan.

WORKHOUSE ACCOMMODATION AT LEICESTER.—The principal matter which came before the Leicester Board of Guardians on the 12th inst. was with regard to the alterations to the workhouse rendered necessary by the report from the Local Government Board inspectors as to the necessity for better accommodation at the house for certain classes of inmates, and proper provision for certain diseases. Mr. Howe, as Chairman of the House Committee, moved the adoption of a scheme prepared by Mr. A. H. Hind, architect. It was proposed to erect male and female receiving and itch wards on the vacant land fronting the lous, giving dormitory and ward accommodation for 40 persons. It was also proposed to remove the present receiving and itch wards, and build two two-story dormitories to accommodate 104 beds. Each block of the receiving wards was designed to contain day-room dormitory (12 beds), water-closets adjoining, bathroom, containing bath and lavatory basin, discharging-room, officers' bed and sitting rooms, and private water-closet. Each block of itch and venereal wards was to contain two wards (four beds each), two bathrooms, with bath and lavatory basin, two water-closets. The wards were perfectly isolated, and were provided with separate entrances. The entrances to the main dormitories were arranged on either side of existing principal front and connected to the house by the old passage at rear of offices. By projecting the building 5 ft. from the existing principal front building, line additional space was given to offices and yards, Nos. 1, 2, and 19. The accommodation provided was—Ground floor, male, 27 beds; first floor, male, 27 beds; total, 54 beds. Ground floor, female, 25 beds; first floor, female, 25 beds; total, 50 beds. The floors were fireproof, and the staircase was of concrete. The exterior of the building was to be faced with pressed bricks, relieved with coloured bands, the copings and sills being of stone. Fireplaces were arranged to all wards, in addition to ventilating radiators, and other ventilators. It was suggested to carry the steam from present boiler for heating purposes. The approximate cost, which had been ascertained by taking rough quantities (allowing 6000 for heating purposes), would be about 6,300. After discussion the question was voted upon, and it was decided, by 24 votes to 10, to adjourn the matter for consideration by the Board in committee.

EXTENSION OF HOSPITAL, ASHTON-IN-MAKERFIELD.—The extensions to the Infectious Diseases Hospital at Ashton-in-Makerfield were opened recently by the Chairman of the Sanitary and Health Committee. The new buildings are erected upon land adjoining the old hospital, which was built about twenty years ago, off Bryn-road. The new buildings consist of four distinct blocks, namely, the administration block, scarlet fever pavilion, diphtheria pavilion, and the laundry block. The administration block contains matron's sitting-room, nurses' sitting-room, dining-room, medical officer's room, kitchen, scullery, stores, pantry and cellars, eight bedrooms, three linen storerooms, bathroom, and lavatory, etc. The scarlet fever pavilion contains wards for eight male and eight female patients, two separate wards of one bed each, nurses' duty-room, two bathrooms, and lavatories, etc. The diphtheria pavilion contains two wards of two beds each, nurses' duty-room, bathroom, and lavatories, etc. The laundry block contains washhouse, drying-room, ironing-room, linen-rooms, disinfecting-rooms, mortuary, ambulance shed, stable for two horses, engine (5-h.p.) and boiler, and all the necessary machinery for a complete laundry establishment. The old fever pavilion, hitherto used for scarlet fever cases, will be improved and used for typhoid cases for eight beds and one small probationer's ward. The total bed accommodation is for thirty-one patients. The cost of the buildings, machinery,

furniture, road-making, drainage, boundary walls, and contingencies will amount to 10,000, exclusive of land. Messrs. John Johnson & Son, of Wigan, were the builders, Messrs. A. H. Barlow, of Wigan, provided the furnishings, and the joint architects were Messrs. Heaton, Ralph, & Heaton, of Wigan, and Messrs. Haywood & Harrison, of Accrington.

NEW BUILDING IN PRINCES-STREET, EDINBURGH.—Plans were passed on the 14th inst. in the Edinburgh Dean of Guild Court for a new building which is to be erected in Princes-street at the south-west corner of South St. Andrew-street, by R. W. Forsyth (Ltd.), Glasgow, from plans by Messrs. J. Burnet & Son, architects, Glasgow. The site is overlooking Waverley Station. It has a frontage to Princes-street of 90 ft., and to South St. Andrew-street of 70 ft. A feature of the elevation is a corner tower rising to a height of 127 ft. 6 in., and finished with a sculptured group and a ball of lead, copper, and bronze. The height of the building to the wall head will be 80 ft. There will be in all seven floors—the first five being used for sales purposes, and the remaining two for administrative work. The main entrance is in Princes-street, with a subsidiary entrance from South St. Andrew-street; and a special feature of the interior fitting will be the staircases and its electric elevators giving access to the upper floors and basement.

NEW LIBRARY FOR SOUTHWARK.—The Libraries Committee of Southwark Borough Council reported on Tuesday having had a number of interviews with Mr. C. Batley with regard to his design for the new library in the Old Kent-road. Various amendments had been made in the design, and the Committee now propose that after same has been formally approved by the Council, it be forwarded to Mr. Carnegie, and Mr. R. J. Dickins (Surveyor to Lord Langstock) for their sanction. In the meantime the architect is to be instructed to proceed with the necessary detail drawings in order that the quantities of the new building may be taken out.

Stained Glass & Decoration.

CHURCH OF ST. MARY, DATCHET.—A reredos, carved in English oak carried by a marble base, and executed after designs by Messrs. Arthur Blomfield & Sons, has been erected in the parish church to the memory of the late Canon Thompson, Vicar, and Rural-Dean of Burnham.

Appointments.

BRITISH MUSEUM.—The Principal Trustees have appointed Mr. Herbert A. Grueber to be Keeper of Coins and Medals *vice* Dr. Barclay V. Head, who has retired from that appointment.

GLoucester.—Mr. R. Hampton Lucas was to have been appointed Borough Surveyor at the last meeting of the Kingston Town Council in succession to Major Macaulay, who recently resigned.

Sanitary and Engineering News.

THE ROYAL SANITARY INSTITUTE.—At an examination in Hygiene in its bearing on school life, held in Leeds on June 15 and 16, 1906, thirty candidates presented themselves—seven for Part I., nine for Part II., and fourteen for the whole examination. The following fifteen candidates were awarded certificates:—Bowena M. Bracewell (Todmorden); Martha A. Chappell (Barnsley); T. Clegg (Elland); Lilian F. P. Cory (Settle); Mabel Lilian Fry (Shipley); Annie Greenwood (Mytholmroyd); Alice Holmes (Menston); W. Kidd (Leeds); A. Longbottom (Drighlington); H. Pawson (Micklefield); Florence E. Relf (Bradford); Elizabeth M. Richardson (Wakefield); Felicia Southam (Darton); Sarah K. Smithson (Dewsbury); W. J. Woodruff (Leeds). The following eight candidates were successful in Part I. only:—Lavinia Barker (Wakefield); T. J. Bedford (Badsworth); B. A. Dakin (Mytholmroyd); Jessie M. Gordon (Mytholmroyd); T. F. Greenwood (Helden Bridge); Edith A. Platt (Sowerby Bridge); Ethel A. Roberts (Barnsley); Charles Turner (Barnsley). The following three candidates were successful in Part II. only:—G. F. Holland (Sowerby Bridge); Fanny Waring (Keighley); H. Woodhead (Settle).

INSTITUTION OF GAS ENGINEERS.—At the annual general meeting opened on Tuesday in last week Mr. Charles Wood, President, observed in his inaugural address that the most significant advance in gas legislation during the twelve months had been the abolition of the onerous restrictions as to sulphur compounds, and the adoption of the Carpenter burner as the standard for testing purposes. He pointed out that whilst in his opinion the fear of electrical competition had ceased to seriously disquiet the

gas industry, the cost of distribution and of the laying of mains was greatly increased by the multiplicity of electric cables.—Awards were made of the London Gold Medal to Mr. J. H. Brown, of Nottingham, for his paper upon "Experiments with Low-grade Mixed Gases," the Institution Silver Medal to Mr. W. Deig, Club for "Notes upon Structural Engineering," and the Bronze Medal to Mr. John Bond for a paper upon "Pyrometers and Carbonisation."

WATER SUPPLY, MELBOURNE.—The reservoir at Allanshaws, near Lauder, which is to provide the Burgh of Melrose with a new water supply, has been completed and opened. The area covered by water when the reservoir is full is about nine acres. The reservoir is formed by impounding the water of the Elwyn water by means of an embankment constructed across its course. The main embankment, which extends at right angles across the Elwyn water, is about 170 yds. in length, while a wing embankment along the south-west side is about 180 yds. in length, making a total length of embankment of 350 lineal yards. The depth of available water in the reservoir at its deepest part is 20 ft., and the capacity of the reservoir is 20,000,000 gallons. The area draining into the reservoir is 500 acres. A Wilson's patent automatic self-cleaning filter, capable of passing from 50 to 60 gallons per minute, has been erected and through which will be passed the water taken from the reservoir. The filter, together with a regulating chamber, etc., are situated in a concrete house on the outside of the main embankment. The works were designed and carried out under the supervision of Mr. George Somervell Cairnes, Edinburgh. The cost of the scheme is between 8,000, and 9,000.

THE PANAMA CANAL.—The Government of Washington convey the information that the Senate of the United States has approved the lock type for the Panama Canal by 36 to 31 votes, a result which was by no means a foregone conclusion. As the lower House has already decided in favour of the same type of canal, the controversy which has agitated American engineers and the general public is deemed closed, and we may now expect to hear of vigorous efforts for the completion of the work at the earliest possible date.

Foreign.

FRANCE.—The works being carried out in the Ile de la Cité, on the site of the Marché aux Fleurs, in connexion with the Metropolitan Railway on the left bank of the river, have led to the discovery of some further portions of the walls of the ancient Lutetia. Some fragments of sculpture have been found, probably connected with tombs of the 11th century A. D., and also a funeral stele with a Latin inscription, entirely intact.—An exhibition of work in silk and velvet was opened on Thursday at the Musée Galliera, including some very fine modern work from Lyons, Paris, and St. Etienne, as well as an interesting collection of old examples.—The Municipal Council of Paris has under consideration a proposal by M. Leoncavallo for the erection of an International Theatre on the Champs Elysées, on the site of the former Franconi Circus.—M. Adolphe Thiers, the architect, has been awarded this year the prize founded by the late M. Bartholdi, which has been bestowed on him for his entitled "Ensemble de Décoratif et de Confort de Deux Fleuves," which was specially mentioned and commended in the review of "Architecture at the Salon" in our columns.—The jury in the competition opened by the Municipality of Montignou for the construction of a new barracks, have awarded the first premium to M. Talbourdeau, architect, of Montignou.—The Municipal Council of Lyons has decided on the foundation of a district school of architecture in the town.—The art museum of Montpellier has received a number of paintings and water-colours by M. Harguinias as an addition to its contents.—The statue of Alfred de Musset, by M. Granet, was inaugurated last Sunday at the road-point of the same day there was inaugurated at Alfort, near Paris, a monument raised to the memory of the former Director of the Veterinary School, Edmond Nocard. It comprises a stele surmounted by a portrait bust, the work of M. Geoffroy. At the foot of the monument are three figures by M. Boucher, symbolising "Science" grouped with figures of a man and woman of the peasantry, offering palm-branches.—The Rouville prize, founded as an award to an engineer who had carried out a work realising a progress in engineering science, has been presented to M. Sejourne, the author of some very important works, among them the Luxembourg viaduct and the Pont des Amidonniers at Toulouse.

BELGIUM.—The Acting British Consul-General at Antwerp (Mr. W. Lydcoote) has forwarded particulars of a notice, issued by the Municipal authorities of that city, inviting tenders for the work of construction of the Government Bonded Warehouses, known as the Nord-Ancien and Nord-Nouveau. The specification ("*Cahier des Charges*," No. 1,144) relating to the contract may

be obtained from the Hotel de Ville, Antwerp, at a cost of 2 francs. All tenders should be sent in sealed registered envelopes, addressed "A Monsieur de Bourgmestre en l'Hotel-de-Ville d'Anvers," and should reach the Hotel de Ville not later than August 16. A deposit of 1,000 fr. is required to qualify any tender. A copy of the specification may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, London, E.C.—*Board of Trade Journal.*

Miscellaneous.

DUFFEIN MEMORIAL, BELFAST.—On the 8th inst. the Marquis of Londonderry, K.G., unveiled the statue of the late Marquis of Dufferin and Ava, which has been executed by Mr. F. W. Pomeroy, A.R.A., and placed on the west side of the new City Hall. The design of the monument is based on the Italian Renaissance. The material used for the structural portions is brown Portland stone from Dorsetshire. All the sculpture on the monument is of bronze. Two figures on either side of the pedestal represent respectively India and Canada. The statue of Lord Dufferin is on the top of the pedestal, and is 8 ft. in height, and is surmounted by a canopy, supported by Ionic pillars, on the top of which is a figure of Fame. The total height of the monument, with the steps, is about 36 ft. The bronze work was done at the foundry of Mr. A. B. Burton, Thames Ditton, Surrey. The architectural portions of the work were designed by Mr. Brunwell Thomas, the architect of the new city hall.

THE "SHARK" OPAL TILING.—Messrs. Callow Wright & Hewlett send us a specimen and description of their "Shark" opal tiling, which is so named from the tooth-like section of the key at the back of each tile. It is a new design, and is to be the only novelty in the tiles, but it is a good form, and likely to be more effectual in keeping them in their places than any other form of key that we have seen on this class of tile.

CONVERSATION.—The Institution of Electrical Engineers held their annual conversation at the Natural History Museum, South Kensington, on Tuesday night. The guests were received by the President, Mr. Ganey, of the Post Office, and the President-elect, Dr. Glazebrook, the director of the National Physical Laboratory. Many of the foreign electricians who have been invited to the country as the guests of the Institution of Electrical Engineers, were present, and were very interested to meet Lord Kelvin and Sir Joseph Swan. Music was provided by the band of the Royal Engineers and the Leonie Ladies Quintette.

SOUTH-WESTERN POLYTECHNIC, CHELSEA.—At the lectures on "Architecture and History," given by Mr. Banister Fletcher, and arranged under the auspices of the University of London Extension Board, held during the past session, the total number of students who entered for the course was 60, and at the examination held at the conclusion of the course the following students satisfied the examiner, the Rev. F. H. Woods, B.D., St. John's College, Oxford:—**Winifred M. Burlingham, **Annie C. Burton, *Henry Dearden, *John Dovston, *Claire Gaudet, *Francis Grissell, *Ethel Hendry, William S. Hinton, Harley C. V. Strickland, Charles S. Welles. Those with a double asterisk against their names received a mark of special distinction, and those with one a certificate of merit. The scheme of instruction consisted of weekly lectures (at which selected notes were given out), illustrated with lantern slides, and specially prepared large lecture diagrams followed by sketching classes, and further explanations of the styles.

HAMPSTEAD GARDEN SUBURB COMPANY.—The Select Committee of the House of Commons on Unopposed Bills, of which Mr. Emmott is Chairman, have passed the Bill promoted by the company, and have ordered it to be reported for third reading. Some amendments have been introduced into the measure for limiting to accommodation roads, and, with the local authority's consent, the exemption of the company from the operation of the London Urban District Councils' by-laws in respect of the width of the roads. The accommodation roads will in no case be less than 15 ft. wide; the other roads on the estate will have a minimum width of 40 ft., and between any two houses standing upon opposite sides of the road there will be a minimum space of 50 ft., having thereon no buildings except a fence, gate, or wall. The promoters undertake to erect no more than eight houses per acre on an average throughout the whole area of the suburb.

ST. PAUL'S CHURCH, FOREMAN SQUARE.—At a sitting of the Consistory Court of London last week Dr. Tristram, K.C., Chancellor of the diocese, decreed a faculty for proposed alterations and improvements of the church, until recently Portman (Proprietary) Chapel, in Baker-street. It is intended to expend about 3,000l. in transforming the basement and cellars—which hitherto have been used as wine-valets—into a hall, and to build four or five classrooms for work connected with the church and parish. The church will at the same time be fitted with a new

system for heating and ventilating purposes, and new flooring is to be laid down.

A. A. STUBBINS'S DRAWINGS.—Mr. Hubert Keys writes to say that his drawings of Stationers' Hall were not sent in competition with those of the Mansion House, as might be inferred from our notice, but represented the work required to be done after winning the Banister Fletcher Bursary, which he gained last year with drawings of Morten College.

INCORPORATED CHURCH-BUILDING SOCIETY.—This society held its usual monthly meeting on Thursday, the 21st inst., at 7, Dean's-yard, Westminster, the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Birchfield, Staffs, 50l.; Harey, S. Michael and All Angels, Staffs, 75l. for the first portion, and Leyton, S. Paul, Essex, 100l. for the first portion; and towards enlarging or otherwise improving the accommodation in the churches at Ascham, S. Nicholas, near Retford, Notts, 25l.; Bylechan, S. Thomas, near Denbigh, 10l.; Clare, S. Peter and S. Paul, Suffolk, 35l.; Great Kent, S. Mary and S. Lawrence, Suffolk, 20l.; Scillinge, S. Mary, near Hythe, Kent, 15l.; and Monevden, S. Mary, near Framingham, Suffolk, 30l. in lieu of a former grant of 25l.; grants were also made from the special Mission Buildings Fund towards building mission churches at Bosch, near Triton, Staffs, 30l.; Newport, S. Barnabas, Mon, 50l.; Portsea, S. Wilfrid, Hants, 100l.; Welches Dam, near Manes, Cambs, 15l., and Werrington, S. Philip, near Caversham, Staffs, 35l.; and towards enlarging the mission school at Llangrannog, S. David, Cardiganshire, 100l. Grants were also paid for works completed: Wakefield, S. John, 75l.; South Barnett, S. Michel and All Angels, Middlesex, 125l.; Fohbing, S. Michael, Essex, 30l.; Babraham, S. Peter, Cambs, 10l.; Llantwit Major, S. Iltyd, Glam., 25l., making 775l.; Rowley Regis, S. Giles, near Birmingham, 55l. on account of a grant of 105l.; and Willisl, S. Michael and All Angels, Yorks, 30l. In addition to this the sum of 200l. was paid towards the repairs of nine churches from Trust Funds held by the Society. The Society likewise accepted the trust of a sum of money as a repair fund for the church of S. Thomas, Greatland, near Halifax.

THE BUILDING LINE IN REGENT-STREET.—In a report circulated on Tuesday the Improvements Committee of Westminster City Council stated that in connexion with the plan submitted for the new building line proposed by H.M. Office of Woods and Forests in Regent-street between Glasshouse-street and Oxford-circus, the Committee had addressed a communication to the London County Council suggesting that that body should ask the Commissioners of H.M. Woods and Forests not to grant leases of the site at the junction of Argyll-place, Chapel-court, and Beak-street, with Regent-street, until the London County Council or the City Council had had an opportunity of considering the advisability and practicability of a widening at either of those points with a view of improving the means of communication between Regent-street and Wardour-street. The London County Council had replied to the effect that the Building Act Committee had decided to comply with this suggestion.

INSTITUTE OF SANITARY ENGINEERS.—The members of the Institute of Sanitary Engineers are holding their summer meeting this year in Manchester, on July 6, 7, and 8. Sir Wm. Mather, M.Inst.C.E., will preside at the meeting, and an interesting programme of discussions and visits has been arranged.

HOUSING OF THE WORKING CLASSES.—Mr. Rider Haggard was the principal witness on the 25th inst. before the Select Committee of the House of Commons which is considering the Housing of the Working Classes Acts (Amendment) Bill. Sir John Dickson-Poynder presided.

Mr. Rider Haggard said that inquiries which he had made showed him that housing was generally defective in rural districts. The worst place he knew in this respect was a village in Somersetshire. In that village there was not a house fit for a human being—all the houses seemed to be falling down and the doors and windows were all loose. He spoke to the medical officer about it, and asked why the houses were not condemned. His reply was that that was a long and troublesome process, and that even if the houses were condemned it was not much use, because to pull them down would only render people homeless. The most extraordinary case of rural housing, or rather the lack of it, was one he met with in Essex, near Waltham. There he found twenty men working on a farm but could see no cottages. He asked where the men lived, and on being told that it was in one of the farm buildings, he asked to see it. The place shown him was a brickshed about 14 ft. square, and looking like a wagon-house. It had no windows. Sacks were laid on the floor round the wall, and there the twenty men slept. Some of them had been there three years. A hundred yards away he saw an elm-tree on a hill. There he found the ashes of a fire and a rod to hold a pot. This was the dwelling place—the kitchen and the parlour of the twenty men. Winter and summer they

did their cooking and spent their Sundays under the tree. Cottages were not built because people could not afford to build them. This farm had been in the same occupation one hundred years. Continuing, witness said that in Huntingdonshire he found the houses perfectly awful. The instances he had cited were the worst which he found on a tour through twenty-six counties. It was a mistake to suppose that the number of houses in villages was always insufficient, and in Norfolk there were more houses than were wanted, because of the desertion of the land by the labourer. Housing was worst when the cottages were bought by speculative people. For instance, a man who had saved a few hundreds would buy some country cottages cheaply and thus get a high rate of interest for his money. He would never do any repairs, and the houses were sometimes allowed to get into such a bad state of repair that they tumbled down.—The Chairman: So the inference is that the powers of control of the local authority are unsatisfactory and inadequate?—Mr. Rider Haggard: I am inclined to think they are.—Answering questions as to his opinion of the Bill before the Committee, witness said he would not give compulsory powers to a District Council unless there were a right of appeal. He would not mind leaving the matter in the hands of the District Council subject to the confirmation of the Local Government Board. His own opinion was that a man should only be required to sell land for the erection of houses or the provision of small holdings in proportion to his own holding in the village. After hearing further evidence the Committee adjourned.

THE PROPOSED NEW LONDON COUNTY COUNCIL CITY HALL.—The Earl of Camperdown's Committee of the House of Lords began on the 26th inst. the consideration of the London County Building Bill. It is promoted by the London County Council, and contains the scheme for the erection of a new County Hall. It is proposed to acquire six acres in extent, on the Surrey side of the Thames adjoining the down stream of Westminster Bridge. The site has a frontage of 800 ft. to the river and to Belvedere-road. On it a building is proposed to be erected somewhat larger than Somerset House, with a terrace or embankment between it and the river. The cost of the land and buildings is estimated at 1,700,000l.

Mr. Cleland, M.P., Chairman of the Establishment Committee of the London County Council, told the Committee that when the Council began work it had a staff of 200. Now the number had risen to 2,000. The departments of the Council were now housed in 30 different buildings, some of them being widely separated. In the buildings which it was now proposed to erect there would be a Council Chamber, committee-rooms, and accommodation for a staff of 2,300. As the Council already had a works department on a freed site adjoining the one which it was now proposed to acquire there was room for expansion should it become necessary. The yearly amount for repayment of loan and interest at the end of six years—which might be taken as the time for completing the building—would be 84,000l., but the Council would save 40,000l. which it now paid for rent of offices. After other witnesses had been heard, the further consideration of the Bill was adjourned.

WAR MEMORIAL, OXFORD.—The memorial to the members of the Oxfordshire Light Infantry, which has been erected in St. Clement's, Oxford, has been completed. It consists of a bronze figure of a soldier in khaki, standing with his rifle at the "ready." The sketch model from which the bronze was copied was executed by Mr. Ambrose Neale. The whole of the work has been done under the supervision of Messrs. Boulton, and carried out in their studios at Cheltenham. The casting, which weighs over half a ton, was executed by Messrs. J. W. Singer & Sons, bronze founders, of Frome.

Legal.

BUILDING DISPUTE IN THE WATERLOO-ROAD.

MR. JUSTICE SWINFEN EADY, in the Chancery Division on the 22nd inst., had before him the case of Williams v. Johnson & Co., on a motion by the plaintiff for an *interim* injunction restraining until the trial or further order the raising of a building called the "Union Jack Club" in the Waterloo-road to a greater height than it was at present. Plaintiff, by his motion, also asked for an order that defendants should pull down the walls already erected, which it was said interfered with the light and air coming to the plaintiff's premises.

In the result no injunction was granted, arrangements being made for an early trial of the action, leave being given to make an application to fix a day for the trial this week. Leave was also granted to add the Union Jack Corporation as defendants.

Mr. Micklum, K.C., and Mr. Eustace Smith appeared for the plaintiff; and Mr. Eve, K.C., and Mr. Attwater for the defendant.

MAIDENHEAD BUILDING DISPUTE.

The bearing of the case of *Lanning v. Davy & another* concluded before Mr. Justice Darling and a common jury in the King's Bench Division last week—an action by Mr. Harold Sydney Lanning, of Maidenhead, to recover from the defendants, also of Maidenhead, damages for alleged negligence by them as architects and surveyors. The defendants denied the alleged negligence and counter-claimed for 87l. 3s., fees for work and labour done.

It appeared that the dispute arose in connexion with the creation of a house, conservatory, and stables for the plaintiff at Boy'n Hill-avenue, Maidenhead. The plaintiff's case was that in the early part of 1903 he instructed Mr. Davy to prepare plans, specifications, etc., for the buildings, and these were prepared. Ultimately tenders were invited and sent in. That of Messrs. J. K. Cooper & Sons was the highest (1,856l.), and that of Messrs. Cox & Sons the lowest (1,698l.). On January 19, 1903, Mr. Davy informed the plaintiff that Messrs. Cooper were prepared to reduce their tender by 5 per cent., and the plaintiff finally accepted this figure. On March 6, 1903, the contract was signed, which was for the erection of a house, conservatory, and stable, and the work, with the exception of the stable, was finally completed with some variations by September or October, 1903. Mr. Davy gave four interim certificates for 300l. each, which the plaintiff paid in April, 1904, and the architect gave a further certificate for 350l., but on May 9 plaintiff's solicitors wrote revoking defendant's authority to certify. Defendants, however, on August 11, 1904, certified for a further 350l. as due to the builders, and on October 30 they certified the balance of 80l. 18s. 2d. Shortly afterwards Messrs. Cooper issued a writ claiming payment of these two sums, making together 130l. 18s. 2d., and the plaintiff in that action, by his defence, alleged that the work was badly done, and counter-claimed in respect of a certain right of way, and for the cost of putting the work right. Messrs. Cooper, by their reply, set up the contract, and alleged that the plaintiff could not maintain his defence and counter-claim upon the main grounds that the contract provided that the architect's certificate should be conclusive evidence of completion, and that as the architect had given a final certificate the plaintiff was precluded from relying upon the various matters alleged in his defence and counter-claim. That action came on for trial, when Mr. Lanning's counsel advised him to settle the case. The action was settled on terms which provided in effect for the plaintiff selling his house to Messrs. Cooper for 2,000l. less the amount of the certificates and the taxed costs of the action. In the present action the plaintiff alleged that the defendants had not carried out his instructions with regard to the position and size of the rooms, that they had been negligent in supervising the execution of the work, in taking out the quantities, and in advising him not to accept the lowest tender. The plaintiff further alleged that the defendants negligently and without any authority express or implied, and in breach of their duty as plaintiff's architects, purported to bind the plaintiff by the terms of the agreement of March 6, 1903, whereby the defendants, as between the plaintiff and the builders, Messrs. J. K. Cooper & Sons, constituted themselves final and sole arbitrators, and made their certificate final and conclusive.

The defendants by their defence denied that they had failed to carry out the plaintiff's instructions in preparing the plans as alleged, and said that they had exercised all reasonable care and skill in their employment. Defendants further said that they asked Messrs. Cooper to reduce the amount of their tender at the plaintiff's request, and the tender was reduced to the sum of 1,764l. They also denied that they had negligently supervised any of the work or had been guilty of any negligence. Defendants further relied upon the agreement of March 6, 1903, made between the plaintiff and Mr. Henry Cooper as barring the plaintiff's claim, and particularly to provisions thereof whereby it was declared that the architect's certificate should be final and binding as between architect and client, and that in all disputed points arising from such agreements the architect's decision should be final and binding by both parties, and that such agreement should be deemed a reference to arbitration. Defendants said it was the fact that they purported to bind the plaintiff by the written agreement of March 6, 1903, but they denied that they did so negligently or without authority, or in breach of their duty as the plaintiff's architects. They said that such agreement was prepared in the plaintiff's interest, and was put forward and procured to be executed by the builders in the ordinary course of the defendants' duty as such architects. By the counter-claim defendants claimed 87l. 3s., being 5 per cent. on the contract price, duplicate copies of plans, etc.

After hearing a great deal of detailed evidence, the jury in the result returned a verdict for the plaintiff for 750l. on the claim, and for the defendants for 50l. on the counter-claim.

Judgment accordingly.

His lordship stayed execution for a fortnight with a view to an appeal.

Mr. G. A. Scott appeared for the plaintiff; and Mr. Marshall Hall, K.C., and Mr. George Wallace for the defendants.

ACTION AGAINST LANDLORD FOR DEFECTIVE FLOORING.

In the House of Lords, composed of the Lord Chancellor, and Lords Macnaughton, James of Hereford, Robertson, and Adair, on the 22nd inst. judgment was delivered in the case of *Cavalier v. Pope* on appeal from the order of the Court of Appeal, setting aside so much of the judgment of Mr. Justice Phillimore as adjudged that the appellant, Minnie Cavalier, should recover from the respondent, William Pope, the sum of 75l. (The case was reported in *The Builder* of August 19, 1905.)

The action was brought by Mr. and Mrs. Cavalier to recover damages from the defendant for personal injuries sustained by Mrs. Cavalier owing to the omission of the defendant's agent to carry out an agreement to do certain repairs in a house known as No. 18, Bridport-place, Hoxton, of which Mr. Cavalier was tenant to the defendant. Mr. Cavalier also claimed from the defendant the expenses he had incurred in consequence of the accident to Mrs. Cavalier.

The facts of the case were as follows:—Mr. Cavalier, in December, 1901, entered into a verbal agreement with the defendant's agent for the tenancy of three rooms in the house in question at a monthly rent. The plaintiff during the tenancy repeatedly called the agent's attention to the fact that the kitchen floor required repairing, and on December 9, 1902, the agent (according to the plaintiffs' case) agreed to do the necessary repairs if Mr. Cavalier stayed on as tenant. The repairs, however, were not carried out, and on October 21, 1903, while Mrs. Cavalier was sitting in a chair in the kitchen, the back legs of the chair went through the floor, and the result was that Mrs. Cavalier was thrown to the ground and sustained serious injuries. At the trial the jury found, in answer to specific questions left to them by the learned judge, that the agent had notice or knowledge that the kitchen floor was in a defective state; that the agent promised to repair it, and that in so doing he was acting within the scope of his authority. They assessed the damages at 75l. for the wife and 25l. for the husband, and judgment was entered accordingly with costs. Mr. Justice Phillimore holding that the wife was entitled to recover because, although the defendant was not liable to her in contract, her injury was caused by the defendant's neglect of a special private duty he owed towards her in reference to the dilapidated condition of the flooring. In their opinion the agreement to repair did not bring the landlord within that class of case where the owner or occupier of dangerous premises was held liable for inviting an unsuspecting guest or stranger to come upon the premises. The contract with Mr. Cavalier to repair could not create a special private duty on the part of the landlord to the wife, which would have had no existence in the absence of the contract. Lord Justice Matthew, however, dissented, being of opinion that the decision in the case of *Langridge v. Levy* was an authority for the position taken on behalf of the wife. By a majority of the Court, therefore, the appeal was allowed, and judgment entered for the defendant as against Mrs. Cavalier. Hence the present appeal to the House of Lords.

The Lord Chancellor, in giving judgment, said he thought the decision of the Court of Appeal ought to be affirmed. He could find no right of action in the wife of the tenant against the landlord, either for letting these premises in a dangerous state or for failing to repair them according to his promise. The husband had sued successfully for breach of contract, but the wife was not party to any contract. He thought that the appeal failed.

The other learned lords concurred, and the appeal was accordingly dismissed with costs. Mr. E. E. Lever and Mr. Wiltshire were counsel for the appellant; and Mr. Montague Lush, K.C., and Mr. Lilley for the respondent.

Patents of the Week.

APPLICATIONS PUBLISHED.*

11,350 of 1905.—DR. F. FURSTENHEIM and C. HIRSCHORN: *Gas Heating Apparatus for Baths.*

This relates to a gas heating apparatus for baths wherein the supply of gas to the burner is regulated by a valve opened by the pressure of the water to be heated, and in which the burner is pivoted or rotatable for the purpose of opening

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

the main gas cock, and consists of the construction wherein the valve is provided with a by-pass through which a quantity of gas sufficient to feed an igniting flame is supplied to the burner when the valve is closed.

12,532 of 1905.—J. J. RATHBONE and J. E. BUTLER: *A Cowl for the Prevention of Down Draught in Chimneys and Uptakes.*

This relates to a cowl for the prevention of down draughts in chimneys or uptakes, and consists of a chamfered fillet running along the underside of the cowl or semi-spherical hood and socket joint or loosely held at its apex by a ball and socket joint to a rod projecting centrally above the chimney or uptake.

16,834 of 1905.—G. J. EARLE, W. FLOWERDEW, and ELLKAY & CORNES, LTD.: *A Folding Cover for Baths.*

This relates to covers for domestic baths, and consists in providing a cover or lid for the bath, which is as long as or slightly longer than the bath, the said cover being hinged to a rail, which is secured to the wall at the side of the bath, a chamfered fillet running along the underside of the rail to support the cover. If one end of the bath rests against the wall one end of the cover may rest on a rebated wood bearer of the same width as the cover fixed to the wall. The other end of the cover is supported by a strut hinged at its upper end to a suitable bracket, which is screwed or otherwise secured to the underside of the cover, the lower end of the strut being hinged or otherwise connected to a guide iron, which moves in a groove in the vertical portion of a bracket, which is fixed to the wall below the cover. This strut and bracket can be made to suit any width of cover.

17,423 of 1905.—J. GARLAND: *Earth Closet Doors.*

This relates to doors for earth closets, and consists in making a frame with a groove on either side in which grooves the door slides. A piece of metal or other material is suitably fixed in the said grooves, so as to extend about half-way up, leaving space for the door to slide upon the top of the said piece, on which the bottom of the door can rest to keep it open. A catch is fixed which can be turned outwards by means of a key, so as to lock the door when closed or open, as may be required. The said frame is fixed in wall.

17,516 of 1905.—A. BLACK: *Windows.*

This relates to windows, and consists of a mechanism for raising and lowering a sliding and hinged sash, comprising in combination a screwed spindle, a worm wheel on the spindle, a worm for rotating the worm wheel and spindle, and a nut working on the screwed spindle, which is made integral with or connected to the hinge of the window sash.

19,403 of 1905.—R. T. SURTEES: *Fireproof or Concrete Structures.*

This relates to means for bracing, hooping, or bonding the embedded rods, bars, or the like in fireproof or concrete structures, and strengthening said structures, and consists of a length of metal of suitable cross-section and length made to form a bracing hoop or bond, and coiled at one or more points to form a loop or loops, and also so connected at a distance from each end as to cause its two ends to form long arms extending fully across the area enclosed by the bracing, by which the bracing is held to the core of the structure and the core is reinforced.

21,022 of 1905.—W. OATES: *Dry Closets.*

This relates to dry closets, and consists in the arrangement of an earthenware or like casing comprising a base, sides, and top, the top being provided with a seat aperture, and the back of the casing being open or having an opening therein for the introduction and removal of a pail or receptacle.

21,706 of 1905.—J. CALVERT: *Window Appliances for Ventilation.*

This relates to means for ventilating rooms, and consists in the provision of a pivoted device composed of a longitudinal strip of wood or other suitable material formed with a central opening, and a door hinged at the lower side of said opening, a sheet of gauze or perforated plate covering the outside of the opening.

1,624 of 1906.—C. DAEM: *Windows and Fastenings Thereof.*

This relates to a window-fastening device, with oval-shaped wooden rods for opening and closing the windows while the casement is in constant contact with said rods, and is characterised by the fact that the wooden rod being of oval section and rotating on a longitudinal axis, the window casement lies in a flat position and is lifted into the top frame abutment when said rod is turned.

3,591 of 1906.—A. KNIGHT: *Ventilating Apparatus.*

This relates to a hit-and-miss ventilating apparatus for shop windows and the like, and consists of a fixed grating, a sliding grating on the fixed one, roller guides and adjustable guiding screws for the slide and springs, and a cord attached to opposite ends of the slide.

PATENTS.—Continued on page 744.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xvi.; Auction Sales, xxviii.

Contracts.

BUILDING.

JUNE 30.—Callington.—SHOWROOMS.—New furniture and general showrooms at premises in Fore-street, Callington, for Mr. W. W. Dymond. Plans and specifications may be seen at the office of the architect, Mr. Lawrence Scantlebury, Callington. Tenders to be delivered on or before June 30.

JUNE 30.—Chard.—MILL.—Extension.—Extension buildings to the Holyrod Mill, Chard, for Messrs. Gifford, Fox, & Co. Names to Messrs. Synnes & Madge, architects and surveyors, Somerset House, Chard, on or before June 30, after which date plans and specifications may be seen at the office of the architect, Mr. Lawrence Scantlebury, Callington. Tenders to be supplied, on receipt of cheque for 3s. 3d.

JUNE 30.—Exeter.—ALTERATIONS.—Proposed alterations at Nos. 11 and 12, and for the erection of two shops and dwelling-houses at Nos. 13 and 14, North-street, Exeter, for Mr. G. H. Skinner. Names to Mr. Charles Cole, architect, 50, High-street, Exeter, by June 30.

JUNE 29.—King's Heath.—HOMES FOR EMPLOYEES.—The Education and King's Norton Joint Poor Law Establishment Committee invite tenders for the erection of six homes for epileptics and other works on the Maynall Hall Estate, near King's Heath, Birmingham, according to plans and specifications prepared by Messrs. C. Whitwell & Son, Architects to the Joint Committee. Builders desirous of tendering must apply to Mr. R. F. Curtis, Clerk to the Joint Committee, at Guildhall Buildings, Birmingham, and deposit the sum of 25s. on or before June 30, 1906. Tenders to be delivered to the Clerk on or before July 25.

JUNE 30.—Leeds.—HOUSES.—House and shop, and two back-to-back houses, in Harbottle-lane, Leeds, for Mr. T. H. Avo. Names to Messrs. Thomas Winn & Sons, architects and surveyors, 64, Albion-street, Leeds, on or before June 30, when bills of quantities will be duly forwarded.

JUNE 30.—Mirdford.—SHOPS, HOSES, ETC.—A shop, house, and slaughter-house at Mirdford, for Mr. F. Lister. Drawings and specifications at office of Mr. E. Vincent King, A.R.I.B.A., architect, 24, Westgate, Dewsbury, to be seen on or before July 20.

JUNE 30.—Ravenshoe.—BILLIARD ROOM.—Various works required in the erection of a billiard room for the Ravenshoe Working Men's Club and Institute. Names and addresses of architects to be delivered to Mr. David H. Lamb, architect, Ravenshoe.

JUNE 2.—Belfast.—ADDITIONS TO COLLEGE.—Tenders addressed to the Education Secretary, Office of Public Works, Dublin, for additions to Queen's College, Belfast, will be received up to, but not later than, 10 a.m. on July 1. The plans and specifications are to be seen at the office of the architect, at the office of Messrs. Stephens & Son, 13, Donegal-square, N., Belfast, by whom forms of tender and bills of quantities will be supplied on deposit with them of 1s.

JUNE 2.—Bingley.—MILL.—ADDITIONS.—Bricklayer's and mason's (including ironfounder's) work, carpenter's and joiner's, slater's, plumber's, plasterer's, and painter's work required in the erection of dressing, twisting, and store rooms, at the Albert Mills, Bingley, for Mr. A. R. Wright. Plans may be seen at the office of Mr. Wm. Rhodes Nunn, architect and surveyor, 13, Market-street, Bingley, from June 25 to July 2.

JUNE 2.—Duffus.—SCHOOL.—IMPROVEMENTS.—The mason, carpenter, plumber, and painter works of improvements at Duffus School. The plans and specifications may be seen with John White, architect, Elgin, and at the school, and estimates must be lodged with the architect on or before July 2.

JUNE 2.—Halifax.—SHED.—Halifax Improvement Committee invite tenders for the execution of the work required in the erection of a store shed in Booth-fold, Halifax. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. James Lord, C.E., Borough Engineer, Town Hall, Halifax, upon the payment of the sum of 1s. Tenders, endorsed "Store Shed, Booth Fold," must be sent to Mr. Keighley Walton, Town Clerk, not later than 5 o'clock p.m. July 2.

JUNE 2.—Invercarron.—WORKSHOP.—The bricklayer, carpenter, slater, plumber, and steel works of a workshop proposed at Invercarron, Stenhouse, for Messrs. James Jack & Sons. Schedule of quantities may be obtained from the architect, Mr. Geo. Gregory, 24 David-street, Stonehouse, with which officers are to be lodged before 12 o'clock noon on July 2.

JUNE 2.—Lochely.—HOUSES AND COTTAGES.—Brick and digger, joiner, plumber, slater, blaster, glazier, iron grates, and painter's work of 110 houses, to be erected in Lochely for the Lochely Iron and Coal Company, Ltd. Schedules of quantities may be had, and plans may be seen at the office of Mr. William Birrell, architect and surveyor, 200, High-street, Kierkeady, on deposit of 1s. 1s. Offers to be lodged with the Secretary of the company, Mr. Vincent-place, Glasgow, on or before July 15, sealed and endorsed "Tender, etc., Houses, Lochely."

JUNE 2.—Northorram.—WALL AND PORCH.—Halifax Education Committee invite tenders for rebuilding

wall near Satterlee School, Keil-lane, Northorram, and for a new porch at Siddal School. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. James Lord, C.E., Borough Engineer, Town Hall, Halifax. Tenders, endorsed "Wall," Satterlee School, and "Porch," Siddal School, respectively, must be sent to Mr. W. H. Osler, Secretary, by or before 12 o'clock noon, July 2.

JUNE 3.—Belfast.—BOARD-ROOM.—Belfast Guardians invite proposals for executing certain works at the board-room of the workhouse, in accordance with plan and specification prepared by Messrs. Young & Muckel's civil engineers, which can be seen at office of Mr. Joseph W. Robb, Clerk of the Union, Clerk's Office, Union Workhouse, Tenders, endorsed "Board-room Alterations," to be lodged in the tender-box, board-room, before 12 o'clock noon on July 3.

JUNE 3.—Halifax.—GREENHOUSES.—Halifax Parks Committee invite tenders for the erection of the joiner's work required in the erection of greenhouses at Arkroyd Park. Plans and specifications may be seen, and form of tender obtained, on application to Mr. James Lord, M.I.C.E., Borough Engineer, Town Hall, Halifax, upon payment of the sum of 1l. Tender, endorsed "Greenhouses, Arkroyd Park," must be sent to Mr. Keighley Walton, Town Clerk, not later than 5 o'clock, on July 3.

JUNE 3.—Hetton.—SCHOOL.—ALTERATIONS.—Durham County Education Authority invite sole tenders for alterations to the school buildings, situated at Hutton, Station Town, and Middleton-in-Teesdale. Plans, specifications, and conditions of contract may be seen at the respective schools, and at the architect's office, Quantities for Station Town and Middleton-in-Teesdale may be obtained on application to Mr. W. Rushworth, F.R.I.B.A., architect, County Education Office, Durham, to whom sealed and endorsed tenders must be delivered not later than July 3.

JUNE 3.—London.—AREAS AND STEPS.—Whitechapel Guardians invite tenders for certain work required to be done in forming area and steps to boiler-house, and in the alteration of the drains to "C" block of the Mill-lane-road, to be carried on enclosed recreation ground for New Herrington Workmen's Club. Tenders to be sent in not later than July 3, before 5 p.m. complete specifications can be seen, and copies taken any day at the club premises, East Terrace, New Herrington, Fence Houses, Mr. Wm. Hill, Secretary.

JUNE 3.—Penlyta.—RESIDENCE.—A residence at Penlyta, Alverton. Plans and specifications may be seen at office of Mr. J. A. James, architect, Port Talbot. Tenders to be delivered not later than July 3.

JUNE 3.—Stockport.—CAR SHED EXTENSION, ETC.—Stockport Tramways Committee invite tenders for the masonry and joiner's labor and materials required in the erection of car shed extension and river retaining wall at Messy-square, Stockport. Plans, sections, specifications, and conditions may be seen, and forms of tender obtained, on application to the Borough Surveyor, St. Peter's-cum-Stockport, on payment of 1s. Tenders, addressed "The Town Clerk, Stockport," sealed and endorsed "Tender for Car Shed Extension," to be left at his office at or before noon on July 3.

JUNE 3.—Wakefield.—ROOMS.—The West Riding General Purposes Committee invite tenders for works in connexion with the erection of two rooms at the County Hall, Wakefield. For bills of quantities and further particulars apply to office of Mr. G. Vickers Edwards, County Architect, County Hall, Wakefield. A deposit of 1l. is required. Cheques, etc., to be sent to the West Riding Treasurer. Sealed tenders, properly endorsed, to be sent to the Architect not later than 10.30 on the morning of July 3.

JUNE 4.—Holmfirth.—REBUILDING MILL.—The mason's, bricklayer's, joiner's, plumber's, ironfounder's, carpenter's, and slater's works required in the rebuilding of Ford Mill, Holmfirth, for Messrs. J. & J. Baldwin & Partners, Ltd., Wood and Butri's branch. The drawings and specifications may be seen, and bills and quantities obtained, at Ford Mill, Holmfirth, between 10 a.m. and 5 p.m. on June 29, and at the offices of Mr. Fredk. W. Ridgway, F.R.I.B.A., architect, surveyor, and valuer, 11, Union-street, Dewsbury. Sealed and endorsed tenders must be delivered to architect on July 4, not later than 12 o'clock noon.

JUNE 4.—Monmouth.—CHURCH BUILDINGS.—The Trustees of the Baptist Church, Monmouth, invite tenders for the erection of their new buildings. The drawings and specifications can be inspected on application to Mr. Sambrook, or at the office of Mr. B. Lawrence, architect, Newport, from whom bills of quantities can be obtained on the deposit of 1s. 1s. The tenders are to be sent in under cover to Mr. Sambrook, Monmouth by July 4.

JUNE 4.—Newcastle-on-Tyne.—RAILWAY STATION BUILDINGS.—North-Eastern Railway Directors invite tenders for works in connexion with buildings and

platform roofing at Newcastle Central Station. Plans and specification may be seen, and quantities and further information obtained, on application to Mr. William Bell, the company's architect, Central Station, Newcastle-on-Tyne. Quantities supplied on personal application to parties tendering for the whole of the works, sealed tenders, marked "Additions, Central Station, Newcastle," to be sent to the Secretary at York not later than noon on July 4.

JUNE 4.—York.—HOUSES.—Dwelling-houses on Poppleton-road. Sealed and endorsed tenders to be sent in to Mr. George H. Pegg, architect and surveyor, 23, Spurr-street, York, not later than July 4.

JUNE 5.—Bately.—HOSPITAL.—Extension.—District Hospital Committee invite tenders for extension of hospital. Specifications and bills of quantities ready on July 5. Apply to Mr. Walter Hamstock, Son, architect, Bately.

JUNE 5.—Bingley.—WASHHOUSE.—A washhouse at Bingley. Plans can be seen, and quantities obtained, on application to Messrs. Samuel Jackson & Son, Tannery-chambers, Bradford, on June 30, until July 5.

JUNE 5.—Devonport.—ADMINISTRATIVE BUILDING.—Devonport Corporation invite tenders for the erection of a new administrative building at the Infectious Diseases Hospital, near North Prospect. Plans, specifications, and conditions may be seen, and forms of tender and quantities obtained on application to the Borough Surveyor, 29, Ker-street, Devonport, to whom tenders must be delivered, properly endorsed, on or before 10 a.m. on July 5. The sum of 1l. 1s. will be required as a deposit.

JUNE 5.—Fochabers District.—BUILDINGS.—The mason, carpenter, slater, plaster, and painter work of the following buildings, Gordon-Richmond Estates:—(1) New barn at Broadley (tenant, George Newlands); (2) alterations on farm offices at Nelher Dalnally (James Mackay, tenant); (3) alterations on farm offices at Nelher Auchtertyth (John Rose, tenant); (4) alterations on farm offices at Corskie (William Feltes, tenant); (5) new wooden cottage at Fochabers. Plans and specifications may be seen at the Estates Office, Fochabers, and tenders will be received by Mr. D. J. Cunningham, factor, up to 12 o'clock on July 5.

JUNE 5.—Hemlingborough.—SCHOOL.—ALTERATIONS.—East Riding of Yorkshire C.C. Education Committee invite tenders for the carrying out of additions and alterations to the Council School at Hemlingborough. Drawings, specification, and forms of tender on application to the Building Surveyor, County Hall, Beverley, or at the above school during the usual hours. Tenders, endorsed "Hemlingborough," to be forwarded not later than July 5, to Mr. John Bickerseth, Clerk to the East Riding Education Authority, County Hall, Beverley.

JUNE 5.—Hildenborough.—ENGINE-HOUSE.—Tonbridge R.D.C. invite tenders for the erection of an engine-house and pump well, and other works incidental thereto in connexion with Hildenborough Sewerage and Sewage Disposal Works, contract No. 2. Plans and sections can be seen at the office of Mr. Frank Harris, Engineer to the Council, Broadway, Southborough, Tunbridge Wells, from whom specification, conditions, and form of tender can be obtained upon depositing the sum of 1l. 1s. Sealed tenders on the form supplied, endorsed "Tender for Engine House, Contract No. 2," must be delivered at the office of Mr. Neville B. Stone, Clerk to the Council, 23, Church-road, Tunbridge Wells, on or before 4 o'clock on July 5.

JUNE 5.—Purdisburn.—COTTAGES.—Belfast Public Health Committee invite tenders for the erection of workmen's cottages on the Milltown-road, Purdisburn. Plans and specifications can be seen at the offices of Messrs. Young & Mackenzie, architects, Scottish Provident Buildings. Sealed tenders, endorsed "Tender for Cottages," to be lodged before 11 o'clock on July 5.

JUNE 5.—Senghenydd.—SHOPS, ETC.—The erection of shops and premises according to the plans of Mr. E. H. Bruton, F.R.I.B.A., Cardiff, for Mr. G. A. Spencer, The Square, Senghenydd, to whom tenders are to be sent not later than July 5.

JUNE 5.—Crosland Moor.—HOUSES.—Works (except joiner's) required in the erection of a house in Frederick-street, Crosland Moor. Plans may be seen, and quantities obtained at office of Messrs. J. Taylor & Co., architects, Central Buildings, Alms-bridge, from June 29 to July 6, on which latter day tenders must be sent in not later than 12 o'clock noon.

JUNE 7.—Box.—RESIDENCE.—New residence adjoining the Box Mills in the Parish of Box, near Bradford. The drawings and specifications may be seen at the site, and copies of the quantities and other information can be obtained, from Mr. W. H. Bromley, building surveyor, Pudding-street, Corsham, by written application. Tenders, sealed and endorsed "Tender for Work," to be delivered to Mr. Walter J. Browning, Box Mills, Box, by noon, July 7.

JUNE 7.—Burton.—ALTERATIONS TO SCHOOL.—The Education Committee invite tenders for alterations and improvements to Stretton County School, near Burton, and request that builders should apply to Mr. Graham Balloun, Director of Education, Stafford, before July 7. Quantities will be supplied on payment of 1l. 1s. The drawings and specifications can be seen at the office of the Education Committee at Stafford.

JUNE 7.—Camberne.—ALTERATIONS AND ADDITIONS.—Cornwall Education Committee invite tenders for alterations and additions to the Rosewarne House Camberne, according to plans and specifications.

which may be seen by appointment at the office of Mr. Sampson Hill, Architect to the Committee, Green-lane, Redruth, from whom all particulars relating to the work may be obtained. Sealed endorsed tenders on official forms, which may be had from the Secretary or the Architect, are to be sent to Mr. F. R. Pascoe, Secretary, Education Office, Truro, on or before July 7.

July 7.—Eccles.—Library.—Eccles Corporation invite tenders for the erection of the Carnegie Public Library, in Church-street, Eccles. A copy of the bill of quantities, general conditions, and form of tender may be obtained at office of Mr. Edwin Parkes, Town Clerk, Town Hall, Eccles, on depositing the sum of 2s. The plans may be inspected, and further particulars obtained, at the office of the architects, Messrs. Potts, Son, & Hennings, 34, Victoria buildings, Tottenham-court-road, Manchester. Tenders, endorsed "Tender for Carnegie Library," to be delivered to Clerk, in an official envelope, not later than 12 noon on July 7.

July 7.—Stretford.—CARPENTER'S HOUSE.—Stretford U.D.C. invite tenders for the work and materials required in the erection of a carpenter's house at the Council Offices, Old Trafford. Drawings may be seen, and specification with schedule of quantities and form of tender, obtained, on application to Mr. Ernest Worrall, the Council's Surveyor, any day during office hours on payment of 10s. form supplied, endorsed "Caretaker's House," and addressed to the Chairman, are due at the Council offices, Old Trafford, by July 7.

July 7.—Swansea.—WAREHOUSE.—Works in connexion with the conversion of the Old Bethany Chapel, Edward-street, Swansea, into a warehouse. Plans and specifications may be seen, and quantities obtained, at the offices of the architect, Mr. Charles T. Rubben, Bank-chambers, Heathfield-street, Swansea, upon payment of 1s. Tenders to be sent addressed to Messrs. Spillers & Bakers, Ltd., millers, Cardiff (Engineering Department), endorsed "Tender for Warehouse," on or before July 7.

July 7.—Truro.—ALTERATIONS TO COLLEGE.—Cornwall Education Committee invite tenders for alterations and additions to the Bella Vista College, Truro, according to plans and specifications which may be seen at the County Education Office, Truro, or by appointment at the office of Mr. Sampson Hill, Architect to the Committee, Green-lane, Redruth, from whom all particulars relating to the work may be obtained. Sealed endorsed tenders, on official forms, are to be sent to Mr. F. R. Pascoe, Secretary, Education Office, Truro, on or before July 7.

July 9.—Grately.—SCHOOL.—Sundry small works of external and internal repairs, gravelling, lavatory accommodation, rebuilding, lighting, ventilation, and new offices to Grately Council School for Southampton C.C. Plans and conditions of contract and specification at the office of Mr. W. J. Taylor, County Surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays, 9 a.m. to 1 p.m.). Plans and conditions of contract may also be seen at the school. A deposit of 1s. will be required for a copy of the specification. Deposits must be made by cheque, payable to Hants C.C., and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Grately Council School," are to be delivered to Mr. H. Barber, Clerk to the C.C., The Castle, Winchester, on or before July 9.

July 9.—Hastings.—ALTERATIONS TO SCHOOL.—The Governors of the Hastings Grammar School Foundation invite tenders (from builders in the County of Sussex) for alterations and additions to the existing grammar school buildings and to the erection of a workshop. Plans and specification may be seen, and quantities obtained, at the offices of the architects (Messrs. A. W. Jeffrey & Son, 55, Havlock-road, Hastings), on payment of a fee of 1s. Sealed tenders, endorsed "Grammar School Tender," are to be addressed to The Clerk, Education Committee, 18, Wellington-square, Hastings, not later than noon on July 9.

July 9.—Mount Shannon, Limerick.—FARM-HOUSES.—The Irish Land Commission (Estates Commissioners) invite tenders for the erection of twelve farmhouses at Mount Shannon, near Limerick. Plans and specifications for same can be obtained from the Secretary, Estates Commissioners, on receipt of 1s. Tenders should be enclosed in a sealed envelope marked "Tender" in left-hand corner, and addressed to the Secretary, Estates Commissioners, 26, Upper Merrion-street, Dublin. The latest date for the receipt of tenders will be July 9, at 12 o'clock noon.

July 9.—Owsebury.—SCHOOL WORKS.—New offices and sundry other small works at Owsebury Council School for Southampton C.C. Plans and conditions of contract and specification at the office of Mr. W. J. Taylor, County Surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays, 9 a.m. and 1 p.m.). Plans and conditions of contract may also be seen at the school. A deposit of 1s. will be required for a copy of the specification. Deposits must be made by cheque, payable to Hants C.C., and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Owsebury Council School," are to be delivered to Mr. H. Barber, Clerk of the C.C., The Castle, Winchester, on or before July 9.

July 10.—Isle of Wight.—REPAIRS TO SCHOOL.—Isle of Wight County Education Committee invite tenders for repairs to the Havenstreet School. Plans and specifications may be seen at the County Education Offices, Newport, I.W., or at the office of the County Surveyor, St. Thomas-street, Ryde, I.W. Sealed tenders, endorsed "Havenstreet School," should reach Mr. F. G. Flux, Secretary, County Education Offices, Newport, I.W., not later than July 10.

July 10.—Queenstown.—SIDE CHAPEL, ETC.—A new side chapel and sacristies, etc., in connexion with St. Colman's Cathedral, Queenstown, for the Most Rev. R. Browne, D.D., Lord Bishop of Clogne. Bills of quantities from Mr. D. W. Morris, surveyor, 68, Harcourt-street, Dublin, on payment of 3s. 3s. The plans and specification can be seen at the offices of Messrs. Ashlin and Cleman, architects, 7, Dawson-street, Dublin, or at St. Colman's Cathedral, Queenstown. Contractors are required to state in their tenders the shortest time they will under-

take to complete the works, under the penalty stated in the general conditions of contract. Sealed tenders to be addressed to architects not later than 12 o'clock on July 10.

July 11.—Bailey.—VILLA RESIDENCE.—Trades required in erection of villa residence at Mount Pleasant, Bailey, for Mr. Conductor Jno. Whitaker. Plans can be seen, and bill of quantities may be had, at the offices of Messrs. Walter Hanscock & Son, architects, Bailey, from July 2 to 11, when tenders must be sent.

July 11.—Stockwell.—FEVER HOSPITAL.—Tenders are invited for alterations to two wards at the South-Western Fever Hospital, Landor-road, Stockwell, S.W., for the Metropolitan Asylums Board. Specifications, bill of quantities, and copy of the conditions and form of tender to be obtained at the Board Office, Embankment, E.C., on deposit of 1s. Drawings may be seen at Messrs. T. W. Aldwinckle & Son, architects, 20, Denman-street, London. Bridger, S.E., on production of specification or form of tender. Tenders, endorsed according to instructions, must be delivered at the Board office by 10 a.m. on July 11.

July 12.—Dewsbury.—NEW POST-OFFICE.—The Commissioners of H.M. Works and Public Buildings invite tenders for a new head post-office at Dewsbury. Drawings, specification, and copy of the conditions and form of contract may be seen on application to the postmaster between 10 and 5. Bills of quantities and forms of tender may be obtained at H.M. Works Office, 11, Abchurch-lane, S.W., on payment of 1s. Tenders must be delivered before 12 noon, July 12, addressed to the Secretary, H.M. Office of Works, etc., Storey-gate, S.W., and endorsed "Tender for Dewsbury Post-office."

July 12.—Wareham.—REPAIRS, ETC.—Wareham and Purbeck Guardians invite tenders for repairs and alterations at the Workhouses, Wareham. Specifications and particulars can be seen at the offices of Mr. W. W. Fookes, architect and surveyor, Wareham. Sealed tenders, endorsed "Tenders for Workhouse Repairs," should reach Mr. J. G. Clark, Clerk, Union Offices, Wareham, not later than 10 o'clock on July 12.

July 13.—New Southgate.—ADDITIONS TO CLUB.—Tenders are invited for alterations and alterations to the New Southgate and Friern Barnet Liberal and Radical Club Society, Ltd.'s Premises, Oakleigh-road, New Southgate. Specifications and particulars can be seen at the office of the architect, Mr. John Ludgs, 95, Pemberton-road, Haringway, on July 23. Tenders, endorsed "Tender," to be delivered to the Secretary, at the Club, on or before 4 p.m. on July 13.

July 14.—Halifax.—VILLA.—For mason's, carpenter's, joiner's, etc., work in the erection of a villa at Holywell Green. Plans and specifications will lay for inspection, and quantities may be obtained at offices of Messrs. Chas. F. L. Horsfall & Son, architects and surveyors, Lord-street Chambers, from July 9 to 14, when sealed tenders must be delivered not later than July 14.

July 15.—Beckenham.—SCHOOL.—Tenders are invited for extension and modernisation of existing boys' girls', and infants' department of the Public Elementary Schools, Bromley-road, Beckenham, for the Beckenham U.D.C. Drawings may be seen, and bills of quantities and form of tender obtained, on application to Mr. John A. Angel, Surveyor, on and after July 2, on deposit of 5s. Tenders, sealed, and endorsed "Tenders for Bromley-road School," to reach the Clerk to the Council not later than 4 p.m. July 16.

July 16.—West Ealing.—NEW SCHOOL.—The Ealing Education Committee invite tenders for new school, Drayton Green, West Ealing. Drawings and specifications may be seen, and bills of quantities and form of contract, from Mr. Charles Jones, Borough Engineer, Town Hall, Ealing, W., upon payment of 5s. Sealed tenders, in envelopes provided, endorsed "Tender for New School, Drayton Green," to Mr. J. B. Johnson, Secretary, Education Office, Town Hall, Ealing, W., before 12 noon, July 16.

July 17.—Edmonton.—ALTERATION, ETC., TO SCHOOL.—Tenders are invited for alteration and addition to Brettenham-road School and annual cleaning and repairs to Brettenham-road and Croyland-road schools. Those wishing to tender should send titles to Mr. Henry W. Bobb, Town Hall, Lower Edmonton, on or before July 2, when specifications, plans, and form of tender will be sent. Tenders to be delivered to the Secretary, Education Offices, Brettenham-road, Upper Edmonton, N., on or before noon, July 17.

July 26.—Hackney.—PUBLIC LIBRARY.—Tenders are invited for the erection of a central library in Mare-street, Hackney, for the Metropolitan Borough of Hackney. Plans and specifications may be seen, and bills of quantities, conditions, form of tender, and form of contract, obtained, at the architect's office, Mr. J. B. Johnson, 11, Mare-square, W.C., on and after July 6, on deposit of 1s. Tenders, endorsed "Tenders for Central Library Buildings," to be deposited with the Town Clerk, Town Hall, Hackney, not later than 5 o'clock p.m., July 26.

No DATE.—Barnsley.—STORAGE HOPPER.—The New Monckton Collieries, near Barnsley, invite tenders for the erection of a brick storage hopper for soundge, plan of which may be seen at the colliery offices.

No DATE.—Dagenham.—INN.—An inn, Dagenham, Essex, for the executors of the late Mr. P. B. Conroy, 1, Northchurch-street, Dagenham. Bills of quantities to be had by applying to Mr. A. T. G. Woods, architect, New-road, Brentwood, on payment of the sum of 2s.

No DATE.—Essex.—SCHOOLS.—Those desirous of tendering for alterations to the West Thurrock and Purfleet Council Schools should send their names to the Architect, Mr. Christopher M. Shiner, 6, Crutchedrivers, Thurrock.

No DATE.—Hamilton.—DORMITORY EXTENSION.—New dormitory extensions, Hamilton Combination Poorhouse. The different trades are included in one schedule, and each contractor must offer for all the trades. Schedules on application to Mr. Alex. Cullen, architect, Brandon Chambers, Hamilton.

No DATE.—Leeds.—FACTORY.—A factory, Springwell-street, Holbeck, Leeds, for Messrs. Jos. May &

Sons. Names and addresses to offices of Mr. G. Fredk. Bowmill, architect, 5, Greaves-street, Leeds.

No DATE.—Shenfield.—PAIR OF TOWERS.—Tenders are invited for the erection of a pair of cottages adjoining the Eagle and Child at Shenfield, Essex. Plans may be inspected on application to Mr. Robt. Burgess, Pied House, Shenfield.

ENGINEERING, IRON, AND STEEL.

JUNE 30.—Chard.—WATER SUPPLY.—Hydraulic ram, reservoir, and laying on water to Waterlaun Manor House, schools, and vicarage. Names to Messrs. James & Madge, architects and surveyors, Somerset House, Chard, on or before June 30, when quantities and bill particulars will be supplied.

JUNE 30.—Kilkeel.—CONCRETE WALL.—A concrete wall at Kilkeel Harbour. Drawing and specification may be seen at the office of the County Surveyor, Mr. J. Heron, Courthouse, Downpatrick, and at the office of the R.D.C., Union Workhouse, Kilkeel. Tenders, endorsed "Kilkeel Harbour Wall," to be lodged in office of Surveyor before 12 o'clock noon on June 30.

JUNE 30.—Merrithy Tydill.—WATERMANS.—Supply and delivery of about 15 tons of cast iron water-mains and specials. Specifications and forms of tender may be obtained on application to the Borough Surveyor, Town Hall, Merrithy Tydill. Sealed tenders, endorsed "Watermains," should reach Mr. J. A. Mearns, Town Clerk, Town Hall, Merrithy Tydill, on or before June 30.

July 2.—East Ham.—ROOF TRUSSES, ETC.—East Ham Corporation invite tenders for the supply and fixing of iron roof trusses and an overhead traveller at the pumping station, Vicarage-lane, East Ham. Bill particulars may be obtained from the Borough Engineer, East Ham, on or before July 2.

July 2.—Glasgow.—ELECTRIC LIGHTING.—Glasgow Corporation invite tenders for the electric light installation, etc., for Townhead District Library. Specifications and forms of tender may be obtained on application to Mr. John Fairweather, and Mr. J. W. Edgar, and sealed tenders, endorsed "Electric Light Installation," to be marked "Townhead Library; Tender for Electric Light Installation," must be lodged with Mr. A. W. Myles, Town Clerk, City Chambers, Glasgow, not later than 12 noon on July 2.

July 2.—Lincoln.—PIPS.—Lincoln Waterworks Committee invite tenders for the supply of cast-iron pipes and special castings and fittings, to be delivered at Lincoln or at Boultham Sliding (M.R.) as required. Drawings, specifications, and schedules may be obtained from Mr. Neil McWhorter, and Mr. J. W. Edgar, and sealed tenders must be sent to Mr. W. L. Page, Junr., Deputy Town Clerk, Bank-street, Lincoln, before 12 noon July 2, endorsed "Tender for Pips."

July 2.—London.—BOILER, ETC.—Fulham Guardians invite tenders for the supply and erection of a saddle boiler, and for alterations to the hot-water piping at the existing boiler house. Specifications and form of tender and specification may be obtained on forwarding to Mr. E. J. Mott, Clerk to the Guardians, Guardians Office, 129, Fulham Palace-road, Hammersmith, W. A stamp addressed "Boiler," etc., and tenders must be sent in not later than July 2, sealed, and endorsed "Tender for Boiler, etc."

July 2.—London.—GIRDER BRIDGES.—The Bengal and North-Western Railway Company directors invite tenders for the supply and delivery of 100 ft. girder bridges, as per specification to be seen at the Company's offices. Tenders, addressed to Mr. Alexander Beat, managing director, 237, Gresham House, Old Broad-street, London, E.C., and marked "Tenders for 100 ft. Girder Bridges," are to be lodged not later than noon on July 2. The fee for the supply of 100 ft. will be charged, which cannot, under any circumstances, be returned.

July 3.—Bamford.—STEEL PIPES.—The Derwent Waterworks Committee invite tenders for the manufacture and supply of steel pipes for a section of the Derwent Aqueduct. There will be about 400 yds. of 40-in. steel pipes, 4,000 yds. of 32-in. ditto, and 12,000 yds. of 22-in. ditto. Specifications may be obtained on application to Mr. Edward Sandeman, M.I.C.E., Engineer to the Board, at offices, Bamford, near Sheffield, on payment of 2s. Sealed tenders, endorsed "Tender for Steel Pipes," to be delivered to him not later than 9 o'clock on July 3.

July 4.—Clarksfield.—VENTILATING, ETC.—Oldham Education Committee invite tenders for the ventilating and electric lighting of the new Council school at Clarksfield. Copy of specification and plan may be obtained from Mr. J. Rennie, Secretary, Education Offices, Oldham. Tenders, endorsed, to be forwarded not later than July 4.

July 4 and 11.—London.—PLATE GIRDER BRIDGES, ETC.—The East Indian Railway Company invite tenders for the supply and delivery of (1) copper inlets, (2) plate girder bridges, and (3) cast-iron girders, to be seen at the Company's offices. Tenders are to be sent to Mr. C. W. Young, Secretary, Nicholas-lane, London, E.C., not later than 12 o'clock noon, marked "Tender for Copper Inlets, or as the case may be," for No. 1 on July 4, and for No. 2 on July 11. For each specification a fee of 1s. is charged, which cannot under any circumstances be returned.

July 4.—Middleton.—SLUDGE REMOVAL APPARATUS.—The Corporation of Middleton invite tenders for the supply and fixing of three sets of sludge removal apparatus, and tank fittings for three 25 ft. diameter circular or rectangular settling tanks at their sewage works. Plans of tanks may be seen, and any other information obtained, on application to the Borough Surveyor, Town Hall, Middleton. Tenders, addressed to the Chairman of the Surveyors' Committee, endorsed "Sludge Removal Apparatus," are to be delivered at Town Hall, Middleton, on or before July 4.

July 4.—Winchester.—WARMING AND VENTILATING.—Warming and ventilating St. Thomas's Church. Plans and specification at office of Thomas Stophor, architect and surveyor, 57, High-street. Sealed and endorsed tenders for the work to be sent to the Secretary, St. Thomas's Church, on or before July 4.

July 5.—Gravesend.—FENCING.—Gravesend Town Council invite tenders for the supply and fixing of about 110 yds. of wrought-iron fencing. Plan and specification may be seen at the Borough Surveyor's

Office, Town Hall, and tenders, marked "Tender for Iron Fencing," must reach Mr. H. H. Brown, Town Clerk, City Office, on July 5.

July 6.—Egremont.—EXTENSION OF BRUSH DESTROYER.—For extension of refuse destructor (not ballmills), for the Metropolitan Board of Works, to be done by W. H. Travers, Engineer and Surveyor, Public Offices, Egremont, Cheshire, on deposit of 5*l.*

July 6.—Warwick.—WATER SUPPLY.—Warwick Corporation invite tenders for the construction of covered service reservoir (capacity about 500,000 galls.), and the provision, laying, and jointing of about 200 yds. of 12-in. and 8-in. cast-iron pipes, together with all special castings and valves required; also for the erection of engine-house and gas-producer house, and other works in connection therewith. Plans and specification may be seen, and form of tender and bills of quantities obtained, at the offices of the engineers, Messrs. Wilcox & Raikes, 65, Temple-row, Birmingham, on payment of a deposit of 3*l.* 5*s.* The tenders must be sent in under seal in envelopes supplied, addressed to the Works Engineer, Contract No. 4, to the office of Mr. Emrahson Campbell, Town Clerk, Warwick, not later than 12 o'clock noon on July 6.

July 7.—Ballymena.—DISINFECTOR.—Ballymena R.C.M. invite tenders for the construction of a steam disinfecter at the Ballymena Workhouse, in accordance with specification to be seen at office of Mr. Charles Johnston, 10, Water Street, Ballymena. Ballymena Sanitary Board tenders, endorsed "Tender for Disinfecter," will be received by Clerk up to 1 o'clock p.m. on July 7.

July 7.—Chesham.—WATER PIPES.—North-Eastern Railway directors invite tenders for the laying of certain water pipes (to be provided by the Company) in the neighbourhood of Chesham, near North Finchley, and Gascoigne Wood Junction. Plans and specification may be seen, and detailed quantities and form of tender obtained, on application to the Works Engineer, Messrs. G. & J. G. G. & Co., district engineer, Mr. H. J. Rudgard, York. Sealed tenders, marked "Tender for Chesham and Milford Junction Water Supply," must be sent in under seal to the Works Engineer, North-Eastern Railway, York, not later than July 7.

July 9.—Doddington.—WATER TANK.—North Westford Guardians invite tenders for the erection of a new water tank in their workhouse, at Doddington, near March, Cambridgeshire. Plans and specification may be seen at the Board-room, Union Workhouse, Doddington, between the hours of 10 a.m. and 4 p.m. Sealed tenders, duly endorsed, must be delivered to Mr. George Sharman, Clerk, Poor Law Offices, Broad-street, March, free of expense, not later than July 9.

July 9.—Dublin.—ELECTRIC WORKS.—The Board of Public Works, Dublin, invite tenders for certain electric works at the Royal Irish Academy House, Dawson-street, and at the Science and Art Buildings and Leinster House, Kildare-street, Dublin. Tenders will be received up to, but not later than, 10 a.m. on July 9. The plans and specification can be seen at the office of Mr. J. Williams, Secretary, Office of Public Works, Dublin, where also forms of tender may be obtained. The envelope containing the specification may be obtained on application to the Board of Public Works, Dublin, on July 9.

July 9.—Dublin.—SWITCHBOARDS.—Dublin Lighting Committee of the Corporation invite tenders for the supply of substation switchboards and accessories, transformer pillars. Specifications, with general conditions and form of tender, can be obtained from the City Electrical Engineer, Fleet-street, Dublin, on payment of 1*l.* 5*s.* for each specification. Tenders, addressed to the Chairman of the Lighting Committee, 3, Cork-hill, Dublin, and marked "Tender for Substation Switchboard, Transformer Pillars, etc.," to be delivered not later than July 9.

July 10.—London.—PIPE LAYING.—The Metropolitan Water Board invite tenders for the laying of about 3,000 yds. of water main from Pimlico-end of the Board's Watercourse in the Kent district. Forms of tender, with schedule and conditions of contract, may be obtained on application to the District Engineer at the Board's Office, Broad-street, E.C.4. Such application must be made between the hours of 10 and 4 (except on Saturdays). Tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, and endorsed "Tender for Pipe Laying, Kent District," must be delivered at the offices of the Board not later than 10 a.m. on July 10.

July 10.—London.—SLUICE VALVES.—The Metropolitan Water Board invite tenders for the making, testing, and delivering of 42 in. and other sluice valves, etc., appertaining to Cranley-gardens, Fortis Green, East Finchley, with specification, with form of tender and contract, with specification, may be obtained, and the drawings inspected, upon application to the Engineer, at The Firs, Southern-road, Fortis Green, East Finchley, between the hours of 10 and 4 (except on Saturdays). Tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, Metropolitan Water Board, Savoy-court, Strand, W.C.2, and endorsed "Tender for Sluice Valves, etc., Appertaining to Cranley-gardens," must be delivered at the offices of the Board, Savoy-court, Strand, W.C.2, not later than 10 a.m. on July 10.

July 10.—London.—SLUICE VALVES.—The Metropolitan Water Board invite tenders for the making, testing, and delivering of 42 in. and other sluice valves, etc., Fortis Green reservoirs. Forms of tender and contract, with specification, may be obtained, and the drawings inspected, upon application to the Engineer, at The Firs, Southern-road, Fortis Green, East Finchley, between the hours of 10 and 4 (except on Saturdays). Tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, Metropolitan Water Board, Savoy-court, Strand, W.C.2, and endorsed "Tender for Sluice Valves, etc., Appertaining to Fortis Green Reservoirs," must be delivered at the offices of the Board, Savoy-court, Strand, W.C.2, not later than 10 a.m. on July 10.

July 11.—Greenock.—COMBINATION HOSPITAL BOILER.—Greenock and Glasgow Combination Hospital Board invite tenders for laundry machinery for new combination hospital, presently in course of erection at Garscube. Invitations, enclosed in sealed envelopes, with specification by Mr. John Dixon, A.M.Inst.M.E., consulting engineer. Schedule of quantities and form of tender can be obtained on

application to Mr. Colin Macculloch, Clerk to the Board of Health, Greenock, on payment of a deposit of 1*l.* 5*s.* for each schedule. Sealed tenders, on the prescribed form, must be delivered at the Town Clerk's Office, Greenock, not later than 10 a.m. on July 11.

July 11.—London.—WATER MAINS, METERS, ETC.—The Metropolitan Water Board and the County Council, Middlesex, invite tenders for the providing, laying, and fixing of about 3,500 lineal yds. of water mains, ranging from 4 in. to 7 in. in diameter, and for the construction and equipment of meter stations and various works connected therewith. Instructions for tender and form of tender, with form of contract and schedules annexed, can be obtained, and the drawings inspected, at the office of Mr. Alex. Bunnie & Sons, 9, Great George-street, Westminster, on payment of 1*l.* Tenders must be received at the office of Mr. Alex. Bunnie & Sons, 9, Great George-street, Westminster, not later than 10 a.m. on July 11.

July 11.—Twickenham.—ELECTRIC LIGHTING AND MACHINERY.—Twickenham U.D.C. invite tenders for the electric lighting and supply of electrical machinery, etc., at the pumping station and destructor buildings. Sewage Disposal Works, The Brewery, Twickenham. Specifications, with form of tender may be obtained, and drawings inspected, at the office of Mr. William Fairley, Consulting Engineer to the Council, 59, Victoria-street, Westminster, also application to Mr. Fred W. Pearce, Surveyor to the Council, Town Hall, Twickenham, on deposit of sealed cheque for 2*l.* 2*s.* Sealed tenders, on the prescribed form, by the Council, to be delivered to Mr. H. Jason Saunders, Clerk to the Council, Town Hall, Twickenham, on or before noon on July 11.

July 12.—Aldershot.—STEEL WATER TANK.—Aldershot Gas and Water Company invited tenders for the manufacture and erection of a steel water tank and substructure, with appertaining works, at Aldershot, near the Barracks, Aldershot. Copies of tender, general conditions, and specification may be had on application to Mr. R. W. Edwards, Secretary and General Manager, Aldershot, Victoria-road, Aldershot, accompanied by a deposit of 2*l.* 2*s.*, and drawings may be inspected at the office of the consulting engineer, Messrs. Taylor & Sons, 8, Santo Crispin, Notion House, Westminster, S.W. Tenders should be delivered in sealed package, addressed to the Secretary, on or before July 12, enclosed in a sealed envelope, and endorsed "Steel Water Tank."

July 12.—Bolton.—CONDENSING APPARATUS.—Bolton Electricity Committee invite tenders for the supply, delivery, and erection of condensing apparatus, specifications and form of tender may be had on application to Mr. Arthur A. Day, A.M.I.C.E., M.I.E.E., Borough Electrical Engineer and Transvaal General Manager, Bolton, on payment of 1*l.* 5*s.* Tenders, endorsed "Condensing Apparatus," to be addressed to the Chairman of the Electricity Committee, Town Clerk's Office, Town Hall, Bolton, and must be delivered not later than 12 o'clock noon on July 12.

July 12.—Lambeth.—SANITARY CONVENIENCE.—The Lambeth Borough Council invite tenders for the construction of an underground convenience at Kennington-area. Drawings can be seen, and specification, bill of quantities, and form of tender obtained, at the offices of the Borough Engineer, Messrs. J. & W. Edwards, 336, Kennington-road, S.E. between the hours of 10 a.m. and 12 noon and 2 p.m. and 4 p.m. (Saturdays excepted), on payment of 1*l.* 5*s.* Tenders, duly made on the prescribed form, must be delivered at the Town Hall, Kennington-green, S.E., not later than 12 o'clock noon on July 12.

July 12.—Birmingham.—WIDENING VIADUCT.—Great Western Railway Directors invite tenders for widening the viaduct, etc., between Great Charles Street and Edgbaston, Birmingham. Specifications and specifications may be seen, and forms of tender and bills of quantities obtained, at the office of the New Works Engineer, at Paddington Station, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to Mr. G. M. Mills, Secretary, Paddington Station, London, and marked outside "Tender for Widening Viaduct, etc., Birmingham," will be received up to, and on, July 17.

July 20.—Frankley.—RESERVOIR.—Birmingham Corporation invite tenders for the construction of a covered filtered water reservoir and connections at the Frankley Waterworks, Northfield, near Birmingham. The drawings may be seen, and specification and bills of quantities obtained, at office of Mr. P. Anthony Lees, Secretary, Offices, 44, Broad-street, Birmingham, on the deposit of the sum of 5*l.* The site at Frankley may be inspected by appointment from July 2 to July 6 inclusive. Sealed tenders, addressed to Secretary, and endorsed "Tender for Works at Frankley," are to be delivered before noon of July 20.

July 20.—Leeds.—FILTER BIOS.—Leeds Waterworks Committee invite tenders for the construction of four filter beds, clear-water tank, meter house, the making of rock-laying, pipes, and drains, etc., in connection therewith, at the site of their new filter beds, Oley-road, Healding, Leeds. Plans may be seen, and the specification, bill of quantities, and form of tender, may be obtained, at the office of Mr. Charles G. Henzel, M.Inst.C.E., Waterworks Engineer, Municipal Buildings, Leeds, on payment of a deposit of 1*l.* 5*s.* Tenders, addressed to the Secretary of the Leeds Waterworks Committee, at the office of Mr. Charles G. Henzel, M.Inst.C.E., Waterworks Engineer, Municipal Buildings, Leeds, and marked outside "Tender for Filter Beds, Oley-road, Healding," must be addressed to the Chairman of the Waterworks Committee, and delivered in a sealed cover at the Town Clerk's Office, Town Hall, Leeds, not later than 10 a.m. on July 20.

July 24.—Thornaby.—STOCKTON.—BRIDGE.—North-Eastern Railway Directors invite tenders for the renewal of the superstructure of the bridge carrying the passenger lines over the River Tees, near Thornaby, Stockton, and the construction and erection of a new steel bridge of five spans, of 100 ft. each, at about 360 ft. including about 350 tons of steel work. The contract will also include the removal and rebuilding of part of the structure of the bridge. Specifications, with specification, detailed quantities, and form of tender obtained, on personal application at the office of Mr. W. J. Cadworth, the Company's engineer, at York. Sealed tenders, marked "Tenders for the Renewal of Tees Bridge, Thornaby," may be sent to the Secretary, Mr. R. F. Dummell, at York, before noon on July 24.

July 25.—Hackney.—ELECTRICITY WORKS.—Hackney Borough Council invite tenders for the following:—Specification No. 27: Section A, arc lamp pillars; section B, erection of arc lamp pillars and switch pillars; section C, arc lamps and accessories; section D, switch pillars. Specifications, with specification, drawings, form of tender, and form of agreement may be inspected at the offices of Mr. Robert Hammond, M.Inst.C.E., the Consulting Engineer to the Council, 64, Victoria-street, Westminster, S.W., and may be obtained there on making a deposit of 5*l.* Extra copies of the specification may be obtained by head fee tenders at a charge of 5*s.* per copy, which sum will not be refunded. Tenders (sealed and marked "Tender for Arc Lighting Apparatus") must be addressed to Mr. W. J. Williams, Town Clerk, at the Town Hall, Hackney, and be delivered on or before 4 p.m. on July 26.

July 25.—Llwynpla.—STEELWORK.—The Rhonda U.D.C. invite tenders for the steelwork of a road bridge of 52 ft. span and 40 ft. in width, erected complete (to contractor's own design) at Llwynpla, Rhonda Valley. Designs and tenders must be received not later than July 26. Plans and sections of the abutments and site and all particulars may be obtained on application to Mr. Charles R. Ruessner and Surveyor, at the Council Offices, Pentre, Rhonda, on deposit of 1*l.* 5*s.*

MISCELLANEOUS.

June 29.—Tunstall.—SCAVENGING.—Tunstall U.D.C. invite tenders for one year from September 29 next: (1) For the removal of nightsoil within the old urban district of Tunstall, District No. 1, the removal of nightsoil and ashes—(2) Mile-hill and Chell district; (3) Goldenhill (Ravenscliffe, Lincolns, Lolebrook, and Woodstock district); (4) Goldenhill (remainder of); (5) For team work within the district. Full details of the tender may be had upon application to the Surveyor, the Scavenging Superintendent, or Mr. Arthur P. Tunstall, Clerk to the Council, Council Offices, Tunstall. Sealed tenders, endorsed "Tender for Nightsoil" or "Nightsoil and Ashes," or "Team Work" (as the case may be), to be sent to the Surveyor, on the proper forms, not later than 12 o'clock noon on June 30.

July 2.—Beaush.—TRAM.—Beaush, Ponton, at the General Sanitary Committee invite tenders for the supplying of timber, and separate tenders for fitting up show-yard. For particulars apply to Secretary, Mr. M. T. Milburn, Jubilee House, Madonsley. Tenders to be sent not later than July 2.

July 2.—Blean.—DISINFECTANTS.—Blean R.D.C. invite tenders for the supply of disinfectants for a period of six months from July 2 next. Particulars and forms of tender may be obtained from the Sanitary Inspector, Mr. H. Elliot, Rose Cottage, Herne Street, near Canterbury. Tenders to be sent to Mr. J. J. Birch, Clerk, 59, Castle-street, Canterbury, on or before July 2.

July 2.—Bolsover.—SCAVENGING.—Bolsover U.D.C. invite tenders for cleansing the ashpits, privies, and dustholes in the Parish of Bolsover, and for providing depots for the contents of the same, and removing such contents to the depots. Tenders for any area or for the whole parish for one year or for three years, from July 25 next, and endorsed "Cleansing," must reach Mr. Jno. Hunter, Clerk to the Council, Bolsover, on or before July 2. Forms of tender may be had of Mr. Browne, the Council's Surveyor, High street, Bolsover.

July 2.—Droxford.—STEAM ROLLERS.—Droxford U.D.C. invite tenders for the hiring of steam rollers, two fitted with scarifiers, to be used on a portion of the main and district roads in the Droxford District, for a certain period between October 1, 1905, and March 1, 1907. Forms of contract to be obtained upon application at the office of Mr. Francis Clark, Clerk to the Council, Bishop's Walkham. Sealed tenders, endorsed "Tenders for Steam Rolling," to be sent not later than July 2.

July 2.—Fife.—SINKING PITS.—Sinking two pits at Blairhall Colliery, East Grange, Fife, for the Glasgow Iron Company, Ltd. Specifications may be seen, and information given, to intending offerers, who are invited to meet at the site of the pits on July 2, on the arrival of the train at East Grange Station, about 11.15 a.m.

July 2.—Warrington.—CARPING.—Warrington Sanitary Works Committee invite tenders for carping for Longford Depot, Particulars and tender form may be obtained from Mr. Richard Wilson, Manager, Longford Depot, Warrington. Tenders, in securely-fastened envelopes, endorsed "Tender for Carping," and addressed "The Chairman, Sanitary Works Committee, Town Hall, Warrington," to be delivered not later than July 2.

July 4.—Cranbrook.—STEAM ROLLING.—Cranbrook R.D.C. invite tenders for steam rolling and scarifying during the ensuing season. Forms of tender must be obtained of Mr. P. H. Crampson, Clerk, Cranbrook, and tenders must be sent before July 6.

July 4.—Manchester.—SCHOOL FURNITURE.—Manchester Education Committee invite tenders for the supply of school furniture at the Plymouth-croft Municipal School. A specification may be obtained, and samples of furniture may be seen, at the offices, in Deansgate, Manchester, on a deposit of 1*l.* 5*s.* Tenders, enclosed in the envelope marked "Tender," to be delivered not later than July 4. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

July 5.—Blyden.—SCAVENGING.—Blyden U.D.C. invite tenders for the removal and disposal of scuttles ashes, contents of ashpits, house refuse, street scavenging, etc., at Blyden, Winton, and Winton Hill. Specifications, forms of tender, and full particulars may be obtained from Mr. Robert Blyden, Sanitary Inspector, at the offices of the Council, Blyden, between the hours of 9 a.m. and 10 a.m. Sealed tenders, endorsed "Tender for Scavenging Contract," are to be delivered to Mr. Henry Dutton, Clerk, Blyden-on-Tyne, before noon on July 5.

July 5.—Carnarvon.—FITTINGS.—For supplying the new chapel at Carnarvon Workhouse with fixtures. Plans and specifications can be seen at the office of Mr. J. Henry Thomas, Clerk, 14, Market-street, Carnarvon. Tenders to be in hand by 10 a.m. on July 5.

July 9.—Selby.—TELEPHONIC CONVENIENS.—Selby U.D.C. invite tenders for telephonic connection between Council Offices and new networks at Brayton Barr. Particulars may be obtained from Mr. Bruce McV. Gray, A.M.I.C.E., Waterworks Engineer, Council Offices, Selby. Tenders, endorsed "Telephone," to be sent by July 9.

July 10.—Romsey.—STEAM ROLLING.—Romsey Corporation invite tenders for steam rolling and scarifying in the borough. Conditions and specifications of the work can be obtained of the Borough Surveyor at his office, in the Market-place, Romsey. Sealed tenders, marked "Rolling," must be delivered at office of Mr. B. W. Atlee, Town Clerk, 2, Porters-bridge-street, Romsey, before 5 o'clock p.m. on July 10.

No DATE.—Broxbourne.—LIGHTING.—Broxbourne Parish Council invite tenders for lighting the public lamps in the parish of Broxbourne. The Lighting Committee are willing to receive tenders for lighting the public lamps in the above parish with gas, from August 1, 1906, to April 30, 1907. Tenders to be addressed to Mr. J. Hunt, Clerk.

No DATE.—Selly Oak.—SCHOOL FURNITURE.—King's Norton and Northfield U.D.C. Education Committee invite tenders for the supply of school furniture consisting of scholars' desks, class cupboards, seats, chairs, etc., required for the furnishing of the new Council school, Tiverton-road, Selly Oak, near Birmingham. Schedules and forms of tenders, together with particulars on receipt of written request, enclosing a stamped envelope, sent to Mr. J. F. Moore, Secretary, Education Offices, King's Norton.

PAINTING, etc.

June 30.—Ulverston.—PAINTING.—Papering and painting at the Devonshire Arms Hotel, Ulverston. Specifications can be seen at the hotel. Tenders to be sent in before June 30 to Messrs. Jennings Bros., Ltd., Castle Brewery, Cockerham.

July 2.—Bunall.—PAINTING.—The Hanley, Stoke, Fenton, and Longton Joint Hospital board invite tenders for painting at the Infectious Diseases Hospital, Backley, Stoke-on-Trent. Specifications and particulars may be obtained from the Architect to the Board, Mr. Elijah Jones, 10, Albion-street, Hanley, not later than July 2.

July 2.—Cardif.—PAINTING.—Painting of certain wards, etc., and for the external painting of a portion of the Cardiff Infirmary. Specifications may be obtained at the Secretary's office at the infirmary. Sealed and endorsed tenders to be delivered to Mr. Leonard D. Ross, Secretary and General Superintendent, not later than 12 noon on July 2.

July 2.—Ecclesfield.—PAINTING.—The Ecclesfield District of the Education Department of the C.C. of the West Riding of Yorkshire invite tenders for painting and distemping required to be executed at the High Green Provident school. Application may be made to the Divisional Clerk for specification. Tenders should reach the divisional Clerk, Mr. W. Haque, Divisional Clerk, Education Offices, Ecclesfield, not later than July 2.

July 2.—Manchester.—PAINTING.—Manchester Education Committee invite tenders for the cleaning and painting of the Municipal Secondary School, Whitworth-street. Specifications may be obtained at the School of Technology, Sackville-street, on a deposit of 11. 1s. Tenders, on the forms provided, addressed to the Chairman of the Education Committee, must be delivered at the School of Technology, Sackville-street, Manchester, not later than 12 o'clock on July 2.

July 2.—Manchester.—PAINTING.—Manchester Markets Committee invite tenders for painting the roof of the Smithfield Market. Specification may be obtained at the office of the City Architect, Town Hall, upon payment of 11. 1s. Sealed tenders, enclosed in the official envelope, to be delivered at the above office not later than 3 p.m. on July 2.

July 2.—Sheffield.—PAINTING, etc.—Sheffield Education Committee invite tender for painting, distemping, and asphaltting required to be executed at Council schools. Names of or before July 2 at the Secretary to the Education Committee, Leopold-street. Specifications and forms of tender will then be forwarded to the contractors, and sealed tenders, which will only be received on forms and in covers provided, should be sent to the office of the Committee not later than 9 o'clock a.m. on July 13.

July 3.—Nottingham.—PAINTING.—Nottingham Education Committee invite tenders for cleaning and painting at the following Council schools: Dunkirk, Wollaton-road, Huntington-street (inside and outside), London-road, A Court-street (outside only). The whole of the work will require to be completed between July 27 and August 23. Specifications, bills of quantities, and forms of tender may be obtained from Mr. Frank B. Lewis, City Architect, Guildhall, on payment of a deposit of 11. for each set. Sealed tenders, properly endorsed, to be delivered to the City Architect not later than 10 a.m. on July 3.

July 3.—West Norwood.—REPAIRS.—Lambeth Guardians invite tenders for cleaning, decoration, and repair of old receiving ward, Elder-road, West Norwood. Tenders, which will be received only on printed forms, sealed and endorsed "Tender for Repairs, Norwood Receiving Ward," must be sent by post to Mr. W. Thurall, Clerk, Guardians Board-room and Offices, Brook-street, Kennington, S.E., not later than July 3. Specification and form of tender will be supplied on personal application.

July 4.—Treforest and Glyntaff.—PAINTING.—Pontypridd U.D.C. Education Committee invite tenders for painting of Ian Wood, Mill-street (elementary) and Pupils Teachers' Cottages. Treforest, and Glyntaff Council schools. Specification may be seen, and forms of tender obtained, at the office of Mr. P. R. A. Willoughby, A.M.I.C.E., Engineer and Surveyor to the Council. Sealed tenders, endorsed "Painting," must be received by Mr. Milton Jones, Secretary, Education Offices, Pontypridd, not later than July 4.

July 5.—Ashington.—COLOUR WASHING.—The Managers of Ashington New High School Council Schools invite tenders for the work of colour-washing the walls of the schools. Copies of specification and forms of tender may be obtained from

Mr. James Marshall, Clerk to the Managers, Council Office, Ashington, to whom tenders should be sent not later than noon, July 5.

July 5.—Redruth, Camborne, etc.—PAINTING.—Redruth and Camborne District Education Committee invite tenders for the work of painting and distemping to be done at the Council schools, in the parishes of St. Agnes, Sixthams, Gwennap, Redruth, Hlogan, and Camborne, as per schedule enclosed. Tenders, which should be endorsed and sealed, are to be sent to Mr. Wm. Burchell, Clerk, Education Office, Redruth, on or before July 5.

July 5.—Manchester.—PAINTING.—Manchester Corporation Paying, Sewering, and Highways Committee invite tenders for painting various bridges over the Bridgewater and Rochdale Canals and the River Medlock. Specification and form of tender may be obtained on application at the City Surveyor's Office, Town Hall, Manchester, on payment to the City Treasurer of 11. 1s. All cheques or postal orders are to be made payable to the order of the Corporation of Manchester. Tenders, enclosed in the official envelope and addressed to the Chairman of the Paying, etc., Committee, to be delivered at City Surveyor's Office not later than 10 a.m. on July 6.

July 7.—Mistley.—PAINTING, etc.—The Standing Joint Committee of the Court of Quarter Sessions and C.C. invite tenders for painting and other work at the Police-station, Mistley, Essex. Specification can be seen at the police-station upon application to the Inspector. Sealed tenders, enclosed in an envelope for Painting, etc., Mistley Police-station, must be addressed to Mr. F. Whitmore, County Architect, 73, Duke-street, Chelmsford, and reach him not later than July 7.

July 7.—Portside.—DISTEMPING WALLS, etc.—Hove Corporation invite tenders for distemping walls, ceilings, etc., at the Hove Sanatorium, Portside. Further particulars may be obtained at the office of the Borough Surveyor (Mr. H. H. Scott), Town Hall, Hove. Tenders, on forms supplied, addressed to Mr. H. Endacott, Town Clerk, Town Hall, Hove, endorsed "Tenders for Distemping, etc., Sanatorium," will be received up to 2 o'clock on July 7.

July 7.—Southminster.—PAINTING.—The Standing Joint Committee of the Court of Quarter Sessions and C.C. invite tenders for painting and other work at the Police-station, Southminster, Essex. Specification can be seen at the Police-station, upon application to the Superintendent. Sealed tenders, endorsed "Tender for Painting, etc., Southminster Police-station," must be addressed to Mr. Frank Whitmore, County Architect, 73, Duke-street, Chelmsford, and reach him not later than July 7.

July 9.—West Riding.—PAINTING.—West Riding C.C. Education Department invite tender for the thorough cleaning, painting, etc., of the Birley Grammar School, Scalloway, Aston, Ancliffe, Treouan, and Gatliffe Provident Schools. Specifications on application from Mr. S. Abson, Divisional Clerk, Education Offices, Woodhouse. Tenders to be delivered not later than July 9.

July 9.—Whitley.—PAINTING.—The Vicar and Wardens of Whitley Lower invite tenders for the painting and decorating of Whitley Lower Parish Church. Further particulars of the work required to be done may be obtained from the Vicar. Tenders to be delivered, free of charge, on or before July 9, and the work to be completed in August.

July 11.—Hford.—PAINTING.—Tenders are invited for cleaning and painting exterior of Downshall School, including interior and exterior of latrines and play-sheds, and boundary railings, during summer vacation. Specifications and forms of tender may be obtained from the Engineer and Surveyor, Town Hall, Hford, on and after July 2, during office hours, on a deposit of 11. 1s. Tenders, endorsed "Tender for painting," must be sent by post, addressed to the Chairman of Education Committee, not later than noon, July 14.

July 16.—Dorchester.—PAINTING, etc.—Certain painting and decorating work at the Dorchester National Schools during the summer holidays. Particulars and forms of tender may be obtained at the Secretary's office, where sealed tenders, marked "Painting," must be delivered before 3 p.m. on July 16. Mr. Henry O. Look, Secretary to the Managers, 24, High West-gate, Dorchester.

No DATE.—Hamilton.—PAINTING.—Hamilton Parish School Board invite tenders for painter work proposed to be done at Greenfield School. Name and address to Mr. Geo. Turner, Master of Works, Hamilton.

ROADS, SANITARY, AND WATER WORKS.

July 2.—Clayton.—SEWERS.—Clayton U.D.C. invite tenders for the construction of about 335 yds. of main sewers of 12-in. diameter, including manholes, lamp-holes, and special works connected therewith. Drawings and specification may be seen, and forms of tender obtained, at the office of the Clayton U.D.C. on any morning from 9.45 to 9.30 a.m. and including June 30. Sealed tenders, endorsed "Clayton Sewerage," are to be forwarded to Mr. Benjamin Ashton, Clerk, Clayton, not later than July 2.

July 2.—Hoyland Nether.—ASPHALTING.—West Riding Education Committee (Hoyland Nether District Sub-committee) invite tenders for asphaltting of the playground of Hoyland Common Provident Boys' School. Specification may be had of Mr. D. Paul, Divisional Clerk, Town Hall, Hoyland, Barnsley. Tenders, enclosed in an envelope marked "Hoyland," should be received by the Clerk on or before July 2.

July 2.—Tyselye.—SEWERAGE.—Yardley R.D.C. invite tenders for the construction of the following foot water sewers and drains, viz.:—1,803 yds. of 18-in. sewer, including 499 yds. in tunnel; 64 yds. of 12-in. sewer; 1,112 yds. of 9-in. sewer; 59 yds. of 6-in. sewer. Also the relaying and reconnection of house drains, together with man-holes, flushing chambers, and other works appertaining thereto, in accordance with plans, drawings, specification, and conditions of contract, which may be seen, on application to the Engineer and Sur-

veyor, Mr. Arthur W. Smith, at the Council House, Sparkhill, near Birmingham, between the hours of 10 a.m. and 3 p.m. (Saturdays 10 a.m. to 2 p.m.). Specification, bill of quantities, and plans, enclosed in an envelope addressed to Mr. Francis Ladbury Thompson, Clerk of the Council, the Council House, Sparkhill, near Birmingham. Tenders, endorsed "Tyselye Sewerage," to be addressed and delivered by the Clerk not later than noon on July 2.

July 2.—Urmston.—FOOTWAYS.—The Urmston U.D.C. invite tenders for the flagging and kerbing of the footways of Station Bridge, Urmston, and its approaches. Plans, specifications, and forms of tender may be obtained from Mr. James Heath, Surveyor to the Council. Sealed tenders must be delivered to Mr. T. Rowland, Clerk to the Council, Council Offices, Urmston, not later than 4 o'clock on July 2.

July 3.—Bedford.—SEWERS, etc.—Bedford Corporation invite tenders for the following works:—(1) The construction of an underground sewage pumping station, including storage tank, engine-room, etc., complete at the Bedford Park; (2) the laying and completing of cast-iron and glazed pipe surface-water sewers in the Amphilford district, including the construction of manholes, lamp-holes, etc.; (3) the construction and completing of a 12-in. lamp-outfall sewer, together with the necessary lamp-outfall and necessary alterations to existing pumping station. Full particulars may be obtained upon application at office of Mr. Wm. H. Bedford, A.M.I.C.E., Town Engineer, Bedford. Sealed tenders, endorsed (1) "Sewage Pumping Station," (2) "Surface-water Sewers," or (3) "Outfall Sewer" respectively, and addressed to the Chairman of the Board of Public Works, Town Hall, Bedford, to be delivered by 9 a.m. July 3.

July 3.—Edinburgh.—ROADS, etc.—Edinburgh Corporation invite tenders for work on the carriage-ways of (1) Belsomton-road, (2) Granly-road, (3) Abercorn-road, (4) Willowbrae-avenue, (5) Westfield-avenue, (6) Bewlands-terrace, (7) Craigkirk-avenue, (8) Shandon-terrace, (9) Shandon-crescent, (10) Shandon-road—macadamising; (11) West Park-place, (12) West Newington-place, (13) line at the foot of the roadway, (14) Eastwood-avenue, (15) Abercorn-road, (16) Willowbrae-avenue, (17) Westfield-avenue, (18) Bewlands-terrace, (19) Craigkirk-avenue, (20) Shandon-terrace, (21) Shandon-crescent, (22) Granly-road, (23) Abercorn-road, (24) Willowbrae-avenue, (25) Westfield-avenue, (26) Bewlands-terrace, (27) Craigkirk-avenue, (28) Shandon-terrace, (29) Shandon-crescent, (30) Shandon-road—macadamising. Specifications and quantities may be obtained on application to the City Road Surveyor, City Chambers. Tenders, sealed within the official hours of business, to be delivered to Mr. Thomas Hunter, W.S., Town Clerk, City Chambers, by 5 p.m. July 3.

July 3.—Salford.—PAVING STREETS.—Salford Corporation invite tenders for the sawing, paving, and completing of certain streets in the borough. The plans and specifications may be seen, and forms of tender, with quantities, obtained, at the Borough Engineer's office. Sealed tenders, enclosed in an envelope addressed to the Chairman of the Highway Committee, must be delivered to Mr. L. C. Evans, Town Clerk, Town Hall, Salford, not later than 10 a.m. on July 3.

July 4.—Chester-le-Street.—STREET WORKS.—Chester-le-Street R.D.C. Highways Committee invite tenders for making up the following private streets in the town of Chester-le-Street:—Prospect-street (back), west end of Prospect-street and Prospect-terrace, Villiers-place, Lucy-street (front), West-view (front), Marnistone-terrace (back), Ashley-terrace (front), Hamilton-terrace (back), North Burns Nicholson's-buildings-road, concrete retaining wall and fencing for ditto. Plans, sections, and specifications may be seen at the Corporation's office, together with form of tender, obtained at the Highway Surveyor's office, any day between 9 a.m. and 5 p.m. The Surveyor will go over the streets any time before 9 a.m. on July 4. Sealed tenders, endorsed "Tender for Private Streets Works," to be delivered to Mr. George W. Aylon, Highway Surveyor, Chester-le-Street, not later than July 4.

July 4.—Hove.—PAVING, etc.—Hove Corporation invite tenders for executing paving and other works in Wilbury-villas (between north end of railway bridge and Chester-le-Street), and in the vicinity of the railway bridge. Plans and specification seen at the office of the Borough Surveyor (Mr. H. H. Scott). Tenders, on forms supplied, addressed to Mr. H. Endacott, Town Clerk, Town Hall, Hove, and endorsed "Tender for Wilbury-villas," will be received up to 6 o'clock on July 4.

July 4.—Manchester.—ASPHALTING.—Manchester Education Committee invite tenders for asphaltting the playgrounds at the Plymouth-grove Municipal School. Bill of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on a deposit of 11. 1s. Tenders, addressed to the Chairman of the Sites and School Buildings Committee, must be delivered at the Deansgate offices of the Education Committee not later than 3 p.m. on July 4.

July 4.—Middleton.—ROADS.—The Corporation of Middleton invite tenders for the execution of works of private street improvements in Ezeeton-street, Walker-street, and Church-street (Rhodes). Specification, quantities, and form of tender may be obtained, and plans may be seen, on application to the Borough Surveyor, between the hours of 9.30 and 10.30 a.m., and on payment of a deposit of 10s. 6d. Tenders, addressed to the Chairman of the Surveyor's Committee, endorsed "Tender for Street Works," are to be delivered at Town Hall, Middleton, on or before July 4.

July 4.—Tadcaster.—STREET WORKS.—Tadcaster R.D.C. invite tenders for macadamising, kerbing, channelling (and asphalt) footpaths on front streets (and on private streets) for the under-surface of Crosscotes, in the Parish of Barwick-in-Elmet.—Marshall-terrace, back Marshall-terrace, Marshall-street, back Marshall-street, back Austwick-avenue, and a portion of back Austwick-road, between back Marshall-place and Austhorpe-road, (together having a length of about 1,200 ft. in yds. Plans, sections, and specification may be inspected at the office of Messrs. Spinks & Pugh, engineers and surveyors, 20, Park-row, Leeds, from whom bills

of quantities and form of tender may be obtained on payment of 2s. Sealed tenders, endorsed "Private Street Works Tender," to be sent to office of Mr. George A. J. J. addressed "Tenders, Borough Council, not later than July 4.

July 5.—Mitcham.—STREET WORKS.—Croydon R.D.C. invite tenders for the execution of private street works in Miles-road (Mitcham). Plans, sections and specifications, prepared by the Council's Surveyor, Mr. R. M. Clark, F.S.I., can be inspected, and form of tender obtained, at his office, Town Hall, Croydon, on payment of 2s. Sealed tenders, endorsed "Tender for Private Street Works," must be delivered to Mr. E. J. Goven, Clerk to the Council, Town Hall, Croydon, before 12 o'clock noon on July 5.

July 7.—Glasgow.—PLAYGROUNDS.—Glasgow Corporation invite offers for (1) excavation, etc.; (2) iron and timber gymnastic apparatus; (3) iron fencing; and (4) caretaker's box and water-clocks, in connexion with the proposed playground for children in Weaver-street, Townland. Specifications and forms of offer may be had on application at the office of Public Works, 14, Edinburgh-street. Sealed offers, marked outside "Offer for Children's Playground," must be lodged with Mr. A. W. Myers, Town Clerk, City Chambers, Glasgow, on or before July 7.

July 9.—Beckenham.—WIDENING ROAD.—Tenders are invited for the widening of Bromley-road (The Knoll) for 300 ft., consisting of 1,500 yds. excavation, 70 yds. concrete, 5 rods gault brickwork, 30 ft. channeling, 50 sq. yds. red brick paving, and remodelling and fitting 100 lin. yds. of roadway, for the Beckenham U.D.C. Plans and sections may be seen, and bills of quantities, specification, and forms of tender obtained, at the office of Mr. John A. Angell, surveyor, on and after June 23, on deposit of 1s. Tenders, sealed, and endorsed "Tenders for Bromley-road widening works," must be delivered to the Town Clerk, not later than 4 p.m., July 9.

July 9.—Penarth.—ROADS.—Penarth U.D.C. invite tenders for private improvement (street) works in Harbour View Road and Lane, Salisbury-avenue Lane, and Clinton-avenue, Penarth. Specifications and bills of quantities obtained from Mr. Edgar L. Evans, A.M.I.C.E., Surveyor, Council Offices, Penarth. Sealed tenders, endorsed "Tenders for Penarth Works," must be delivered not later than noon on July 9.

July 9.—Sunderland.—SEWERS.—Sunderland Corporation invite tenders for the construction of about 227 lineal yds. of 24 in. cast-iron pipe sewer, and about 23 lineal yds. of 18 in. re-clay pipe sewer, together with drop manholes, etc., across the foreshore and roadway at the end of Sealane. Drawings and specifications may be seen, and forms of tender and bills of quantities obtained, at the Borough Surveyor's Office, Town Hall, on payment of 1s. Sealed tenders, addressed "Tender for Sealane," to the Chairman of the Health Committee, and endorsed "Tender for Sewer at end of Sealane," must be delivered at the office of Mr. Fras. M. Bowry, Town Clerk, Town Hall, Sunderland, before 12 o'clock noon on July 9.

July 9.—Wandsworth.—ROAD WORKS.—The Wandsworth Borough Council invite tenders for making up and paving of Ravensbury-road. Specifications and drawings may be seen, and forms of tender obtained, at surveyor's office, 41, High-street, Wandsworth, before 10 and 4 (Saturday), 10.12. Tenders to be delivered at Council House, East Hill, Wandsworth, endorsed "Tender for Paving Ravensbury-road," before 12 noon, July 9.

July 10.—Lewisham.—ROAD WORKS.—Lewisham Borough Council invite tenders for kerbing, channelling, and making up of the roadway, and putting the roadway with artificial stone (in separate contracts) of Barry-road (part of), Dunoon-road (part of), and George-lane (part of), Lewisham. Specifications, drawings, and forms of tender obtained at the Town Hall, Catford (Surveyor's Department). Copies of the specification may also be had on payment of 1s. Sealed tenders, enclosed in an envelope, sealed, and endorsed "Tender for Lewisham Road Works," must be delivered by 4 o'clock on July 10 at the Town Hall, and placed in the box here provided for the purpose.

July 10.—Ottery St. Mary.—FOOTPATH.—The C.C. of the County of Devon invite tenders for the construction of a new footpath over St. Saviour's Bridge, Ottery St. Mary, to the railway station, being a continuation of the present footpath, and about 458 ft. in length. The plans, specification, and form of contract can be seen at the office of the Council, at the Castle of Exeter, where tenders are to be sent on or before July 10.

July 10.—Sunderland.—ROAD WORKS.—Sunderland Corporation invite tenders for channelling, macadamising, and crossing, and necessary catchpits, drains, etc., in Roker Park-road, Sunderland. Drawings and specifications may be seen, and form of tender and bill of quantities obtained, at the Borough Surveyor's Office, Town Hall. Sealed tenders, addressed "To the Chairman of the Highways Committee," and endorsed "Tender for Macadamising, etc., Roker Park-road," must be delivered at the Town Clerk's Office, Town Hall, before 12 o'clock noon on July 10.

July 10.—Tynemouth.—PAVING, ETC.—Tynemouth Corporation invite tenders for executing, in footpaths, street works, and in lanes between Albany Park-road and Dunwick-terrace and in lane between Albany Park-road and King Edward road, Tynemouth; (2) paving, etc., in lane between Tynemouth and Milton-terrace, North Shields; (3) paving, etc., in lane between Windsor Gardens and Sandringham Gardens and in lane between Sandringham Gardens and Queen's-terrace, North Shields; (4) paving, etc., in Beverley Gardens, Cultercross. Plans and specifications may be seen at the office of Mr. John F. Smilie, Borough Surveyor, Town Hall, Tynemouth. Sealed tenders are to be sent not later than 10 a.m. on July 10.

July 11.—London.—SEWER WORKS.—The Metropolitan Borough Council of Holborn invite tenders

for new brick sewer, etc., in John-street, Bedford-row, agreeably with plan and specification prepared by the Public Health, which can be inspected between 10 and 4. Tenders on forms supplied, endorsed "Tender for New Sewers," to be delivered to Mr. Lionel Walker, Town Clerk, No. 197, High Holborn, W.C., before 12 noon, July 11.

July 11.—Wood Green.—PERMANENT WAY.—The Light Railways and Tramways Committee of the Middlesex County Council invite tenders for the work and materials required in the construction of the permanent way for electric traction, bridge work, road widenings, etc., to be laid along Green-lane, in the districts of Wood Green and Southgate to a length of three miles, or thereabouts. Plans, conditions of contract, specification of works, etc., may be seen, and schedules of quantities obtained on payment of 10s. on application to Mr. H. T. Waklam, Civil Engineer, Middlesex Guildhall, Westminster, S.W., on and after June 27. Tenders, endorsed "Tender for Light Railway No. 1," to be delivered to Sir Richard Nicholson, Clerk of the C.C., Middlesex Guildhall, Westminster, S.W., before 12 noon, July 11.

July 12.—Kensington Gate.—UNDERGROUND CONVENIENCE.—The Lambeth Borough Council invite tenders for the purchase at Kensington Gate. Drawings can be seen, and specification, bills of quantities, and form of tender obtained, at the office of Mr. Leonard Nottingham, Town Clerk, 346, Kensington-road, S.E., before 10 and 12 and 2 and 4 (Saturday) excepted, on payment of 1s. Tenders, on prescribed form, to Town Hall, Kensington Green, S.W., before 12 noon, July 12.

July 14.—Stretford.—STREETS.—Stretford U.D.C. invite tenders for paving, with granitic road asphalt, etc., the following streets, viz.—(a) Wensley-street, (b) Bursleigh-street, (c) North Woodside-street, (d) Alphonso-street. The drawings and specification may be seen, and forms of tender, with schedule of quantities and other particulars obtained, on application to Mr. Ernest Worrill, the Council's Surveyor, on payment of a deposit by cheque of 2s. Sealed tenders, endorsed "Private Street Works Tender," addressed to the Chairman of Highways, are due at the Council Offices by July 14.

July 17.—Brinsley.—SEWERAGE WORKS.—Basford R.D.C. invite tenders for the construction of sewers and drains, and works for the Parish of Brinsley, Nottinghamshire. The drawings may be seen at the office of Mr. N. Maylan, Engineer and Surveyor to the Council, at the Public Offices, Nottingham. Specifications and bills of quantities, and form of tender may be obtained on deposit of cheque for 2s. Sealed and endorsed tenders, to be delivered to Mr. G. Spencer, Clerk to the Council, before 9 a.m. July 17.

July 19.—Bedminster.—ROADWORKING.—Bristol Education Committee invite tenders for making up of Barton-street, Bedminster. The plans and specifications may be inspected, and form of tender obtained, at the office of Mr. Peter Adde, at the Strand House, Town Hall, Bristol, on and after July 19. Tenders, to be delivered at the office of the Education Committee, at the Guildhall, by noon on July 19.

STONE, MATERIALS, AND STORES.

June 30.—Merthyr Tydfil.—ROAD MACADAM.—Merthyr Tydfil Council invite tenders for the supply at different railway-stations within their district for a period of one year of—(a) limestone macadam, gravel, and chippings; (b) gray grit stone and chippings; (c) granite or basalt macadam and chippings. Specification and forms of tender, and other particulars may be obtained on application to the Borough Engineer, Town Hall, Merthyr Tydfil. Sealed tenders, addressed to Mr. T. Aneuryn Rees, Town Clerk, Merthyr Tydfil, and endorsed "Tender for Macadam," must be delivered on or before June 30.

July 2.—Bollington.—GRANITE.—Bollington U.D.C. Highway Committee invite tenders for the supply of 200 tons of Welsh granite, macadam, and for a quantity of 1-in. Welsh granite macadam and chippings, to be delivered at the Bollington railway-station. Tenders, endorsed "Macadam," to be sent in so as to reach Mr. Samuel Knight, Clerk, Council Offices, Bollington, near Macclesfield, not later than 5 p.m. on July 2.

July 2.—Horsforth.—STONES.—Horsforth U.D.C. invite tenders for the supply and delivery of the under-mentioned materials, as may from time to time be ordered during the period ending March 31, 1907:—(1) Granite; (2) limestone; (3) Yorkshire stone, kerbs, and flags; (4) concrete flags; (5) burses and carts (hire of); (6) tools; (7) scavenging brooms; (8) pitch and creosote oil; (9) disinfectants. Forms of tender and further particulars may be obtained by applying to Mr. Robert R. Jones, Engineer and Surveyor, Council Offices, Horsforth. Sealed tenders, endorsed "Tender for Supply of Materials," to be accompanied by samples of the materials tendered for, to be delivered at the Council Offices, Horsforth, not later than 12 o'clock noon on July 2.

July 2.—Norwich.—PAVING BLOCKS.—Norwich Corporation invite tenders for the supply and delivery of 100,000 sq. yds. by 8 in. by 4 in. deep creosoted deal paving blocks; also 16,000 3 in. by 9 in. by 3 in. deep cream sectional Jarrah blocks. Specification may be seen, and form of tender obtained, on application at office of Mr. Arthur E. Collins, M.Inst.C.E., City Engineer, etc., Guildhall, Norwich. Tenders, on the forms supplied, enclosed in an envelope, sealed with sealing wax, endorsed "Creosoted Blocks" or "Jarrah Blocks," as the case may be, and addressed to the Chairman of the Executive Committee, to be delivered at office of Engineer, not later than 3 p.m. on July 2.

July 2.—Rhymney.—ROAD MATERIAL, ETC.—Rhymney U.D.C. invite tenders for the following—No. 1: The hiring of a 10-ton steam roller and scarifier for about 100 days; tenders to supply living van, bagman, notice boards, water-cart, coal, and all stores. No. 2: About 2,000 tons of clean limestone, broken to a gauge of 2 1/2 in., delivered as follows—

Rhymney R.R. Station, about 1,200 tons; Rhymney and M. Station, about 700 tons; Rhymney Bridge and N.W. Station, about 100 tons. Samples to be sent to G. High-street, Rhymney. No. 3: About 200 tons limestone gravel, delivered as follows—Rhymney R.R. Station, about 200 tons; Rhymney B. and M. Station, about 100 tons. No. 4: Half-tone of limestone and gravel per ton. All the above are man (day-work). Tenders on forms to be obtained from Mr. W. Lloyd Marks, Surveyor, G. High-street, Rhymney, sealed, and endorsed "No. 1, 2, 3, 4 or 5" (as the case may be), must be sent or delivered to Mr. L. Reynolds, solicitor, Milborne-chambers, Merthyr Tydfil, not later than 12 noon on July 2.

July 2.—Wakefield.—SETTS AND MACADAM.—The Corporation of Wakefield invite tenders for the supply and delivery at Wakefield of granite or whinstone setts and macadam. Forms of tender and any other information may be obtained from the City Surveyor, Wakefield. Tenders, sealed and properly endorsed, must be sent to Mr. W. W. Greenhalgh, Town Clerk, Town Hall, Wakefield, not later than 9 a.m. on July 2.

July 3.—Halifax.—STORES.—Halifax Gasworks Corporation invite tenders for the supply of (1) brass lump fittings; (2) brass main cocks and unions; (3) cast-iron valves; (4) cast-iron gate valves; (5) cast-iron of iron; (6) sulphuric acid; (7) lime; (8) spent oxide for the purchase of (2) cast-iron valves; (9) spent oxide for the purchase of (2) cast-iron valves; (10) spent oxide for the purchase of (2) cast-iron valves. Forms of tender and further information may be obtained on application to Mr. W. G. Evans, Engineer, Gasworks, Halifax. Tenders, properly endorsed, must be sent to Mr. Keighley Walton, Town Clerk, on or before July 3.

July 3.—London.—STORES.—Bomby, Barohn, and Co. invite tenders for the supply of the following stores, viz.—Class A: (1) Axes for carriage and wagon; (2) boiler plates; (3) brass boiler fittings; (4) crank arms; (5) spiral and valve castings; (6) cast-iron for carriages and waggon; (7) wheels for carriages and waggon; Class B: (1) Carriage fittings; (2) copper plates; (3) iron and steel; (4) iron and steel; (5) iron and steel; (6) iron and steel; (7) iron and steel; (8) iron and steel; (9) iron and steel; (10) iron and steel. Tenders must be made on forms, copies of which, with specification, can be obtained at the office of Mr. W. V. Constable, Office Secretary, of the Gas Company, Bishopsgate-street Without, London, E.C., on payment as follows—For Class A, 1s. 1d. each; for Class B, 10s. 1d. each; for Class C, 2s. 6d. each (which will not be returned).

July 4.—London.—GRANITE.—Lambeth Board of Health invite tenders for the supply of 200 tons of waste granite, broken into pieces of 1/2 yd. or 3/4 yd. square, for use in breaking, to be delivered at their show-yard, 8, Wincob-street, Kennington-road, S.E., having first obtained the sanction of the contractor at the weigh-bridge of the workhouse in Kenton-road. Tenders, with bills of quantities, and forms of tender, and full specification, including name of quarry, to be sent to Mr. W. Thornall, Clerk, Guardians' Board, 11, Abchurch-lane, London, E.C. 4. Sealed tenders, addressed to the Chairman of the Board, must be delivered at the office of Mr. W. Thornall, Clerk, Guardians' Board, 11, Abchurch-lane, London, E.C. 4, before July 3.

July 5.—Salford.—STORES.—Salford Gas Company invite tenders for the following material, in twelve months ending August 31, 1907:—(1) Gas valves; (2) iron and steel; (3) cast-iron valves and connections; (4) iron castings; (5) iron and steel; (6) iron and steel; (7) iron and steel; (8) iron and steel; (9) iron and steel; (10) iron and steel; (11) iron and steel; (12) iron and steel; (13) iron and steel; (14) iron and steel; (15) iron and steel; (16) iron and steel; (17) iron and steel; (18) iron and steel; (19) iron and steel; (20) iron and steel. Tenders, with bills of quantities, and forms of tender, and full specification, including name of quarry, to be sent to Mr. W. Thornall, Clerk, Guardians' Board, 11, Abchurch-lane, London, E.C. 4, before July 3.

July 9.—London.—STORES.—The Madras Railway Company invite, until 12 o'clock on July 9, tenders for the supply and delivery, free on board of white metal, copper, tool steel, twist drills, screw stocks, pins and cotter, bolts and nuts, carriage door locks, and screw taps, tube expanders, circular saws, steel and window catches, hinges, commode stools, hammock springs, engine lamps, engine packing, horseshoe, buffalo hoes, belting, rubber hose, floorcloth, brushes, plate-glass, fire engine tubes, and transfers, as per specification, to be seen at the Company's office. Tenders to be delivered in sealed envelopes (supplied by the Company), a check (which cannot be refunded) for 10s. to be sent to Mr. W. H. Cole, Secretary, 1, Broad-street-place, Finsbury-circus, London, E.C.

July 10.—Romsey.—FLINTS.—Romsey Corporation invite tenders for the supply (including field flints, and weighing of 250 tons of hand-picked flint) to be delivered at the Fair Field, Romsey, before September 1 next. Sealed tenders, endorsed on the outside with the words "Flints," to be sent to the office of Mr. B. W. Atline, Town Clerk, 2, Porters-gate, Romsey, before 5 o'clock p.m. on July 10, and must be for lots of not less than 100 tons. Specification and conditions can be seen at the office of the Borough Surveyor, Market-place, Romsey.

July 12.—Brighton.—DRAIN PIPES.—Tenders are invited for the supply of such glazed earthenware pipes as may be required by the Brighton Corporation for the year ending July 31, 1907. Specification and form of tender can be obtained at the office of the Borough Engineer, Town Hall, Brighton, and addressed to the Town Clerk, Town Hall, Brighton, and endorsed "Tender for Supply of Drain Pipes," to be delivered before 10 a.m. July 12.

July 12.—East Barnet.—GRANITE, ETC.—East Barnet Valley U.D.C. invite tenders for the under-mentioned for one year, ending September 30, 1907:

Supply of broken granite for roadways; supply of gravel for roadways; supply of hoggins; horsing of water tubs, etc.; general cartage; cartage of granite, gravel, hoggins, etc. Further particulars and forms of tender can be obtained on application to Mr. Henry York, C.E., Surveyor to the Council. Tenders, which must be on the forms supplied, must be sent in, addressed to the Chairman of the Council, not later than 12 noon on July 12.

July 15.—**Epping**.—GRANITE AND GRAVEL.—Epping, U.D.C. invite tenders for the supply and delivery of (1) 120 tons of granite (more or less), broken so as to pass in any direction through a 1½-in. ring, and 450 tons of well-scriven gravel, to be delivered at Epping Railway station in such quantities and at such times prior to March 31, 1907, as may be ordered by the Surveyor. Samples of material to

accompany each tender, and the tender is to state the rate per ton of the material. Tenders, endorsed "Tender for Highway Material," to be delivered to Mr. G. J. Creed, Clerk of the Council, Epping, not later than 4 p.m. on July 16.

July 15.—**Leeds**.—PITCH.—Leeds Electricity Committee invite tenders for 150 tons of coal tar pitch, to be delivered in carts in such parts of the city of Leeds, and at such times, as the committee may require, during the twelve months ending July 31, 1907. Conditions and forms of tender may be obtained at the office of the Electric Lighting Department, 1, Whitehall-road, Leeds. Tenders must be in the form provided, and must reach Mr. Robert E. Fox, Town Clerk, Leeds, on or before July 16, in sealed envelopes, endorsed "Electric Lighting—Tenders for Pitch."

July 17.—**Rochester**.—ROAD METAL.—Rochester Corporation invite tenders for the supply of the undermentioned for the period of twelve months ending June 24, 1907, viz.:—(1) 1,500 tons 2-in. broken Quenast, Guernsey, or Aberdeen granite; (2) 40 tons 1½-in. broken Cherbourg quartzite; (3) 350 tons 3-in. granite chippings; (4) 350 tons ¾-in. granite chippings; (5) 500 tons 2½-in. broken Kentish sandstone; (6) 150 cubic yds. Aylesford sand; (7) 150 cubic yds. Aylesford gravel; (8) 500 cubic yds. Thames ballast. Specifications and form of tender can be obtained on application to Mr. William Banks, A.M.I.C.E., City Surveyor, Rochester. Sealed tenders, endorsed "Tender for Road Metal," are to be delivered at offices of Mr. Apsley Kennette, Town Clerk, Guildhall, Rochester, before 4 o'clock on July 17.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*CLERK OF WORKS	Deptford Borough Council	4l. 10s. per week	July 6
*INSTRUCTOR IN WOODWORK	London County Council	130l. per annum	July 7

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*FREEHOLD BUILDING LAND, CHELMSFORD—At the Mart	B. Bailey & Co.	July 4
*FREEHOLD FACTORY SITE, FOXHORS END—At the Mart	Edwin J. Griers	July 5
*FREEHOLD PROPERTY, SITTINGBOURNE—At The Bull Hotel, Sittingbourne	Ja'kson & Sons	July 6
*BUILDING PLOTS, RUISLIP PARK—On the Estate	Ventom, Bull, & Cooper	July 7
*FREEHOLD BUILDING PLOTS, NEW MALDEN—On the Burlington Estate, New Malden	Mivart & Co.	July 7-11
*FREEHOLD BUILDING SITE, EALING—At the Mart	E. & H. Lumley	July 10
*FREEHOLD BUILD. LAND, HUNTON BRIDGE, near WIMBORNE	Humbert & Flint	July 11
*BUILDING SITE, HAMMEBSMUTH	Oarrett, White, & Poland	July 11
*FREEHOLD SITES, ASHDOWN FOREST—At the Beacon Hotel, Crowborough	Charles J. Pariss	July 14
*FREEHOLD BUILDING ESTATE, HENDON—At the Mart	Buckland & Sons	July 16
*FREEHOLD BUILDING LAND, STANFORD HILL, N.	Hobson, Richards, & Co.	July 18
*FREEHOLD ESTATE, STOKE NEWINGTON—At the Mart	Furber	July 20
*FREEHOLD BUILDING SITE, BERMONDSEY—Winchester House, Old Broad-street, E.C.	Ventom, Bull, & Cooper	July 23

PATENTS.—Continued from page 738.

4,106 of 1906.—J. K. WINDEMULLER: *Ball and Socket Joints for Pipes.*

This relates to a ball and socket joint for pipes comprising a ring bearing against the ball, which extends through an annular nut screwed into the fixed portion of the joint, the arrangement being such that when the nut is tightened the packing material situated in the stuffing chamber is compressed, but the ring is not acted upon.

5,522 of 1906.—A. FRIEDERICH: *A Fastening Device for Doors and the like.*

This consists of a fastening device for doors and the like, comprising two rigid portions that are hinged together, the former of which is adapted to be attached to the door frame, adjacent to the edge of the door, whilst the latter is provided with a pivoted latch that is adapted to engage with the former part and thereby lock the two parts together at right angles to each other, and thus prevent the opening of the door.

5,976 of 1906.—H. E. PRATORIUS: *Flush Bolts.*

This consists of a safety flush bolt in which the lower end of the bolt is held in an inclined guide on the frame plate, in such a manner that on rearward movement or withdrawal of the handle the latter is caused to project from the frame plate.

17,776 of 1905.—A. TRACY: *Apparatus for Making and Forming Cavity Bricks or Blocks of any Plastic or Semi-plastic Material to Enable the last Side or End to be Formed and the Cavity left Perfect.*

This relates to an apparatus for making and forming cavity bricks or blocks of any plastic or semi-plastic material to enable the last side or end to be formed and the cavity left perfect, and consists of a pair of comblike interlocking bridges so constructed that separately they are made up of strips, and together they form a single perfect and complete table or surface. These comb-like bridges are placed on either side or on either end of the box or die that is used for forming the brick or block, and suitable spaces are cut out of the sides or ends of this die to enable the bridges to pass through and across the cavity that has been formed in the material used to make the bricks or blocks.

19,588 of 1905.—A. H. MOUNTAIN: *Gully Top for Drains.*

This consists of a gully top for house drains, having a grid formed with a number of parallel bars of approximately triangular or wedge-shaped cross-section and cauted with their sharp or knife edges in the direction of the waste or down pipe outlet, thus forming openings which are wider at the top than at the bottom,

23,541 of 1905.—W. E. EASTAUGH: *Stone Dressing Chisel.*

This relates to a chisel for dressing or cutting stone and other material, having a detachable and reversible cutter of a diamond or double wedge formation, said cutter having depressions and projections on the sides thereof, and adapted to fit into a handle having corresponding depressions and projections.

7,883 of 1906.—N. KETELSEN: *Manufacture of Drain Pipes.*

This relates to a machine for the production of drain pipes, comprising a mould for forming the lower half of the drain pipes, a hand-actuated ledge for forming the upper half of the drain pipe, and means for raising the finished drain pipes above the mould.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 9.—By SALTER, SIMPSON, & SONS (at Norwich).	
Easton, Norfolk.—"The Easton Hall Estate, 730 a. 2 r. 15 p. l.	£9,100
By STAFFORD & ROGERS (at Bedford).	
Goldington, Beds.—Two enclosures of pasture, 31 a. 0 r. 11 p. l.	2,000
Three freehold cottages and gdns.	280
June 12.—By THOMPSON & WOOD (at Barnetby),	
Barnetby, Lincs.—House and shop, l. with offices, 5 a. 1 r. 10 p. l.	550
"The Years," l.	250
Freehold house and shop	225
St. Barnabas-rd., four plots of land, l.	235
"The Orchard," and 0 a. 3 r. 20 p. l.	270
Freehold buildings and stables	120
Freehold building land, 3 a. 2 r. 0 p.	150
June 13.—By SALTER, SIMPSON, & SONS (at Bury St. Edmunds).	
Barningham, Suffolk.—"The Home Farm," 261 a. 2 r. 35 p. l.	2,500
Two freehold farms, 32 a. 3 r. 1 p.	805
"The Weston Farm," 90 a. 2 r. 34 p. l.	1,100
Thorpe Moteux, Suffolk.—"The Green Farm, 195 a. 2 r. 30 p. l., also two cottages adjoining, and 1 a. 1 r. 36 p. l.	1,350
Cockfield, Suffolk.—"Green Farm," 54 a. 2 r. 8 p. l.	1,650
Monks Eleigh, Suffolk.—"The Tyo Farm," 224 a. 1 r. 36 p. l.	1,175
Brookley, etc., Suffolk.—"The Mole Farm," 180 a. 1 r. 16 p. l. and c.	950
June 14.—By MADDISON, MILES, & Co. (at Acle).	
Acle, Norfolk.—"Whitethorpe" and "Sunnyside," l. p.	930
By MADDISON, MILES, & Co. (at Bungay).	
Bungay, Suffolk.—Market-pl., freehold shop and residence, p.	500
June 15.—By G. B. HILLIARD & SON (at Chelmsford).	
Purleigh, Essex.—"The Limes," l. p.	233

By DREWETT & WATSON (at Kintbury),	
Kintbury, Berks.—Freehold house, blacksmith's shop, and three cottages, area 1 a. 1 r. 25 p. l.	£390
High-st., etc., 14 freehold cottages.	780
By WAINWRIGHT & HEARD (at Yeovil).	
Lovington, Somerset.—"Mador Farm," 126 a. 1 r. 1 p. l.	1,975
Alford, etc., Somerset.—Portions of the Alford Estate, 264 a. 2 r. 37 p. l. (in lots)	7,294
By OFFEN & HINSLEY (at Chelmsford),	
Danbury, etc., Essex.—"Jacketts" and "Wickham" farms, 310 a. 1 r. 30 p. l.	2,950
Woodham Ferris, Essex.—"Saltcoats Marsh," 20 a. 0 r. 28 p. l.	240
By STAFFORD & ROGERS (at Bedford).	
Redford.—30 and 40 Western-sl. (s.), 5 r. 383.	735
Empington, Beds.—Two freehold cottages.	200
By DYER, SON, & HILTON (at Lewisham).	
Lewisham.—201, 200, and 211, High-st., l.	1,500
yr. 1161.	
June 16.—By MESSRS. CHALK (at Cambridge),	
Tewkesham, Cambs.—"The Hall Farm," 244 a. 0 r. 32 p. l. (including the Manor of Basingbourne and Warburtons)	6,100
By STAFFORD & ROGERS (at Burnham-on-Crouch),	
Burnham-on-Crouch, Essex.—"Brook Farm," 38 a. 2 r. 27 p. c. v. r. 361.	310
"Romains Farm," 33 a. 1 r. 19 p. c. v. r. 361.	350
"Cobbins Farm," 52 a. 2 r. 22 p. c. v. r. 401.	350
Two copyhold enclosures, 4 a. 0 r. 15 p. l.	115
June 18.—By HAMPTON & SONS,	
Wimbleton.—26, Lancaster-rd., l. yr. 951.	1,500
16 to 22, Crooked-billet, l. v. r. 1094. 48.	1,450
West Horsley, Surrey.—Lower-rd., "Iron House," and 3 a. 0 r. 29 p. l. yr. 161.	355
Long Reach.—A freehold corner site, 4 a. 0 r. 10 p.	310
By HERRING, SON, & DAW,	
Minories.—Nos. 73, 74 and 75 (warehouses) area 19,500 ft. l. p.	13,000
Cardiff, Glamorgan.—High-st., "The Castle Arcade" (48 s., offices, etc.), area 28,389 ft. u. t. 73 and 78 yrs. g. r. 7581, s. r. 2,999, 138.	15,370
By MOSS & JAMESON,	
Paddington.—46 and 48, Westbourne Park-rd., s. r. 437 yrs. s. r. 164, yr. 1344.	1,410
Leighton.—94 and 102 Liverpool-rd., s. 21 yrs. g. r. 101. 48. yr. 981, 108.	445
By CHARLES MUSKETT,	
Wood Green.—59 and 61, Cranbrook-rd., n. s. 65 yrs. g. r. 104, yr. r. 1344.	475
34, St. Alban's-crees, u. t. 84 yrs. g. r. 51, yr. 261.	255
Blenheim-rd., stabling and yard, u. t. 71 yrs. s. r. 31. 88.	140
Park Ridings, two plots of land, l.	240
By W. MAURICE-JONES (at Finchley).	
Finchley.—Lambert-rd.; "Lathbury," l. yr. 261.	445
6, Churchfields-ave., also "Louisa" and "Aberdour," u. t. 95 yrs. g. r. 221, yr. 1121.	975
By FRANK SWAIN,	
Baywater.—17, Pembroke-villas, u. t. 38 yrs. s. r. 104, yr. 101.	£1,250
By G. A. WILKINS (at London),	
City.—6 and 7, Queen-st., area 2,550 ft., building lease for 80 yrs., let at per annum	1,300

June 19.—By BOYTON, SONS, & TREVOR.
 City—2 and 3, Cherry Tree-crt. (business premises), s. r. 300.
 Clarendon—20, Red Lion-crt. (s.), f. y. 60.
 By C. H. BROWN.
 Wandswoth—48, Park-rd., f. p.
 By GEO. HEAD & CO.
 Holloway—45, Thorpedale-rd., ut. 64 1/2 yrs., g. r. 48, w. r. 44 1/2.

By GEO. RAVENSHREAR.
 Hanwell—46 and 48, Rosebank-rd., 29 and 31, St. Margaret's-rd., 43 and 45, St. Mark's-rd., 2 and 3, Debarrow-crt., and 2 1/2, Bishop-rd., ut. 70 1/2 yrs., g. r. 47 1/2, s. r. 21 1/2 1/2.

By ROGERS, CHAPMAN, & THOMAS.
 Chelsea—Marham-st., f. g. rents 201, reversion in 13 yrs.
 Godfrey-st. (s.), f. g. rents 14 yrs.
 Markham-st., f. g. rents 25 1/2 1/2, reversion in 50 yrs.
 Epsom—Fairbank-st., ut. 22 yrs., g. r. 24, y. r. 27 1/2.

By RUTLEY, SON, & VINE.
 Mayfair—48, Bedford-crt. (s.), ut. 10 1/2 yrs.
 Kentish Town—22, 27, 31, and 34, Litcham-st., f. w. r. 42 1/2 1/2.

By SIMSON & SONS.
 Dulwich—170, Overhill-rd., f. y. r. 120.
 44 yrs., g. r. 16 1/2, y. r. 84 1/2, s. r. 50 1/2.
 Peckham—80, 82, and 84, Hornby-rd. (s.), ut. 44 yrs., g. r. 16 1/2, y. r. 84 1/2, s. r. 50 1/2.

By W. WESTON.
 Chiswick—52, St. Alban's-av., f. y. r. 80.
 St. John's Wood—87, Albany-rd. (s.), ut. 44 yrs., g. r. 104, y. r. 70 1/2.
 Notting Hill—134, Notland-rd. (s.), ut. 44 yrs., g. r. 12 1/2, y. r. 52.

By HUBBERT & PLINT.
 Hanwell—Church-rd., "The Spring" and 5 a. 3 r. 1 p. l. 1/2.

By MORTAGU & ROBINSON.
 South Kensington—24 1/2, Cart-gdns., f. g. r. 10 1/2, reversion in 45 yrs.

By C. C. & T. MOORE.
 Clapton—120, 130, and 132, Blurton-rd., n. t. 67 yrs., g. r. 12 1/2, w. r. 105 1/2 1/2.

By NEWTON, SANDHARD, & EWALDS.
 North Woodwich—Albert-rd., etc., f. g. rents 21 1/2, reversion in 44 yrs.

By DRIVER, JONAS, & CO. (at Ipswich).
 Great Wenham, Suffolk, "The Priory Farm," 15 a. 1 p. l. 1/2, s. r. 120 1/2, also cottage adjoining.

By W. WESTON.
 Chiswick—52, St. Alban's-av., f. y. r. 80.
 St. John's Wood—87, Albany-rd. (s.), ut. 44 yrs., g. r. 104, y. r. 70 1/2.

By RIDER & SONS.
 Fulham—302, 304, and 306, Munster-rd., ut. 74 yrs., g. r. 104, w. r. 110 1/2.

By MORTAGU & ROBINSON.
 South Kensington—24 1/2, Cart-gdns., f. g. r. 10 1/2, reversion in 45 yrs.

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BRICKS, &c. (continued).

Best Blue Pressed	£ s. d.
St. Pauls	3 15 0 per 1000, at railway Depot.
Do. Bullnose	4 0 0 " " "
Best Stronbridge	" " "
Fire Bricks	3 14 0 " " "
GLAZED BRICKS.	
Best White and Ivory Glazed Stretchers	12 0 0 " " "
Do. Headers	11 0 0 " " "
Do. Bullnose and Flats	16 0 0 " " "
Double Stretchers	19 0 0 " " "
Double Headers	18 0 0 " " "
One Side and two Ends	19 0 0 " " "
Two Sides and one End	20 0 0 " " "
Splay Chamfered Squints	20 0 0 " " "
Best Dipped Salt Glazed Stretchers and Header	12 0 0 " " "
Quoins, Bullnose, and Flats	14 0 0 " " "
Douglas Stretchers	15 0 0 " " "
Double Headers	14 0 0 " " "
One Side and two Ends	15 0 0 " " "
Two Sides and one End	15 0 0 " " "
Splays Chamfered Squints	14 0 0 " " "
Second Quality Whites and Dipped Salt Glazed	2 0 0 " " less than best:

Thames and Pit Sand 6 9 per yard, delivered.
 Thames Ballast 5 3
 Best Portland Cement 25 0 per ton.
 Best Ground Blue Lime Lumps 18 0 " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Gray Stone Limes 11s. 0d. per yard, delivered.
 Stourbridge Fireclay in sacks 27s. 0d. per ton, at rly. dep.

BATH STONE—delivered on road wag. a. d.
 Sions, Paddington Depot 1 6 1/2 per ft. cube.
 Do. do. delivered on road wagons.
 Nine Elms Depot 1 6 1/2 " "

PORTLAND STONE (20 ft. average)—
 Brown Whitbed, delivered on road wagons, Paddington Depot, Nine Elms Depot, or Finsbury Wharf.
 White Basebed, delivered on road wagons, Paddington Depot, Nine Elms Depot, or Finsbury Wharf.

Anaesther in blocks	1 10 per ft. cube, del. rly. depot.
Greenhill	1 6 " " "
Darley Dale in blocks	2 4 " " "
Red Corehill	2 2 " " "
Closhure Red Freestone	3 0 " " "
Red Mansfield	2 4 " " "
YORK STONE—Robin Hood Quality.	
Scrapped random blocks	2 10 " " "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3 per ft. super.
6 in. rubbed two sides ditto ditto	2 6 " " "
3 in. sawn two sides (random sizes)	0 11 1/2 " " "
2 in. to 2 1/2 in. sawn one side slabs (random sizes)	0 7 1/2 " " "
1 1/2 in. to 2 in. ditto ditto	0 6 " " "
Scrapped random blocks	3 0 per ft. cube.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8 per ft. super.
6 in. rubbed two sides ditto	3 0 " " "
3 in. sawn two sides slabs (random sizes)	1 2 " " "
1 1/2 in. self-faced random slabs	0 5 " " "

Hopton Wood (Hard Bed) in blocks 2 0 per ft. cube, del. rly. depot.
 " " " 6 in. sawn both sides landings 2 7 per ft. super, del. rly. depot.
 " " " 3 in. sawn both sides random slabs 1 0
 " " " 2 in. do. 0 8 1/2 " "

SLATES.

In. In.	£ s. d.
20x12 best blue Bangor	13 2 6 per 1000 of 1200 at r. d.
20x12 " "	13 17 6 " " "
20x10 first quality	13 0 0 " " "
20x12 " "	13 15 0 " " "
16x8 " "	7 5 0 " " "
20x10 best blue Fort-madoc	12 12 6 " " "
16x8 " "	12 6 " " "
20x10 best blue Earslough fading green	15 17 6 " " "
20x12 " "	18 7 6 " " "
18x10 " "	10 5 0 " " "
16x8 " "	13 5 0 " " "
20x10 permanent green	11 12 6 " " "
18x10 " "	12 6 " " "
16x8 " "	9 12 6 " " "

TILES.

Best plain red roofing tiles	42 0 per 1000 at rly. depot.
Do. Hip and Valley tiles	3 7 per doz.
Best Broseley tiles	50 0 per 1000
Do. Ornamental tiles	52 6 " "
Do. Hip and Valley tiles	4 0 per doz.
Best Runbon red, brown, or brindled do. (Edwards)	57 6 per 1000
Do. Ornamental do.	60 0 " "

MEETING.

WEDNESDAY, JULY 4.
 Royal Archaeological Institute.—Mr. W. H. St. John Hope, M.A., on "The Cistercian Abbey of Beaulieu, in the County of Southampton." 4 p.m.

PRICES CURRENT OF MATERIALS.

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

BRICKS, &c.

Hard Stocks	1 8 0 per 1000 alongside, in river.
Bough Stocks and Crizes	" " "
Picked Stocks	1 5 0 " " "
Facings	2 15 0 " " delivered.
Flettons	1 6 0 " " at railway depot.
Red Wire Cuts	1 12 0 " " "
Best Farham Bed	3 12 0 " " "
Best Red Pressed Runbon Facing	5 0 0 " " "

TILES (continued).

Table listing various tile types such as Hip tiles, Valley tiles, Best Red or Mottled Staffordshire do., etc., with prices per doz. or per 1000.

WOOD.

Table listing building wood types like Deals, Battens, Joist, etc., with prices per standard or per load of 50 ft.

JOISTERS' WOOD.

Table listing various wood types for joists, including White Sea, Yellow deals, Battens, etc., with prices per standard.

JOISTS, GIRDES, &c.

Table listing joist and girde types like Rolled Steel Joists, Compound Girders, etc., with prices per ton.

METALS.

Table listing various metal types such as Iron, Steel, Sheet Iron, Galvanised, etc., with prices per ton in London.

LEAD, &c.

Table listing lead and other materials like Lead-Sheet, Pipe in coils, Soil pipe, etc., with prices per ton.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

Table listing English sheet glass in crates with various stock sizes and prices per ft. delivered.

ENGLISH BOLLED PLATE IN CRATES OF STOCK SIZES.

Table listing English balled plate in crates with various stock sizes and prices per ft. delivered.

OILS, &c.

Table listing various oil types like Raw Linseed Oil, Turpentine, etc., with prices per gallon.

VARNISHES, &c.

Table listing various varnish types like Fine Pale Oak Varnish, Pale Copal Oak, etc., with prices per gallon.

TERMS OF SUBSCRIPTION.

Text detailing subscription terms for 'The Builder' magazine, including rates for London and other regions.

TO CORRESPONDENTS.

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

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses. Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the Editor, who retains the right to reject it if unsatisfactory.

All communications regarding literary and artistic matters should be addressed to THE EDITOR, and not to the Publisher. Business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to 'The Editor,' and must reach us not later than 10 a.m. on Thursdays. (N.B.—We cannot publish tenders unless authenticated either by the architect or the building owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is stated, nor any list in which the lowest tender is under 1000, unless in some exceptional cases and for special reasons.)

BRIGHTON.—For the erection of two pairs of farm lathings on cottages adjoining the Warren Farm School, for the Guardians, Mr. E. Wright, architect, Parochial Offices, Princes-street, Brighton.

BRENTFORD.—For the supply of 150 yds. of Blue Ghersey Granite, for the Urban District Council, Mr. G. Burnham & Son, Ryegate, Brentford.

BURNLEY.—For erecting a new school in Fulledge, for the Education Committee, Mr. O. H. Pickles, Borough Surveyor, Town Hall, Burnley.

CHICHESTER.—For erecting new school buildings to accommodate 1,100 children, for the Gloucester-road district, for the Education Committee, Messrs. Chatters & Smithson, architects, 17, Regent-street, Chichester.

DARTFORD.—For cleaning and painting at Darenth Asylum, for the Metropolitan Asylum Board, Mr. T. Hatch, Engineer-in-Chief.

DEVONPORT.—For leveling, paving, and completing lanes between Tamag and Warleigh-avenues, for the Corporation, Mr. J. F. Burnas, Borough Surveyor, Municipal Offices, 23, Ker-street, Devonport.

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DEVONPORT.—For levelling, paving and completing lane at rear of Nos. 40 to 56 Wilton-street (part 6), for the Corporation, Mr. J. F. Burns, Borough Surveyor, Municipal Offices, 29, Kent-street, Devonport.—

Table with 2 columns: Name and Amount. Includes J. Olders £2,920, Williams & Co. £2,563, T. Bell £2,500, T. Richard £2,076.

FENTON (Staffs).—For sewage disposal works, for the Urban District Council, Mr. S. A. Goodall, Surveyor, Town Hall, Fenton. Messrs. Wilcox & Raikes, consulting engineers, 63, Temple-row, Birmingham.—

Table with 2 columns: Name and Amount. Includes J. Moffat £34,778, G. Rutter £24,000, H. E. Buckley £23,878, J. S. Dawson Ltd £23,288, A. Braithwaite & Co. £23,021, Ball & Robinson £22,840, G. & J. Warner £22,510, W. Mitchell & Son £22,050, G. Freeman & Sons £21,728, J. Bentley £21,589, F. Barke £21,504, G. Holloway £21,200, J. R. Vernal £21,138, J. Laing & Son £21,125, P. H. Bennion £20,850, J. G. Robinson £19,950, Samlers & Torrance £19,800, S. Wilson, Jun. £19,790, J. Owens £19,740.

FISHGARD (Devonshire).—For building a new English Church, for the committee of the church. Messrs. G. Morgan & Sons, architects, 24, King-street, Carnarvon. Quantities by Mr. D. B. Phillips, High-street, Fishguard.—

Table with 2 columns: Name and Amount. Includes Harris & Evans £1,861, D. Roberts £1,814, J. Thomas £1,597, Davies, George £1,596, Thomas £1,596, Williams & Howell £1,570, W. Morgan & Co. £1,470, D. Thomas £1,391, L. Lesterstone £1,391.

GRANGE-MOUTH.—For constructing a covered sewage tank, for the Town Council, Messrs. Warren & Stuart, engineers, 11, Hope-street, Glasgow.—

GUILDFOED (Surrey).—For erecting eighteen cottages in Clive road, for the Town Council, Mr. C. G. Mason, Borough Engineer, and Mr. W. J. Capp, architect, Stoke-road, Guildford.—

Table with 2 columns: Name and Amount. Includes R. Smith £2,749, Cropley & Son £2,490, W. E. Wallis & Son Ltd £2,260, W. H. Bolden & Co. £2,261, Fisher Bros. £2,250, R. Wood & Son £2,227, W. H. Bolden & Co. £2,200, Jenkins & Son, Ltd. £2,200, T. H. Johnson £2,150, E. Pitt, McCarty & Co., Ltd. £2,130, J. J. Lovell & Son £2,074, W. H. Brown £2,030, G. Kersley £2,000, W. H. Brown £1,980, H. Lindfield & Son £1,953, W. H. Gaze & Son £1,795, C. E. Kenworthy £1,770, Mitchell Bros. £1,600.

GUILDFOED.—For surface-water drainages in the Charlottville and Guildford Park Estates, for the Town Council, Mr. C. G. Mason, Borough Engineer and Surveyor, Guildford.—

Table with 2 columns: Name and Amount. Includes A. G. Osenton £2,805, W. H. Wheeler £2,753, W. Pearce £2,638, E. & E. Has £2,654, Tree & Sons £2,628, Holl & Sons £2,638, J. Douglas £2,595, Smith & Co. £2,514, G. Bayner £2,459, G. Rutter £2,420.

GUILDFOED.—For the construction of a new road, for the Town Council, Mr. C. G. Mason, Borough Surveyor. This gate, Guildford.—

Table with 2 columns: Name and Amount. Includes W. H. Holden £914, S. Henley £670, D. B. Porter £495.

HORSFORTH.—For the extension to Springfield Convallescent Home, for the committee of the Leeds Workpeople's Hospital Fund. Messrs. W. A. Hobson & Co., architects, 2, Basinghall-square, Leeds. Quantities by architects.—

Table with 2 columns: Name and Amount. Includes Butcher £2,603, G. Verity & Sons £2,731, J. W. Hemsley & Son £695, J. L. Stanbury & Son £412, Painters: Roylance & Horsman £198, Slaters: J. Atkinson & Son £132.

HENDON.—For sewerage and road-making works for the Hendon Urban District Council, Mr. S. Slater Grimey, Engineer.—

Table with 8 columns: Name, Fenchley-road, Fenchley-road, Golden Hill-road, Hermitage-road, Ebenezer-road, Ebenezer-works, Amount. Includes J. Nowell & Co. £2,728, F. G. Brummell £418, T. Adams £372, G. G. Rayner £244, J. & W. Drake £242, J. Jackson £236, R. Harland Ltd £216, O. T. Gibbons £1,955.

KEMPSTON (Beds.).—For waterworks (contract A), for the Urban District Council, Mr. F. G. Deacon, engineer, 4, Great George-street, Westminster.—

Table with 2 columns: Name and Amount. Includes P. Marland £10,805, G. Hay & Co. £6,000, A. Jewell £6,571, W. L. Meredith £6,187, F. W. Trimmer £6,126, Jenkins & Son £6,040, W. G. Williams & Co. £5,833, W. G. Wilmoth £5,813, John Bros. £5,801, Moran & Son Ltd £5,700, A. E. Nunn £5,692, H. M. Patrick £5,677, J. Jones & Son £5,499, J. Mitchell & Son £5,471, F. C. Thir £5,459, J. Jackson £5,428, F. G. Tomlinson £5,408, Smith & Co. £5,378, Dobson & Co. £5,269, Hodgson & Son Ltd £5,238, E. W. Ashley £5,173, R. C. Brewer & Co. £5,170, Holliday & Greenwood Ltd £5,146, E. Ray £5,077, R. C. Crawford £4,924, Davies, Ball & Co. £4,858, Dean, Ltd £4,820, T. Egan & Son £4,542.

KEMPSTON (Beds.).—For waterworks (Contract B), for the Urban District Council, Messrs. Bradley, Son, & Nichols, engineers, 11, Victoria-street, Westminster.—

Table with 2 columns: Name and Amount. Includes P. Marland £5,247, G. Hay & Co. £4,387, F. W. Trimmer £3,759, Moran & Son Ltd £3,588, W. Smart £3,493, H. Ashley £3,358, E. Taylor £3,300, A. Jewell £3,349, J. Hickson £3,320, F. Mitchell £3,315, W. L. Wallis & Co. £3,296, H. Powell £3,269, H. H. Powell £3,269, A. E. Nunn £3,225, J. Moffett £3,198, S. H. Jones £3,180, Jones & Son £3,162, F. C. Thir £3,149, Davies, Ball & Co. £3,132, W. Lewis £3,114.

LEEDS.—For erecting two factories, Castle-street and Saville-street, Mr. Percy Robinson, architect and surveyor, Yorkshire Post-chambers, 63, Albion-street, Leeds.—

Table with 2 columns: Name and Amount. Includes Brickwork and Masons: W. D. Dews & Co. £1,410, Carpenters and Joiners: J. Trickett & Son, Bramley, Leeds £750, Ironfounders: J. Bagshaw & Son, Ltd, Baldry, Yorks £710, Slaters: J. Atkinson & Son, Ltd, Leeds £600, Plumber: H. Lindley, Leeds £224, Painters: G. Coates & Son, Leeds £55.

LEWISRAM.—For repairs and cleaning and painting works at the Park Fever Hospital, Hither Green, S.E., for the Metropolitan Asylums Board, Mr. W. T. Hatch, Engineer-in-Chief.—

Table with 2 columns: Name and Amount. Includes J. Baker & Co. £2,735, H. Kent £2,268, Vitor & Son £2,050, Sabev & Son Ltd £2,047, Lushy & Salmon £2,010, E. Foster & Son £1,840, W. Mills £1,875.

LONDON.—For erection of shop in Gun-street, E. Messrs. H. W. & E. J. Caston, surveyors, Ulleswater-road, Palmer's Green.—

Table with 2 columns: Name and Amount. Includes Johnson Bros. £553, G. F. Brad & Co. £51, S. Blow £391, G. Barker £519.

LONDON.—For erecting villas at Church-lane, Finchley. Messrs. Homer & Lucas, architects, 38, Bucklersbury, E.C.—

Table with 2 columns: Name and Amount. Includes Godden £7,507.

Table with 8 columns: Name, Golden Hill-road, Hermitage-road, Ebenezer-road, Ebenezer-works, Amount. Includes J. South-Fenn £1,988, E. Proctor & Sons £801, J. Kirkaldy £515, J. Scott-Fenn £1,996, E. Proctor & Sons £1,097, W. Dudley £932, J. Scott-Fenn £2,287, E. Proctor & Sons £1,376, A. H. Inns £1,393, J. Scott-Fenn £1,376, E. Proctor & Sons £1,376.

LONDON.—For repainting of Westminster, Battersea, and Hammersmith bridges, for the London County Council.—

Table with 2 columns: Name and Amount. Includes Westminster-bridge: J. Scott-Fenn £1,988, E. Proctor & Sons £801, J. Kirkaldy £515. Battersea-bridge: J. Scott-Fenn £1,996, E. Proctor & Sons £1,097, W. Dudley £932. Hammersmith-bridge: J. Scott-Fenn £2,287, E. Proctor & Sons £1,376, A. H. Inns £1,393.

LONDON.—For roads and sewers, Golden's Green (Fenchley-road) Estate, Ltd., for Mr. James Gibb, 191, West-end-lane, West Hampstead. Mr. H. J. S. Abrams, surveyor, 84, Canfield-gardens, South Hampstead.—

Table with 2 columns: Name and Amount. Includes T. Adams £21,834, S. Kavanagh & Co. £1,699, W. Neave & Co. Ltd £1,375.

LONDON.—For pulling down and rebuilding No. 7, Deane-street, W., for Mr. Maurice de Meza, Mr. Harold Kennard, architect, 25, Dovercourt-street, Strand, W.C., quantities by Mr. Oliver Kennard, 13, Railway Approach, London Bridge, S.E.—

Table with 2 columns: Name and Amount. Includes T. Stevens £1,799, C. F. Kealey £1,714, Holiday & Greenwood £1,677, Sabey & Son £1,634, E. A. Roome & Co. £1,614, P. E. Minter £1,591, G. Neal £1,589, J. Carmichael £1,587, W. Shepherd & Co. £1,515.

LONG GROVE.—For work at Long Grove Asylum, for the London County Council.—

Table with 2 columns: Name and Amount. Includes A. Turner £2,432, R. Mulford £2,298, H. Smith & Son £1,714, Werner, Pfeifferer & Co. £1,026, W. F. Mason, Ltd, Manchester £756, Alternative tenders £781.

LONG GROVE.—For building a new school for 250 scholars, for Berkshire Education Committee, Mr. E. Fisher, architect, 19, Buckingham-street, Strand, quantities by Messrs. Hicks & Lyburn.—

Table with 2 columns: Name and Amount. Includes Mark Martin & Sons £3,769, H. W. Godwin £3,732, G. Kersley £3,435, H. Crosby & Co. £3,410, W. Watson £3,391, H. Harris & Son £3,376, M. Payne & Co. £3,270, A. Faulks £3,219, Wear & King £3,210, G. H. Gibson £3,204, E. C. Hughes £3,190, R. Pitt McCarthy £3,075, Martin, Wells & Co. £3,049, Ba Ten Bros. £2,980, C. W. Cox & Sons £2,937.

LUTON.—For paving, etc., in Frederick-street, Beech-road, and Oak-road, for the Town Council, Mr. S. F. L. Fox, A.M.I.C.E., Borough Surveyor, Luton.—

Table with 2 columns: Name and Amount. Includes Frederick-street, Oak-road, Beech-road, G. Powell £1,077, T. Fry & Sons £959, Patent Victoria Stone Co. £623.

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Table with 2 columns: Name and Amount. Includes Frederick-street, Oak-road, Beech-road, G. Powell £1,077, T. Fry & Sons £959, Patent Victoria Stone Co. £623.

MORESEY.—For supplying water to Selly Banks, Moresby, Whitehaven, for Whitehaven Rural District Council. Mr. G. Boyd, C.E., 33, Queen-street, Whitehaven.—

T. Davidson, Parton, Whitehaven* £179

MORLEY.—For the formation of a reservoir at Texas Mills, for the Cotton Spinning Co., Ltd. Messrs. T. A. Buttery & S. B. Birds, architects, Queen-street, Morley.—

A. Mitchell, Royal Exchange, Leeds* 1950 10 8

NOTTINGHAM.—For pulling down premises and erecting a four-story factory. Messrs. Heazell & Sons, architects, Burton-buildings, Nottingham. Quantities by architects:—

H. Enoch, Nottingham* £3,955

NOTTINGHAM.—For house, Mapperley Park, Nottingham. Messrs. A. R. Colvert & W. R. Cleave, architects, 18, Low-pavement, Nottingham:—

G. Hopewell & Son* £1,380 [Lowest of eight tenders.]

PEMBERTON (LANCS).—For the erection of a Carnegie Library, for the Corporation. Messrs. J. B. & W. Thornley, architects, College-chambers, Wigan.—

W. France .. £4,525 0 0 Thompson & J. Dickinson .. 1,320 0 0 Briley .. £4,200 0 0 Waterworth & Bickerstaffe 4,263 0 0 D. A. Ablett 4,122 0 0 T. & H. Hough .. 4,224 0 0 Wigan* 4,013 0 0

POOLE.—For proposed store at Poole. Mr. F. Bath, architect and surveyor, Crown-chambers, Salisbury:—

J. McManus £2,325 0 0 Peirson & Co. 2,137 0 0 Hadley & Sons 2,132 0 0 F. Deacon & Son 2,109 0 0 A. & J. Main & Co., Ltd. 2,065 2 3 F. Smith & Co., Ltd. 2,049 0 0 E. F. Blakeley & Co. 1,998 0 0 Redpath, Brown & Co., Ltd. 1,991 0 0 E. Braby & Co. 1,889 13 5 H. Sampson & Sons 1,872 0 0 D. G. Somerville & Co. 1,853 0 0 G. Thompson & Co. 1,850 0 0 Jukes, Coulson, Stokes, & Co. 1,840 0 0 A. J. Colborne 1,830 18 0 W. G. Crane 1,835 0 0 Norton Bros. & Co. 1,800 0 0 Vincent & Follard. 1,886 12 0 Dorset Ironfoundry Co., Ltd. 1,868 0 0 F. W. Hesant & Co. 1,850 0 0 Burt & Vick 1,790 0 0 W. Glover & Sons 1,738 12 4 Kirk & Randall 1,720 0 0 Wire-wave Roofing Co. 1,672 0 0 Wood Bros., 93, Whyteville-road, Forest Gate, London, E. 1,400 0 0

RHIGOS.—For altering the Welsh Independent Chapel, for the Church Committee. Mr. T. Roderick, architect, Ashbrook House, Aberdare:—

J. M. Jones £880 0 0 D. Jones, Hirwain* 650 8

TOOTING BEC.—For the erection of two additional ward blocks, recreation-hall, and staff quarters at Tooting Bec Asylum, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief. Quantities by Messrs. Fowler & Huggan, 9, Adam-street, Adelphi, W.C.:—

J. Barker & Co., Ltd. £39,766 0 W. Moss & Sons, Ltd. 34,649 0 Wadson Bros. 34,050 0 R. Wilkins & Sons 38,844 0 H. Lovatt, Ltd. 34,030 0 Leslie & Co., Ltd. 37,373 0 J. & C. Bowyer 33,920 0 Cropley Bros., Ltd. 37,837 0 W. Johnson & Co., Ltd. 33,660 0 Stephens & Son, Ltd. 37,798 0 W. Lawrence & Sons 37,848 0 Son 33,484 0 Edwards & Medway 36,855 0 K. & E. Kirk & Randall 33,398 0 Perry Bros. 35,977 0 F. & H. F. Higgs 33,160 0 Perry & Co. 35,550 0 Ryevotham 32,727 0 Martin, Walls, & Co., Ltd. 35,190 0 G. E. Wallis & McCormick & Sons 35,158 0 Sons, Ltd. 32,230 0 Eowe & Co., Ltd. 31,900 0 Rowley Bros. 32,090 0 Fatman & Fotheringham, Ltd. 34,678 0 T. J. Hawkins & Co. 31,312 0 Galbraith Bros. 34,675 0 J. Garratt & Sons, Ltd. 34,633 0 83, Balham-hill, London, S.W. 31,295 0 Thomas & Edgo 31,590 0 S.W.* 29,300 0 J. Allen & Sons, Ltd. 34,500 0 E. J. Clayton; 29,300 0

* Withdrawn.

STRANRAER.—For water works, for the Town Council. Mr. Gilbert Thomson, C.E., 164, Bath-street, Glasgow:—

H. Hastie, Largs* £5,100

TYNEMOUTH.—For providing and laying 400 yds. lineal of 1 1/2 in. pipe sewer near Hartley Station, for the Rural District Council. Mr. A. S. Dinning, Surveyor, 21, Elision-place, Newcastle-on-Tyne:—

W. Carr £204 9 0

WATFORD.—For additions to and alterations of the Council offices, for the Urban District Council. Mr. D. Waterhouse, surveyor, 14, High-street, Watford:—

Chilford & Gough, Watford* £27 0 0

WATFORD.—For 400 lineal yds. of 9-in. stoneware pipe sewers and storm-water drain, King-street and Smith-street, for the Urban District Council. Mr. D. Waterhouse, Engineer and Surveyor:—

J. Frost & Sons 1766 13 6 1/2 P. Ray £548 0 0 G. Chesswas 693 9 7 H. Brown, Watbracy & Clark 650 0 0 ford* 396 0 0 Smith & Co. 615 0 0

WEST HAM.—For making-up streets—1-loop 1, Pretoria-road, Lady-smith-road, Mafeking-road, Group 2, Beckton-road, Brock-road, Chadwin-road, Chadwin-road East, Cranley-road, Denmark-street, Echnan-road, Saloman's-road, Selby-road, Group 3, Durban-road, Springfield-road, for the Corporation. Mr. J. G. Morley, Borough Engineer, Town Hall, West Ham:—

Table with 3 columns: Group 1, Group 2, Group 3. Rows include T. Adams, G. J. Anderson, F. & S. Sons, W. Griffiths & Son, D. T. Jackson, J. Jackson, Parsons & Parsons.

WOBRURN SANDS.—For proposed house, Woburn Sands, for Aspley Hill Estate. Mr. W. B. Stonebridge, architect, Woburn Sands:—

S. Foster £585 Gregory Bros* £500 A. J. Dawes 562 Corby & Son 490 * Subject to modifications reducing price.

WOBRURN SANDS.—For new offices, Station-road, Woburn Sands, Beds. Mr. W. B. Stonebridge, architect, Woburn Sands:—

Ayre & Son £255 0 0 Gregory Bros. £220 0 0 W. T. Sharpe 230 0 0 C. Sinfield 210 10

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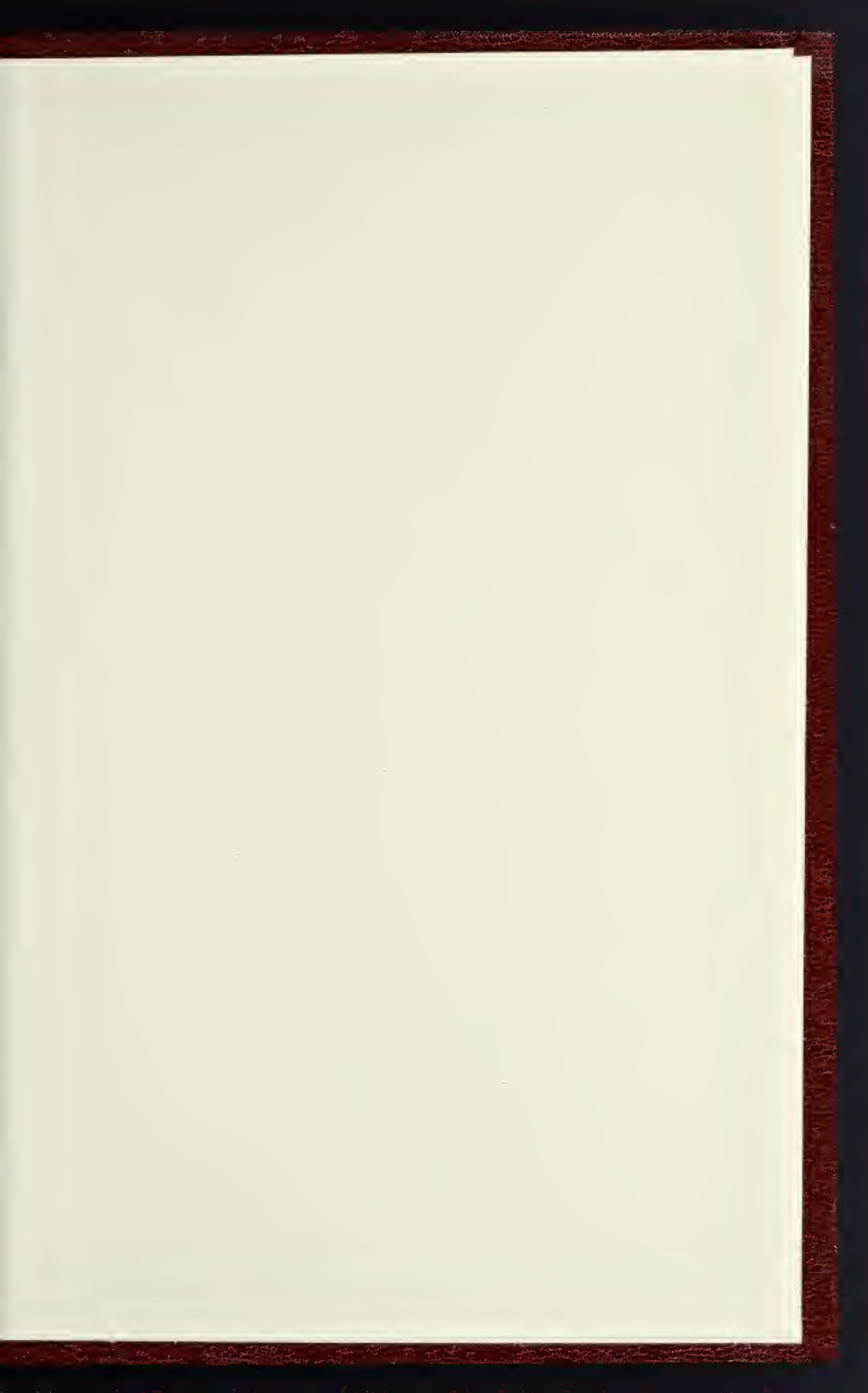
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